

Using an alternate reality game to teach information literacy

By Adam (AML) Jerrett

Submitted in fulfilment of the requirements of the degree

MIS (Multimedia)

*Department of Information Science
Faculty of Engineering, Built Environment and Information Technology
University of Pretoria*

*Supervisor: TJD Bothma
Co-Supervisor: K (JW) de Beer*

Date of Submission: April 2016

Declaration

I, Adam Jerrett, declare that the contents of the following dissertation are my own work in the fulfilment of requirements for the MIS (Multimedia) degree at the University of Pretoria. No work within this dissertation has been previously submitted in the fulfilment of requirements for other degrees, both at the University of Pretoria and other institutions.



Adam (AML) Jerrett

08/04/2016

Date

Abstract

This research aims to document the design, development and implementation of the *Nomad* alternate reality game for the purposes of teaching and exercising information literacy. Alternate reality games are unique games that are played by players in the real world, where players attempt to uncover an overarching narrative story throughout the play of the game. Twelve examples of such games are examined within the literature in order to discern the genre's suitability for educational purposes.

Game design theory literature was consulted to form the basis of *Nomad's* design, whilst also adhering to noted alternate reality game design principles from additional literature. Design of the game followed both agile processes as well as the spiral model of software development. A portion of this finalised design was developed and implemented as a pilot study, with various changes being made to the final design – the game proper – as a result. The pilot study and the game proper represent cases that are utilised within this study's research method, a case study.

Data on these cases was gathered through non-participant observation, interviews, questionnaires, document analysis and computer-generated log file analysis, using appropriate research instruments (the researcher-as-instrument, the players themselves, and the game websites and associated back-end technology for further analysis). Each case was separately subjected to constant comparative analysis in an attempt to discern the qualitative opinion of the players regarding the educational and entertainment value of both iterations of the game. An understanding of these qualitative conclusions aims to aid future educational alternate reality game designers with their work, as well as examine the use of alternate reality games within an educational context.

Keywords

Alternate reality games, education, entertainment, information literacy, skill teaching, skill exercise, game design theory, pilot study, empirical study, case studies, collaborative play, qualitative analysis

Acknowledgements

How does one eat an elephant? I have been told multiple times throughout this journey that the answer to this question is “one bite at a time”. Now that it seems my elephant has been devoured, it is necessary to thank all the people who helped cut it into bite-sized chunks.

Firstly, my sincerest thanks go to my family for their unending support. Hopefully questions like “When will you be done with your Master’s?” can now finally cease. Thanks also goes to my partner, Miss Nicola Head, who somehow managed to keep me sane through the majority of my elephant eating.

Thank you to everybody at the University of Pretoria’s Department of Information Science who have helped me on this journey. Each of you have helped in one way or another, and you are far too numerous to thank individually, though special thanks goes to Prof. Theo Bothma, Prof. Ina Fourie and Dr. Marlene Holmner for repeatedly guiding me on my way.

A huge thank you to all the members of both design teams for the *Nomad* alternate reality game, specifically: Mr. Jason de Andrade, Mrs. Annique Smith, Mr. Diffie Bosman, Mr. Ebbie Swart, Mr. Stefan Scheepers, Mr. Peter Briggs, Mr. Mitch Dart and Mr. Eduan Müller. Thank you even moreso to Mr. Devon Meerholz, Miss Erinn-Mae Schoemaker and Miss Ané Steenkamp, the actors who brought to life the game’s pivotal characters. Without all of you the game would not exist. Also, a further thank you here goes to the players who played *Nomad* – without you the game would not have come alive as it did.

Additionally, I would be remiss not to thank my direct colleagues and former lecturers from the Multimedia Department. Mr. Kosie Eloff and Mr. Willem-Jan Olwagen, thank you for being incredible lecturers and mentors in my first years as a lecturer and researcher. Mrs. Annique Smith, thank you for always being a door away when I needed to talk things through. Mrs. Isabel Silvis, thank you for beginning this journey with me and for being a friend throughout countless years of study. Mr. Diffie Bosman and Mr. Yan Wong, thank you for always being ridiculous and making me laugh on even the most difficult of days. Lastly, Mr. Nelis Franken, if it were not for your suggestion to create an alternate reality game to teach information literacy this dissertation would not exist.

Finally, thank you to Mr. Koos de Beer, for being a friend and mentor to both myself and the whole Multimedia department at the University of Pretoria. Your guidance has helped me grow as both an aficionado of alternate reality games and as a game studies researcher. Without you I would be Jon Snow – I would know nothing. Your guidance and friendship has been paramount to my completion of this journey, despite the countless times you have insisted that I was wrong.

I’m not wrong.

Contents

Declaration	i
Abstract	ii
Acknowledgements	iii
Lists of Figures and Tables	xi
List of Figures.....	xi
List of Tables.....	xv
1. Chapter 1 – Introduction	1
1.1 Introduction	1
1.2 Problem Statement.....	2
1.3 Statement of Intent.....	3
1.4 Significance of the Study.....	5
1.5 Aims and Objectives.....	5
1.5.1 Research Questions.....	6
1.6 Literature Overview	7
1.6.1 Educational Approaches to Game Design.....	8
1.6.2 Games in Education	8
1.6.3 Alternate Reality Games	9
1.6.4 Alternate Reality Games in Education	10
1.7 Research Design	11
1.7.1 Research Paradigm and Methodology.....	11
1.7.2 The Case Study Research Method	11
1.7.3 Development Methodologies	13
1.8 Assumptions, Limitations and Study Scope	13
1.8.1 Design Assumptions.....	14

1.8.2	Design Limitations.....	15
1.8.3	Empirical Study Scope.....	17
1.8.4	Ethical Considerations.....	18
1.9	Conclusion.....	19
2.	Chapter 2 – Literature Review	21
2.1	Introduction	21
2.2	Learning Theories and Games.....	21
2.2.1	Towards Self-Actualisation Through (Learning to) Play.....	21
2.2.2	Applying Learning Theories in Games.....	24
2.3	Game Design and Education	25
2.3.1	Games and the Creation of Contextual Learning Environments	26
2.3.2	Important Elements in Educational Game Design	32
2.4	Alternate Reality Games (ARGs)	46
2.4.1	Defining Alternate Reality Games.....	47
2.4.2	Important Components of Alternate Reality Games	54
2.5	Uses for Alternate Reality Games in Education	61
2.5.1	Alternate Reality Games as a Teaching Tool.....	61
2.5.2	Motivating Personalised Player Engagement	62
2.5.3	Guided Learning and the Role of the Protagonist-by-Proxy	64
2.5.4	Implicit Learning: The Unified Metaliteracies Framework	65
2.6	Educational Applications.....	67
2.6.1	Alternate Reality Games as Integrated Coursework.....	69
2.6.2	Alternate Reality Games as Behavioural Change Vehicles.....	79
2.6.3	Alternate Reality Games as External Learning Environments	86
2.6.4	Summary of Educational ARGs.....	93

2.7	Conclusion.....	95
3.	Chapter 3 – Methodologies.....	97
3.1	Introduction	97
3.2	Research Design.....	98
3.2.1	Research Paradigm and Methodology.....	98
3.2.2	Research Method.....	99
3.3	Development Methodologies	120
3.3.1	Agile Development Principles	120
3.3.2	Spiral Development.....	124
3.4	Conclusion.....	131
4.	Chapter 4 – Alternate Reality Game Design	132
4.1	Introduction	132
4.2	The <i>Nomad</i> ARG.....	133
4.2.1	A Note Regarding Game-related URLs and Figures	133
4.3	<i>Nomad</i> Pilot Study Design.....	134
4.3.1	Pilot Study Embedded Narrative Overview	134
4.3.2	Pilot Study Game Design.....	135
4.3.3	Discussion of Design Decisions	144
4.4	<i>Nomad</i> Full Empirical Study Design	148
4.4.1	Embedded Narrative Overview.....	148
4.4.2	Game Design	154
4.4.3	Discussion of Design Decisions	180
4.5	Teaching Information Literacy through <i>Nomad</i>	190
4.5.1	Live Event 1: Finding Alice.....	190
4.5.2	Primary Puzzle 1: Finding books, QR codes, and the Oxford English Dictionary	190

4.5.3	Secondary Puzzle 1: Understanding the Notes.....	193
4.5.4	Secondary Puzzle 2: ‘#thoughtsdream’ (Nomad pilot)	194
4.5.5	Secondary Puzzle 2: “I am a Messenger” (Nomad game proper).....	195
4.5.6	Live Event 2: Talking to The Nomad.....	195
4.5.7	Primary Puzzle 2: Physical Book Ciphers.....	196
4.5.8	Secondary Puzzle 3: More Notes	199
4.5.9	Secondary Puzzle 4: Riddles, Locations and Marked Pages.....	199
4.5.10	Live Event 3: Solving the “Marked Pages” Puzzle	199
4.5.11	Primary Puzzle 3: Scientific Riddles.....	200
4.5.12	Primary Puzzle 4: Completing the Research	201
4.5.13	Primary Puzzle 5: Traversing the Relevance Accordion Menu.....	203
4.5.14	Live Event 4: The Messenger’s Commendation.....	205
4.5.15	Primary Puzzle 6: Completing The Nomad’s Timeline	205
4.5.16	Primary Puzzle 7: Collaboratively Unlocking the Passphrase	206
4.5.17	Live Event 5: Rescuing The Nomad	206
4.5.18	Observer Puzzles	207
4.5.19	Miscellaneous Skills Learned During Nomad	209
4.5.20	Skill Acquisition Summary.....	209
4.6	Conclusion.....	212
5.	Nomad Pilot Study Implementation, Results and Analysis	213
5.1	Introduction	213
5.2	Pilot Study Implementation	213
5.2.1	The AIM viral video	215
5.2.2	The ‘Far From the Madding Crowd cipher’ puzzle.....	217
5.2.3	The ‘Who is’ riddle puzzle	219

5.2.4	The photo segments puzzle	221
5.2.5	New book lists in Far From the Madding Crowd	223
5.2.6	Pilot Study Diagram.....	225
5.3	Results and Analysis.....	227
5.3.1	Player Understanding of the Game.....	227
5.3.2	Player Community.....	232
5.3.1	Player Interpretations and Theories Regarding The Game.....	240
5.3.2	Player Participation	243
5.3.3	Game Effectiveness.....	252
5.3.4	Player Recommendations	259
5.4	Conclusion.....	264
6.	Nomad Game Proper Implementation, Results and Analysis	266
6.1	Introduction	266
6.2	Game Proper Implementation.....	266
6.2.1	The Observers in the class	267
6.2.2	The rabbit hole transmission repeated.....	267
6.2.3	Identifying community leaders	269
6.2.4	Scrambling binary strings.....	271
6.2.5	Reassembling the obstructed QR code.....	271
6.2.6	An escaped Subject	273
6.2.7	Activating and waking the beacons	274
6.2.8	Abandoning Mia.....	276
6.2.9	The “Instructions” node.....	276
6.2.10	Forcing the game forward.....	278
6.2.11	The new ending of the Nomad ARG.....	279

6.2.12	Game Proper Diagram	280
6.3	Results and Analysis.....	282
6.3.1	Player Understanding of the Game.....	282
6.3.2	Player Community.....	285
6.3.3	Player Interpretations and Theories Regarding The Game.....	291
6.3.4	Player Participation.....	294
6.3.5	Game Effectiveness.....	301
6.3.6	Player Recommendations	311
6.4	Conclusion.....	319
7.	Chapter 7 – Conclusion and Suggestions for Future Work.....	320
7.1	Introduction	320
7.2	Summary of the Study	321
7.3	Results of the Study	322
7.3.1	Summary of Empirical Study Results	323
7.3.2	Research Sub-questions.....	325
7.3.3	Main Research Question.....	329
7.4	Salient Issues within the ARG Genre.....	330
7.4.1	Replayability.....	330
7.4.2	Engaging the Audience.....	331
7.4.3	The Importance of the TINAG Aesthetic in Educational Applications	332
7.4.4	Effective Design and Maintenance Practices for Compelling, Small-Scale ARGs.....	333
7.5	Future Work.....	334
7.5.1	Contribution of the Study	334
7.5.2	Suggestions for Future Research	335
7.6	Conclusion.....	338

8. References	340
9. Appendices	358
9.1 Research Consent.....	358
9.1.1 Appendix A – Ethics Approval for the Study	358
9.1.2 Appendix B – Sample of Focus Group Consent Form	359
9.1.3 Appendix C – Sample of Name and Likeness Use Consent Form.....	360
9.2 Research Instruments	361
9.2.1 Appendix D – Electronic Questionnaire Used for Data Gathering.....	361
9.2.2 Appendix E – Active Player Focus Group Interview Schedule	364
9.2.3 Appendix F – Player-Observer Focus Group Interview Schedule	367
9.2.4 Appendix G – Observer Focus Group Interview Schedule	370
9.3 Game Assets.....	373
9.3.1 Appendix H – Ana Kirlitz’s Electronic AIM 121 Questionnaire.....	373

Lists of Figures and Tables

List of Figures

Figure 1: "Flow" Diagram (Csikszentmihalyi 1990:74).....	44
Figure 2: Stewart's (2006) Sphere of Chaotic Fiction.....	53
Figure 3: The Waterfall Model (Royce 1970:19).....	125
Figure 4: The Spiral Model for software development (Boehm 1995).....	126
Figure 5: A screenshot of Ana's research blog, stylised with University of Pretoria branding to look official.....	136
Figure 6: The "burn mark", created with coloured powder, outside the lab building	137
Figure 7: The symbol that represented the game: A clock with a book having its pages turned inside it. The symbol hinted at the importance of time in the narrative and the game's use of books for its puzzles.....	138
Figure 8: The original 'Midnight Chapters' hub website.....	139
Figure 9: The pages around the University of Pretoria campus	139
Figure 10: The symbol on the ground outside the library	140
Figure 11: The library slip in <i>Alice's Adventures in Wonderland</i>	141
Figure 12: An example of the messages left by The Nomad	142
Figure 13: A piece of the photo under the "nomad" entry.....	143
Figure 14: The game proper version of 'Midnight Chapters'	156
Figure 15: The "evidence wall" on 'Midnight Chapters'	156
Figure 16: The timer overlay on 'We Are The Messengers'	156
Figure 17: The new INL 110 ClickUP module banner.....	157
Figure 18: 'We Are The Messengers', the game's hub website. The home page contains a chat box, links to the forum, and the game's trademark node construct.....	159
Figure 19: The node information overlay of the first node, "I Am A Messenger"	159
Figure 20: The completed photo once all the QR codes had been scanned	160

Figure 21: An example Subject observation written by The Observers	160
Figure 22: The different avatar colours. Users with purple avatars completed this puzzle	161
Figure 23: A QR code and corresponding cipher set from this puzzle.....	163
Figure 24: A marked page. There is no indication as to which book it is from.....	164
Figure 25: A marked page from the puzzle now alluding to a book and page number	165
Figure 26: The Messenger's diary entry.....	166
Figure 27: The initial list within the expanding article list puzzle for Special Relativity. This list contains each article submitted by the players.....	168
Figure 28: An expansion of the menu structure upon clicking the first relevant article. The list of submitted articles is now reordered.....	168
Figure 29: The completely expanded puzzle	169
Figure 30: Partial images of the cassette tape location.....	170
Figure 31: The completed location photo.....	170
Figure 32: The completed timeline.....	171
Figure 33: Locations at which the QR codes were placed	172
Figure 34: The message revealed to the players	172
Figure 35: The Observer Organisation's Operating System install logs.....	173
Figure 36: The Observer organisation logo, present on game nodes and business cards	174
Figure 37: An open Observer node next to a locked one	174
Figure 38: The way audio logs were rewarded to the player: as an auto-play HTML 5 audio element in each Observer node.....	175
Figure 39: Examples of the ICAO Radiotelephony Alphabet used in HTML comments used throughout Observer storyline puzzles.....	175
Figure 40: An Observer's Subject file in a dossier.....	176
Figure 41: A frame of the provided video with part of the puzzle keyword.....	177
Figure 42: The prompt for the players to revisit the locations found in 4.4.2.1.20	179

Figure 43: One of two pieces of email correspondence included in the final digital dossier. It discusses The Messenger and The Nomad potentially being the same person, a large narrative reveal. 179

Figure 44: An email from the Head Observer discussing the circumstances under which Ana Kirlitz may be released from Observer custody. This narrative reveal explains Ana's absence from the majority of the game. 180

Figure 45: The Actors of *Nomad's* pilot study. From left to right: Ané Steenkamp (Ana Kirlitz), Renate van Heerden (herself), Devon Meerholz (The Nomad). Names and pictures are used with permission, and taken from game assets where possible..... 181

Figure 46: The Actor of *Nomad's* game proper. From left to right: Ané Steenkamp (Ana Kirlitz), Mia Schoemaker (herself), Devon Meerholz (The Nomad), Michael Jerrett (The Messenger). Again, all names and pictures are used with permission, and taken from game assets where possible. 183

Figure 47: The node structure on 'We Are The Messengers' 189

Figure 48: The node-like structure of the *Cloud Chamber* user interface (Investigate North 2014a)..... 189

Figure 49: Primary Puzzle 1's flow (within the pilot). "Primary" books (that continue the expansion of the puzzle) are coloured blue. 192

Figure 50: The results of searching for the '#thoughtsdream' hashtag..... 194

Figure 51: Solving "Black Beauty" in *The Jungle Book* (Kipling 1894) 196

Figure 52: The flow of primary puzzle 2. The path through the puzzle is coloured in blue. 198

Figure 53: A correct Harvard method reference within the puzzle and its subsequent appearance on the "reference list" below the input element..... 202

Figure 54: A sample list of relevant articles..... 203

Figure 55: An example of the path (in blue) for the accordion menu puzzle. This puzzle assumes that the only articles submitted are relevant articles, and as such they all appear on the list of relevant articles shown in Figure 54. 204

Figure 56: The screenshot of the date, time and location of live event 1, as captured from the viral video..... 216

Figure 57: The Messenger's riddle, asking players to recruit "those that need be taught" 218

Figure 58: The 'Far from the Madding Crowd cipher' as it first appeared 218

Figure 59: The 'Who is' riddle 219

Figure 60: A segment of the photo in <i>Lord Jim</i> (Conrad 1900).....	222
Figure 61: The half-completed photo of The Nomad, as compiled by a devoted player	223
Figure 62: A Diagram of the Pilot Study's Run	226
Figure 63: The number of potential sessions transferred from Ana's research blog to 'Midnight Chapters'	234
Figure 64: A player's riddle, addressing The Messenger	245
Figure 65: The Messenger's reply to the player's riddle.....	245
Figure 66: Text from <i>Alice's Adventures in Wonderland</i> posted by THE MASK	247
Figure 67: The message sent to the community's "leader"	270
Figure 68: A suspicious email, presumably sent by an unknown player	270
Figure 69: The pieces of the obstructed QR code.....	272
Figure 70: The reconstructed QR code	272
Figure 71: The unobscured QR code.....	272
Figure 72: The orphan page asking players to "activate" the beacons	273
Figure 73: The node alluding to the phone call	274
Figure 74: The "Instructions" red node.....	277
Figure 75: The Messenger's warning to the players	277
Figure 76: An example of the reference format followed in primary puzzle 4 (Bothma et al. 2014:141)	278
Figure 77: A diagram showing the run of the game proper	281
Figure 78: The Eye of Horus, also known as The Eye of Ra (The Hallway Museum 2015) and the Observer organisation symbol.....	293
Figure 79: Ethics clearance for the study.....	358
Figure 80: Consent form distributed within the focus groups during data gathering.....	359
Figure 81: A sample of the consent form completed by actors to include their names and photographs in this dissertation	360
Figure 82: The first section of the digital questionnaire.....	361

Figure 83: The second section of the electronic questionnaire.....	362
Figure 84: The final section of the electronic questionnaire	363
Figure 85: First section of the "active player" focus group interview schedule	364
Figure 86: Second section of the "active player" focus group interview schedule	365
Figure 87: Final section of the "active player" focus group interview schedule	366
Figure 88: First section of the "player-observer" focus group interview schedule	367
Figure 89: Second section of the "player-observer" focus group interview schedule	368
Figure 90: Final section of the "player-observer" focus group interview schedule	369
Figure 91: First section of the "observer" focus group interview schedule	370
Figure 92: Second section of the "observer" focus group interview schedule.....	371
Figure 93: Final section of the "observer" focus group interview schedule.....	372
Figure 94: The first section of Ana Kirlitz's in-game questionnaire	373
Figure 95: The second section of Ana Kirlitz's in-game questionnaire	374

List of Tables

Table 1: Research sub-questions and their proposed answering methods.....	7
Table 2: Constructivist instructional principles in games	28
Table 3: Characteristics of ARGs	51
Table 4: Qualities of Educational ARGs.....	93
Table 5: The implementation of Patton's (1987) observation framework	112
Table 6: Research instruments	116
Table 7: How <i>Nomad</i> 's development adhered to agile principles.....	121
Table 8: Considerations within the spiral model (Boehm 1995) as applied to the <i>Nomad</i> ARG.....	129
Table 9: <i>Nomad</i> Pilot Study Game Flow	135

Table 10: <i>Nomad</i> Game Proper game flow.....	155
Table 11: "Observer narrative" game flow in <i>Nomad's</i> game proper	173
Table 12: A separation of fields for a relevant article, in this case an example in the form of "Problems with causal loop diagrams" (Richardson 1986).....	202
Table 13: Skills learned or exercised during <i>Nomad</i> by category	210
Table 14: Shortcomings of the <i>Nomad</i> game pilot	255
Table 15: Narrative suggestions for <i>Nomad's</i> game proper	259
Table 16: Ludic suggestions for <i>Nomad's</i> game proper.....	261
Table 17: The beacon challenges	274
Table 18: Shortcomings in <i>Nomad's</i> game proper implementation.....	305
Table 19: Player suggestions for <i>Nomad</i> and other ARG narratives.....	311
Table 20: Ludic suggestions made by the players regarding <i>Nomad</i> and similar campus-based or educational ARGs	313
Table 21: Qualities of Educational ARGs (repeated from Table 4)	322
Table 22: Qualities of Educational ARGs, revised to include <i>Nomad</i>	334

1. Chapter 1 – Introduction

1.1 Introduction

The notion of practical, skill-based learning, or the teaching and exercising of specific skill sets through practical application, is becoming paramount to success in a 21st century society (Gee 2003). An old computer science adage overheard at a conference discusses the difference between theory and practice as indistinguishable in theory, but not in practice (Savitch 1994). This is due to the fact that theoretical components are often derived from a need to formalise the ideas behind the practical application of a trade. However, the practical application is often rapidly changing, which leads to discrepancies between theoretical and practical knowledge.

As such, the idea of “actionable” theoretical knowledge has become a key component of the creation and administration of an effective, “authentic learning” experience (Galarneau 2005). This necessity for a high level of practical prowess in increasingly technologically-enabled industries, regardless of the field, means that education systems must adapt to incorporate or move towards highly practical teaching strategies in order to produce 21st-century-literate graduates that can be assets to their respective industries (Binkley et al. 2012).

Engagement has been identified as a prominent barrier to learning (Whitton 2011). As such, research into engagement in an educational environment has garnered much recent interest in order to determine whether there is a correlation between engagement and the ease with which content is learnt (Galarneau 2005). Digital games have been examined as a way to stimulate this engagement with learning (Whitton 2011). However, the issue of “access”, or personal preference of an individual, must also be taken into account, as access itself is a barrier to engagement (Brown & Cairns 2004). Thus, there is the potential to use digital games to stimulate engagement with a learning experience. Meeting the additional criterion of “access” may help to pose a more engaging scenario for learners, and a better overall learning experience as a result.

This issue of engagement in learning can be approached from various perspectives. Some educational contexts attempt to address this issue through the educational philosophy of constructivism, formalised largely by Jean Piaget (Wadsworth 1996). Constructivism deals with the way in which learners internalise knowledge and reframe their mental models of a given subject to accommodate that new knowledge. Specific to constructivism, however, this knowledge is largely acquired through action. This is similar to the actionable knowledge called for in the creation of authentic learning environments (Galarneau 2005). Constructivism, thus, supports the idea of learning through practice.

Important to the philosophy of constructivism is the central idea that learners build their own learning experiences based on their own interests, environments and backgrounds (Wertsch 1985). This importance of personal context and its effect on individuals is a central idea not just in an educational

environment, but also in various studies of human psychology. This can be seen in Malcolm Gladwell's (1996) discussion of tipping points where the "power of context", or the effect an environment has on an individual, is one of the three "agents of change" he defines.

1.2 Problem Statement

At the University of Pretoria, in order to promote the teaching of core Information literacy competencies (Dunn 2002), compulsory credit-bearing information literacy modules are presented to all students who register at the university. Academic and Information Management (or AIM) is presented either as a single semester module (AIM 101) or over two semesters (AIM 111 and AIM 121). These modules cover all the theoretical aspects relevant to the acquisition and development of core information literacy competencies such as information relevance, information location, search strategies and information retrieval (de Boer, Bothma & du Toit 2011). The modules aim to help students better navigate the expanse of information made available to them by the university and its library. This skill set is thought to be invaluable, and is therefore focused on by the university as well as other academic institutions (Owusu-Ansah 2004; Badke 2005; Maybee 2006).

However, teaching this skill set within a traditional environment is often challenging due to the barriers of engagement and access as discussed earlier (see 1.1). One way to address these issues, as noted by Whitton (2011) is through the use of games.

The utilisation of games or similar structures within educational contexts is well researched, with various terms being given to each within an educational context. When discussing digital products one examines "serious games", or games made for an intention other than entertainment (Abt 1987). Other, more traditional games (such as board games or pen-and-paper-based games) can also be used for educational purposes (Jean 2013). These can also be classified as serious games, though are often simply noted as tools for "game-based learning", a term that often lacks formal definition, but was popularised by Prensky (2003).

Additionally, games need not be explicitly utilised in educational contexts. Instead, only the game elements need to be used. The process of overlaying game elements onto an existing structure or system is known as gamification. The process followed during this gamification is one of integration, where game mechanics and game design principles are integrated into non-game contexts for the purpose of making these contexts more engaging or successful (Muntean 2011).

The play of a game involves a player exploring a space of possibility constructed through the rules of the game itself (Salen & Zimmerman 2003:67; Bogost 2008:120). Within this space of possibility (or "possibility space"), all actions in the game take place, allowing meaning to emerge (Salen & Zimmerman 2003:67). The player has to accept the game's rules and its possibility space in order to

actively play the game. This is known as the “lusory attitude” (Suits 1978:34), a phenomenon discussed widely in game design (see Salen & Zimmerman 2003; Fullerton 2008; Koster 2013; Schell 2014). By accepting this lusory attitude, the player enters an environment whereby progression in the game is dictated by player action and a corresponding system outcome (Salen & Zimmerman 2003:34). This interplay between action and outcome, referred to in 2.3.1 as the “action > outcome” molecule, allows the player to explore the game which in turn increases the player’s understanding of the game system itself. As a result, the player learns the game and the system through the act of play. This suggests that games may be inherently constructivist by nature. This suggestion is discussed further in 2.3.1.2.

One of the challenges when teaching through games is that engagement needs to be fostered through both the content being taught as well as the media experience (Gee 2003). Students should engage with the content in order to learn what is needed from the educational experience, whilst being kept engaged by the entertainment experience as well (Gee 2003). Importantly, this combined experience should not simply alter the presentation of the teachable material, as this approach does not change the content’s non-game origins, but rather veils it with a thin layer of abstraction (Laurel 2001).

1.3 Statement of Intent

The challenge of creating a valid educational and entertaining experience can be tackled through the use of game design theory, whereby a designed experience can give students concrete reasons for completing tasks assigned to them for the purpose of learning. Game design theory is used due to an inherent interactivity in games that mirrors the interactivity of being taught practical skills in traditional environments, and could possibly be more valuable for skill-based learning than non-interactive media used for the same purpose (Siemens 2005).

It is for this reason that this dissertation presents the design and implementation of an alternate reality game, or ARG, that teaches and exercises information literacy competencies. The ARG is presented as a case study (Gerring 2004; Pickard 2013:101; Yin 2013).

An ARG can better achieve this over other games and gamified systems due to an inherent emphasis on collaboration and multiple forms of media (for communication, gameplay and narrative exposition), which drives the players to achieve game goals and advance in the game and the story (Kim, Allen & Lee 2008). This emphasis on collaboration and multimedia mirrors aspects of the traditional education system and, as a result, complements the existing system rather than replacing it (Zhang & Nunamaker 2003).

An ARG was also chosen in this regard due to the genre’s space of possibility – the real world (McGonigal 2003a). Player interaction within this space of possibility (reality) leads to a dynamic experience, with players and designers interacting with the game in real-time (McGonigal 2003a).

Within an ARG players can have a tangible effect on the course of the game world and its narrative (Stewart 2008). It is this dynamic nature that distinguishes ARGs from traditional or digital games.

This dynamic nature allows players to create a customised game experience through the process of play. This can be expanded in educational ARGs: this customised game experience also becomes a customised learning experience. This suggests that ARGs are suitable vehicles for a constructivist learning environment, and are thus suitable for this study.

Additionally, an ARG was chosen over a traditional game due to the scarcity of research within the field of both ARGs and educational ARGs. This dissertation later discusses a mere twelve educational ARGs due to lack of academic work on the subject (see 2.6). Transmedia storytelling, or, in the case of an ARG, a transmedia experience, is created through the dissemination of a single story across multiple digital media, such as games, films, television programmes and websites (Jenkins 2008:93–97). This exclusivity towards digital media, and the large scope of such multiplatform projects is a possible reason for this scarcity of research.

As noted, educational ARGs are scarcely discussed in the literature. ARGs that have been developed for educational purposes have seen positive, though niche, results. The general consensus on such applications is that ARGs, while valid and novel applications for teaching purposes, still need additional research and development (Whitton 2009a; Connolly, Stansfield & Hainey 2011; Bonsignore, Hansen, et al. 2012). Additionally, though practical frameworks do exist, such as the frameworks proposed from the ARGOSI (Alternate Reality Games for Orientation, Socialisation and Induction) project *ViolaQuest* (Whitton 2009a), the lack of a ARG-specific theoretical framework for their design means that ARG design is often guided by game design theory which, while extensive, may not always highlight subtleties that could be specific to ARG design.

The successful design of an educational ARG through game design theory helps to show both that the design of the ARG itself can be an enriching learning experience (de Beer & Holmner 2013) and that game design theory can be applied successfully in educational contexts through the successful run of the game (Squire 2005). As such, the design of an ARG for this purpose extends the work of De Beer and Holmner (2013).

This ARG, designed in order to address the issues of engagement and effective learning within Information literacy education, incorporates the skills and activities taught within the University of Pretoria's AIM modules. It was run over two months in a single semester by launching within a module external to the AIM modules, INL 110 (Introduction to Information Science).

Using a module that is separate from AIM was a decision taken in order to partially simulate an external environment in which to exercise the game's integrated skills. This aims to test skill transfer between the explicit learning environment and a simulated "authentic" one (Galarneau 2005).

The ARG ran parallel, albeit separately, from both the AIM and INL modules, whilst integrating the theoretical and practical aspects of the AIM coursework into the game puzzles. The game attempted to engage by borrowing aspects from virtual reality for teaching purposes. These are "spectacular nature", "autonomy of movement", "immediate effort/result satisfaction" and the "search for constant stimuli" (Frontera 2012). This approach attempted to enhance and individualise the acquisition and exercise of the core Information literacy competencies of relevant information location and multichannel information location by integrating these competency exercises into the game's narrative (story) and ludic (gameplay) contexts. This integration of the game and the learning outcomes of the AIM modules within the real-world possibility space created an "authentic learning experience" (Galarneau 2005).

1.4 Significance of the Study

The ARG, thus, aimed to be a practical application of a combination of both an "authentic learning experience" and an "authentic play experience", with both experiences designed as equally important in an attempt to show that both educational and entertainment value can be gleaned from such a product in equal measure. This approach is unique in that its design differs from both traditional "skill-and-drill" edutainment games (Fisch 2005) which focus on the educational experience, and commercial video games which often do not provide meaningful educational experiences, tangential or otherwise, in favour of creating the most entertaining experience possible (Portnow 2008). This study also presents an examination of the validity of running edutainment-based multimedia experiences in concurrency with traditional teaching methods in skills-based teaching environments. Its results help to determine the probable effectiveness of similarly designed implementations and studies by future potential researchers.

1.5 Aims and Objectives

The aim of this dissertation and the empirical study accompanying it is to provide both a theoretical and practical understanding of how alternate reality games and their play affect traditional educational environments.

On a theoretical level this dissertation hopes to better understand, in a real-world context, how explicitly designed games, rather than gamification techniques, can complement academic curricula. This dissertation focuses on the use of an alternate reality game over traditional or digital games for various reasons, the most important of which are: the necessity for collaboration (McGonigal 2008) and the ability for players to alter the game itself (Stewart 2008). These principles, while sometimes present

in more traditional structures, are inherent to ARGs, and can be used more effectively than in their traditional counterparts due to the genre's space of possibility: the real world (McGonigal 2003b).

The results of the accompanying empirical study can be seen as an examination of the validity of running edutainment-based multimedia experiences in concurrency with traditional teaching methods in order to examine the amount of skill-based learning and skill transfer within and between educational environments. The results of the empirical study, as well as the literature analysis, prove the validity of using game design principles in educational contexts. These conclusions may additionally help further prove the valid use of game design practices and implementations in educational contexts.

On a practical level, this dissertation documents the design, development and implementation of an alternate reality game for educational purposes. The goal of the empirical study was to teach and exercise the students' Information literacy skills without the same explicit awareness that may be present in a traditional education system or learning environment. This lack of awareness can then present opportunities for tangential learning to the players (Portnow 2008).

The veiling of Information literacy exercises as integral actions in an external system hopes to be more engaging than traditional skill exercise. Additionally, the design of the game as complementary to, but external from, any academic module taken for degree credit helps persist the illusion of the external system (the game) to the players, allowing for a more authentic acceptance of the lusory attitude — the acceptance of a game context, its rules and its limitations, in order for the game to be played (Suits 1978:34). This acceptance, along with the perceived value of in-game rewards (Kim, Allen & Lee 2008) hopes to create an "authentic play experience" (Galarneau 2005) in which players feel their play of the game can meaningfully affect the game world (Stewart 2008).

The completion of this empirical study took place at the University of Pretoria. The ARG was designed and implemented with the help of a student team registered for IMY 773 (Multimedia Technologies), as was done in previous years (de Beer & Holmner 2013). An initial game pilot, targeted at AIM 121 students, tested the game's overall viability at linking with information literacy outcomes. The game's full run (the "game proper") was then targeted at students registered for INL 110 both to afford closer control of the student group by both the design team and author, due to the co-operation of lecturers presenting the module, and to test the level of "authentic learning" experienced by players.

1.5.1 Research Questions

As this dissertation and the implementation of the accompanying empirical study draws upon multiple educational and game design philosophies to inform its design and development, the central question of this dissertation can be expressed as follows:

How can an Alternate Reality Game be developed so that it, through its design and implementation, creates an “authentic learning” environment that teaches and exercises Information literacy skills to the students who play it?

Sub-questions stemming from this central question are:

- Why is an Alternate Reality Game used as a case study instead of existing traditional gamification or game structures?
- How does the specific issue of engaging players in an Alternate Reality Game context differ from a traditional game context with regards to education?
- How is an Alternate Reality Game designed and implemented in order to promote skill-learning and skill-exercise?
- How and why did the desired and intended effects, or the measure of “success”, of the game on the players, differ in terms of skill-learning, skill-exercise and engagement?
- How do Alternate Reality games create a more effective, “authentic learning” environment for teaching Information literacy when compared to traditional teaching environments?

The table below details the manner in which these questions are planned to be answered:

Literature Review and Analysis	Empirical Study
Why use an ARG rather than existing structures?	What was the measure of “success” for the game in terms of skill-learning, skill-exercise and engagement?
How do you engage players in an educational ARG, instead of a traditional educational game?	How do ARGs foster an “authentic learning” environment more effectively than traditional methods?
How do you design and implement an educational ARG? (Theoretical approach)	How do you design and implement an educational ARG? (Empirical study development)

Table 1: Research sub-questions and their proposed answering methods

1.6 Literature Overview

The literature examined within this study primarily focuses on four domains: learning theories and their use in games, game design principles in educational contexts, alternate reality games and the use of alternate reality games in education.

1.6.1 Educational Approaches to Game Design

Educational approaches and the learning theories that govern them are fields that evolve and expand over time (Schunk 2011). Multiple learning theories exist, with each new theory often evolving, expanding upon or changing existing theories.

Those relevant to educational game design include constructivism, constructionism and situated cognition (Dondlinger 2007; Schunk 2011). Additionally, this dissertation examines behaviourist theories (Thorndike 1913; Watson & Rayner 1920; Schunk 2011:78) due to the use of conditioning in game design (Salen & Zimmerman 2003:344–345). Cognitive learning theories (Schunk 2011:278–279) and elaboration theory (Reigeluth & Carr-Chellman 2009) are examined due to their connection to the concept of situated cognition (Brown, Collins & Duguid 1989), which is additionally noted as useful in digital games (Dickey 2006; Halverson et al. 2006). Lastly, an examination of this dissertation’s chosen educational perspective, constructivism (Wadsworth 1996), is done due to its inherent application for learning in an authentic context within games (Gee 2003; Galarneau 2005; Dickey 2006; Bonsignore, Hansen, et al. 2012).

As such, it can be seen that games do not only apply a singular learning theory in their applications, but often combine multiple aspects of multiple theories in order to produce the desired player effect (Becker 2005). This combination aims to increase the learning done through games in the hopes that Maslow’s (1943) goal of self-actualisation is reached, giving meaning to both the act of learning and play.

The above multitude of learning theories are each briefly discussed later (see 2.2.1).

1.6.2 Games in Education

Educational game literature importantly distinguishes between educational games and edutainment games (Dondlinger 2007). Educational games traditionally house more interactivity than edutainment titles (Fisch 2005). This is because edutainment titles are often bound to a “skill-and-drill” format, whereby learning is done through repetition (Laurel 2001; Denis & Jouvelot 2005; Fisch 2005). As a result, educational games that are also entertaining are preferred to edutainment titles (Fisch 2005).

The creation of these entertaining educational games, as a result, should utilise game design theory during their development so that the game, whilst remaining educational, adheres to sound principles that ensure the game’s entertainment value, despite being an educational product. The application of game design theory includes the implementation of elements such as narrative plot, rewards systems, goals, strategy and the use of multiple forms of media within a game (Dondlinger 2007). These elements are necessary aspects of robust game design, as they are discussed by Salen and Zimmerman’s (2003) seminal game design text “Rules of Play: Game Design Fundamentals”. Additionally, Koster (2013), Schell

(2014) and Fullerton (2008) discuss similar elements. As such, these sources inform the game design theory pedagogy discussed in this dissertation.

Due to this dissertation's focus on an alternate reality game as a vehicle for learning purposes, the literature examined focuses on designing entertaining, educational games through the use of game design principles. In understanding how to best implement these principles, the literature defines various factors that need to be considered for effective educational video game design. These are narrative context, goals and rules, interactivity and, lastly, multisensory cues and motivation (Dondlinger 2007).

Examining these factors (as seen in 2.3.2) helped to inform the design and implementation of this dissertation's empirical study.

1.6.3 Alternate Reality Games

Defining alternate reality games is often difficult due to various factors, of which this dissertation focuses on two. The first of these is the newness and novelty of the genre itself (Whitton 2009a; Bonsignore, Hansen, et al. 2012); as the first definitive source on the genre, the International Game Developers' Association's Wiki and subsequent white paper on the topic, was first published in 2006. This source was informed by various successful ARGs, such as *The Beast*, *Chasing the Wish* and *Perplex City* (International Game Developers Association 2011), and as such is often used to help inform both alternate reality game research as well as design. The second factor that complicates definition is that of terminology and categorisation.

This dissertation seeks to provide a working definition for the term "alternate reality game" (seen in 2.4.1.2). While this dissertation's succinct definition may not be able to act as an umbrella term for all ARGs, it will help in better framing *Nomad* as an ARG based on certain characteristics. These characteristics include the use of the real world as a possibility space to integrate player reality and game world (McGonigal 2003b; Szulborski 2005; Martin & Chatfield 2006; Ornebring 2007; Bono & Breeze 2008; Dena 2008; Kim, Allen & Lee 2008; Stewart 2008; Gurzick et al. 2011), an interactive narrative that is fragmented across multiple forms of media (Unfiction 2002; McGonigal 2003b; Martin & Chatfield 2006; Ornebring 2007; Bono & Breeze 2008; Dena 2008; Kim, Allen & Lee 2008; Stewart 2008; Bonsignore, Hansen, et al. 2012; Chess & Booth 2013; Hansen et al. 2013), and the importance of collaboration within a community (Alternate Reality Gaming Network 2002; Unfiction 2002; McGonigal 2003b; Ornebring 2007; Bono & Breeze 2008; Dena 2008; Kim, Allen & Lee 2008; Stewart 2008; Gurzick et al. 2011; Bonsignore, Hansen, et al. 2012; Hakulinen 2013). Other important components within ARGs such as authenticity, immersion (McGonigal 2003a; McGonigal 2003b) and the importance of exploration within the narrative (McGonigal 2003b; Bono & Breeze 2008; Kim, Allen & Lee 2008; Stewart 2008; Chess & Booth 2013; Hansen et al. 2013) are also discussed.

1.6.4 Alternate Reality Games in Education

The literature regarding using alternate reality games for educational purposes concerns three primary streams: the design principles used in educational ARG development, the theoretical benefits of using ARGs for educational purposes; and the empirical results of designed games for that purpose.

Design principles and their theoretical benefits aided in the design of the empirical study. While ARGs are games, and thus can be designed using game design theory as a basis, the elements and characteristics unique to the genre as discussed above (see 1.6.3) distinguish them significantly from digital or traditional games. As a result, there are many benefits that ARGs possess within an educational context: notably that the design of an ARG is useful for teaching (Colvert 2009; de Beer & Holmner 2013), that ARGs facilitate guided learning (Bonsignore 2012; Bonsignore et al. 2013) and that ARGs implicitly exercise information literacy skills (Bonsignore, Hansen, et al. 2012). Furthermore, specific design principles guiding motivation and engagement have been created and adapted for ARG design (Davies, Krizova & Weiss 2006; Whitton 2009a).

Multiple alternate reality games have been developed for educational purposes, each often dealing with a specific subject and set of learning outcomes. Some were integrated into traditional coursework at their targeted institutions, such as *Skeleton Chase* (Johnston, Massey & Marker-Hoffman 2012) and *Finding Identity* (Fujimoto 2012). Others, similar to this dissertation, were developed to act as complementary to existing educational contexts, such as *ViolaQuest* (Whitton 2009a) and *Stop Toilworn Diamond* (Hakulinen 2013). Additionally, some commercial ARGs were designed with skill learning as the ultimate goal in mind. These include *World Without Oil* (Rusnak, Dobson & Boskic 2008) and *Urgent: Evoke* (Bonsignore, Hansen, et al. 2012), both of which were developed in part by Jane McGonigal, a game designer who strongly believes in the potential of games as teaching vehicles (McGonigal 2011). This dissertation will focus largely on the analysis of games in all three of these categories (integrated games, complementary games and commercial games). The review and analysis of these educational applications aimed to, along with the understanding of ARG-specific theoretical constructs, better inform the design of the empirical study.

A notable observation within the examination of educational applications is the questioning of a key feature in commercial ARGs: the adherence to the aesthetic of “this is not a game” (McGonigal 2003b). Whitton (2009) found that the aesthetic may not be as effective within educational institutions as designers cannot be certain of a shared knowledge base among such a large and diverse target group. This lack of adherence to “this is not a game” permeates most educational applications for this reason, suggesting that the aesthetic has evolved through application from a design principle to a design consideration for logistical reasons. The aesthetic and the importance of its use is discussed in 2.4.2.1.

1.7 Research Design

As noted previously, the empirical study in this dissertation is framed as a qualitative case study (Gerring 2004; Pickard 2013:101; Yin 2013). However, the design of the game itself does not follow a research methodology or method, but rather a development methodology.

1.7.1 Research Paradigm and Methodology

The research followed an interpretivist paradigm (Pickard 2013:11) that primarily focused on qualitative research, despite both qualitative and quantitative data being collected throughout the study. A mixed methods approach (Creswell & Tashakkori 2007) was discounted due to the qualitative approach to the case study framing and the data processing and analysis. As such, quantitative data gathered within the study was used primarily to support gathered qualitative data and to help infer conclusions in this regard.

1.7.2 The Case Study Research Method

In framing *Nomad* as a case study, a working definition for the study was put forth through the examination of case study literature including Yin (2013), Pickard (2013), Gerring (2004) and Case (2012). This definition suggests that *Nomad* is a singular phenomenon examined in a specific location during a specific period of time, and that its examination as a case study hopes to lead to a greater understanding of educational ARGs in other contexts.

This definition amalgamates the two empirical studies of *Nomad* (the pilot study and the game proper) into a singular phenomenon. This rejects the notion of a multiple-case case study in favour of an amalgamated single-case case study, as the benefits of multiple case design are not utilised within the study (Gerring 2004; Pickard 2013:108; Yin 2013:53–64).

1.7.2.1 Data Collection Techniques

Various data collection techniques were used in this study through the utilisation of research instruments discussed later (see 1.7.2.2). These techniques were non-participant observation (Patton 1987:81; Pickard 2013:229), document analysis (Pickard 2013:252–254), log file analysis (Pickard 2013:256), questionnaires (Pickard 2013:207) and focus groups (Stewart & Shamdasani 1990; Powell, Single & Lloyd 1996; Gorman et al. 2005).

The use of these five data collection techniques, and their comparison against each other, results in methodological triangulation (Denzin 1970:301).

1.7.2.2 *Research Instruments*

Research instruments used in this study include:

- The use of the researcher, the “human instrument” (Lincoln & Guba 1985:188) for observation and collection of data.
- The use of Google Analytics for the generation of log data for the games’ hub websites. This data includes: number of unique visitors, number of page views, session lengths and other qualitative data.
- Server log files and databases tracked select user activity such as: registration, logging in and out, puzzle completion and posts to the games’ forums.
- Player-created communication channels (such as additional forums and mobile instant messaging groups) were analysed as additional documents by the researcher.
- Physical and electronic questionnaires, as well as adequate completion materials (pens, pencils, printed questionnaires in the physical case, and access to an online questionnaire via a phone/tablet/computer in the latter case) were provided to willing participants.
- Semi-structured interviews were conducted with players through the creation of focus groups, where the focus groups themselves were guided by an interview schedule and recorded for later analysis.

1.7.2.3 *Intended Sample*

The game’s pilot study was targeted at first year students who were registered for the mandatory Academic Information Management courses at the University of Pretoria. In the case of the pilot, the specific targeted module was AIM 121. The selection of AIM 121 was due to its presentation in the second semester allowing for adequate design and development time to occur during the first semester as per the project timetable. Additionally, the selection of AIM 121 students as a target audience hoped to allow for an examination of the viability of the integration of AIM 121 learning outcomes within the design of the game itself. Due to the game pilot being launched from within AIM 121 lectures, despite the study being external from the module itself, it was hoped that the players within the target group would find the game content more familiar than if it were to be launched from within another module, as in the full implementation of the study. The pilot study involved the first two weeks of planned gameplay.

The full empirical study (the “game proper”) was targeted at first year students registered for Introduction to Information Science (INL 110). However, due to the nature and scope of alternate reality games as a genre, it could not be guaranteed that every student would play the game proper (Hakulinen 2013). This was a reasonable expectation, however, as previous studies such as *ViolaQuest* (Whitton 2009a) and *Stop Toilworn Diamond* (Hakulinen 2013), were seen to have much smaller player groups

than the size of their targeted audience. This is because some potential players may choose to ignore or simply not notice initial game interactions. It could also not be guaranteed, due to the nature of the alternate reality game genre, that students from outside the targeted undergraduate degree programs (BIS Information Science, BIS Multimedia and BIS Publishing) would be excluded from participation in the game proper.

1.7.2.4 Procedure for Data Processing and Analysis

All qualitative data gathered through the research instruments both during and after the game were subjected to constant comparative analysis (Strauss & Corbin 1998:67; Pickard 2013:269). Constant comparative analysis occurs through a multi-phased coding process, whereby themes and categories within the data set are gradually refined and linked to one another (Strauss & Corbin 1998:13). The phases of this coding process are open coding (where categories are defined for analysis) (Strauss & Corbin 1998:101–122), axial coding (where the relationships between categories are established) (Strauss & Corbin 1998:123–142) and selective coding (where an overarching category that contains the categories and subcategories from the other coding phases is defined) (Strauss & Corbin 1998:143).

The results from this coding process are then analysed and documented in the form of case study reports (Pickard 2013:108; Yin 2013:164–191) for both the pilot study and the game proper.

1.7.3 Development Methodologies

As noted in 1.7, this study separates its research methodology from its development methodologies. Due to *Nomad*'s existence as an ARG, and, thus, a game, it was decided that development methodologies utilised in game design and software development would be suitable to guide the design of the empirical study.

As such, the study followed the spiral development methodology (Boehm 1995). It also integrated agile development principles into the spiral model to encourage rapid iteration time and flexible designs throughout the design period (Beck et al. 2001).

In following these development methodologies and principles, the design of the empirical study was continuously iterated upon and expanded throughout the pilot and the redesign of the game proper. This culminated in a polished final product in the form of the implemented game proper.

1.8 Assumptions, Limitations and Study Scope

As with all research, the design and run of an alternate reality game within a closed environment (in this case, the University of Pretoria) has natural constraints. These constraints were somewhat heightened

by the suggestions from the literature that alternate reality games, despite their context, are novel and niche experiences (Whitton 2009a; Bonsignore, Hansen, et al. 2012; Hakulinen 2013). This conclusion lead to various assumptions that were made in order to delimit the scope of this study.

1.8.1 Design Assumptions

As alternate reality games, by nature of their design and possibility space, can grow exponentially both during the initial design phases as well as during the running of the game itself the following assumptions were made. As mentioned, these assumptions delimit the scope of the study by limiting the scope of the game itself.

Most importantly, it was assumed that the players would play the game. This links closely with a point made multiple times in the literature: if players do not play the game, the game does not progress (Kim, Allen & Lee 2008). It was also assumed that during play, players adhered to the lusory attitude (Suits 1978:34); as not doing so may dilute the gameplay experience for others (Salen & Zimmerman 2003). Players should also be intrinsically motivated during gameplay through their enjoyment of game activities and game narrative, as this helps the game progress, as well as allowing the game to alter itself based on player action. However, it was not assumed that any of the players had participated in ARGs or similar transmedia experiences prior to their participation in the game, as few ARGs have been run in South Africa, barring previous efforts at the University of Pretoria on which this study extended (de Beer & Holmner 2013).

It was assumed that the player group, at least in part, was formed out of students from the noted intended sample — that is, either AIM 121 students (in the pilot study) or INL 110 students (in the game proper) registered at the University of Pretoria. This is, as previously mentioned, a design decision made relating to the logistics of the empirical study. This assumption caused some limitations to the game's overall design, but was outweighed by the advantages it presents, such as the ability to have dedicated channels and target spaces. Additionally, it was assumed that any physical play in a real-world space would occur on the University of Pretoria's Hatfield campus in order to demarcate physical game boundaries.

Assumptions were also made regarding the time frames in which players would play the game. It was assumed that at least some players, though not all, would play the game from start to finish (the initial rabbit hole to the last live event). This could not be guaranteed as, due to an ARG's wider possibility space and less explicit rule set compared to other genres, players may start and stop playing at any point during the game's run. Additionally, this start-to-finish time frame, due to the design of the empirical study, had to occur during very specific portions of the academic semester so as not to conflict with the academic responsibilities of its players, such as test and examination periods. It was thus assumed that players would not play in these periods, nor would they actively play during University recesses or public holidays, unless given specific motivation to do so.

Due to the educational nature of the game, further assumptions could be made with regards to content. Firstly, basic assumptions of access could be made, such as player access to computers or various other media needed to participate in the game. Where players did not necessarily have this access initially, access was provided through gameplay. The same can be said of specific skill sets necessary for objective completion: where it could not be assumed within the design, it was taught within the game context. An example of this is the inclusion of Beale ciphers (Kruh 1982) in the game's design — had players not figured out the cipher, a game character would have taught them how to do so. However, certain information literacy skills and skill sets were assumed, such as being able to operate social media platforms, communicate in online and real-world contexts and navigate websites.

Despite these assumptions for skill teaching and exercise, it was important that, regardless of the level of teaching built into the game's design, game activities did not deviate too much from the learning outcomes the game veils through play. In the case of the empirical study, it was assumed that game activities are largely concerned with information literacy-based activities and contexts, as well as closely related fields, and not those of a completely unrelated field.

Assumptions specific to the intrinsic play of alternate reality games were also considered. Firstly, the game proper's design assumes that it would only be played once in the current context of the empirical study — that is, the game proper would not be rerun for another similar group (such as in the presentation of subsequent INL 110 modules) without significant alterations. While some ARGs, such as *World Without Oil*, are designed to be explicitly replayed by other player groups (Rusnak, Dobson & Boskic 2008), and the question of replayability is considered important for educational ARG applications (Hakulinen 2013; Hansen et al. 2013), the empirical study was designed as a complete experience, and as such it was assumed that it would not be replayed. It was assumed that the likelihood of a potential player participating in both game iterations was low.

Lastly, it was assumed that the “collective detective” aesthetic would be adhered to by the players (McGonigal 2008). This assumes that players will collaborate for problem solving purposes to reach game objectives. Additionally, it was assumed that players would want to discover the story through their own explorations of the possibility space, as collective exploration and problem solving across multiple platforms is an inherent part of ARG play.

1.8.2 Design Limitations

The scope of this research project and its accompanying dissertation forms the basis of many design limitations for the project. However, some design limitations discussed below stem from the nature of alternate reality games as a genre.

An important limitation in regards to this study was that of resource availability and cost. Promotional ARGs are built as transmedia marketing campaigns for specific products. This can be seen with *The Beast*

(an ARG promoting the film Artificial Intelligence), *I Love Bees* (to promote Halo 2) and *Year Zero* (to promote the Nine Inch Nails album of the same name) (International Game Developers Association 2011). These promotional ARGs differ from other grassroots or educational applications often by nature of their scope — being more interactive and, importantly, having external funding.

The lack of explicit external funding for this research project meant that fewer resources were available to the team during design, and that, of the resources available, most were self-funded. The knowledge of this limitation guided the game design in some aspects, but did not detract from the quality of the designed experience. However, it must be noted that had the project had external funding, as well as specific resources or platforms having been available to the design team during development, the game's "spectacular nature" (Frontera 2012) could have been expanded. This is an important aspect in the creation of virtual (or in this case, alternate) realities (Frontera 2012).

The specificity of the target audience, though designed, also caused some limitations. In terms of design, this meant that a lot of interactions needed to be built and targeted towards INL 110 (and, in the pilot study, AIM 121) students, to the possible exclusion of students outside of the module who wished to play the game. This limitation was mitigated in design by keeping most of the game activities accessible to all potential players, with only specific game events explicitly targeting the target audience. Additionally, as noted by Whitton (2009), educational applications may encounter difficulty in assuming shared knowledge bases and characteristics of their specific target audience. This limitation was mitigated in part due to the study's specificity of targeting, but it remains impossible to understand every potential characteristic possessed by members of the target audience. Based on the assumption above, that not all or none of the players had participated in transmedia or similar experiences prior to the game's run, it should be noted that the unfamiliarity of players to the ARG genre could also be a limitation on its design, and that the game's design, both in ludic and narrative contexts, should accommodate players who are new to the genre.

Access of players to specific technologies also needed to be taken into account in this regard. As mentioned earlier, where players did not have intrinsic access to technologies for gameplay purposes, the game had to adequately provide these technologies. This links both to the limitation of resources as well as the target audience's inherent accessibility to technologies. It was not feasible to develop assets that required technologies that could not be easily provided to the players, such as specific mobile operating systems. As such, these considerations became limitations on asset development and specific platform use.

Additionally, whilst ARGs traditionally have a large real-world possibility space due to their digital nature (McGonigal 2003b), the scope of real-world play in the ARG described in this dissertation was limited to the University of Pretoria Hatfield campus. This was done for player and designer convenience, as well as to suggest to the players, despite the aesthetic of "this is not a game", some legitimacy regarding the game having some affiliation with the University of Pretoria. This suggestion, though never explicitly

stated, may have lent some additional meaning to the act of playing the game to some players. However, this decision limited real-world events to the Hatfield campus alone, which may have lessened the “spectacular nature” of the game when compared to the possible use of external locations.

The student-oriented timetable that guided the game’s run was also a considerable limitation on the study’s scope. Due to the necessity for the game to run to completion for players to experience the narrative’s entirety, players needed to play fairly actively to advance the story at a reasonable pace. The notion of player activity and time thus became crucial factors in determining various measures of success for the study, as the study necessitated qualitative accounts of what the players perceived to be a completed game.

Lastly, the crucial limitation to the success of the ARG was one shared with the genre as a whole — the ARG’s scope, play and success relied largely on the players themselves. This consideration and subsequent limitation is inherent in all games, but is prominent in ARGs, where explicit player involvement directly drives the narrative context (Kim, Allen & Lee 2008). As such, whilst this was not a direct limitation of the study, it had some bearing on the overall measure of success of the study. As such, this was seen as a core consideration throughout both the preparatory research and the design of the game itself.

1.8.3 Empirical Study Scope

The scope of the empirical study and the accompanying research presented in this dissertation can be described as a case study of the design, development, implementation and run of an educational alternate reality game. This case study is contextualised by an understanding of other documented educational alternate reality games throughout the literature. This understanding guides the game’s design.

The empirical study was aided in its design by two small teams of students as part of the IMY 773 (Multimedia Technologies) module presented at the University of Pretoria, with one team aiding design of the pilot study, and the other the design of the game proper. Both iterations of the game design, including asset creation, were self-funded by the researcher and the design teams.

The empirical study took place at the University of Pretoria. This includes all real-world activities performed by players for gameplay purposes. The pilot study targeted students registered for AIM 121 (Academic Information Management) in an attempt to better correlate game activities and learning outcomes, while the game proper targets INL 110 (Introduction to Information Science) students for participation in the study, as this sample allows for less logistical considerations. Participation by both intended sample groups could not be guaranteed.

The pilot study consisted of a small portion of the game proper's content, which was then redesigned where necessary and reused within the game proper. The game proper ran in the semester subsequent to the pilot study's completion. In both instances, the study made use of platforms and technologies accessible to members of the intended sample groups or provided them with access to these through gameplay where necessary.

Data not gathered through log files, game hub websites or observation occurred at the completion of both the pilot study and the game proper through focus group interviews and questionnaires. This data collection attempted to discern qualitative data regarding player opinions about the game iterations. The data was then analysed, supported by quantitative data provided by the game's hub websites, in order to draw conclusions about the study.

Conclusions regarding the study hope to be applicable both to future educational and grass-roots alternate reality games. However, it must be noted that case-specific findings may not be easily generalised due to the nature of ARGs as niche applications (Whitton 2009a; Bonsignore, Hansen, et al. 2012); as well as aspects of the study's scope, such as its location, intended sample and time frame. Regardless, the empirical study hopes to prove a successful educational application of an alternate reality game that can be used as a case in, or as a basis for, future research.

1.8.4 Ethical Considerations

University of Pretoria regulations and guidelines as per the Code of Ethics for Research were followed for the duration of the study (University of Pretoria 2014a). As such, all relevant ethical clearances were sought and approved, both from the Department of Information Science's internal research committee, as well as the Faculty of Engineering, Built Environment and Information Technology's committee for research ethics and integrity (University of Pretoria 2014b). Gathering of qualitative data for both the pilot study and the game proper only occurred once clearance from these committees had been granted.

There are many principles with regards to ethical considerations in qualitative research, and clear standards often differ from perspective to perspective or from case to case (Lichtman 2012). Ethical principles important to this study include those of privacy and anonymity, confidentiality, informed consent and the "do not harm" principle (Lichtman 2012).

It must be noted that while participants may not have been aware of their play of the alternate reality game as part of a research study during play, they were informed thereof at its completion. The decision to have participants be unaware of their involvement in the study from the outset is one that helped preserve the aesthetic of "this is not a game" (McGonigal 2003b).

At the game's conclusion, only willing participants were polled to help inform the study's conclusions through focus group interviews and questionnaire completion, as noted in the study's research design. Names, student numbers and any other personal information obtained from the participants in the study were not used for any purpose other than to associate the participants with the needed data for both quantitative and quantitative analysis. Participation through the game's hub websites, though tracked, was entirely anonymous, as the online handles used by students were not referenced in the study. Any information gathered for the study or this dissertation was only used once provided with a signed consent form from the participant. In addition to this, confidentiality was ensured within the focus group interviews and questionnaires, with responses only informing study results. These results are published in this dissertation and may be used in conference papers or journal articles that report on specific aspects of this study. All raw data collected from these qualitative interactions has been stored on password-protected storage and will be kept for a minimum of fifteen years to ensure study validity.

Lastly, "do not harm" was adhered to as there were no safety implications for participants during the empirical study.

1.9 Conclusion

This dissertation documents the design, development, implementation and run of an educational alternate reality game within a tertiary education setting. Key topics of discussion include that of engagement in alternate reality games specific to educational applications, the creation of "authentic learning environments" that pair skill learning and exercise with authentic contexts, benefits of alternate reality games for educational purposes not present in traditional structures, how educational alternate reality games are designed, and the measure of success the specific application documented in this dissertation achieved from a qualitative perspective.

In discussing these topics, the research may also contribute to the understanding of related considerations within the field of alternate reality game research and design. These include discussions regarding the aesthetic of "this is not a game", the replayability of ARGs both in commercial and educational contexts, and challenges to ARG design that are informed by their implementations in the local context of a South African tertiary education institution.

The fulfilment of aims and objectives set forth by the study's research questions hopes to answer some of the questions posed by Bonsignore et al. (2012) regarding ARGs. These include the effectiveness of relevant small-scale ARGs given limited resources and scope to provide experiences of similar enjoyment when compared to large-scale applications and how to design ARGs for learning scenarios without "destroying the fun". Bonsignore et al. (2012) thus concern themselves with how educational applications can best be implemented, as opposed to whether such applications are possible. This

question correlates directly with the study's main research question, and as such, aims to be answered through this dissertation.

The following chapters address the aims set forth within this chapter. Chapter 2 details the literature review of study, which builds the theoretical framework of the study. Chapter 3 details the study's research methodology. Chapter 4 discusses the design of both the pilot study and the game proper. Chapter 5 and Chapter 6 detail the implementation, run, results and analysis of both the pilot study and the game proper, respectively. Finally, Chapter 7 concludes the study by answering the research questions. Chapter 7 additionally provides suggestions for future research to potential ARG designers.

2. Chapter 2 – Literature Review

2.1 Introduction

This literature review is separated into five distinct sections. The first two of these sections describe the context necessary to best design educational games. This is done by first examining learning theories and then examining elements in games, based on game design theory, that help fulfil the goals of these learning theories. Next, a definition of alternate reality games as a genre for the purpose of this study is presented. Once this is understood, potential uses of alternate reality games in educational contexts are examined. Finally, a thorough examination of various applications of educational alternate reality games is undertaken.

The purpose of this review is to provide a comprehensive theoretical context that facilitates an understanding of how alternate reality games can be designed to support skill exercise acquisition and exercise. A sectioned approach best creates this context. This context is then used to examine example applications within the educational ARG genre which directly inform the design decisions of the empirical study itself.

2.2 Learning Theories and Games

The following sections examine various learning theories and educational perspectives, as well as how they apply to games.

2.2.1 *Towards Self-Actualisation Through (Learning to) Play*

Humanist and motivational learning theories suggest that the learning process forms part of the human goal of self-actualisation (Maslow 1943). Self-actualisation and learning can also occur during the flow state, which can occur during the play of games (Csikszentmihalyi 1990:67).

It can be argued that this flow state can also be achieved through the application of various learning theories that intend to increase motivation and engagement with the learning material. As games also intend to engage and motivate their players to invest in the game's narrative and ludic (gameplay-related) contexts, it is valuable to discuss various learning theories that are frequently used in games. This examination can then help to define how games can teach effectively.

Behaviourist theory consists mostly of conditioning approaches (such as classical or operant conditioning, discussed below), whereby behaviour is defined by responses to external stimuli and that learners can be trained to respond to these stimuli (Schunk 2011:78–102). The most basic of these

approaches is known as classical conditioning, a technique popularised by Ivan Pavlov (Schunk 2011:78). Conditioning can often be seen as associative learning – where learning takes place through an understanding of cause (learner action) and effect (learning outcome) (Thorndike 1913:4; Schunk 2011:76). In his famous experiments, Pavlov trained dogs to salivate at the sound of a bell after noticing they would often salivate in the presence of the handler who would feed them, regardless of the presence of food (Schunk 2011:78; McSweeney & Murphy 2014). A similar study was later attempted by John Watson who attempted to induce musophobia in a small child by pairing the presence of a rat with an unpleasant noise (Watson & Rayner 1920). The latter study proved the susceptibility of humans to classical conditioning.

Though, in the case of Watson and Rayner's (1920) research, conditioning may be considered ethically questionable, the process of operant conditioning, a method that evolved from classical conditioning, is still used in games when considering reward and punishment schedules (Skinner 1938; Skinner & Ferster 1957; Salen & Zimmerman 2003:345). This conditioning method positively rewards correct behaviour, and either punishes or simply does not reward incorrect behaviour (Skinner 1938). This is known as positive and negative reinforcement and links closely to the reward schedules often found in games, with research often dedicated to the practice of operant conditioning in game design (Hopson 2001; Salen & Zimmerman 2003:344–345). However, compared to classical conditioning that triggers an involuntary response, operant conditioning incentivises behaviour based on outcomes (Schunk 2011:91). This outcomes-based approach allows the subject of the conditioning more agency, where agency is the ability of the subject to be autonomous, or merely to choose their own actions (King 2008:100). Autonomy, paired with the reward and punishment schedules in operant conditioning, can thus be used as an exploratory teaching tool.

Cognitive learning theories, such as elaboration theory (Reigeluth & Carr-Chellman 2009) and Gagne's (1970) learning conditions, concern themselves not with the behaviour of individuals and the learning that leads to the alteration thereof, but rather on how to effectively improve cognition so that learning can occur. These theories describe how observation of a system or task aids cognition, and how these systems or tasks can be structured to correctly stimulate learning (Schunk 2011:278–279). In games, cognitive learning theories are applied within the game's task and system structure. The game system must be structured in such a way that progression through the game allows players to progressively learn about the game as well.

Elaboration theory supports cognitive learning by suggesting that tasks should be ordered from simplest to most complex in order to facilitate a learning curve that aids cognition (Reigeluth & Carr-Chellman 2009). This learning curve can be seen in games through the implementation of a difficulty curve, where tasks are often ordered in such a way that the challenge level of the game scales with the skill level of the player (as they spend more time with the game and learn more about the system). This difficulty ratio relates to the "flow" state (Csikszentmihalyi 1990:67).

Additionally, the presence of a learning or difficulty curve allows for agency in the progression of learning, with the player allowed to scope and sequence learning outcomes as they see fit. This increases motivation. Games allow for this through their use of interactivity, a core component in games (Salen & Zimmerman 2003:58–69). The presence of interactivity allows for players to be autonomous as they explore the game system (Salen & Zimmerman 2003:65). As noted previously, this autonomy is “agency”. It can be argued, then, that play, defined as “free movement within [a game’s] rigid structure” (Salen & Zimmerman 2003:311), allows for an inherent autonomy, as “free movement” provides that agency. Each game moment, even in the absence of explicit choice, presents smaller, micro-level choices to the player which presents them with agency (Salen & Zimmerman 2003:65).

This integrates with the concept of situated cognition. Situated cognition suggests that knowledge should not be separated from its necessary context, as this is how skills and knowledge are best learnt (Brown, Collins & Duguid 1989). In games, this suggests that what learning players do within the game is contextual to that specific game system. However, this presents a unique opportunity for games to provide players with an authentic context wherein knowledge learnt in-game is transferrable to an outside context. This is useful for skill teaching and exercise (Halverson et al. 2006). Additionally, this authentic context may allow for more effective skill teaching and exercise opportunities than can be provided by traditional contexts (Dickey 2006). As such, the allowance for agency in these situated cognition environments through designed learning experiences may result in an authentic, contextual understanding of both the completed tasks and the learning environment.

Constructivist theories aptly describe the learning path through situated cognition environments, as learners construct new knowledge based on the integration of new knowledge with previous knowledge and contexts (Wadsworth 1996). Research argues that games inherently adhere to these constructivist principles as the play of any game is an active learning experience within the system (Gee 2003; Galarneau 2005; Dickey 2006). As players play a game, they plot their own path through the game, and thus access the learning experiences these games provide.

Multi-literacy teaching in traditional environments is also inherently constructivist, as 21st century learners need to contextualise new knowledge from various types of sources based on their existing contexts in an increasingly globalised world (Cazden et al. 1996). With these multi-literacies inherently practised in games (Gee 2003), including alternate reality games (Bonsignore, Hansen, et al. 2012), it can be seen that constructivist principles will be used extensively in both the development and analysis of this dissertation’s empirical study.

Lastly, the model of experiential learning suggests that the learning that facilitates goal reaching is best done through the contextualisation of experience (Kolb 1984). This is done through concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Kolb 1984). Experiential learning, in this case, is inherently practiced in games through a game’s use of goals in structuring a play experience (Fullerton 2008:313; Juul 2010).

The above discussion of these learning theories suggest the effectiveness for games as teaching tools, due to the large number of learning theories inherent in the design and play of games. Games utilise cognitive learning theories to design experiences that can be explored through constructivist techniques, should the player be motivated through both behaviourist conditioning theories and motivational learning techniques as well as given the agency to do so. In this way, games allow players to reach goals, as goals are an important element in games (Fullerton 2008:313; Juul 2010). Learning how to reach these goals and subsequently reaching them can thus be linked to self-actualisation, which is, in itself, a human goal (Maslow 1943). Games inspire players to learn, and that learning results in self-actualisation.

2.2.2 Applying Learning Theories in Games

Applying each of the above learning theories, each with a multitude of literature surrounding their development and continued use, can be daunting, especially when, as mentioned, games are often designed with the goals of these theories in mind (Becker 2005). As such, an application of Gagne's (1970) nine events of instruction as applied to games can form a useful basis for the empirical study's design (Becker 2005). These events, as they are applied to games by Becker (2005) are as follows:

- "Gaining attention": This event initially attracts players to the game, often by introducing them to an essential narrative plot or game mechanic that they will be interacting with. Additionally, this event entices players to begin playing.
- "Informing learners of the objective": Here, some sort of narrative or ludic exposition gives context to the player's goal. It informs them why they are playing.
- "Stimulating recall of prior learning": The game provides a frame of reference, either narratively or through its ludic construction (for example, by adhering to expectations of a game's genre by utilising similar in-genre conventions), to the players that suggests how they should progress by drawing upon prior understanding.
- "Presenting the stimulus": Once the game has been sufficiently contextualised for the players both narratively and ludically, they are presented with the game world, and given the agency to interact within it.
- "Providing learning guidance": This links strongly to the inherently constructivist nature of games. The system should, in a self-contained manner, teach the player to play by guiding them to the completion of basic game interactions.
- "Eliciting performance": Here, the player acts upon the agency given to them by the system. This performance encapsulates the core interactivity of the game.
- "Providing feedback": Player feedback is crucial to providing meaningful play, where player actions are "discernible and integrated" into the game itself (Salen & Zimmerman 2003:34). Feedback shows players the results of their actions. Without adequate feedback, players are unaware of their progression towards their goal within the larger system.

- “Assessing performance”: It can be argued that feedback in games provides immediate assessment, though this is not always provided through a quantitative measure of a score or leaderboard. The successful completion of tasks within a game implies a positive assessment.
- “Enhancing retention and transfer”: Within the context of a single game, later game mechanics are often variations of initial mechanics, encouraging players to adjust their approach to new mechanics and puzzles as they are presented by applying existing knowledge, thus encouraging skill transfer. Within the context of multiple games or entire genres, expectations of the genre can allow for similar skill transfer through an application and understanding of genre-specific conventions.

These events can be seen as iterative when applied to multiple game sections of the same product; and can be applied to any game genre, including alternate reality games, thus providing a useful framework for educational game design.

2.3 Game Design and Education

While it is difficult to strictly define what constitutes effective educational game design and how designers can achieve this, it is agreed that successful applications result in learning (Farrell & Moffat 2014). Additionally, educational game design tends to forgo traditional “skill-and-drill” formats present in edutainment titles in favour of integrating learning into the game’s context (Fisch 2005). “Skill-and-drill” formats here refer to the process of learning through repetition (Fisch 2005). This process is common in traditional edutainment titles that often simply veil the learning process by making it initially appear more enjoyable through the use of appealing aesthetics, but are functionally identical to traditional learning practices (Laurel 2001; Fisch 2005; Klopfer 2008:24). Instead, Fisch (2005) posits that learning should be intrinsically integrated into the entirety of the game context: learning should be automatic.

This differentiation is important as it defines a stricter pedagogical approach that potential designers should follow when considering potential education applications: one of game design theory. As such, this approach is followed during the design of this dissertation’s empirical study. While the pedagogy is based on existing work – specifically that of Salen and Zimmerman (2003), Koster (2013) and Schell (2014). Some of the design is still driven by intuition, as is often the case in game design (Farrell & Moffat 2014).

The pedagogy examines these three sources extensively in order to present a comparative analysis between them. This comparative analysis helps develop the pedagogy due to the radically different approach of the three sources. Salen and Zimmerman (2003) present a formalised approach to game design, discussing game elements and game design principles in a large degree of detail. As such, this source is widely referenced in subsequent seminal game design texts, such as Fullerton (2008), whose

pedagogy largely mirrors Salen and Zimmerman's, Koster (2013) and Schell (2014). The latter two of these sources are used within this dissertation for the aforementioned comparative analysis. Schell's (2014) work presents an expanding pedagogy that takes his audience through the process of game design from start to finish. As such, this work is also an effective pedagogical approach to examine. Schell (2014) also focuses on designing games for the optimal player experience. This "player experience" perspective is largely absent from the more formal pedagogies of Salen and Zimmerman (2003) and Fullerton (2008). Koster (2013) expands upon this perspective, but presents a much less structured formal pedagogy than Schell (2014), Salen and Zimmerman (2003) or Fullerton (2008). Whilst Koster (2013) does discuss formal elements of game design, presenting various theoretical elements that inform his "theory of fun", this source is the least formal of the examined sources. As such, Koster's (2003) work presents interesting considerations during design that may not be present in other sources because of this unique approach.

In the interest of scope, it is best to define specific elements of game design that are important to education and discuss these elements with the aforementioned pedagogical approach, leaving decisions of intuition to be informed by the researcher's understanding of this pedagogy as well as experience gained from individual, later-examined, examples within the field (see 2.6). The examined elements are those of narrative context, goals and rules, interactivity, multisensoriality, engagement and motivation (Dondlinger 2007).

2.3.1 Games and the Creation of Contextual Learning Environments

The following section discusses the creation of contextual "authentic learning environments" as proposed by Galarneau (2005).

2.3.1.1 Learning Environments as Formal, Experiential and Cultural Systems

Constructivism can be simplified into three primary tenants that enable learning to take place (Savery & Duffy 2001):

- Understanding results from interactions within an environment.
- Having problems to solve within that environment stimulates learning, determines what is learnt and determines how the learnt information is organised.
- Knowledge is the result of a social process whereby a comparison of multiple individual accounts of understanding further inform the environment and the understanding thereof.

With regards to games this environment that acts as a context for problem solving and social information dissemination is the game itself.

It is at this point that each primary tenet can be linked to a particular framing of the concept of a game as noted by Salen and Zimmerman (2003:105):

- An interaction with the environment, in the first case, presents a framing of a game as a formal (closed) system wherein players perform game actions, delineated by rules, in order to evoke a response from the system (Salen & Zimmerman 2003:102; Fullerton 2008:43). This core interaction is described by Salen and Zimmerman (2003:34) as an “action > outcome” molecule. Fullerton similarly describes these core interactions as the procedures players partake in during play (Fullerton 2008:29). These interactions within a game environment, along with the permanence of change it brings to the environment (thus, integrating the molecule’s results into the game system) results in meaningful play (Salen & Zimmerman 2003:34). Meaningful play, by its integrated and discernable nature, inherently fosters understanding (Salen & Zimmerman 2003:34).
- The ability to solve problems within that environment, while formal by design, is in practice an experiential and experimental activity (Fullerton 2008:91). This allows the activity to be classified as part of an experiential (open or closed) system. Problem solving encourages free movement (various, disparate attempts to solve the problem) within a rigid structure (the problem itself), paralleling with Salen and Zimmerman’s (2003:304) definition of “play” and notions regarding the experimental nature of play (Fullerton 2008:91). This suggests that play stimulates learning. The free movement within a rigid structure of a game environment would also determine the nature and organisation of what was learnt.
- The social participation in the construction of knowledge arises from this play when individual accounts are shared (Savery & Duffy 2001). In this framing, the learning environment (and, indeed, the game itself) is framed as a cultural (open) system (Salen & Zimmerman 2003:99). It must be noted that this participatory construction of knowledge is an action performed outside of the formal or experiential boundaries of the learning environment itself. This necessitates participation both inside and outside the learning environment for knowledge to be transferred.

It can be seen, then, that a game mirrors a successful context learning environment and thus can be considered as one, provided the right educational context is set.

2.3.1.2 Constructivist Instructional Principles and the effects of the Magic Circle

Similarly, Savery and Duffy (2001) proceed to set out instructional principles based on constructivism. These principles aid in the delineation of boundaries for a constructivist learning environment, similar to the boundaries that exist in games through their framing as rules, play or culture as per Salen and Zimmerman (2003). As such, it is possible to evaluate the effectiveness of games as learning environments by evaluating Savery and Duffy’s (2001) instructional framework in relation to a game’s “magic circle”.

The “magic circle” of a game is the space in which, when framed as “rules” or “play”, the game is played (Salen & Zimmerman 2003:94–99; Fullerton 2008:32). When a player enters into the magic circle, they are playing the game. This assumes they abide by the game’s rule structures, even if it means players act purposefully inefficiently in order to achieve the game’s goals (Suits 1978:34).

The magic circle frames game actions as contextual to either the systemic or experiential outcomes of those actions. Additionally, framing games as culture allows one to analyse the way in which the magic circle interacts with external contexts (Salen & Zimmerman 2003:307). Discussing a game within these framings, then, represents a discussion of the game in its totality: this includes its systems, player experiences and the culture that forms around those experiences. Because of this, a discussion of the magic circle and its effects on culture is the most complete way to present a comparison to effective learning environments in this study.

Savery and Duffy’s instructional principles (2001), and how they are met with regards to a game’s magic circle (Salen & Zimmerman 2003:94–99; Fullerton 2008:32) are shown below:

Table 2: Constructivist instructional principles in games

Instructional principle	How games achieve this
<p>“Anchor all learning activities to a larger task or problem” (Savery & Duffy 2001:3)</p>	<p>The larger task that is being worked towards is that game’s goals (Fullerton 2008:313; Schell 2014:148). The outcome of the game (whether the learning has taken place) can be judged based on how these goals have been reached (Salen & Zimmerman 2003:258). All actions within the game influence the game world, where on a macro- or micro-level, and thus the learning tied to these actions are in turn tied to the game’s goals.</p>
<p>“Support the learners in developing ownership for the overall problem or task” (Savery & Duffy 2001:3)</p>	<p>Task ownership can be provided to the player in multiple ways, but is often achieved through the player control of a character, avatar or protagonist (Salen & Zimmerman 2003:454; Lee 2006; Bonsignore 2012). During play, the player completes tasks assigned to them either by the game system or by themselves (Fullerton</p>

	<p>2008:314). The ability for players to exercise their agency results in them implicitly taking ownership for their actions. In turn, ownership of player action translates to an ownership of the larger task and it is their own actions that affect that task.</p>
<p>“Design an authentic task” (Savery & Duffy 2001:4)</p>	<p>The property of task authenticity in games relates directly to its ability to be completed within the game’s possibility space – the space in which the player executes all game actions, explores the game world and sees the results of their interactions (Salen & Zimmerman 2003:67; Bogost 2008:120). Any task that is able to be completed whilst abiding by the rules that govern the game world can be considered authentic because the completion of the task is given context within the magic circle. As such, as long as all game goals can be quantified within the system, all tasks with the system are authentic.</p>
<p>“Design the task and the learning environment to reflect the complexity of the environment they should be able to function in at the end of learning” (Savery & Duffy 2001:5)</p>	<p>This principle suggests that a game’s internal context (its rules and the narratives that guide its play) must have external meaning. This is inherently true when considering games as cultural systems – the game’s rules and its play have an effect on its cultural framing (Salen & Zimmerman 2003:513). The degree to which this principle is met in games depends on the amount of external meaning the magic circle engenders when framing the game as a cultural system. In scenarios where the game world exists with rules similar to the world inhabited by the players, rules of the game world can often be inferred by players; as can the consequences of performing game actions within the similarly-structured player world. In these scenarios there is a near-direct relationship of in-game actions and similar</p>

	<p>player-world actions, which directly maps the learning within the game and player worlds.</p>
<p>“Give the learner ownership of the process used to develop a solution” (Savery & Duffy 2001:5)</p>	<p>Process ownership is inherent in games because of the autonomy (King 2008:100) they exhibit during the process of play. It is the players themselves who develop a solution, even if that solution is enacted by an avatar that they control within the game world.</p>
<p>“Design the learning environment to support and challenge the learner’s thinking” (Savery & Duffy 2001:5)</p>	<p>All games contain conflict, whether direct or indirect (Salen & Zimmerman 2003:50; Fullerton 2008:34). This conflict often arises from the players competing against the game system itself in order to reach the game’s macro- and micro-level goals (Schell 2014:179). This competition promotes challenge, and the inclusion of challenge, especially when matched to player skill, promotes the presence of the flow state (Csikszentmihalyi 1990). Well-designed games should adequately support the completion engendered by this inherent conflict through their design.</p>
<p>“Encourage testing ideas against alternative views and alternative contexts” (Savery & Duffy 2001:6)</p>	<p>Koster (2013:41) argues that games become boring once the problem they pose is mastered. Systems with a limited amount of actions and outcomes cannot continue to engender meaningful play once players cannot exercise meaningful choice. Meaningful choice results where a choice made by the player is discernably and correctly, within the context of the game environment, responded to by the system (Salen & Zimmerman 2003:61). When considering the exercising of meaningful choice by the player, it is important that a game does not provide a consistently optimal choice to the player (an action that is the most optimal action at any</p>

	<p>given point during play). It can be argued that meaningful choices cease to exist once this action is found, at which point meaningful play also collapses (Salen & Zimmerman 2003:241). Players simply repeat this optimal action, and cease to make choices within the system (Salen & Zimmerman 2003:241). As such, while players are still searching for this potentially optimal strategy, they must actively be testing ideas (moving freely and playing) within the possibility space to achieve the sought-after mastery Koster (2013:41) mentions.</p>
<p>“Provide opportunity for and support reflection on both the content learned and the learning process” (Savery & Duffy 2001:6)</p>	<p>This principle is only applied to games when they are viewed as a cultural system. When reflecting on a game within this framing, players regard the game as a cultural text (Salen & Zimmerman 2003:513), from which interpretations can be made regarding the contextual experiences, even outside of a game’s rules or its play, the game itself provides.</p>

2.3.1.3 *Serious Games and the Theory of Fun*

Inevitably, discussions regarding games for educational instruction becoming confused with the catch-all term “the serious game”. However, this concept is often vaguely described, and where definition is found, it is widely disputed (Susi, Johannesson & Backlund 2007; Breuer & Bente 2010). Early definition of the term notes the necessity for a pedagogical purpose, whilst maintaining that this purpose is the primary objective of a serious game. The primary purpose of a serious game is not amusement (Abt 1987:9). Michael and Chen’s (2005:17) later definition agrees with Abt (1987:9): serious games are games where education is valued above entertainment. “Fun” is not the primary purpose. Serious games exist to educate, inform and train.

It is only in Zyda’s (2005) later definition where entertainment is described as an equally important purpose of serious games. Like Abt (1987) and Michael and Chen (2005) before him, Zyda (2005) stresses the need for pedagogy as an outcome of serious games. However, Zyda (2005) mentions that entertainment with the game system results in the pedagogy.

The approach of learning as the outcome of a “fun” game forms much of the basis of Koster’s (2013) “theory of fun”, a theory upon which this dissertation’s empirical study, as well as much of this literature review, is based. Koster (2013:39–43) suggests the opposite of Abt (1987) and Michael and Chen (2005). He argues that fun results from the exercising of one’s brain; and because games exercise one’s brain, games should be thusly considered to be fun (Koster 2013:39–43). However, the fun from games arise out of the process of their mastery; once the game is mastered, it becomes boring (Koster 2013:39–43).

To engender this mastery, games teach their players about the game system by presenting them with a possibility space (which exists as a model, however abstract, of some reality) and teaching them the rules of that possibility space. In any scenario where some aspect of the game system’s rules can be mapped onto the player reality, concepts taught within the game are expected to map to the player reality. In this framing, games provide practice for real life challenges, teaching its players concepts such as exploration, spatial relationships, aiming, timing and power dynamics (Koster 2013:4). While all of these concepts may not be directly applicable, depending on the game, to the player’s immediate external context, learning still occurs in the pursuit of mastery. As noted above, the pursuit of mastery elicits fun. In this way, Koster (2013) equates learning to fun.

Thus, when considering Koster’s (2013) “theory of fun” for game design, stricter definitions of the “serious game” phenomenon as provided by Abt (1987), and Michael and Chen (2005), no longer seem as definitive. A core component of a designed game experience is that of player pleasure, as discussed later (see 2.3.2.5); and thus it seems narrow-minded to undervalue the pursuit of “fun” for the sake of education should the two be able to co-exist or even foster one another, as Koster (2013) and Zyda (2005) believe the case to be.

2.3.2 Important Elements in Educational Game Design

The following section discusses the elements considered important in educational game design by Dondlinger (2007).

2.3.2.1 Games and Narrative

Narrative is an important element in all video games (Frasca 2003; Fullerton 2008:100–101). It can be argued that any game contains a narrative, whether it be embedded or emergent (Salen & Zimmerman 2003:383). Embedded narrative is a game’s explicitly designed plot: it is passive and exists prior to player interaction with the system. It must be noted that due to the interactivity inherent in games, player interaction is often required to progress the embedded narrative, but never explicitly alters it as, even during moments where player choice can influence the embedded narrative, the results of those choices are embedded into the narrative prior to player interaction.

Emergent narrative, by comparison, arises from the player's interaction with the possibility space (Salen & Zimmerman 2003:383). A player's placement within the game world at any point in a game requires them to make moment-to-moment micro-level choices that have an effect on the game world's immediate context. These player actions and system outcomes form their own, often unpredictable, narrative experiences based on each player choice and the results thereof. Each of these micro-narratives can, in turn, combine to create a larger narrative of how the player played at any given point within their play experience. In one instance, player choice may have led to the player avatar being killed and the player needing to repeat an in-game battle, but in another, the player's skill and previous knowledge may have rewarded him/her with an unbridled victory. Emergent narrative is, thus, the "story of play".

Koster (2013:166) argues the importance of a game's embedded narrative (he calls it the game's "fiction"), despite its existence as an element that could simply provide additional context to the overall experience. A game's embedded narrative dictates the overall player experience, regardless of the game's mechanics. This, in turn, affects the game's emergent narrative as player experience may affect how players engage in the act of play. To illustrate this point, Koster (2013:171) presents two games: one is a "game of mass murder where [one throws] victims down a well and they stand on each other to try to climb out"; the other is Tetris. Both games have identical mechanics: pieces fall into a game space, and it is up to the players to position them correctly so no piece overflows the game board. If the board overflows, the player loses. In the former case, however, the overflow may represent a player's victim escaping and alerting the authorities. This provides a much more realistic, oftentimes more visceral, narrative context, which changes the way in which the experience is framed.

Koster (2013:153) uses the argument that game fiction alters player experience to support the validity of games as an artistic medium, stating that narrative context helps fulfil his definition of art: "the point at which something becomes subject to interpretation". This necessity for interpretation parallels to constructivist instructional principles, most notably the opportunity and support for reflection within the learning environment (Savery & Duffy 2001).

Schell (2014:296–316) also discusses the ability for either embedded or emergent narratives in games to aid in the construction of player meaning. Like Koster, Schell's (2014:51) approach to game design focuses on the overall player experience provided by the game itself, and thus believes that narrative constructs serve as an integral part of this experience: "story" is one of four basic elements that a game consists of.

Schell (2014:298–300) further theorises that game narrative often focuses on being either a "string of pearls" or a "story machine". Schell's (2014:299) "string of pearls" is a largely linear experience: pearls are predetermined narrative events, and the string represents the moments of player interaction that occur between the pearls. This experience is similar to the linear narratives found in passive media, such as books and films, and can be likened to Salen and Zimmerman's embedded narrative (2003:383), as

this experience is created during the game's design. Schell's (2014:299–300) "story machine", conversely, frames game actions as their own stories. In this framing, each "action > outcome" molecule generates micro-narratives of varying interest to the player (Schell 2014:296–316). Because these micro-narratives are based on player interaction with the system, and thus can be considered the "story of play", Schell's "story machine" can be likened to Salen and Zimmerman's (2003:383) emergent narrative. The search for a combination between these two disparate styles of narrative delivery is currently fruitless, Schell (2014:298) argues, due to various problems.

These problems often deal with the logistics of interactive narrative and the amount of player agency that can be taken into consideration during design. The less one considers the effect of player action on a game's narrative context, the more linear it becomes, and the more one considers agency. However, the larger the narrative scope becomes, the more difficult it becomes to provide an equally satisfying player experience across all branches of the embedded and emergent narratives, as both narratives still need to be designed within a game's possibility space (Schell 2014:296–316). An understanding of these problems, then, despite a lack of concrete solutions, is essential to the design of a good narrative context that can facilitate learning.

Three-dimensional environments are often the possibility space for these game narratives, as they were found to be conducive to the contextualisation of learning (Dickey 2006). As such, the narrative context for educational learning environments that incorporate emergent and embedded narratives should be tightly coupled to the necessary learning outcomes — that is, the skill teaching and exercise should be contextualised and feel integrated into the game world (Fisch 2005). Because of this, a game's narrative context should present a "magic circle" wherein skill learning and exercise are natural progressions of the narrative and ludic outcomes of the game itself. This successfully promotes learning, both within the game itself and as transferrable skills in similar external contexts.

2.3.2.2 *Games, Goals and Rules*

Goals are an inherent part of games as systems of artificial conflict (Fullerton 2008:313; Juul 2010). During outcome evaluation in games, goals can either be classified as met or not met (Salen & Zimmerman 2003:258). This suggests that goals are tightly coupled to a game's outcome. Game goals are also linked to the game's structure as a formal system: players are guided towards goals by the rules of the game system (Schell 2014:179). Thus, goals link both to game rules and game outcomes. When examining this statement, it can be seen that these links suggest much about Salen and Zimmerman's (2003:80) very definition of a game itself: "a game is a system whereby players engage in artificial conflict, defined by rules, that results in a quantifiable outcome". Goals are thusly inherent in games.

Schell (2014:178) also notes the integral nature of goals in games, as goals, or a sequence of them, help achieve the game's objective: "games are about achieving goals". It is of the utmost importance that

players understand these goals so that their actions are given context and purpose. Understanding a game's goal allows a player to visualise the achievement of that goal. If a player can visualise the goal, they will be provided with the motivation to reach that goal and will become engaged with the means of doing so. As such, Schell (2014:179) describe good goals as follows:

- Goals are concrete and universally known to the player.
- Goals are achievable by the player, despite the challenge that achieving them may pose. Unattainable goals are undesirable.
- Goals are rewarding on various levels. When coupled with challenge, simple goal achievement can be seen as inherently rewarding, though the addition of rewards can heighten the pleasure obtained from this achievement. However, the process of goal achievement should be rewarding in itself in order to foster player motivation to strive for this achievement to begin with. This inherent reward for goal achievement is described as autotelic play (Csikszentmihalyi 1990:67). Rewards external to mere goal achievement are discussed later (see 2.3.2.5).

While Koster (2013) does not formalise the nature of game goals within game systems, his discussion of the nature of games inherently discusses their influence. Koster (2013:36) frames a game as a puzzle that its players are compelled to solve through play, due to a natural human aptitude for pattern-matching. Games are clearly designed as formal systems, and thus present clear exercises for the human brain until the presented game problem is solved (Koster 2013:36). If the act of solving a presented game problem results in an outcome, it can be inferred that game goals have been met during outcome evaluation (Salen & Zimmerman 2003:258). This in turn suggests that the achievement of game goals is integral to Koster's (2013:36) classification of a game itself. Additionally, Koster (2013:40) argues that the act of solving the presented problems in games results in fun.

Fun, in Koster's (2013:40) framing, is an external goal that all games should achieve through their design. This implicit desire for games to be fun is echoed by Fullerton (2008:36). Fun arises from mastery and comprehension of the game system, which Koster (2013:40) directly relates to learning. While a player still experiences a game as "fun", they are engaging in the process of learning.

Thus, if game goals are integral to a player's pursuit of mastery, their attempt at achieving these goals inherently results in learning. As long as there are goals, players will learn about the game system in order to achieve those goals. This suggests an inherent coupling between a successful understanding of a game's overall context, and the successful achievement of game goals.

Because of this, a game's goals and the rules that make these goals achievable should properly inform the learning experience (Dondlinger 2007). In applications where this property is met it can be suggested that where the goals and rules of an educational game are linked to integrated skill learning

or skill exercise activities, mastery of the game system by way of its goals may imply mastery of the skills being exercised or taught.

2.3.2.3 *Games and Interactivity*

To say that interactivity within a game system is the property that differentiates it from other traditional entertainment media such as books or film, is a broad statement. Indeed, all media can likely be considered interactive on some level (Salen & Zimmerman 2003:58). In this case, the act of turning a book's page or closing one's eyes out of fear during a film could be considered interactions with those traditional media. However, Salen and Zimmerman (2003:58) argue that allowance for these broader understandings of interactivity diminish its use in solving design problems in game design.

As such, interactivity as discussed in this dissertation equates to Salen and Zimmerman's (2003:60) formal framing of "explicit interactivity" as "participation with designed choices". When examining the choices that create this interactivity, Salen and Zimmerman (2003:61) differentiate between micro- and macro-level choices. Micro-level choices represent moment-to-moment interactivity within the game system, whereas macro-level choices represent larger chains of micro-level choices that inform the larger player experience (Salen & Zimmerman 2003:61). Micro-level choices are inherently bound to the "action > outcome" molecules that can be seen as fundamental to a game's inherent interactivity. In this way, provided the "action > outcome" molecules are discernible and integrated into the game system, the system will also contain meaningful choice (Salen & Zimmerman 2003:61). The necessity of meaningful choice in games was discussed earlier (see 2.3.1.2).

The notion of important and meaningful choices is also discussed by Fullerton (2008:318–323). The process of decision-making as a player within a game should be an interesting one (Fullerton 2008:320). Choice should result in consequence for the player, and as such present them with dilemmas. In a dilemma, players must carefully weigh up the options and consequences of each choice and how that affects the game world (Fullerton 2008:320). These choices vary in scale: some are "inconsequential" (which is not a "meaningful choice"), some are "minor" (having small impact), "necessary" (having indirect impact), or "important" (having direct, immediate impact) (Fullerton 2008:319). Others still are "critical", having life or death consequences for the player (Fullerton 2008:319). As such, these levels of choice presented by Fullerton (2008) represent a spectrum of "meaningful choices" presented to the player by a game.

Meaningful choice, and the interactivity that leads to it, eponymously leads to the creation of meaning by the player (Salen & Zimmerman 2003:62). This meaning is emergent from its derived context (Salen & Zimmerman 2003:366), and is implicitly tied to the player experience.

The effect of interactivity on the player experience is the focus of both Koster's (2013) and Schell's (2014) work. Schell's (2014:51) discussion of interactivity occurs in his discussion of mechanics: one of the four elements in his tetrad that comprise a game. One of Schell's (2014:170) mechanics is that of "actions". Actions can either be basic or strategic. Basic actions simply articulate any designed interactivity within the game's possibility space, whereas strategic actions are defined as more meaningful: they are basic actions performed in the pursuit of goal achievement (Schell 2014:170). It is in this discussion of action where Schell (2014:171) discusses the penchant for games to provide their players with "game verbs". Game verbs describe the basic actions of the game that can, through player interaction, result in meaningful, strategic actions (Schell 2014:171). An example of a transformation from a basic action to a strategic action is how the game verb "jumping" can become "jumping across the game level's platforms to reach the end of the level" through the player application of this basic action in pursuit of a game goal (Schell 2014:171).

As such, Schell (2014:171) implores that the use of actions and interactivity within a game system lead to emergence. The higher the ratio of strategic actions to basic actions a game contains, the more emergent the system is. Schell's (2014:171) request for emergence relates to Salen and Zimmerman's (2003:366) discussion of meaning-making. This relation suggests that if meaning is emergent, games should support emergence so that the meaning that informs the player experience can be engendered.

Koster (2013:64) also notes the proficiency of games to provide the player with game verbs due to their inherent interactivity. However, this interactivity means little when simply tied to a formal game system (Koster 2013:166). Meaning is not inherent within the formal game system; it is inherent within the context of the system (Koster 2013:166). As such, Koster (2013:64) agrees with Salen, Zimmerman and Schell: interactivity needs to engender meaning-making in its experience to provide value that may not be provided by more traditional media such as literature. He does note, however, that games as a "compound medium" have the potential for this, as they include a large combination of elements (text, audio, video, images) where traditional media often only contain single instances, or smaller combinations, of these elements.

Interactivity provides players with free movement within a system: they are free to explore a possibility space where player action results in a system outcome (Salen & Zimmerman 2003:66). This allows players to be active participants within the system (Swartout & van Lent 2003:34), and provides them with agency (Poremba 1998). It is necessary, however, for this agency to engender meaning-making as meaningful choice (Salen & Zimmerman 2003:62) that leads to meaningful play (Salen & Zimmerman 2003:34) through meaningful, strategic actions (Schell 2014:170).

The fact that the concept of interactivity is so entwined with the creation of meaning suggests its importance in educational contexts. Earlier (see 2.3.1.2) it is mentioned that understanding is borne from interactions with an environment (Savery & Duffy 2001). It can be seen above that interactions

within a context can engender meaning. It can thus be suggested that interactivity fosters the meaning that leads to understanding.

2.3.2.4 *Games and Multisensoriality*

To say that “the play of games is a multisensory experience” seems, once again, a broad and almost obvious statement, although very rarely is such a statement explicitly mentioned in the literature. Indeed, we can see that games better the multisensory processing ability of its players (Donohue, Woldorff & Mitroff 2010), but this does not discuss the multisensoriality of the act of play or of games themselves.

To examine the question of games as multisensory experiences, it is best to examine what a game (in this case, a digital or video game) is. It should first be noted that a digital game, prior to its play, is a closed automated complex system (Salen & Zimmerman 2003:88). The game system is closed as it is created from a specific set of rules. It is these rules, in turn, that automate a system that interprets player actions. The system then provides outcomes as immediate but narrow interactivity (Salen & Zimmerman 2003:87). The system’s complexity comes from the intricacy of the relationships between its elements (Langton 1997:112).

These closed automated complex systems manipulate information. This information includes, but is not limited to: text, images, audio and video (Salen & Zimmerman 2003:88). These are all forms of multimedia (Purchase 1998), often interpreted by either, if not both, of the auditory and visual human senses. Thus, digital games, systemically, both engender and exist as automated sensory or multisensory experiences. When consequently considering the act of play as per Salen and Zimmerman (2003:304), free movement within such a system should inherently deliver upon some aspect of this sensory or multisensory experience.

Schell (2014:54) discusses the multimedia elements that game systems handle collectively as “aesthetics”. His examination of the aesthetics focuses on how aesthetics can improve the overall player experience. These include the notions that game aesthetics can help in making the game world feel more complete and inherently rewarding to explore. Schell (2014:385) also notes the effect of aesthetics on engagement. A game that is considered “beautiful” may engage more players and allow them to overlook systemic imperfection in the game’s design.

Aesthetics do more than simply guide player experience, however. During design, aesthetics play an important role in guiding the design of both a game and its player experience (Schell 2014:389). As mentioned previously (see 2.3.2.1), Schell (2014:51) believes games consist of four basic elements, of which aesthetics is one. This means that aesthetics should act to enhance or inform the other three of these elements, namely: story (narrative), mechanics (the game system) and technology (upon which

the game system is built). In this way, a game's aesthetics affects the way its embedded and emergent narratives are received, and game mechanics can often be derived from or based on the context the aesthetic provides.

However, Schell's (2014:385) discussion of aesthetic is not simply limited to visual aesthetics, but also on the role of audio in enhancing the overall aesthetic experience. While not as fundamental as the formal aspects of a game system that allow for the necessary interactivity that makes the player experience possible, Schell (2014:390) notes that audio severely affects this player experience. As an example he notes that a game with high quality audio often garners better reception from players than the same game with low quality audio. Similar notions on the importance of audio can be found in other studies (Collins 2007; Jørgensen 2008a; Jørgensen 2008b; Nacke, Grimshaw & Lindley 2010; Toprac & Abdel-Meguid 2010; Adu Poku 2012). Auditory aesthetics, like visual aesthetics, directly affect a game's tone and atmosphere (Schell 2014:390).

Koster (2013:94), in his pursuit of "fun", only briefly discusses the role of aesthetics and multisensoriality in games, noting how aesthetic appreciation can result in player enjoyment because of what he calls "delight". "Delight", according to Koster (2013:94), is when a player recognises a pattern (as opposed to learning or solving patterns during play) and is, often pleasantly, surprised by it. In this sense, aesthetics and delight can often enhance a player experience momentarily as these constructs force the player to compare the game environment with other external contexts and often appreciate it as a result. Koster (2013:107) goes on to later mention that different players may find different game elements more fun than others based on their unique brain chemistry, which suggests that games that provide complex multisensory experiences should appeal to a subset of players who appreciate similar experiences in other external contexts.

These perspectives present an interesting question regarding how best to use multisensoriality in games. Multisensory cues are often used in games to foster greater engagement (Salzman, Dede & Loftin 1999). This is achieved through the directed attention these cues provide which can highlight importance within an interactive environment, such as showcasing relationships within the system. These cues also provide multiple sensory perspectives to players, and can encourage them to explore these perspectives through interaction. The exploration of these perspectives can thus help players understand the aforementioned relationships more thoroughly than can be achieved through the singular perspectives often found in traditional media. Multisensory perspectives and information can thus aid players in complexly understanding a game context and its surrounding systems.

2.3.2.5 *Games, Engagement and Motivation*

As noted earlier (see 2.3.2.2) player knowledge of systems built to achieve learning outcomes can suggest knowledge of the outcomes themselves. However, in order to foster this knowledge, players

must be motivated and engaged throughout their exploration of a learning context for these learning outcomes to be achieved. As such, motivation and engagement are considered the final key characteristics in educational game design to be discussed in this dissertation (Dondlinger 2007).

Salen and Zimmerman (2003:329–361) discuss these elements in their discussion of pleasure. These elements are initially fostered during play from a game’s implied promise of a pleasurable experience within the system. This experience begins with the acceptance of Suits’ (1978:34) lusory attitude. Following the game’s rules to achieve goals engenders a pleasurable experience (Salen & Zimmerman 2003:331). It is important to note here that these game rules often present a more difficult, more obtuse experience that simply exercising complete freedom of movement, unbound by rules, within the system. This is because the rules of a game create the context that provides meaning for the player, as mentioned earlier (see 2.3.2.2).

Once players have chosen to engage in the act of play through the acceptance of the lusory attitude, they need to be further engaged by the game’s design and its content (Salen & Zimmerman 2003:334). The design of these engaging, pleasurable experiences is often difficult due to the search for a single, generalisable, “fun” experience across a group of players who may be fundamentally different human beings.

Koster (2013:102) discusses this difficulty by alluding to individual differences from person to person. Some people are naturally better at certain activities than others. This difference and preference extends to studies of gender as well, with males typically having natural aptitudes for spatial skills over linguistics, and the opposite being true of females (Koster 2013:104). Additionally, males often prefer experiential learning (trial-by-doing), where females prefer behaviourally-modelled learning (trial-after-modelling). However, these aptitudes are not concrete, and can be exercised through application, often disappearing over time (Koster 2013:110). Games can help provide such applications.

This does, however, suggest that different people are often drawn to different types of games (Koster 2013:107). This poses a problem as it means that it is likely impossible to create a game that appeals to every player. It is in perhaps this area that the medium of games seems fundamentally limited. However, this limitation exists in other media products as well (Koster 2013:108).

Koster (2013:110) further argues that this limitation could be transformed into a strength for games as teaching tools. Despite personal preference, if games can improve the skills in which players are not naturally proficient, thus providing them with an understanding of these skills and eliminating proficiency bias over time, these games can provide some value for those players. Though the experience may not initially be “fun”, the more a player’s mental model of initially foreign concepts expands, the more they may understand and appreciate the designed experience.

When considering how to make games as intrinsically engaging as possible and the difficulty in determining exactly how this should best be done; it is best to perhaps examine theories that help make concrete the abstract concepts of engagement, pleasure and fun.

In discussing their MDA (Mechanics-Dynamics-Aesthetics) framework, Marc LeBlanc formalises eight typologies of game pleasure (Salen & Zimmerman 2003:334; Hunicke, LeBlanc & Zubek 2004; Koster 2013:90; Schell 2014:128). These typologies can be defined as follows:

- “Sensation”: Pleasure provided by the multisensoriality of games.
- “Fantasy”: Pleasure provided through “make-believe”. The ability for games to allow its players to explore contexts different to their own.
- “Narrative”: Pleasure provided by the game’s embedded context, enhanced by the “fantasy” pleasure above.
- “Challenge”: Pleasure derived from having player skill tested on a mechanical level. The notions of challenge, skill and how they relate are discussed when examining flow (Csikszentmihalyi 1990).
- “Fellowship”: Pleasure derived from engaging in play in a larger cultural context, such as during multiplayer experiences.
- “Discovery”: Pleasure derived from interactions and exploration of the game’s possibility space.
- “Expression”: Pleasure derived from the potential for self-examination games provide its players (this ties to the opportunity for reflection with a cultural system discussed in 2.3.1.2).
- “Submission”: Pleasure derived from the inherent activity of accepting the lusory attitude and attempting to find meaning within the rigidity of a game system.

Furthermore, Richard Bartle described four player types that thrive upon some of the above pleasure typologies (Bartle 1996; Salen & Zimmerman 2003:465; Schell 2014:129):

- Achievers experience pleasure from goal achievement. This aligns to Hunicke et al.’s (2004) “challenge” typology as it relates both to flow and autotelic play (Csikszentmihalyi 1990). In this case, the achievement of reaching the goal is inherently rewarding, as it is the overcoming of challenge.
- Explorers experience pleasure in understanding the depth and breadth of the game context. The “discovery” typology is inherently engaging for them. This typology does not simply imply an exploration of the game world, but also a deeper understanding of the game’s systems. Explorers strive for the completion of their understanding and mental model of the game context.
- Socialisers experience pleasure from their interactions with people within the game’s context. This suggests that their pleasure derives from “fellowship”. Here, the game acts as a shared

context to help form lasting relationships. The interactions with the game system are perceived as largely complementary to the game's more open cultural context.

- Killers are somewhat more difficult to map to Hunicke et al.'s (2004) pleasure taxonomy. Killers experience pleasure from competition and victory. This competition can also be directed towards the system in single player experiences, manifesting as a player-versus-system artificial conflict (Salen & Zimmerman 2003:250). However, the literature suggests that Killers experience pleasure from the achievement of competition and victory at the expense of other players. In this way, they are Socialisers as a means to an end for competitive purposes, but they do not find pleasure in "fellowship", but rather the lack thereof. In this case it can be loosely suggested that their closest pleasure typology match is that of "expression". Killers find pleasure in how the game system allows them to express their (often toxic) competitive desires.

Schell (2014:130) also continues to list other pleasures not discussed by the above frameworks. These are:

- "Anticipation": Waiting for pleasure is pleasurable in itself.
- "Completion": This maps to Bartle's (1996) "explorers" and Hunicke et al.'s (2004) "discovery" pleasure. There is pleasure to be had in completing game tasks and goals.
- "Delight in other's misfortune": Otherwise known as the German "schadenfreude", this pleasure is almost Killer-like (from Bartle's (1996) player types). It describes the feeling one has when another person has retribution taken against them for previous wrong-doing.
- "Gift-giving": Pleasure that arises from making someone else happy.
- "Humour": While difficult to define the concept of humour, it provides pleasure.
- "Possibility": The act of being provided with choice, and having options, is a pleasurable one. This suggests an inherent pleasure that agency provides through interactivity in games.
- "Pride in an accomplishment": This pleasure is visceral, and can exist long after the accomplishment itself. It is the pleasure gleaned from self-actualisation.
- "Surprise": Surprises are pleasurable, despite their classifications as good or bad.
- "Thrill": Pleasure from thrill is derived from fear for a situation when that fear is accompanied by an inherent safety.
- "Triumph over adversity": This links to Bartle's (1996) "achievers", as well as the notions of challenge (Hunicke, LeBlanc & Zubek 2004) and autotelic play (Csikszentmihalyi 1990).
- "Wonder": This describes the pleasure that accompanies awe and amazement. In games, this wonder is often provided through multisensoriality, relating to Hunicke et al.'s (2004) "sensation".

Lastly, Koster (2013:90) provides his own components of "fun":

- "Fun": "the act of mastering a problem mentally".

- “Aesthetic appreciation”: This is enjoyable. It results in “delight”, which is temporary pleasure, as discussed above (see 2.3.2.4).
- “Visceral reactions”: These are physical reactions to physical mastery. Due to the necessity for skill in physical mastery, one can argue that these reactions are most prominent in “achievers” (Bartle 1996), or players who value challenge (Hunicke, LeBlanc & Zubek 2004).
- “Social status signals”: These signals relate the player to their greater cultural context. In this way “socialisers” (Bartle 1996) benefit from this component, as it engenders both fellowship and expression (Hunicke, LeBlanc & Zubek 2004).

These pleasure types all attempt to contribute to a more engaging and immersive player experience. This level of engagement and immersion is difficult to quantify because fun, as noted by Koster (2013:107), is a largely subjective experience that differs from player to player. However, attempts have been made to quantify more measurable aspects of the player experience and how this relates to engagement and immersion. Of these, a systemically relevant one to game design is that of flow. Games need to provide challenge to the player to avoid the experience becoming boring. The concept of flow suggests that immersion and engagement are intensified when challenges are appropriately scaled to a player’s skill level (Csikszentmihalyi 1990).

Flow is a feeling of complete immersion in an activity to the point where merely the engagement can be considered as fun, despite the actual outcome of the activity (Csikszentmihalyi 1990). Understanding flow requires an understanding of its major components, of which Csikszentmihalyi (1990) identified eight. Four of these components describe the characteristics of the activity:

- It should be an activity able to be plotted on a challenge versus ability curve.
- It should have clear goals.
- Whilst engaged in this activity, participants should feel in control of their actions.
- Participants should get feedback for every action taken.

This striving for a goal, coupled with “action > outcome” molecules that provide the player with meaning, should manifest as the last four characteristics:

- Intense concentration, which leads to:
 - A merging of action and awareness;
 - A loss of self-consciousness; and
 - An altered sense of time.

If some (but not necessarily all) of these components are met, a person is said to be experiencing flow, a state of mind that exists between anxiety (too much challenge for a lesser-skilled participant) and boredom (too little challenge for the participant’s abilities) (Csikszentmihalyi 1990). As with the

subjectivity of the pleasure types discussed above, flow is unique from person to person, as it is dependent on the variables of challenge and skill level (or “ability”), both of which are subjective. A diagram of flow is shown below:

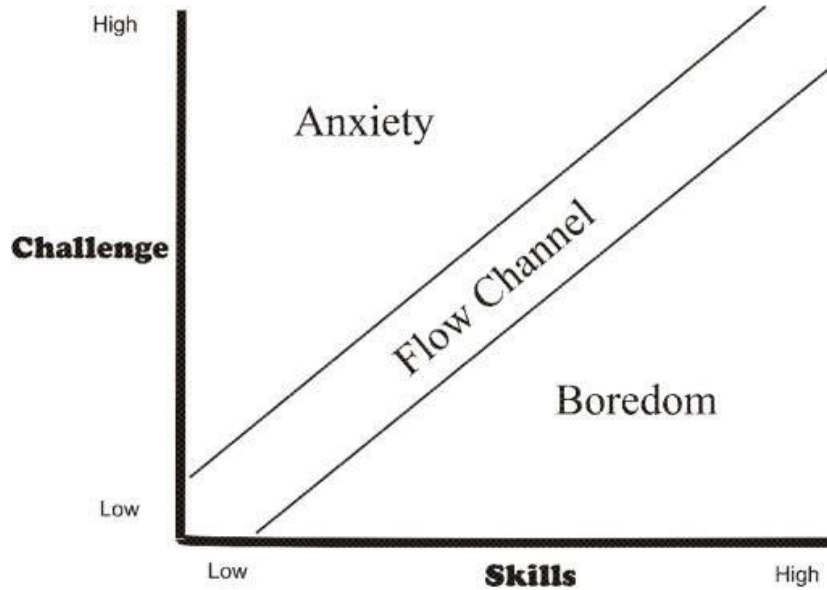


Figure 1: "Flow" Diagram (Csikszentmihalyi 1990:74)

Regarding Flow in games, Chen (2007) expanded the concept of Flow as it relates to game design. Analysing Csikszentmihalyi’s components of Flow from a game design perspective, Chen identified three core elements a game should contain in order to evoke Flow:

- The game should be intrinsically rewarding (this links to Csikszentmihalyi’s direct feedback component).
- The game should allow a challenge-to-ability ratio at a suitable difficulty curve to allow for progression (this links to the skill-based challenge component).
- The player needs to feel agency, or direct control, over the game (this links to the necessity for control component).

Chen (2007) proposed that one way to implement a direct flow system in a game is through the use of dynamic difficulty adjustment, which scales challenge on the difficulty curve to just the correct “height” in the Flow Zone diagram to still be difficult to attain (to facilitate the need for clear goals), but to be attainable based on user interactivity with the system. Dynamic difficulty adjustment is a potential application of a feedback system when considering games as cybernetic systems (Salen & Zimmerman 2003:222), a perspective that emerges from communications theory (Littlejohn 1992:200). Dynamic difficulty adjustment is an example of a negative feedback system that helps to stabilise the system (Salen & Zimmerman 2003:215), and can be utilised in any game system that actively monitors its state

and makes changes to that state based on the fulfilment of criteria. It is this stabilisation, Chen (2007) argues, that helps maintain or re-establish the Flow state.

Finally, if designing for pleasure or flow does not lead to engagement, motivational elements can furthermore be introduced into the game system to foster or increase player motivation. These motivations for engagement can be either intrinsic or extrinsic (Salen & Zimmerman 2003:332; Denis & Jouvelot 2005; Schell 2014:150).

Intrinsic motivation is player-created, player-maintained motivation. Intrinsic motivation is unique to the player, and arises out of a player's own desire to act out of their own, often in pursuit of a goal (Salen & Zimmerman 2003:332; Schell 2014:151). Intrinsic motivation leads to autotelic play. Autotelic play, as mentioned previously, is the act of completing a task because the completion, in itself, is rewarding (Csikszentmihalyi 1990:69; Salen & Zimmerman 2003:332). Intrinsic motivation is tightly coupled with flow, as it is often stimulated by the challenge a game provides through its play. Players are motivated to complete self-created challenges that are often linked to game goals. The game's fiction, its embedded narrative, provides intrinsic motivation to players by suggesting its progression, as well as a sense of fantasy, challenge and curiosity, as a reward (Dickey 2006). While the reveal of the fiction can be considered a tangible reward, it is player-maintained motivation that results in its reveal. Intrinsic motivation concerns itself with the play of the game itself as the reward (Salen & Zimmerman 2003:332).

Hallford and Hallford (2001:158) argue explicit rewards are also necessary, as the promise of explicit reward is often a motivational factor for play. As such, they define four reward types that can be found in role-playing games, though these rewards can also be found in other game types:

- “Rewards of Glory”: These rewards link to the intrinsic pleasures of triumphing over adversity and pride in an accomplishment (Schell 2014:150). Rewards of Glory have no value within the game system, but greatly impact the player experience. They make the player feel powerful and in control of outcomes within the game world. Rewards of Glory are an outcome of enacted player agency.
- “Rewards of Sustenance”: These rewards help maintain the player's stake in the game by maintaining the status quo of the game world. These enable the player to continue playing the game without losing progress such as avatar skills, experience and other quantifiable game elements through the use of a save point, health and magic potions or specialised armour. Rewards of Sustenance ensure that, going forward, the player can continue to prevail, or at the very least not lose progress in their attempts to do so.
- “Rewards of Access”: Rewards of Access provide the player with access to new locations, features, mechanics or resources inside the game itself. Importantly, these rewards are often only used once, securing access for the player permanently, at which point they become useless, as they have served their purpose.

- “Rewards of Facility”: Rewards of Facility allow the player new dimensions of play. They allow the player access to skills or items or mechanics that can fundamentally change how that player plays the game by allowing for new strategies and opportunities for meaningful play to emerge from the game’s potential interaction set (a hypothetical set of all possible “action > outcome” molecules available at any point in the game).

Extrinsic rewards, and in turn extrinsic motivation thus concerns itself more with the ends rather than the means (Salen & Zimmerman 2003:345). This practise is not bad, and is often necessary in the practise of good game design. Schell (2014:151) agrees, arguing that intrinsic and extrinsic motivation are not binary, but rather exist as extremes of a scale. Here, certain game elements can be more intrinsically motivating than others to different players, echoing Koster’s (2013:102–111) notion of “different fun for different folks”.

Schell (2014:151–153) illustrates this scale in relation to reward and punishments. He notes that, for external motivation, we are motivated by the rewards provided whilst attempting to avoid punishing elements in the same system (or the lack of reward). In this system, players must perform interactions with the system to receive the associated rewards. Internally, however, players must choose to interact with the system without the promise of explicit rewards. They interact with the system in pursuit of pleasure.

The notions of conditioning, positive reinforcement and negative reinforcement were discussed earlier (see 2.2.1). The player pursuit of rewards (positive reinforcements) and the avoidance of negative reinforcements or punishments, both internally and externally, leads to the ability for conditioning and the use of reinforcement schedules in games (Salen & Zimmerman 2003:345).

The wealth of theory that exists in pursuit of providing players with a “fun” experience suggests that player experience is paramount in the practice of game design. The elements of engagement and motivation are incredibly important in helping to craft this experience. However, despite the wealth of theory that can aid the design of games that support these elements, they remain unique to individual player experience (Salen & Zimmerman 2003:353; Koster 2013:107; Schell 2014:153). Pleasure is emergent within a game system, and in this case, the act of play becomes inherently engaging (Salen & Zimmerman 2003:354–356). However, it is important to note that these elements cannot be explicitly designed; only designed *for*. As such, when considering the design of pleasurable elements in educational applications, one must ensure that elements of engagement and motivation are contextual to the game experience.

2.4 Alternate Reality Games (ARGs)

The following section discusses literature pertaining to the alternate reality game genre, the difficulty in succinctly defining it and how this dissertation defines the alternate reality game genre.

2.4.1 Defining Alternate Reality Games

The following sections attempt to define alternate reality games for the purpose of this dissertation.

2.4.1.1 The Search for an Umbrella Term

The definitive ARG whitepaper (International Game Developers Association 2011) initially classifies alternate reality games as a type of Massively Multiplayer Online Game (MMOG), as its use of multimedia nullifies classical geographical boundaries of games, like MMOGs do, by having multiple people concurrently participate in a possibility space whilst online. However, the authors argue that ARGs are not explicitly tied to the digital representations that MMOGs heavily rely on, such as the use of avatars and player investment in fictional digital spaces, and as such can provide a more enriching experience (Martin & Chatfield 2006).

This differentiation effectively defines ARGs as a separate genre of game altogether (Martin & Chatfield 2006). This invites multiple terminologies to be used when describing ARGs or similar game experiences. This terminology includes “immersive games” (McGonigal 2003b), “pervasive games” (Benford, Magerkurth & Ljungstrand 2005; Montola 2005; Walther 2005; Hinske et al. 2007), “transreality games” (Lindley 2004), “mixed reality games” (Tamura, Yamamoto & Katayama 2001; Hinske et al. 2007; Montola 2010) and, most recently, a “massively multiplayer story game”, a label used in the marketing of *Cloud Chamber*, a digital game that includes alternate reality game-like characteristics in its design (Investigate North 2014b).

McGonigal (2003b) notes that immersive games encourage large-scale social interaction within both physical and virtual worlds thanks to the immersion fostered by the aesthetic of “this is not a game” which allows for more effective collaboration during play. This is noted as a key component of immersive games. However, the core difference between immersive games and alternate reality games in this instance is an immersive game’s adherence to the “this is not a game” aesthetic. This suggests that immersive games may be a subgenre of the alternate reality game genre.

Definitions of pervasive games are slightly more varied. McGonigal (2003b) argues that pervasive games, while sharing alternate-reality-game characteristics like a real-world possibility space and the necessity for real-world skills during problem solving, differ from immersive games mainly by their lack of adherence to the “this is not a game” (TINAG) aesthetic. Pervasive games framed in this way can be seen as less immersive due to their use of multiple platforms largely being used only to symbolically enrich a player’s view of the game universe; instead of having these players be truly active participants through

their total immersion. This framing suggests that an alternate reality game can be either an immersive game or a pervasive game, but not both. This also suggests that only two mutually-exclusive subgenres of alternate reality games exist.

Benford et al. (2005) and Walther (2005) present more technical examinations of the “pervasive game” concept. These authors note that pervasive games, as a genre, extend the gaming experience into the reality that surrounds its players, often residing “on the threshold of tangible and immaterial space” (Walther 2005), often through the use of mobile technologies. While this more technical definition suggests extensive use of mobile technology, Benford et al. (2005) disproves this notion by arguing for the pervasiveness of augmented reality gaming, such as the augmentation of tabletop games with computer-generated overlays.

Walther (2005) further notes a pervasive game’s persistence and its transmediality, along with its mobility and the distribution that engenders mobility when defining characteristics of pervasive games. This perspective is interesting, as these characteristics (distribution, persistence, mobility and transmediality) are often found in immersive games, as they contribute to the seamless game world that fosters immersion. By extension, alternate reality games contain these as well.

Montola’s (2005) framing of pervasive games presents a broader perspective, defining them as “a game with one or more salient features that expand the contractual magic circle of play socially, spatially or temporally”. They use pervasive technologies that incorporate characteristics such as the distribution, mobility, transmediality and persistence presented by Walther (2005), to support, augment and realise this larger magic circle (Hinske et al. 2007). This broader definition suggests that alternate reality games discussed by McGonigal (2003b) as “immersive games”, such as *The Beast*, can also be classified as pervasive games, as these games expand spatial, social and temporal dimensions through their design as multi-platform, multiplayer experiences. Montola’s (2005) definition, thus, suggests that “pervasive game” can be used as an umbrella term for any game that befits its criteria. This suggests, in turn, that alternate reality games are then a subgenre of pervasive games.

Transreality and mixed reality games are tangential to above pervasiveness as well. While often used to describe similar concepts (and, indeed, the umbrella term of pervasive games on the whole), transreality games differ slightly from pervasive or mixed reality games. Transreality games combine virtual gaming experiences with equally designed physical experiences to enrich the overall player experience (Lindley 2004). Both designed experiences are separate from one another, but should still feel seamlessly integrated into the shared context. However, in separation to the larger pervasive games umbrella term, transreality applications “may not pervade life in general”. That is, while they appropriate elements from the player’s reality, they may not necessarily integrate the player’s reality with the game’s (Lindley 2004).

Mixed reality games, similarly, are less pervasive at their core than Montola's (2005) earlier framing, though they have the potential to be (Montola 2010). Montola (2010) describes mixed reality games, seemingly unhelpfully, as "games that utilise various mixed-reality setups". Understanding what is meant by the mixed reality these setups provide requires an understanding of the scope of mixed reality. Mixed reality spans the space between augmented reality, a technology that overlays contextual data onto a projection of reality, and augmented virtuality, which overlays data from a reality into a virtual simulation (Tamura, Yamamoto & Katayama 2001). It is "a kind of virtual reality, but a broader concept than augmented reality" (Montola 2010). As such, mixed reality games occupy a similar space of applications to transreality ones, when considering notions of pervasiveness discussed earlier: both genres often appropriate reality in the construction of their contexts and gameplay, but do not have to provide pervasive experiences for the player as a result of this appropriation.

The "Massively Multiplayer Story Game" label is currently exclusive to *Cloud Chamber* (Investigate North 2014b), a digital game that links social interaction and discussion through the use of a commenting system in-game to game progression. While the game exists only on a single platform and is played digitally, its use of multimedia and progression through collaboration mechanics are similar to those used in alternate reality games. It must be noted that while *Cloud Chamber* cannot, by some definitions, be considered an alternate reality game due to the lack of a real-world possibility space (McGonigal 2003b), it does fit Montola's (2005) definition of pervasive games due to the game's social expansion of the magic circle.

This vast array of differing descriptions for similar experiences illustrates the difficulty in both explaining and defining both the genre of alternate reality games as well as their specific applications. The notion that alternate reality games (and all similar experiences, regardless of the descriptors one uses) expand the magic circle in various dimensions, however, can be used as a basis for understanding the concept of an alternate reality game where definition would otherwise prove difficult.

2.4.1.2 *Towards a Working Definition of the Alternate Reality Game*

This raises the question of how to best and succinctly define the concept of an alternate reality game for the purposes of this study. Few comprehensive definitions exist, and as such, consultation of the ARG whitepaper presents a definitive initial source (Martin & Chatfield 2006):

Alternate Reality Games take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world. The contents of these narratives constantly intersect with actuality, but play fast and loose with fact, sometimes departing entirely from the actual, or grossly warping it – yet remain inescapably interwoven.

This definition identifies various elements of ARGs. These elements, from the above definition, are the use of player reality as a possibility space, narrative content that is often based on narratives within player reality, and interplay between player reality and game reality which is often loosely defined. However, these are only three elements that potentially comprise an ARG. While these components correlate to some characteristics of pervasive games, such as the widening of the magic circle (Hinske et al. 2007; Montola 2010) and persistence (Walther 2005), the elements presented do not yet capture the full depth proposed by McGonigal's immersive game (2003b).

In search of characteristics that augment an existing understanding of an ARG from the whitepaper definition, examination of Sean Stewart's characteristics of ARGs might allow for broadening description of the genre. Stewart (2008) notes the following:

- An ARG's narrative is fragmented. The fragments must be assembled by the players.
- The narrative is platformless, making use of multimedia technologies to disseminate information.
- The player community is collective, and collaborate using multimedia technologies.
- The player community's actions affect the game world in meaningful ways. In this way players create the fiction.

This suggests a further five characteristics: fragmented narrative, platformless narrative, a player community, the use of multimedia technologies, and a player-malleable game world.

ARG community websites Alternate Reality Gaming Network (ARGN), Unfiction and ARGology all also present definitions that help define characteristics of ARGs. ARGN (2002) notes that ARGs force players to interact with the game system and the community in order to solve puzzles; some puzzle pieces and solutions may be placed into the real world.

Unfiction's (2002) definition notes the use of multimedia to present a transmedia interactive fiction that contains puzzles. These puzzles are presented by the game's designers, the "puppetmasters", who are hidden from the players. Furthering the game's narrative is done by the player community solving these puzzles.

Finally, ARGology's definition echoes the above elements, additionally noting that the "puppetmasters" have very fine control of an ARG's progression and that the traditional game boundaries within an ARG encompass, effectively, the player's entire reality (Bono & Breeze 2008). This encompassing is achieved through the use of multimedia technologies that provide players with real world/game world interplay that presents a more immersive experience. Here, players are immersed in the game world because of their inherent immersion in their own reality, which an ARG integrates with (Bono & Breeze 2008).

These three definitions introduce more examinable characteristics, whilst confirming others that were previously identified. These characteristics include: puppetmasters who control the game world, the use of puzzles to further the narrative, an expansion of the magic circle and increased immersion due to the game’s platformless, integrated nature within the player’s reality.

In further search for characteristics of an ARG that might further inform a succinct definition of the term, academic sources from various ARG scholars were consulted both in search of new characteristics and in order to validate previously identified ones. A summary of these characteristics and the sources that discuss each is provided below:

Table 3: Characteristics of ARGs

Legend: 1: Martin and Chatfield (2006), 2: Stewart (2008), 3: Alternate Reality Gaming Network (2002), 4: Unfiction (2002), 5: Bono and Breeze (2008), 6: McGonigal (2003b), 7: Kim et al. (2008), 8: Dena (2008), 9: Gurzick et al. (2011), 10: Örnebring (2007), 11: Bonsignore et al. (2012), 12: Hansen et al. (2013), 13: Hakulinen (2013), 14: Szulborski (2005), 15: Chess and Booth (2013).

Characteristic	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Player reality as a possibility space	X				X										
Interactive narrative		X		X	X	X	X	X				X			X
Narrative based on player reality/history	X														
Platformless, transmedia, fragmented narrative		X		X				X			X	X			
Integration of player reality and game reality and resultant immersion	X				X	X	X	X	X	X				X	

Use of multimedia technologies		X		X	X	X	X	X				X			
Player agency within the world creates the fiction		X										X		X	
Player community and collaboration		X	X	X	X	X	X	X	X	X	X			X	
Player-community and player-system interaction			X									X		X	
Use of hidden “puppetmasters”				X	X									X	
Use of puzzles to further game narrative			X	X								X		X	
Real-time						X		X						X	
All-encompassing expansion of the magic circle	X				X				X						
No explicit rules									X						

The above table clearly shows various characteristics of ARGs, with the importance of each often being noted by the number of authors who discuss it. However, despite this fairly comprehensive list of characteristics, Stewart (2006) still argues against a succinct definition for the term itself.

In Stewart’s (2006) observations, alternate reality game play experiences are fundamentally different to different players. Some players play for the story experience, other for the ways the game mechanics interact with reality and others still in order to collaborate with other players (Stewart 2006). Additionally, because of these vastly different experiences, different players focus on different

characteristics when trying to define the genre as a whole. This divided focus can be seen in Table 3, where certain characteristics are nearly unanimous, but others are mentioned only briefly in the literature. Lastly, Stewart (2006) notes that the search for a definition often ignores the greater context of the games themselves. By defining ARGs, criteria are presented by which a game can be categorised as either “an ARG” or “not an ARG”.

Stewart’s (2006) final point serves as an attempt to not limit alternate reality or similar games to a single set of criteria. Instead, Stewart (2006) prefers to place concepts seen within an ARG (authorship, ruleset and plot coherence) on the X, Y and Z axes of a “sphere of chaotic fiction”, named as such to reference the uncertainty of the end result of an ARG’s narrative, which is determined by the players.



Figure 2: Stewart's (2006) Sphere of Chaotic Fiction

Stewart (2006) presents a valid construct through which to view all ARGs, along with the similar experiences discussed in 2.4.1.1.

Despite this, defining the characteristics of ARGs helps to provide a working definition of an alternate reality game for this study. As such, in opposition to Stewart’s (2006) argument against defining of ARGs, a working definition, based on the most-cited characteristics of ARGs and those especially relevant to this study, is presented below:

An alternate reality game is a game that focuses on delivering a platformless, fragmented narrative experience to its players. This narrative is progressed through the collaborative solving of puzzles that, along with the narrative, is delivered through the use of multiple mediums (audio, text, and video, amongst others) and technologies that utilise these media. The use of these real-world mediums allows the game to interface with the reality of the players, allowing for a more immersive play experience than is provided by other media. It is the use of these same technologies that allows the players to interact with the game and possibly, through their actions, alter the very narrative it attempts to deliver.

2.4.2 Important Components of Alternate Reality Games

While an understanding of characteristics of alternate reality games helped inform the above definition, the characteristics themselves are often summarised explanations of greater phenomena in alternate reality games. These phenomena can best be understood as design principles for the ARG genre. These design principles are: the “this is not a game” aesthetic, platformless narrative, real life as a medium, designing for a hive mind, storytelling as archaeology, and collaborative storytelling (Matheny 2013).

These principles can better be examined under three broader categorisations. Real life as a medium and the “this is not a game” aesthetic contribute to discussions of authenticity and immersion. Platformless narrative and storytelling as archaeology form a discussion of narrative formed through exploration. Finally, designing for a hive mind and the notion of collaborative storytelling in an ARG informs the process of collaborative play.

2.4.2.1 Authenticity and Immersion

Part of the large potential and allure of the alternate reality game genre is the notion that its context unfolds in the reality inhabited by its players (McGonigal 2007a). This brings the promise of unrivalled immersion – a quality that is highly sought after in game development. Because players are, by their nature as human beings, immersed in reality; they can be more easily immersed into an integrated ARG game context, should they choose to be.

It must be noted that, when examining the broader concept of “immersion” for this dissertation, it is discussed using McGonigal’s (2003b) framing of the “immersive game”. Within this framing, there is a distinct differentiation between McGonigal’s (2003a) pervasive games and immersive ones: the use of the “this is not a game” aesthetic in its design. “This is not a game”, then, must somehow engender greater immersion than traditional pervasive games.

The phrase “this is not a game” can have many meanings, making succinct definition difficult. At its core, “this is not a game” can simply represent a system’s denial of a potential ludic nature (Szulborski 2005:19). Indeed, this is often how the aesthetic is usually discussed – TINAG implies that a game is denying its game origins.

McGonigal (2003b) raises an additional observation of the term: because of an ARG’s integration with player reality, the way in which players attempt to solve game problems mirror potential real-world solutions to similar problems. To illustrate this notion, McGonigal (2003b) uses an example pertaining to the Cloudmakers’ reactions to the 9/11 attacks in America. To the players, approaching the reality of the situation with a “playful attitude” acted as a coping mechanism. In this way, at least at first, the player attempted to “solve” the mystery of 9/11 (McGonigal 2003b).

In attempting to understand the TINAG aesthetic, it can be suggested that TINAG is an amalgamation of both of these observations. On one hand, TINAG means that a game denies its game origins, and makes every effort to make its context seem believable. Game artefacts that make use of multiple media work as they do in real life: phone numbers, email addresses and blogs related to game content all masqueraded, during the game, as real, working artefacts (McGonigal 2003b). The game never admits, within its fiction and content, that it is a game (McGonigal 2003b). Most importantly, the play of the game requires real actions to be taken by the players that mirror, exactly, those actions in their own reality – “nothing about [the] virtual play [is] simulated” (McGonigal 2003b). This lack of simulation in gameplay and artefacts – making the entire context seem as “real” as possible, obscuring any game-like component, is what McGonigal (2003b) calls “TING[ing] a game” using “TING techniques”. When referring to “TING”, McGonigal (2003b) refers to the “this is not a game”, or TINAG, aesthetic. A TING (or TINAG) technique is simply the use of a narrative or ludic device that allows the player to more easily believe that the experience created by the ARG is “real”.

On the other hand, a more player-focused understanding of the TINAG aesthetic – their treatment of the game as “real” thanks to the TING techniques mentioned above, seems to invoke Suits’ (1978:34) lusory attitude. ARG players accept the game as part of their reality and attempt to abide by its, often unspoken, rules (Gurzick et al. 2011) to preserve the intended game experience. This suggests that players do not really believe that the experience is “not a game” (Stenros et al. 2011). The TINAG aesthetic is exactly what the term implies: an aesthetic (Stenros et al. 2011). In some cases, a game’s denial may not even be necessary to create an immersive experience: a player’s lusory attitude towards the aesthetic is sufficient (McGonigal & Jerrett 2014).

McGonigal (2003a) calls this the “performance of belief” or “the Pinocchio effect”. In clarification of this, she references her discussions with Elan Lee, lead designer of *The Beast*, and Sean Stewart, the game’s lead writer. Stewart offers the fact that *The Beast* was set in the future (2142 AD) with a narrative that involved killer robots as a means to “shatter” the TINAG illusion (McGonigal 2003a). Lee extends this, noting that the beauty of the TINAG aesthetic was its presentation of “a game with an identity crisis[...]| know it’s a game[...]|You know it’s a game[...]|IT doesn’t know it’s a game” (McGonigal 2003a). This presents a conflicting reality to the player. This is because while most games, as standalone simulations, are clearly games due to their context, existing purely on multimedia-enabled devices, an ARG’s use of real life as a medium – to use real artefacts that can be affected by the game’s players in their own reality – blurs the above notions of simulation and reality.

McGonigal (2003a) notes that, because of this conflicting reality, players of *The Beast* self-regulated their actions. Players often did not perpetrate, or discuss, real-life actions that could be construed as “going too far” when viewed outside of the game context. An example of this is when players refused to discuss the content of a fake email inbox that belonged to a real Microsoft executive, despite multiple players having hacked into the account, out of fear that the information they found there may have been too personal (McGonigal 2003a).

Because of this, McGonigal (2003a) offers a version of Apter's (1991) "tiger in a cage" metaphor for a pleasurable play experience. In this metaphor, a crowd's reaction to both a tiger and a cage differs on the state of both the tiger and the cage. An empty cage is a boring observation for the crowd. If the tiger is out of the cage, the crowd will become anxious, but within the cage's boundaries, the observation of the tiger is a pleasurable experience (Apter 1991). McGonigal (2003a) extends this metaphor into a design principle for the TINAG aesthetic: the presence of a cage (the game's boundaries) should be communicated to the players, but the cage should be so designed that it is easy for the players to feign ignorance towards its presence. They do not see a cage. This is not a game.

An outcome of the use of both TING techniques and the lusory attitude by players in ARG contexts highlights the potential for transformative play in ARGs that adhere to the TINAG aesthetic. Transformative play is defined as a form of play that changes the context of the game itself through the act of play (Salen & Zimmerman 2003:305). Examples of this include how a player's thought process surrounding the game context may change through play. Play transforms the player (Salen & Zimmerman 2003:305; McGonigal 2003b). The transformative play present in TINAG ARGs is intriguing: players often continue to, even after the game is over, see peculiar real-life events as part of a potential ARG, even where no such game may exist (Phillips 2001). An example of this transformative play is discussed above when Cloudmakers attempted to "solve" 9/11 (McGonigal 2003b). This transformative play is made more possible by the immersive aesthetic that "this is not a game".

The use of this aesthetic suggests that ARGs have the potential to act as "serious games" that can help solve real-world problems. In this regard the genre has educational potential (examined in 2.5 and 2.6). Examinations of this potential often mention the characteristic of "authenticity" when discussing adherence to the TINAG aesthetic (Bonsignore et al. 2013; Hakulinen 2013). Because ARGs allow players to participate in the game as themselves, and not a player character or avatar (Lee 2006; Bonsignore et al. 2013; Hansen et al. 2013), the tasks they perform in the game and the tasks they perform in similar real contexts are often identical. This is considered more "authentic" when considering the notion of authenticity as discussed earlier (see 2.3.1.2).

The creation of this authenticity is a key benefit the ARG genre possesses over traditional games. Skill learning is promoted as a result, as players do not simply help avatars to learn a skill, but rather learn it themselves (Lee 2006). This leads to the creation of an "authentic learning environment" (Galarneau 2005). Because of this, adherence to the TINAG aesthetic by either the players or the game helps reinforce both authenticity and skill learning and acquisition through the repetition of its mantra: "This is not a game, and you are not playing. This is real, and you are doing."

2.4.2.2 *Exploratory Narrative*

When examining early understandings of the genre (Unfiction 2002; Martin & Chatfield 2006; Stewart 2008) it can be seen that an ARG's use of transmedia for narrative delivery has been noted as one of the genre's defining characteristics. Importantly, the ability to interact with the game world is what drives this narrative forward (McGonigal 2003b; Bono & Breeze 2008; Kim, Allen & Lee 2008; Stewart 2008; Chess & Booth 2013; Hansen et al. 2013). As such, the exploration of the game world both uncovers and drives the narrative component in alternate reality games.

To encourage this exploration, multiple forms of media are used to convey the narrative. Because each multimedia technology conveys different parts of the same narrative, the narrative becomes fragmented, and is conveyed as a transmedia experience (Stewart 2008). This phenomenon is that of "transmedia fragmentation" (Dena 2008). This concept is not exclusive to the alternate reality game genre, first being experimented with in Ong's Hat, an early work of transmedia fiction that is cited as the inspiration for modern transmedia narratives and ARGs (Matheny 2013). However, transmedia fragmentation is prevalent within the ARG genre (Dena 2008).

These narrative fragments, however, cause a logistical problem to players that help reinforce a necessity for collaboration, another important component discussed later (see 2.4.2.3). This problem is that of extreme fragmentation between delivery media (Dena 2008). Dena (2008) notes that narrative fragmentation in ARGs does not often manifest as cohesive units like episodes of television shows or complete books. Rather, narrative fragments deliver similar content to the paragraphs in a book. Even complete resources (such as full in-game websites dedicated to single topics) often only serve as fragments of context in an overall larger narrative framework (Dena 2008).

Because of this, it is unlikely that any single player will find all of the narrative fragments an ARG presents, let alone contextualise all of these fragments with regard to the overarching narrative. As a result, this fragmentation encourages collaboration, first to find the necessary narrative fragments and then to understand how each fragment integrates into the larger context (Dena 2008). Further complicating matters in this regard is the order in which these fragments are discovered. Here, Dena (2008) uses Ryan's (2001) "complete graph" architecture to explain that, when considering each narrative fragment as a node in a bidirectional graph, the narrative coherence of these nodes seems, at first, to be non-existent, because of the order in which the graph is traversed. Additionally, the real-time nature of ARGs (McGonigal 2003b) means that players can start the traversal of this graph from any of its nodes. This makes the task of understanding the narrative experience more difficult for latecomers without significant aid.

This aid exists in ARG culture as the "game guide" (Dena 2008). A "game guide" is a player-created artefact, often created collaboratively, in an effort to better understand the game's fragmented narrative (Dena 2008). It has the additional benefit of acting as a "neutral walkthrough" that new players can follow or read in order to better understand the game world up until the point they begin playing themselves. These guides are often written from a first-person perspective, but often

amalgamate the shared experience of the community. Game guides, as such, are important artefacts in alternate reality games. This is because the artefact is borne from collaborative player interaction with the system the subsequent collaborative authoring of the game world (Alternate Reality Gaming Network 2002). They are an example of the “player-as-author” paradigm (Poremba 1998), where players create content that is then integrated into the game world (Bonsignore, Hansen, et al. 2012) and provide a valuable, experiential account of the community. The cause-and-effect recollection is, in itself, its own narrative experience (Dena 2008), and as an artefact can prove useful for later study by the game’s designers, potential players and academics alike.

Stewart (2006) discusses the complications of ARG narrative delivery, player interaction that creates and changes it and the player documentation thereof as “chaotic fiction”. Chaotic fiction is a construct created through the interaction of audience (player community) and author (puppetmasters) on an existing scenario – an ARG (Stewart 2006). It is deemed “chaotic” as the end product of the interaction (the completed fiction) may greatly differ from the original scenario prior to player/puppetmaster interaction (Stewart 2006).

The degree to which the completed fiction is “chaotic” is determined by three concepts (Stewart 2006). The first of these is the amount of interaction between author and audience: the degree of authorship both the author and audience have with regards to the completed fiction. Next, the degree of freedom provided within these interactions is provided by the rule-set of the framework, as imposed by the author. The more freedom the audience is given, the more potentially chaotic these interactions can become. Lastly, plot coherence is examined as a construct. In this case traditional ARGs, despite their extreme fragmentation examined above, have a large degree of plot coherence when examined against collaborative works of seemingly unrelated fiction like Uncyclopedia (Stewart 2006). Uncyclopedia is a satirical parody website of the popular online encyclopaedia Wikipedia (Sankar 2006). When considering Uncyclopedia’s plot coherence, it can be said that the website exhibits a form of meta-coherence when considering the shared themes of the created fictions on the platform (Stewart 2006).

Stewart (2006) places these three concepts, as noted earlier, on a “sphere of chaotic fiction”, shown in Figure 2. Interaction in the sphere of chaotic fiction leads to what Stewart (2006) calls “chaotic play”. Chaotic play is defined as the experience and creation of chaotic fiction (Stewart 2006). This includes the player experience of the chaotic fiction itself. However, perhaps more importantly, chaotic play explains the ways in which the collaborative interplay within the community, as well as between the audience (the player community), the “scenario” (the unaltered game system in this case) and the author (the puppetmasters) actually creates the chaotic fiction itself (Stewart 2006).

2.4.2.3 Collaborative Play

When considering the notion of chaotic play, one must note that the audience that contributes to the chaotic fiction is a collective (Stewart 2006). As noted previously in the discussion of narrative (see 2.4.2.2), ARGs engender collaboration due to a scope that is not intended to be understood in its entirety by an individual player. Rather, it is the collective effort of a community, Stewart's (2006) "audience", that drives the game forward (Kim, Allen & Lee 2008).

McGonigal (2003b) dubs this collective effort "the collective detective", a term that stems from Stewart's own work on *The Beast* and his early involvement with communities such as Unfiction (2008). The "collective detective" here refers to the community exploring and engaging with the game world, uncovering narrative fragments and solving game puzzles (McGonigal 2003b). The collective detective engages in the "solve" component of the Unified Metaliteracies Framework as proposed by Bonsignore et al. (2012) and discussed later (see 2.5.4).

Earlier still, the "collective detective" moniker stems from the term "collective intelligence" (McGonigal 2008). The term, as it was originally explained, describes a notion that is very close to the constructivist understanding of knowledge creation. This notion is that emerging technologies and the internet facilitate the rapid exchange of information. These technologies are used by a network of human beings, and these human beings should "mobilise and coordinate the intelligence, experience, skills, wisdom and imagination of humanity" for the betterment of a global, collaborative knowledge culture (Lévy 1999). Knowledge "ceases to be the object...[it] becomes a project" (Lévy 1999).

Collaboration as a part of the collective detective paradigm in ARGs manifests as an attempt to create shared construction of meaning. Contextual meaning-making, where information is not separated from its context and is contextualised within an individual's mental model, forms part of situated cognition and constructivist learning theories (Brown, Collins & Duguid 1989; Wadsworth 1996). This meaning-making begins with the presentation of portions of contextualised information by an information source. Recipients assimilate this information with relation to their own understanding of the related larger context. This turns the knowledge from explicit knowledge (presented by the information) to tacit knowledge (contextualised by the recipient). After this, recipients share and debate their understanding with that of others in an attempt to have potentially different perspectives further alter that understanding of the larger context (Nonaka 1994). This building of knowledge is a joint effort of all the recipients within the shared context over time, and results in contextualised, shared understanding of the larger context or system (Arias et al. 2000).

When considering ARGs, this meaning-making can, as noted earlier, lead to the creation of artefacts by the players such as game guides (Dena 2008), which aim to centralise the shared understanding of the larger context as it is created. This creation is noted as a central component of the Unified Metaliteracies Framework (Bonsignore, Hansen, et al. 2012). As such, player production is often designed to form part of an ARG's gameplay, such as the need to write a script for the second season of *Urgent: Evoke* as part of a game challenge (Evoke 2010c).

The “player-as-author” paradigm discusses the role player agency has on the creation of player-specific experiences during play (Poremba 1998). It deals with the emergent narratives (Salen & Zimmerman 2003:383) created by the player. Player interactions with game systems (including ARG game systems) lead to emergence, and the creation of emergent narrative and meaning as a result (Salen & Zimmerman 2003:62). However, dynamic interplay between audience and scenario in ARGs has a greater possible emergent consequences. Player action can fundamentally change the scenario that was initially presented by the author (Stewart 2006). This potentially drastically altered resultant fiction is why Stewart (2006) refers to ARGs within his sphere of chaotic fiction.

This potential for change is described by McGonigal (2007a) as “the puppetmaster problem” . In describing the problem, McGonigal (2007a) notes the controversy surrounding the term “puppetmaster”. The “puppetmaster” implication suggests that if an ARG’s designers are the puppetmasters, the ARG’s players must be their puppets. This initially seems to be the case when examining the carefully-orchestrated nature of ARGs, where players submit to the lusory attitude (Suits 1978:34) and the will of the game’s designers for the sake of an experience that is implicitly promised to them. McGonigal (2007a) argues that this submission can even, at times, constitute the removal of player agency within the ARG genre because, for the game to progress, players must complete tasks assigned to them by the puppetmasters.

When described in this framing one begins to wonder about the more sinister potential of the ARG genre. Indeed, player acceptance of this submission seems, to quote McGonigal (2003b), “perverse”. However, the disparity between the almost-sinister theoretical ARG and the reality of the running ARG shows that such sinister motives can never be realised. The disparity between theoretical and actual ARG play forms the basis of the puppetmaster problem (McGonigal 2007a).

The puppetmaster problem lies in the reality of an ARG’s implementation: once the content is live within the game system, the puppetmasters lose the control they once exerted over both the content and the players (McGonigal 2007a). How the players interpret the newly live content influences how the remainder of the live ARG will be played (McGonigal 2007a).

The moment an ARG begins, the game’s puppetmasters are the ones submitting the game to the hands of its players (McGonigal 2007a). They no longer have control of that live content (McGonigal 2007a). While contingency plans can be developed, the puppetmasters’ lack of direct control of the game system and the necessity for human elements within that system to provide players with immediate feedback regardless of that lack of control, is a crucial part of the ARG dynamic and the resultant chaotic fiction (Stewart 2006; Hansen et al. 2013). It is within this dynamic that the allure of the greater pervasive and immersive game genres are found: players have a degree of ownership in the game and its outcome in conjunction with its creators (McGonigal 2007a). Games of these genres are, by design, “the player’s game”.

2.5 Uses for Alternate Reality Games in Education

The following discussion examines the theoretical benefits of using ARGs for educational purposes.

2.5.1 *Alternate Reality Games as a Teaching Tool*

The design of alternate reality games, educational or otherwise, can be considered an educational experience (de Beer & Holmner 2013). Due to the transmedia nature of the genre regarding its delivery of narrative, the use of various technologies and skills, including computer and technology literacies, are exercised throughout an ARG's conceptual design and asset development (de Beer & Holmner 2013). These required skills include web development; image, sound and video editing; programming skills; database management; user experience; interaction design and game design, among others (de Beer & Holmner 2013). It is also noted that designers of ARGs become well-versed in the context surrounding the narrative upon which the game's fiction is based (de Beer & Holmner 2013). The same is true of their understanding of puzzle and game mechanics. In order to design suitable puzzles, members of the design team have to implement and understand sample puzzles and solutions to ensure that correct information was given to the players.

De Beer and Holmner (2013) frame the creation of the ARGs examined in their paper as part of a capstone experience wherein Multimedia students practise the skills learnt in the Multimedia degree programmes at the University of Pretoria. It can be seen that skill exercise during design is not the only outcome noted. The design teams of these ARGs also had deeper understandings of both the narrative content (such as the Free Mason movement or the end of the Mayan calendar) and the ludic content (for example: cryptography or hardware programming) (de Beer & Holmner 2013).

De Beer and Holmner (2013) briefly discuss the games designed by three subsequent design teams consisting of Multimedia students. These games, *Number Thirteen*, *Colossus Innovation* and *Campus Ghost*, were designed with a single, broad, educational outcome: learn how to create and attempt to run an alternate reality game on the University of Pretoria's Hatfield campus. Both *Number Thirteen* and *Campus Ghost* were considered successful, having run to completion. *Colossus Innovation*, however, had to be ended prematurely due to lack of player participation in the game. As mentioned, the design teams, in all three cases, learnt more than simply how to create and run an ARG. The teams had better understanding of their respective games' narrative and ludic context by the end of the module.

These outcomes suggest that the design of an ARG can contain elements of constructionist learning. Constructionist learning extends constructivist theories with regards to personalised learning experiences by additionally providing learners the opportunity to learn through construction of an environment with materials (that are, in this case, both physical and virtual) (Papert 1986). The creation of an ARG's fiction can only happen through the active design of the alternate reality itself. This process

is recursive: the alternate reality is designed, which allows the development of a game based within it. The game then further informs revisions or alterations to the reality itself.

Colvert's (2009) design of an ARG surrounding Ridley's (2002) book *The Mighty Fizz Chilla* displays the effectiveness of the notion proposed by De Beer and Holmner (2013). Similar to the efforts described in De Beer and Holmner (2013), Colvert's (2009) application for the purpose of teaching technological and narrative literacies were considered successful. It is discussed in greater detail in 2.6.1.5.

It must additionally be noted that an understanding of the designs of all three campus ARGs discussed in De Beer and Holmner (2013) greatly informs the design of the empirical study. This is because its development is aided by design teams comprised of students enrolled for the module discussed by De Beer and Holmner's (2013) work.

2.5.2 *Motivating Personalised Player Engagement*

The ARGOSI project defined six motivational elements to help engage potential ARG players. They are: community, competition, completion, creativity, narrative and puzzle solving (Whitton 2009a).

The creation of an inherent, personalised engagement can be considered a key factor in ARG design. Should engagement not exist, players cease to play and game progression stops, as noted by Kim et al. (2008). An understanding of relevant, contextual, motivation that leads to this engagement is also important in alternate reality game applications, as adherence to the "this is not a game" aesthetic relies on an intrinsic motivation: the curiosity of a potential game's players. If this curiosity is not fostered within an ARG's design, ARGs adhering to the TINAG aesthetic may never be discovered or played by their targeted communities.

Guidelines have been suggested for the promotion of this curiosity, as well as the components of fantasy and challenge in ARG design. These guidelines were adapted from an understanding of digital games, but can be applied to ARGs when considering the fostering of player engagement. Davies et al.'s (2006) guidelines can be adapted for ARGs as follows:

- Player action should have meaning within an ARG. This links to meaningful play, the notion that every action should have an outcome in the game system, and that outcomes should be discernible and integrated into the larger game context (Salen & Zimmerman 2003). This also links to player agency (Poremba 1998). If player action has no outcome, there is no motivation for the player to perform that action, as the action becomes meaningless.
- There should be an overriding goal, as well as sub-goals, within the game. This provides the player with an objective to overcome, as well as incentives for rewards. Additionally, these goals

should have integrated outcomes on the game state that respond to how players, through agency, reached those goals.

- The game should exercise mental skill and, by extension, critical thinking. This necessity for challenge exists in all ARGs, as they contain puzzles for players to solve, as noted by the Unified Metaliteracies Framework discussed later (see 2.5.4).
- The outcome of the game should be uncertain at the outset. This outcome is often revealed through narrative progression and the play of the game itself. This helps enrich the fantasy of the alternate reality as well as engage the curiosity of the players.
- Players should develop strategies in order to succeed. This links closely to the necessity for mental skill, and illustrates player constructivism through play.
- The game should include multiple paths to success. This links directly to a constructivist approach of the player experience: players build their own strategies and execute these strategies as emergent paths that are responded to through an ARG's dynamic design.
- Players should be able to overcome most obstacles in an ARG. This links closely to player engagement, as well as the concept of flow (Csikszentmihalyi 1990) whereby games need to retain a balance between player ability and game difficulty to avoid player frustration (too difficult for relative ability) or boredom (too easy for relative ability).

Regarding the fostering of motivation for this engagement, the ARGOSI project defines six motivational elements to help engage potential ARG players, as well as possible implementations thereof (Whitton 2009a). These are:

- “Community”: This can be fostered through the use of social media tools and designed collaborative activities.
- “Competition”: This can be encouraged through the use of explicitly announced prizes and in-game leaderboards.
- “Completion”: As some players derive pleasure from completion (Schell 2014:130), allowing players to see the complete game structure and where fragments need to be completed supports these desires.
- “Creativity”: As noted, game activities can often lead to the creation of artefacts that can be both internal or external to the game context (Dena 2008; Bonsignore, Hansen, et al. 2012). Supporting this through gameplay can be motivational.
- “Narrative”: The mystery that traditionally surrounds ARG narrative and is fostered by transmedia fragmentation is compelling to players (Dena 2008).
- “Puzzle-solving”: Solving puzzles (and the implicit problem mastery that comes with it) is fun (Koster 2013:90). Design should thus support these puzzle elements.

It must be noted that suggested implementations of Whitton's (2009a) “competition” element (leaderboards and explicit prizes) are often components of gamification (Muntean 2011). As such, they

are widely used game elements. The pervasiveness of such elements may interfere with the “this is not a game” aesthetic, if incorrectly implemented.

This conflict highlights a core conclusion of the ARGOSI project when considering design principles for educational ARGs: the TINAG aesthetic may not be suitable within educational contexts (Whitton 2009a). This conclusion is explained through various observations from within the ARGOSI project. These include the notion that students require clear purposes for the completion of educational activities, the disparity between the “exclusive”, secretive nature of the TINAG ARG (where knowing a game is being played separates “players” from “non-players”), the inclusivity strived for in tertiary education contexts, and questions regarding institutional safety and institutional responsibility for students (Whitton 2009a).

When designing educational ARGs with these elements and principles in mind, it can be seen (as examined later in 2.6) that these applications can be motivating and engaging to students who choose to interact with educational ARG contexts.

2.5.3 Guided Learning and the Role of the Protagonist-by-Proxy

In designing for engagement, alternate reality games often need to design more than merely an engaging context (the alternate reality). The context and alternate reality simply inform the game’s fiction. However, it stands to reason that for ARGs to be truly effective experiences, the integration of player reality and game world should contain as many shared components as possible. If a component has meaning both within the player reality and the game world, it may be regarded as more important to the player due to its use in two separate (though interwoven) contexts.

These components, however, need not simply be game objects. Instead, in the context of an ARG, game characters can serve as middlemen between the player reality and the game world. Many ARGs use in-game protagonists for this purpose (Bonsignore 2012). These protagonists include the characters of Dana in *I Love Bees* (McGonigal 2008), Nadirah (who is a legitimate recording artist outside of the game, lending to her credibility) in *Conspiracy For Good* (Kring 2010a), Viola in *ViolaQuest* (Whitton 2009a), Beth in *Stop Toilworn Diamond* (Hakulinen 2013) and, of note, April in *The Arcane Gallery of Gadgets* (Bonsignore 2012).

These in-game protagonists often serve as characters who introduce players to the ARG’s game world and its fiction. The initial interaction between player and game character (such as the players being asked for help by a game character) can serve as one of the game’s many “rabbit holes”, or entry points (McGonigal 2008; Whitton 2009a; Bonsignore 2012; Hakulinen 2013). It is this initial interaction that allows the players to become the individual protagonists of the ARG itself; because the players are given the same information about the game world as is received by the game’s protagonist, the players become the game’s “protagonist-by-proxy” (Andersen 2008).

Bonsignore (2012) documents the creation of April G, the protagonist of *The Arcane Gallery of Gadgetry*, to allow for the “protagonist-by-proxy” phenomenon. The game’s designers made sure that April, as a character, was relatable to the game’s audience, so that players could look to April for help and advice during the game, as well as feel compelled to help her.

The ability for April to provide players with hints (as her character was written and acted by the game’s lead writer) in solving in-game puzzles and direct their narrative exploration demonstrates the power of the protagonist trope within the ARG genre. This relates closely to Vygotsky’s (1980:86) “zone of proximal development” when attempting to understand the potential for learning in ARGs. The “zone of proximal development” is the distance between a learner independently solving problems that result in learning and the potential for growth in this problem solving when assisted by adults or capable peers. Extending this, a “zone of intervention” can be identified where the intervention of assistance aids in the learning process (Kuhlthau 2004:129).

The creation of “protagonists-by-proxy”, through the use of a protagonist that intervenes and assists where necessary, can thus support learning in an educational ARG. Through participation in the game, its protagonists-by-proxy, the players, complete puzzles and drive the narrative forward in an attempt to have the protagonist reach their final goal, which often results in the conclusion of the narrative (Bonsignore 2012). In this way, the in-game protagonist, controlled by the game’s designers, has to do little actual work regarding moving the plot forward themselves, as the players fill this role. The players are encouraged by the protagonist to learn the necessary skills they need in order to complete their (educational) game tasks that affect the narrative.

This protagonist-by-proxy technique also bestows an additional, albeit intrinsic, reward to the players: it was *they* who helped the in-game protagonist fulfil their final role. This notion can later be remembered by the players and presented as an accomplishment to those outside of the magic circle.

2.5.4 Implicit Learning: The Unified Metaliteracies Framework

Bonsignore et al. (2012) discuss a theoretical benefit of the play of ARGs that directly relates to the purpose of this dissertation. They posit that alternate reality games are inherently used, due to their design and genre, to practice 21st century literacies, which include technology, communications, media and information literacies, among others.

Due to the vast range of these literacies, the authors propose a Unified Metaliteracies Framework (UMF) for Transmedia Practices. This framework consists of seven categorisations of actions practiced to exercise 21st century literacies: gather, make sense, manage, solve, create, respect and collaborate.

- “Gather” refers to the finding of information segments, trailheads and hooks in the ARG and evaluating their relevance, authenticity and placement within the alternate reality. This also involves the separation of game artefacts from real-world objects or red herrings.
- “Make sense” refers to the aggregation of gathered information, using skills possibly taught and exercised during earlier gameplay, to form narrative and ludic frameworks within the context of the alternate reality. However, the teach-before-practice approach to ARG puzzle design may not always hold true, leading players to construct their own path to contextualisation and sense-making through their agency, thus hinting once again at the inherent constructivism in games.
- “Manage” refers to the careful organisation of these created frameworks for personal, communal and archival use, often throughout the ARG or transmedia experience, as well as to act as compilations of game artefacts and assets for future study or use.
- “Solve” refers to what the researchers consider one of the most vital parts of ARG gameplay and design – the ability to solve problems or puzzles in order to advance the game’s narrative. This component also frames an alternate reality game’s inherent dynamic design as an “ergodic discourse”; where this component is necessary in order to progress the narrative forward, with each discourse taking place on a plane of negotiation between player and designer.
- “Create” refers to the player ability to, through agency, produce artefacts that may exist either within the alternate reality’s fiction or external from it. Either of these types of artefacts may help new players in understanding the game or the context in which it takes place; or the production of these artefacts can form part of the “solve” category, where artefact creation drives game narrative forward.
- “Respect” refers to the social aspect of play within alternate reality games where, due to the potentially large and diverse player base, a respect for culture, ethics and legal systems is employed within the community in order to facilitate collaboration. Additionally, where this respect is not in place on an individual player basis, it is learnt through community interaction and gameplay, thus exercising communications literacies through gameplay.
- “Collaboration” manifests in alternate reality games through their design, as well as the above “respect” category. ARG players must collaborate in order to participate in the “ergodic discourse” of gameplay. This is often done through social media and Web 2.0 tools, further exercising communications and media literacies.

In addition to these components, various educational benefits of ARGs are also discussed, with questions posed regarding how ARG design can support them. These discussions include the ability for ARGs to potentially reach larger audiences than traditional educational contexts, as well as how this potential impacts repeatability, scale and resource costs during development (Bonsignore, Hansen, et al. 2012).

Questions regarding the learning experience gained through ARG development are discussed earlier (see 2.5.1). Additionally, Bonsignore et al. (2012) raises questions regarding the ability to develop compelling small-scale ARGs with limited resources, the reuse of educational ARGs and the need for specific design

principles for small-scale, “classroom-size” ARGs. These questions will be addressed on conclusion of the empirical study (see Chapter 7).

Moseley et al. (2009) discusses similar implicit pedagogical benefits of ARGs through the nature of their play. These include:

- Critical thinking being exercised through the solving of an ARG’s puzzles.
- Narrative devices within the game system can act as a means for fostering player engagement with the game.
- Player agency allows for actions taken by the players themselves to produce additional or personalised meaning within the game system. As such, the game may feel more relevant to the player because their agency can affect the game context.
- The nature of an ARG’s unfolding narrative and ludic structure through the genre’s use of transmedia for extreme fragmentations maintains engagement. The vast array of media from which players can extract relevant game content allow for more frequent and more varied interactions with the game system.
- Potential social interaction can be fostered within the community that forms around the game and their collaboration.
- Rewards given to players in ARG contexts can, if necessary, be linked to assessment.
- The use of existing multimedia technologies makes ARGs both easy to design and easy to play.

These benefits further suggest the necessity for an inherent, personalised form of player engagement within an ARG as discussed earlier (see 2.5.2). In achieving this, ARGs can achieve design or educational goals such as that of skill acquisition and exercise. It must also be noted that the use of Web 2.0 technologies during play implicitly teaches or exercises computer and communications skills, regardless of the game’s fiction or context (Moseley et al. 2009).

2.6 Educational Applications

The following sections document various examples of alternate reality games that were played or developed for educational purposes. The examination of these applications hopes to help inform the design of the empirical study by giving examples of narrative and gameplay elements within these applications that may be exclusive to educational ARGs, understanding why these elements were included, and determining the metrics by which educational ARGs may be considered successful. Additionally, considerations and conclusions within each study provide insight into the successes and failures of each contextual application. These conclusions and considerations, then, may best inform the empirical study’s design and implementation. However, it must be noted that, due to context-specificity, some considerations may be more relevant than others for the empirical study design.

For the purposes of this dissertation, in order to limit the scope of examined games, only games that are supported by academic documentation (conference papers, conference presentations and academic journal articles) are reviewed. This criterion was chosen as the academic format allows better identification of the following components for each game: overall narrative, example gameplay, results of the game or study and each game's measure of success. These components will then help inform the metrics that will measure the empirical study's success at its conclusion.

The broad categorisations these games fall under were chosen to aid the understanding of certain design choices made within games in these categories. "Alternate Reality Games as Integrated Coursework" examines these applications as a more deeply immersive game-based learning; "Alternate Reality Games as Behavioural Change Vehicles" examines the notions of tangential learning (Portnow 2008) and the willingness of players to learn and apply that learning through play; and "Alternate Reality Games as External Learning Environments" examines game framed similarly to this dissertation – games played as external to targeted course content that are educational in nature, but also voluntary. These three framings range from a broad overview of the ARG genre in educational contexts to narrower, voluntary applications, and thus can provide wider insight when considering design implications in the empirical study.

Each game in each category was examined as it presents unique elements that help inform the theoretical framework for the empirical study. Examples of these elements for each game are as follows:

- *Skeleton Chase* (Johnston, Massey & Marker-Hoffman 2012) presents the notion that despite inconclusive results in some game aspects, educational ARGs can remain successful should they provide an entertaining experience.
- *Finding Identity* (Fujimoto 2012) presents a game-based-learning style ARG that encourages creativity and reflection within the imagined game world.
- *The Arcane Gallery of Gadgetry* (Bonsignore et al. 2013) offers the notion of the "protagonist-by-proxy" and its importance to the educational ARG genre in the facilitation of learning.
- *The Tower of Babel* (Connolly, Stansfield & Hailey 2011) examines a large-scale educational ARG and the design considerations that form as a result of largely-online participation.
- *The Mighty Fizz Chilla* (Colvert 2009) presents the validity of designing ARGs as a teaching tool.
- *World Without Oil* (Rusnak, Dobson & Boskic 2008) exists as one of the few packaged, replayable educational ARGs that can be deployed in its original form across multiple target groups, notably as an examinable unit.
- *Urgent: Evoke* (Waddington 2013), while similar to *World Without Oil*, shares the notion of largely sequential real-world mission-based gameplay and their effectiveness in educational ARGs.
- *Conspiracy For Good* (Stenros et al. 2011) exists as an important example of understanding an ARG's audience, as well as how to best deliver narrative in keeping with the game universe.

- *ViolaQuest* (Whitton 2009a) is an early example of an educational ARG used as an external learning environment. *ViolaQuest* aimed to aid students with orientation, socialisation and induction into student life. As such, it exercises information literacy skills, at least in part, for this purpose.
- “*Who Is Herring Hale?*” (Piatt 2009) is another example of an early educational ARG used as an external learning environment. “*Who Is Herring Hale?*”, similarly, exercises information literacy skills, at least in part, for the purposes of student induction.
- *Black Cloud’s* (Niemeyer, Garcia & Naima 2009) relevance is presented in its academic approach, specifically building its game design upon constructivist educational principles as presented by Dewey (1916).
- *Stop Toilworn Diamond* (Hakulinen 2013) presents a context that is most similar to the context in which the empirical study takes place, and argues its design decisions based very heavily on this context, making it of particular importance to this dissertation.

2.6.1 Alternate Reality Games as Integrated Coursework

The following section presents various examples of ARGs that have been played as part of coursework in educational institutions.

2.6.1.1 Skeleton Chase

Skeleton Chase was an alternate reality game that was developed in order to influence the level of physical activity performed by first year students in a tertiary education institution (Johnston, Massey & Marker-Hoffman 2012). The reason for the development of a game, and specifically an ARG for this purpose, was chosen by the researchers due to the mapping of gameplay elements such as experiential and social learning, goals and the pursuit of fun to learning preferences of students, which include aspects such as collaboration, experiential activities and goal orientation (Oblinger 2004). Additionally, the necessity of fun was a prominent reason for student participation in physical activity (Allender, Cowburn & Foster 2006). This same necessity for fun can also be noted as a prominent principle in game design (Koster 2013:40).

The designed game did not adhere to the aesthetic of “this is not a game” (McGonigal 2003b) in order to make students aware of the game from the outset to allow them to potentially change classes from the game’s target group (a specific class of students enrolled in a health module), should they not wish to participate. For the target group, however, the play of the ARG replaced the traditional fitness requirements for the course (Johnston, Massey & Marker-Hoffman 2012).

The game’s narrative involved the recovery of a kidnapped professor and her teaching assistant by the players. The kidnapping occurs due to the victims’ involvement with a special “skeleton plant” that they

use as an ingredient for a health drink. The company that funded the drink's development, however, had been illegally testing the drink on unknowing students. During the course of the game, the players find out about and shut down the company's illegal operations, saving the kidnapped professor and teaching assistant in the process (Johnston, Massey & Marker-Hoffman 2012).

The goal of *Skeleton Chase's* gameplay was not to force, but rather influence physical activity in its players through behavioural change. To encourage this, game activities were often live-event driven, with players needing to traverse a large university campus to solve puzzles or participate in the game (Johnston, Massey & Marker-Hoffman 2012). This kind of movement within the game indirectly fulfilled parts of the health course's physical activity requirement (Johnston, Massey & Marker-Hoffman 2012). Additionally, for further experiential mapping, game activities often linked to the lecture content within each specific week, such as a nutrition lecture followed by a game puzzle that tasked players with creating a health bar (Johnston, Massey & Marker-Hoffman 2012). Game narrative also echoed lecture themes where possible without explicit reference to the themes, such as alcohol abuse (Johnston, Massey & Marker-Hoffman 2012). Gameplay took place over multiple technological platforms, a characteristic seen in most ARGs (Dena 2007). This transmedia experience also directly linked to student learning preferences of using multiple technologies. Gameplay was conducted at the end of theory classes for the target group by way of a directive from game characters via messages or live visits, and players participated in the game in teams, with teams competing to be the first to solve the game mystery (Johnston, Massey & Marker-Hoffman 2012).

Regarding quantitative results, the study's main hypothesis – that an ARG would increase physical activity for those playing it, held true – with the game group's physical activity increasing from pre-game baselines, while other, non-player, groups registered for the same course decreased physical activity. However, a secondary hypothesis that weight loss (or at least a minimising of weight gain) would follow the increased physical activity did not hold true, with both groups gaining weight over the course of the game run (Johnston, Massey & Marker-Hoffman 2012). The researchers propose that this lack of agreement could be caused by multiple factors, as weight management is a complex process that varies between individuals. Additionally, as the mean weight gains observed within the data fell within ranges typical in other studies (Racette et al. 2005; Levitsky et al. 2006; Wengreen & Moncur 2009), a hypothesis concerning the minimising of weight gain cannot be confirmed (Johnston, Massey & Marker-Hoffman 2012).

Qualitatively, players report becoming aware of walking as a viable means of campus transportation, along with enjoying and being motivated to engage in the physical activity, exploratory and collaborative aspects of the game (Johnston, Massey & Marker-Hoffman 2012). They also felt that the game provided an ample platform for learning, as well as for student interaction and support. However, the students did criticise aspects such as the length of the game compared to non-player group exercise sessions, as well as the automatic team selection. They also raised concerns regarding what non-playing peers may have thought of them for their participation (Johnston, Massey & Marker-Hoffman 2012).

Regarding measures of success, the authors never clarify their stance on the study's explicit success or failure, rather focusing on strengths – such as the increase in physical activity through gameplay and the representation within the study of typically understudied student groups – and limitations – such as the heterogeneous game and control groups, and how this caused a lack of explicitly voluntary participation when compared to a more open, opt-in study – of the study itself (Johnston, Massey & Marker-Hoffman 2012).

In the search for a more explicit answer, when analysing the study in comparison to other educational ARGs to be discussed, various aspects of the study are promising. The large player base (n = 42 out of 115 students) can be considered a success, as the ability to change class groups was initially given to the student body. Additionally, because player feedback often matched up with researcher reasoning for the creation of a game application to encourage physical activity, the study can be considered an overall success, regardless of the inconclusiveness of one of the study's hypotheses – weight management within the game group.

2.6.1.2 *Finding Identity*

Finding Identity was an alternate reality game developed to help give social science students a better understanding of Japanese-American living conditions and culture during World War II. The game and its subsequent study was run in a K-12 (in this case, a high school) setting. As such, the content needed to fulfil curriculum standards for the setting in which it was run (in this case, academic standards for the state of California) (Fujimoto 2012). This necessity can be seen in other examined games within this dissertation, such as *The Arcane Gallery of Gadgetry* (Bonsignore et al. 2013), which will be discussed later (see 2.6.1.3). This necessity makes integrated coursework ARGs of particular interest in relation to this study, as the necessity to conform to academic standards could possibly result in a stricter pedagogical experience that may limit game design choices within each application.

In the case of *Finding Identity*, this necessity to reach learning outcomes resulted in the design of a game that, whilst described and designed as an ARG in Fujimoto's (2012) study, may not be considered an ARG due to a lack of participant authenticity. Authenticity in this regard refers to the fact that players do not use avatars in the play of the game or play any sort of role or character (Bonsignore et al. 2013; McGonigal & Jerrett 2014). In ARGs, players play as themselves within a game context that intertwines with the real world. The physical actions that affect the game world during this reality/alternate reality interplay helps skill transference (often the goal of ARGs) in educational contexts (Bonsignore et al. 2013).

As such, in *Finding Identity* the aesthetic of "this is not a game" was not followed, and students were tasked with imagining themselves as a member of the fictional Japanese-American Takahashi family. The game progresses through the completion of activities related to the history of Japanese-Americans

during the 1940s (Fujimoto 2012). Additionally, Fujimoto (2012) notes that *Finding Identity*, due to its necessity to fulfil learning objectives, could be considered a lot more closed in comparison to other ARGs.

One may then question whether or not *Finding Identity* truly is an ARG, as its placement of players in explicit roles and more formal, closed, system (Salen & Zimmerman 2003:53) mirrors that of traditional and, in this case, educational games (Fisch 2005), or pervasive games (McGonigal 2003b); or other systemic structures such as those utilised in gamification (Deterding et al. 2011). However, despite its questionable status as an ARG as defined by this dissertation, aspects of its implementation are still relevant to help inform design decisions, as the study frames the application as an ARG and judges its results on the merits of the game within this framing (Fujimoto 2012).

As mentioned, the game's narrative guides players through various scenarios that aim to make players reflect on events within the game context as if they were living during that time. These scenarios range from the attack on Pearl Harbour to post-war resettlement (Fujimoto 2012). After the game had provided narrative context to the players by explaining each scenario, they were then linked to the puzzle or activity (often an assessable component) for that scenario. These activities constituted *Finding Identity's* main gameplay.

Puzzle design in *Finding Identity* adhered to multiple requirements for typical ARGs, such as the necessity for individual information seeking, information sharing and collaboration in solving puzzles (McGonigal 2003b; McGonigal 2008; Bonsignore, Hansen, et al. 2012). An additional puzzle requirement in *Finding Identity* noted that puzzles should not take too much time to complete (Fujimoto 2012), a sentiment echoed in many educational applications for logistical reasons (Piatt 2009; Whitton 2009a).

The puzzles themselves were often fairly simple, making use of technologies such as email to send each player within each game group a message that lead to a fragmented puzzle solution, such as a word or a set of letters. When combined with the solutions acquired by the other group members, the puzzle would be complete and often unlock the activity for each scenario (Fujimoto 2012).

Activity design followed similar design principles to the game's puzzles and, as such, was largely collaborative. Game groups were required to synthesise, or "create" in Bonsignore et al.'s (2012) Unified Metaliteracies Framework, products that discussed their thoughts, feelings and perspectives on the activity's given scenario. These products would then be created through the use of new media technologies and platforms such as blogs, information visualisations and video, and would often require group members to do in-depth research on the given scenario in order to better support their opinions (Fujimoto 2012). In keeping with the game-framing of the coursework, assigned marks for activities added to each group's standings on a shared leaderboard, included to enhance motivation through the visibility of the feedback (the marks and standings) that hoped to motivate competition.

Evaluation for *Finding Identity* took place on multiple levels – single person and expert evaluations informed the game’s field study, and were done by a website designer (concerned with the usability of the game website) and two subject matter experts (concerned with the learning outcomes) respectively (Fujimoto 2012). The results of the field study, however, are the most relevant for this dissertation.

These results noted significant increases in player understanding of military segregation within the period (a specific scenario), as well as their experience in finding and evaluating historical sources. While other scenarios did not show significant increases in player understanding, Fujimoto (2012) does note a marginal increase in their understanding of game content as a result. Additionally, player feedback noted their overall enjoyment of the game and that meaningful learning occurred. However, some players also made recommendations regarding the clarity of assessment rules within *Finding Identity* (assessment rubrics). These recommendations are notable when attempting to understand educational products like *Finding Identity*, where the scenario helps gamify the explicit learning experience, as it shows that assessment components should still feel clear to game participants.

As with the evaluation of *Skeleton Chase* (Johnston, Massey & Marker-Hoffman 2012), Fujimoto (2012) never explicitly measures the success of *Finding Identity* in his conclusions. However, the positive feedback received from players as well as various increases in their understanding learning outcome-relevant scenarios suggests that the designers accomplished their goal of the creation of a more engaging learning environment, whilst still adhering to the strict pedagogy of a formal curriculum. Thus, though *Finding Identity* suffered from some limitations based on its context, it can also be considered a success.

2.6.1.3 *The Arcane Gallery of Gadgetry*

The Arcane Gallery of Gadgetry (hereafter referred to as “AGOG”) attempted, like *Finding Identity* (Fujimoto 2012), to teach a group of K-12 (in this case, Grade 8) social studies students (Bonsignore, Kraus, et al. 2012; Bonsignore et al. 2013). Similar to *Finding Identity*, AGOG immersed students into a historical context.

However, unlike *Finding Identity* (Fujimoto 2012), AGOG did not task its players to play as a fictional character within a historical setting, but rather as themselves in the present day as members of JENIUS (Junto of Enlightened Naturalists and Inventors for a United Society), a modern day secret society based on the Junto, a society established by Benjamin Franklin in 19th century America (Bonsignore, Kraus, et al. 2012; Bonsignore et al. 2013). Led by April Gravure and a JENIUS ambassador, the players attempt to discover the mystery behind the fire of the “Temple of Invention”, the U.S. Patent Office, that occurred in 1877 (Bonsignore, Kraus, et al. 2012; Bonsignore et al. 2013).

Players take on various roles in the JENIUS society that inform each player's gameplay: based on an aptitude test they become either cryptographers (members tasked with ensuring the security of JENIUS artefacts through code and cipher knowledge), archivists (members who determine relevance and authenticity of artefacts), inventors (who create new JENIUS designs and manage old ones) and surveyors (who maintain societal maps, charts and other geographic data) (Bonsignore, Kraus, et al. 2012). These player roles contain aspects of the community roles discussed in the ARG Whitepaper, such as information specialists (archivists) and puzzle solvers (cryptographers) (Thompson 2006).

Narratively, *AGOG* also adhered to the character device of a protagonist-by-proxy (Bonsignore 2012). This device utilises the existence of an in-game protagonist that the players are able to assist. This character discovers game events along with the players. It has been shown through various ARGs, such as with April Gravure in *AGOG* (Bonsignore et al. 2013) and Dana in *I Love Bees* (McGonigal 2008), that the ability for players to relate to and communicate with game characters who are "on their level" raises motivation and engagement as the players feel like they are working with someone within the game space, and are not simply left to traverse it themselves without guidance (Bonsignore et al. 2013). Protagonists can serve as an important mouthpiece for the game's designers, or the "puppetmasters", as these characters can demonstrate skills required in solving game puzzles that players can then emulate. The use of these protagonists makes the players the game's "protagonists-by-proxy", as discussed earlier (see 2.5.3).

Despite the rich immersion the above narrative provides players, *AGOG* also did not adhere to the "this is not a game" aesthetic due to the game's implementation within a classroom. Instead, game elements were introduced at the start of the class and discussed by the group before the undertaking of game activities. These group discussions helped orient individual players by allowing them an opportunity to voice their opinions on narrative and gameplay elements and thus piece together to overall structure of the game as it unfolded as a group (Bonsignore, Kraus, et al. 2012). This design decision was made due to its effectiveness in cooperative learning environments (Bonsignore, Kraus, et al. 2012). During these discussions, an "investigation wall" game element was introduced for players to interact with in order to aid visual and conceptual connections across JENIUS subsets (having cryptographers understand something discovered by an archivist, for example) (Bonsignore, Kraus, et al. 2012).

Gameplay was separated into a training phase and the game's final mission. As the name implies, the missions for each JENIUS subset's training phase trained players in the skills they would need to know as inventors, cryptographers, archivists and surveyors in order to complete the game's final mission, which involved the collaboration of all these skills (Bonsignore, Kraus, et al. 2012). These training missions included skill exercises like: using Geographic Information Systems software (surveyors), searching patent databases (archivists), encoding and decoding ciphers (cryptographers), and creating electrical circuits (inventors) (Bonsignore, Kraus, et al. 2012). Importantly, each skill being exercised was integral to the mission's success due to close mapping between the skill being exercised and the mission's

solution. Additionally, badges were awarded to individual players, which then appeared on the player's profile page in order to motivate and engage players (Bonsignore, Kraus, et al. 2012).

The results of *AGOG* confirm the hypothesis set out by the authors regarding heavily collaborative play and the engagement it provides players within an educational context (Bonsignore, Kraus, et al. 2012), noting that the explicit teaching format in a game context (that players have to be trained in a specific order subset) provided an authentic learning environment for players. They additionally noted the success of the designed cross-subset pollination, whereby players from different order subsets would collaborate to complete missions, as well as the game's final mission. The players then seemed to be very supportive of one another, often congratulating their peers on game discoveries and mission completions through in-game chat mechanisms (Bonsignore, Kraus, et al. 2012). Additionally, despite *AGOG*'s denial of the "this is not a game" aesthetic, players still participated in the experience wholeheartedly, calling it "imaginary real", or taking some game elements at face value based on their faith in the fiction, akin to believing something based on one's faith within a real-world context (Bonsignore, Kraus, et al. 2012).

Regarding the game's measure of success, the authors refer to *AGOG* as an application that "offers an early foundation of best practices[...]when implementing ARGs[...]for teens" (Bonsignore, Kraus, et al. 2012). This choice of words may suggest that they consider it a successful application, especially when regarding the tightly coupled design-and-outcome approach with which they presented their study (Bonsignore et al. 2013). Additional to the observed qualitative results of the study, it must also be noted that the game's active player base (n = 55 out of 60 students across the two classes in which the game was run) could also contribute to calling *AGOG* a successful application of an educational ARG.

2.6.1.4 *The Tower of Babel*

The *Tower of Babel* ARG was developed aiming to increase the motivation felt by secondary education students engaged in learning foreign languages (Connolly, Stansfield & Hainey 2011). As with *Finding Identity* (Fujimoto 2012) and *AGOG* (Bonsignore, Kraus, et al. 2012; Bonsignore et al. 2013), the game was played in a K-12 institutional setting. However, uniquely for the *Tower of Babel* ARG, the ARG itself was run in a distributed fashion, and played by students from multiple institutions in multiple countries. In order to facilitate the need for a robust structure to support this distribution, the design team decided to create a customised theme for Moodle, an open-source Virtual Learning Environment, and thus use Moodle as the game's overall technological functionality. The use of Moodle also allowed for the explicit marking of player-created artefacts as course deliverables by respective participating educators (Connolly, Stansfield & Hainey 2011).

This decision to use Moodle for the game's technological functionality informed *Tower of Babel*'s stance on the "this is not a game" aesthetic, with the designers choosing not to adhere to the aesthetic. Though

their reasoning behind this is not explicitly mentioned within the study, it is theorised that due to *The Tower of Babel* being designed as an ARG that students would play as part of their coursework, maintenance of the aesthetic would have been counterintuitive to the study and the game itself.

The distributed aspect of the *Tower of Babel* ARG mirrors that of commercial ARGs such as *I Love Bees* (McGonigal 2008), *Conspiracy For Good* (Stenros et al. 2011) and *Urgent: Evoke* (Waddington 2013), which allowed the ARG design principle of “designing for a hive mind” and the notion of collective intelligence to thrive within the application (McGonigal 2008).

The Tower of Babel's narrative context tasked players with helping game characters construct a modern Tower of Babel – a construct noted in biblical texts as a symbol of a linguistically united society through a common language (Connolly, Stansfield & Hailey 2011). The modern tower's foundations are built upon various values and principles of European culture (such as freedom, access to education and respect) (Connolly, Stansfield & Hailey 2011), thus increasing the game's teaching potential outside of its multilinguistic roots. Throughout the game, players help game characters from the future save languages and cultures that are under threat by sending information about these threatened cultures and languages into the future to help educate the population on these aspects, thus building the Tower of Babel (Connolly, Stansfield & Hailey 2011).

Gameplay involved game characters providing players with quests that often required collaboration from speakers of multiple native European languages (Connolly, Stansfield & Hailey 2011). Often messages from game characters would need to be translated, for instance, which provided the opportunity for inter-player collaboration to facilitate the start of a given quest. These quests sometimes required simple search tasks to find the correct answers, but would often branch into more complex content creation quests where players would have to compile information about themselves, their cultures or other cultures and represent this information in various ways (Connolly, Stansfield & Hailey 2011).

The results of the *Tower of Babel* ARG are documented in regards to the game's final pilot study. From an initial group of 328 students, 92 (n = 92) completed the game's post-test questionnaire (Connolly, Stansfield & Hailey 2011). Questionnaire results suggested that students on average spent nearly double the amount of time playing the game at home than they did in allotted class times (3,66 hours in relation to 1,94 hours per week on average). This finding supported the notion that gameplay for learning purposes could also be motivational outside of a typical classroom context. Additionally, 78% of students reported enjoyment of the game (phrased in the study as the game “meeting their expectations”), with the majority noting that the game helped motivate and engage them in multilingual learning (Connolly, Stansfield & Hailey 2011).

However, the study did note some negative comments regarding the nature of the ARG as an educational game (Connolly, Stansfield & Hainey 2011). Some of these comments regard immersion (where the game felt more like a forum website than a virtual environment akin to more traditional video games), ludonarrative dissonance (where story elements were not correctly integrated into gameplay elements – in this case, the game’s narrative and its evaluated components), and simple confusion (where players skipped instructions, didn’t discover information or simply didn’t understand what was required of them) (Connolly, Stansfield & Hainey 2011).

Regarding the measure of success of the *Tower of Babel* ARG, the design team considered the ARG “largely successful”, noting the large scale participation by students regarding game interactions (finishing quizzes and interacting with students) and content creation (file uploads for assigned quests). The team notes an ARG’s use as a novel interaction tool, specifically with regards to their language learning outcomes, and were pleased with the game’s positive response from its player base, suggesting that educational ARGs can be used as effective teaching tools (Connolly, Stansfield & Hainey 2011). Their evaluation agrees with those provided by Whitton (2009a) and Piatt (2009) in their respective studies (as discussed later in this dissertation – see 2.6.3.1 and 2.6.3.2 respectively).

Additionally of note, it can be seen through the examples of narrative context, gameplay and learning outcomes within the *Tower of Babel* ARG that these elements are closely linked. This resulted in a deeply authentic, personal and creative environment in which students could practice multiple languages through interaction with one another and with the game world (Connolly, Stansfield & Hainey 2011). This suggests that gameplay complexity in an educational ARG should remain constant and focus rather on providing a safe environment for players to practice necessary skills in authentic contexts, as this may provide effective skill learning, retention and transference without the need for a traditional game difficulty curve.

2.6.1.5 *The Mighty Fizz Chilla*

The *Mighty Fizz Chilla* ARG presents an example of an application that supports the “design as a teaching tool” notion discussed and propagated by De Beer and Holmner (2013). Additionally, while the game was designed by one learner group, it was also played by another (Colvert 2009), meaning that this ARG also examines the traditional “play as a teaching tool” approach, as examined in the above examples.

In the creation of the *Mighty Fizz Chilla* ARG, the design team used the book of the same name, by Phillip Ridley (2002), as the basis for the game’s narrative, whilst making changes to the plot in order to facilitate a more interactive experience for their player group (the students a year below them). As a result, the narrative premise of the original work remained fairly unchanged: Milo Kick helps “the Captain” track down the Mighty Fizz Chilla (also referred to here as “MFC”) with the help of various characters, each of whom have their own intentions (Colvert 2009).

The nature of characterisation in the novel allows for ARG-like gameplay, as through most of the novel, Milo is attempting to understand the story of the MFC through the piecing together of various stories told by the characters (Colvert 2009). This uncertainty was embedded into the designed experience, with the researcher challenging her team to make their peers believe that the MFC was headed towards their school. This twist on an established narrative is common in alternate reality games: narratives may have a basis in initial fact, but change to reflect the “alternate reality” the game creates. This can be seen in examples such as *AGOG* (Bonsignore et al. 2013) and the player-imagined realities in *Finding Identity* (Fujimoto 2012). The aim of the players in this participatory version of the *Mighty Fizz Chilla* novel, was to find the MFC and either kill or tame it (Colvert 2009).

Gameplay from the ARG largely followed Milo’s journey from the novel, and had players communicate with various characters, each of whom would reveal information and clues to help the players solve the mystery of the MFC (Colvert 2009). Each character had their own unique identity, based on their characterisation from the novel. During asset creation, the designers kept this in mind, creating assets that both reflected each character’s identity, as well as providing clues to the players, resulting in assets that provided both narrative and ludic context (Colvert 2009). These clues, as in most ARGs, led to objects or puzzles that would further player understanding of the mystery, such as Cressida’s rock, shown to players through her video blog, or a secret code hidden in Dee Dee 6’s potion book (Colvert 2009). Notably, gameplay within the *Mighty Fizz Chilla* ARG did not explicitly teach curriculum-based skills to its player base, unlike other examples studied within this section. However, the players’ interaction with the world of the *Mighty Fizz Chilla* ARG aimed to provide them with an understanding of the source material.

The game’s recorded results focus on the design team’s understanding of ARG (and game) creation. The designers noted the importance of creating well-developed characters for creating an immersive experience, even if the players didn’t necessarily explore the characters themselves in detail (Colvert 2009). They also noted the necessity for players to complete game tasks to keep the game both running and on-course in terms of the designed experience, as noted by Kim et al. (2008). They also discussed player-puppetmaster interactions within ARGs, and the dynamic nature of play this encourages, noting that, as designers, they felt connected to the players and as if they were helping the players through the game; but that ultimately, the game itself is in the hands of the players, as their actions altered the course of its design (Colvert 2009). These sentiments were mentioned in earlier literature by McGonigal (2007a) when discussing the “puppetmaster problem”. Lastly, they noted the complexity of dynamic play in ARGs that stems from the lack of an explicit ruleset due to their real-world setting. Whilst the rules were generally communicated from puppetmaster to players during the game, this was done in the form of guidance, as opposed to more explicit rule statements. This notion is once again supported by ARG scholars (Szulborski 2005; Gurzick et al. 2011). Additionally, the notion of guidance that results in learning ties into the earlier discussion (in 2.5.3) of an ARG’s gameplay taking place in the “zone of proximal development” (Vygotsky 1980:86).

It can be seen through these results that concepts that the design team learned through the development of the ARG were often concepts discussed by alternate reality game scholars. This tight coupling between what the design team learnt about ARG development and the principles that guide larger-scale implementations seems to suggest that the application was a successful one, both in terms of the game itself and the learning experience it provided the designers. This application additionally provides an example to support the “design as a teaching tool” notion supported by De Beer and Holmner (2013), which was also practised by the design teams for this dissertation’s empirical study.

2.6.2 *Alternate Reality Games as Behavioural Change Vehicles*

The follow section discusses ARGs that attempted to persuade players to change various behaviours through informing them within a narrative of the consequences of a lack of behavioural change.

2.6.2.1 *World Without Oil*

World Without Oil is noted as being one of the first applications of a “serious ARG”, akin to a serious game, wherein players voluntarily imagined themselves as part of an alternate reality where the world had been struck by an oil shortage (Rusnak, Dobson & Boskic 2008). Jane McGonigal (McGonigal 2010a), the game’s lead designer, noted that this premise helped spark behavioural change in players as they were allowed to simulate these dangerous situations in their own lives before experiencing it themselves.

World Without Oil (WWO) is unique as an ARG due to its lack of explicit puzzle solving and player-driven story, leading to some criticism of its classification as an ARG (Rusnak, Dobson & Boskic 2008). Instead of the typical narrative and gameplay interplay found in other ARGs, whereby player participation advances and informs the narrative (Kim, Allen & Lee 2008), *WWO* challenged players to live their everyday lives within the created alternate reality for 32 days, with each day representing a week within the ARG (Rusnak, Dobson & Boskic 2008). The voluntary act of play in this regard does not adhere to the aesthetic of “this is not a game”(McGonigal 2003b).The game’s puppetmasters released scenarios for each day, denoting things like riot activity, oil price spikes and transport limitations for the players. The players then had to respond to these changes within the alternate reality by documenting how they solved or worked around each problem whilst continuing their normal routine. In this way, puppetmaster-player interaction was concerned more with facilitating player action than explicitly directing it (Rusnak, Dobson & Boskic 2008). Additionally, *WWO* is an example of a replayable ARG, a rarity in the genre due to its design (Hansen et al. 2013), providing lesson plans for educators who wish to replicate the scenario with different target groups (Rusnak, Dobson & Boskic 2008).

This player creation of artefacts (which links to Bonsignore et al.’s (2012) “Create” component of their UMF framework) lead to unique learning experiences for each player. This is because, in order to take

action to solve or bypass a scenario's problems, players had to first understand the problem. Additionally, feedback from the actions they took garnered further understanding of the overall scenarios (Rusnak, Dobson & Boskic 2008). The pervasiveness of these artefacts, in turn, helped players create their own communities based on location or other factors. These communities then helped motivate players to continue playing, due to the realisation that each individual within the community was sharing in the same game world, thus preventing individual players from experiencing isolation.

This core gameplay in *WWO* – the creation and documentation of personal narratives (arguably the driving narrative in *WWO* in comparison to other examples) – and the subsequent interaction with other players when exploring their narratives via their artefacts, showcases the social and contextual nature of learning in constructivist environments (Vygotsky 1980). Additionally, gameplay also facilitated constructionist learning through the creation of game artefacts by players (Steiner, Kaplan & Moulthrop 2006). This creation of artefacts additionally showcased information literacy skills, both through its multimodality (the need for computer literacy to create blogs, videos and other artefacts) and its necessity for critical thinking and reasoning. The latter skills are ones that would be needed within such a scenario, thus also showcasing the potential for skill transference in this context (Rusnak, Dobson & Boskic 2008).

The results of *WWO* led to unique observations due to its design. While the traditional lack of an avatar in ARGs often leads to more immersive, authentic experiences due to players playing as themselves (Lee 2006), *WWO*'s largely online nature facilitated the creation of player avatars through the creation of artefacts, with several players being tied to multiple *WWO*-playing identities (Rusnak, Dobson & Boskic 2008). Despite this, players and designers noted a feeling of accountability within the alternate reality, regardless of the potential characterisation their online selves could portray (Rusnak, Dobson & Boskic 2008).

The safety and authenticity of the game world also allowed for an authentic learning environment for the players that was driven by communal interaction and understanding. As a result, five factors that contributed to player learning in *WWO* were defined: dynamic relations with artefacts, real world agency, empowered action, reflective thinking and participation in an ethically-engaged community context (Rusnak, Dobson & Boskic 2008). These factors parallel with the earlier examination of constructivist principles within the “magic circle” of gameplay (see 2.3.1.2).

When considering these promotional factors towards learning in *WWO*, as well as Jane McGonigal's evaluation of the game (2010a), it can be considered successful in its mission to help its players imagine the alternate reality they participated in, as well as various problems it could pose. McGonigal (2010a) also notes that real behavioural change could be seen in some players, as they were still practising game solutions (such as growing their own vegetables to circumvent supply shortages) for the three years after the game had finished its run. However, it is noted by Rusnak et al. (2008) that ethical considerations for these kinds of “serious ARGs” exist.

2.6.2.2 *Urgent: Evoke*

Urgent: Evoke (hereafter referred to as *Evoke*) was an ARG developed in conjunction with the World Bank to promote social innovation (Waddington 2013). Like *World Without Oil*, *Evoke* can be classified as a “serious ARG”, and was once again directed by Jane McGonigal (2010a). Like *World Without Oil*, new players opted into the experience, with the game being marketed as an online game more than an explicit ARG. This, as with *World Without Oil*, broke the “this is not a game” aesthetic from the outset (Waddington 2013).

Player interaction with *Evoke* first begins with the game’s rabbit hole. Ironically, the rabbit hole includes the phrase “this is not a simulation”, despite players already knowing that they’re playing a game, though this was likely included to promote the lusory attitude (Suits 1978:34). The rabbit hole informs players of the core gameplay: they are responding to “evokes”, narrative scenarios in which a call for innovation is sent out across time by the *Evoke* Network. To respond, players need to read about the scenario (in the form of a comic strip), investigate the story (understand the context surrounding what caused the scenario) and finally, accept a mission that involved figuring out how to aid the *Evoke* Network (Waddington 2013).

These scenarios evolve throughout *Evoke*’s ten weeks of play, with each scenario dealing with different aspects of social innovation, from the core idea itself (“Social Innovation”) through to Crisis Networking and imagining the next steps for the *Evoke* Network (Evoke 2010a). An example mission structure for the first mission, Social Innovation, goes as follows:

Narratively, Tokyo is dealing with a rice famine in the year 2020, so Tokyo’s Governor reaches out to the *Evoke* network via their leader, Alchemy, to help solve the famine. Alchemy promises that *Evoke*’s agents (the players) will help solve the problem. Players then need to investigate the story by “uncovering secrets” (answering questions) about the scenario, such as understanding Japanese culture and the idea of food security (Waddington 2013). Once players understood the context of their mission, their task was to accept it. To “master the mindset of a social innovator” by completing at least one of three mission facets: “Learn”, “Act” and “Imagine” (Evoke 2010b).

The “Learn” component of Social Innovation challenged players to learn about innovation in Africa by reading and responding to a blog post. Acting for this mission required players to “shadow” social innovators by interacting with them on social media, and document these interactions. Lastly, Imagine had players discuss their lives in the year 2020 when the “evoke” was broadcast, including what they were doing to enact social innovation and change (Evoke 2010b).

Subsequent missions followed this mission structure, and, like *World Without Oil*, the alternate reality of *Evoke* was largely built and curated by personal player stories, with players interacting with one

another's content (blog posts and other contributions). These interactions informed a game leaderboard that showed player standing, but did not affect the game's win condition: to win, players had to complete all *Evoke's* missions and create an "Evokation", a social innovation project that acted as the game's final test (Waddington 2013). The person or group who submitted the best Evokation was then declared the game's winner, winning prizes such as project funding, job shadowing and a conference scholarship (Waddington 2013).

Waddington's (2013) analysis of *Evoke's* results provides a juxtaposition to the analyses of games documented above that merits discussion. He prefaces his analysis by discussing the *Evoke* team's expectations for the project – numerical estimates for various player tiers such as "visitors" and "active players". He notes these estimates as "modest", and as a result, costly when considering the scope of the project. These estimates note that, of 87 500 visitors to the site, only 70 would complete the game by completing one aspect of each mission, and furthermore, only 10% of that number would submit and Evokation for consideration by the designers as the game's "winner" (McGonigal 2010b). These estimates likely take McGonigal's experience with previous projects (*World Without Oil* and *I Love Bees*) into account, where *I Love Bees* had 750 000 active players from a pool of 3 250 000 estimated players (42 Entertainment 2010). These estimates are indeed "modest" when considering the realised numbers. *Evoke* had 177 673 visitors, of which 223 players completed one aspect of each mission. It must also be noted that *Evoke's* individual estimates were vastly improved upon, with 74 Evokations submitted against a projected 7 (McGonigal 2010b).

Waddington (2013), however, remains unimpressed, citing the fact that game completion of *Evoke* only required modest effort, and that realised numbers from visitors through to Evokation completions are still largely dwindling, despite *Evoke's* large budget. However, this perspective may perhaps be limited when evaluating the success of ARGs, and may suggest a misunderstanding regarding player tiers (Dena 2008; Kim, Allen & Lee 2008) in ARGs. Examples from this literature review are generally quick to note the novelty of ARGs and their appeal to a niche audience (Piatt 2009; Whitton 2009a); and thus note that appeal to large prospective groups may still not draw enough dedicated players to conclude a quantitatively successful ARG when calculating percentages of participation.

As a result, perhaps *Evoke's* results should be examined purely on their reaching of proposed milestones, where actual numbers always outweighed estimates. In this regard, *Evoke* thrived. Additionally, qualitatively, *Evoke* seemed to achieve its goal of informing and exciting players regarding social innovation (Waddington 2013).

Evoke was still, however, not without fault, and though qualitatively players were excited about *Evoke*, often their final Evokations were unrealistic and, perhaps more importantly, were not maintained post-game, such as the winning Evokation, "Re-Buffalo", which now exists as only a rarely-updated online presence (Waddington 2013). This seems antithetical to the game's message of behavioural change to promote social innovation. Additionally, the lack of an avatar in ARGs through design often means that,

while there is a greater potential for behavioural change due to the authenticity of the experience, players may only be able to take certain actions in their real-world environments due to limiting factors, and these limiting factors may effect player interaction with the alternate reality in turn (Waddington 2013).

When considering the success of *Evoke*, Waddington (2013) decides to rather pose a question regarding its relevance as an educational tool. In his estimation, *Evoke* was “not especially successful” due to its completion ratio when considering aspects like its budget. In an attempt to find value in the game in spite of this estimation he examines the capitalist ideology that underlies its design: whether or not the message of social innovation at the individual level (“[doing] good and [making] money”) is the correct way to solve the problems *Evoke* posed in its narratives. He concludes that this message is apt for people who believe it is a possibility, but less so, should one not believe that social innovation is a “miracle cure” (Waddington 2013).

While this perspective is valid, it could also be considered cynical when examining the average player of *Evoke*. Because *Evoke* did not subscribe to the aesthetic of “this is not a game”, players had to invest in the concept of a game involving social innovation before they began to play. Thus, it is highly unlikely that members of the player community disagreed with *Evoke*’s ideology, as they could choose to stop playing the game if this were the case.

In this regard, while *Evoke*’s ideology may have been an engagement barrier for potential players with conflicting ideologies, *Evoke*’s surpassing of its own milestones (McGonigal 2010b) suggests that it was successful and meaningful to those who engaged with the medium. This once again echoes notions that ARGs are an effective teaching tool for those who enjoy the medium (Piatt 2009; Whitton 2009a).

2.6.2.3 *Conspiracy For Good*

Conspiracy For Good (CFG) was an ARG created collaboratively by Tim Kring Entertainment, Nokia and The Company P (Stenros et al. 2011). Because of the scale of the collaboration, as well as Nokia’s involvement to promote new augmented reality technology, the assets and approach to *Conspiracy For Good* often mirrored similar promotional ARGs (Barlow 2006) rather than educational ARGs. However, due to the nature of the narrative, it can be considered educational in nature due to its attempt to galvanise players into understanding and supporting charities that aid the developing world (Stenros et al. 2011). Additionally, the discussion of narrative friction discussed in Stenros et al. hopes to inform design decisions in the empirical study.

Conspiracy For Good’s major rabbit hole was a viral teaser campaign of various people claiming “[they were] not a member” (Kring 2010b). The membership that people were denying was that of the *Conspiracy For Good* organisation. The *Conspiracy For Good* organisation had risen from centuries of

underground activity to oppose Blackwell Briggs, a corporation who wanted to place an oil pipeline through a Zambian village. Players were then tasked with helping a local school teacher and recording artist in uncovering the illegal actions of the corporation, save the village, and build a library for the schoolteacher's pupils (Kring 2010a; Stenros et al. 2011). The ARG ran for six months, four of which were played online, with the game culminating in two months of live events around London.

The online component of *Conspiracy For Good's* gameplay largely facilitated the introduction of the storyline and its characters, utilising typical ARG multimodality to present distributed puzzles and narratives. Additionally, this period was augmented by seemingly unrelated mobile games that served as supplementary entry points into the game ("hooks") (Stenros et al. 2011). Stenros et al. (2011), however, focus more on the gameplay surrounding the game's live events in their analysis.

Real-world gameplay for *Conspiracy For Good* involved players, using a Nokia phone equipped with augmented reality technology, going on treasure hunt-like activities by scanning locations and objects with their phones to reveal game clues (Stenros et al. 2011). To increase authenticity and engage players in artificial conflict these live events often had players interact with, or even escape from, game characters during play. Each live event was filmed in order to later show how player action affected the game's alternate reality, with each event ending in a reward for the players in the form of a celebration of the CFG organisation's actions that day (Stenros et al. 2011).

Qualitative results show that players enjoyed the game, praising its high production value and the fun of live events, the latter of which is often the case in ARGs (McGonigal 2003a). Of note, however, most respondents in the study reported a familiarity with games that suggest their awareness of the nature of ARGs (Stenros et al. 2011). Due to this, the report on *Conspiracy For Good*, while noting its strengths, focuses more on the reservations players had during the game due to the nature of narrative delivery within the ARG genre.

An important distinction in understanding why possible narrative friction occurred in *Conspiracy For Good* was the clear separation of online and real-world gameplay, with live events occurring exclusively during the last section of the game's run (Stenros et al. 2011). This juxtaposes the more typical dispersion of live events throughout the online gameplay of the game, such as during *I Love Bees* (McGonigal 2008). As a result, the game's live events often attracted a different audience to that of the online components of the game. This was largely due to the restriction of location, with live players being sourced from a small pool of the distributed online community, as well as local players who were often not involved, or even aware of, the online narrative and alternate reality their actions were affecting (Stenros et al. 2011). In contrast, online players expressed feelings of exclusion due to this online/live game separation, as they wanted to affect the narrative through live play.

This player ignorance often undermined *Conspiracy For Good*'s self-identification as a "participatory drama" that was largely narratively focused. To attempt to remedy this, live events were prefaced by game characters giving exposition regarding the game's narrative up to that point, as well as the players' intentions as a result. However, this information was relayed whilst in character in an attempt to preserve authenticity, and as such often did not do much to aid new players who were initially confused or apathetic about the narrative (Stenros et al. 2011). The researchers thus propose that *Conspiracy For Good* could be functionally considered as two separate games for separate audiences.

The two audiences for these differing game mechanics often carried different expectations regarding play. In the case of online players there may have been an expectation that they no longer had a role to play once the live events began. In the contrasting case of the live players, however, unfamiliarity with ARG tropes meant that some players did not examine aspects of the live game or online narrative (objects, instructions etc.) as deeply as they should have, thus leading to confusion or misunderstanding regarding their actions (Stenros et al. 2011).

Lastly, an ARG's dynamic nature was also missing from *Conspiracy For Good*, with players acting as the pawns on CFG's set board (the narrative) (Stenros et al. 2011). Whilst some players still felt that they were afforded agency within this strict game progression (where player actions did not actually influence the overall narrative), others noticed when events were forced into specific directions (Stenros et al. 2011). This relates largely to the notion of agency and its place in ARGs and live games, as discussed earlier (McGonigal 2007a), and how this agency affects meaningful change within the game system. This lack of agency is also mentioned when discussing the overall narrative's dramatic sophistication, with players criticising its clichéd setup and expressing the want for the possibility to defect from the CFG organisation in game to rather side with Blackwell Briggs (Stenros et al. 2011).

This discussion of agency and players wanting to be "bad" within the game's fiction presents an interesting claim regarding the aesthetic of "this is not a game" in ARGs. Stenros et al. (2011) argue that despite the adherence to the TINAG aesthetic in *Conspiracy For Good*, players are still acutely aware of the separation between reality and fiction. It is argued that players would prefer an understanding of how to best play the game over a lack of understanding game boundaries due to steadfast dedication to the aesthetic. This may have been emphasised in *Conspiracy For Good* as the lack of an explicit ruleset clashed with the lack of dynamic play. For example, players may have wanted to join Blackwell Briggs, an action well within the scope of CFG's alternate reality, only to find out that there was no way for them to join. This dissonance provided a paradox of sorts: the "rules" don't prohibit the action, and yet the action cannot be performed, so thus there must be rules to prohibit the action.

Despite the value these discussions on the shortcomings of *Conspiracy For Good* provide, nowhere do these discussions provide a measure of success regarding the ARGs goal: to educate people on the plights of developing regions in similar scenarios. Based on the conclusion that the live events in *Conspiracy For Good*, while fun, felt disconnected from the online component of the ARG where the

serious narrative was unravelling, it may be reasonable to assume that the educational goal did not reach the live event player community as effectively as an integrated ARG might have.

The official post-game video, however, mentions the awareness of the online player community regarding real-world organisations involved in the narrative, such as Room to Read, who attempted to supply books for the proposed in-game school library. Some players even created and sold *Conspiracy For Good* merchandise to raise awareness and physically support the game narrative's final goal (Kring 2010a). These actions suggest a more cohesive understanding of the humanitarian conflict that drove the narrative, suggesting that tangential learning and understanding did form part of the designed experience, thus facilitating the necessary education, though whether or not it inspired behavioural change from its players is yet to be studied.

As a result, though *Conspiracy For Good* was largely developed as a promotional ARG, its design did facilitate education, though likely only marginally successfully due to the reality of its separate player communities. Its examination in this dissertation proves a useful example of the importance of proper integration between various game elements (whether online or real) and game narrative, ensuring that each component remains relevant and believable throughout gameplay, as well as the importance of flexibility in ARG narratives based on the inherent flexibility in their play.

2.6.3 Alternate Reality Games as External Learning Environments

This section discusses ARGs that were played and run separately from traditional coursework that still intended to teach their audiences.

2.6.3.1 ViolaQuest

ViolaQuest (Whitton 2009a) is one of the earliest academic examples of an educational alternate reality game and could thus be considered seminal work in the genre, being mentioned by most of the literature that succeeded it (Piatt 2009; Connolly, Stansfield & Hainey 2011; Bonsignore, Kraus, et al. 2012; Hakulinen 2013). *ViolaQuest* is also noteworthy as an application that was run external to a specific course or module at an educational institution. This notion of *ViolaQuest* as an alternate reality game that creates an "external learning environment" is of particular interest to this dissertation due to the empirical study's classification as a non-integrated ARG.

ViolaQuest was the product of the ARGOSI project (Alternate Reality Games for Orientation, Socialisation and Induction), and was run at Manchester Metropolitan University in 2008 (Whitton 2009a). The game's aim was to help acclimatise first-year university students to their institution and local culture. *ViolaQuest* also focused specifically on teaching library and information literacy skills – goals shared, albeit on a smaller scale, by this dissertation's empirical study.

In order to best do this, Whitton (2008) notes that the “this is not a game” aesthetic had to be ignored in favour of a safe, accessible learning environment that potential players recognised as part of the greater university context, though she does reflect that the TINAG aesthetic may form part of the appeal of smaller-scale applications.

ViolaQuest's narrative revolved around Viola Proctor, a university student, and her quest to discover a secret society and machine (The Society for Communication With Intelligent Dinosaurs and its communication device) (Whitton 2009b). This is done through the completion of game puzzles that yield six pieces of a map that hint at its location. During gameplay, players learnt more about both the society and the machine they were hunting until the game's final live event where the players communicated with the dinosaurs and learnt their secrets (Whitton 2009b).

ViolaQuest had an active participant similar in ratio to other educational ARGs (n = 23 out of 173 total players) (Whitton 2009a), such as *Evoke* (McGonigal 2010b), which Whitton (2009a) considers disappointing. More importantly, the results of *ViolaQuest* produced various observations regarding student motivation, as discussed earlier (see 2.5.2), that provide educational-ARG specific theories for future applications. In this regard, Whitton questions the relevance of various ARG design considerations for educational applications, such as the TINAG aesthetic, the size of the initial audience to foster an acceptable active player group and the notions of compulsory and voluntary participation; and how that affects game design and gameplay.

Whitton (2009a) also notes the tension between an ARGs niche nature and the inclusivity of formal education; and notes the necessity of a clarity of outcome to provide incentive for students to participate. This clashes with the notion that participation in ARGs (as a niche, secretive experience) is its own reward. Additionally addressed is the novel nature of ARGs in educational contexts: that ARGs can definitely be effective for some students, but there is little evidence to support its generalisability to large populations with distributed characteristics.

Additionally, the ARGOSI project produced a practical framework to aid in educational ARG creation that builds upon theories presented in the Whitepaper (Phillips 2006) and is based upon *ViolaQuest*'s design (Whitton 2009a). As noted earlier, however, these theoretical and practical frameworks can and should be expanded as the genre of ARGs evolves (see 1.3).

Overall, the measure of success of *ViolaQuest* is difficult to measure. As an educational application, it is widely referenced and is considered seminal in terms of the questions and theories it proposes, which perhaps suggests its success. However, despite a relevant, completed design that was successful with pilot groups, the run of the game proper produced “disappointing” quantitative results and possibly more questions about the genre in educational contexts than it solved. However, it must be noted that *ViolaQuest* was one of the first ARGs to be run in an educational context and still produced active player

ratios similar to later-developed educational applications, such as *Evoke* (McGonigal 2010b), whilst seemingly providing an enriching experience to those who did participate (Whitton 2009a). This suggests its success in retrospect, however marginal, both as a game and as seminal work in the field of educational ARGs.

2.6.3.2 *Who is Herring Hale?*

“*Who Is Herring Hale?*” (hereafter referred to as *Herring Hale*) is another example of an educational induction ARG that was run at the University of Brighton in 2006, predating *ViolaQuest* (Piatt 2009). The game was designed to support induction outside of time allotted for it within the university schedule, thus creating its “external learning environment”; and ran for nine weeks, assigning players a short task each week in order to allow players to balance both university responsibilities and gameplay (Piatt 2009).

While technically remaining true to the “this is not a game” aesthetic, *Herring Hale* arguably discards the aesthetic during its rabbit hole (the game’s entry point). Though *Herring Hale* never self-identifies as a game, the rabbit hole’s phrasing, a message from time detective Herring Hale from the year 3006, clearly defines the ARG’s game-like boundaries: Over the nine game weeks, players need to reveal nine saboteurs who seek to undermine the future University of Brighton, now called the Earth Intellectual Curiosity Centre, by going back in time to the present day (2006) to divert its course through history (Piatt 2009). Each saboteur’s identity was hidden within information provided by each of the nine major support services on the campus, and the players needed to report these identities to *Herring Hale* within the given week (Piatt 2009). While these kinds of narratives are not uncommon in alternate reality games, as both *I Love Bees* and *The Beast* utilise future-present communication in their narratives (Kim et al. 2009), the futuristic elements are often revealed over time, and not presented as the game’s premise from the outset.

Gameplay in *Herring Hale* involved minor tasks that involved each support service of the university. Tasks included locating book loan desks in the library, applying for campus jobs, decoding messages on various location-specific leaflets, video scrubbing, blogging and using the university’s online community area (Piatt 2009). To incentivise task completion, each week’s task resulted in prizes for the fastest completions, with points awarded on a communal leader board that counted towards a grand prize (Piatt 2009). This incentivisation, it could be argued, further ignores the TINAG aesthetic, as the notion that *Herring Hale* could somehow send players prizes from the future is never narratively explained.

The results of *Herring Hale* showcased similar quantitative results as previously examined applications (n = 12 active players from an initial player community of 42). *Herring Hale*’s qualitative feedback was additionally overwhelmingly positive, with players noting that it helped with induction and orientation in a way formalised structures couldn’t due to the game’s added engagement, and that they felt like a

special part of the experience. The latter player group (n = 30, those who were involved but did not complete the game) noted confusion surrounding the game's purpose and a lack of time to complete the game's later puzzles, especially as each task needed to be completed in the given week (Piatt 2009).

Given these results, *Herring Hale* was considered an interesting alternate to traditional teaching methods – one that is particularly effective for those who engage with it, despite not necessarily appealing to all students (Piatt 2009). Additionally, its framing as an external learning environment that players need to commit to allowed the game to feel special to the players and akin to a break from their university responsibilities (Piatt 2009). This examination once again highlights the novel nature of the ARG genre as something that can be meaningful because of its uniqueness.

2.6.3.3 *Black Cloud*

Black Cloud poses a relevant example for study in this dissertation largely due to the academic approach followed in its design. While *Black Cloud's* gameplay merely sought to have students investigate real-world environmental problems (a notion similar to the aim of *World Without Oil* (McGonigal 2010a)), the design approach of the game applied Deweyan, constructivist principles to gameplay in order to facilitate learning (Niemeyer, Garcia & Naima 2009). This feature is unique in the examined literature to *Black Cloud*, and careful examination of its application may prove useful to the design of this dissertation's empirical study.

A Deweyan approach was taken to the research in order to examine the difference between traditional schooling methods and games (Niemeyer, Garcia & Naima 2009). While traditional schooling tends to separate work and play as not necessarily exclusive, but certainly separate, constructs. Games, and alternate reality games in particular, present a unique opportunity to merge these constructs (Dewey 1916). This is largely due to player delineation in an ARG between the states of playing and not playing the game, as an ARG itself perpetually exists (if only for a while) within the real world. In this regard the preservation of the TINAG aesthetic initially attracted players who were potentially unaware of game or ARG tropes, allowing for a more authentic experience for players as they recontextualised the world around them based on game content (Niemeyer, Garcia & Naima 2009). This experience could then foster learning, as striving to understand the game world (understanding the purpose of the *Black Cloud*) itself required research, content creation and reflection – three elements that often form part of “work” in K-12 curricula.

To start the game, a matric (Grade 12) English class was targeted during the game's rabbit hole. During this period, a game artefact, a lost “Pufftron”, was hidden somewhere within the English classroom (Niemeyer, Garcia & Naima 2009). In exchange for finding it, players were rewarded with breakfast served by an in-game character, thus preserving the “this is not a game” aesthetic (Niemeyer, Garcia & Naima 2009). Notably, this “Pufftron” device became one of the principle elements for gameplay, and

one of the game's first puzzles revolved around using the device and discovering what each coloured set of LEDs corresponded to (a specific aspect of pollution). Other puzzles included a scavenger hunt, the development of a communal "pollution taxonomy" and the description and eventual building of city models that represented the player group's "ecological utopia", which were then displayed in an exhibition to the public (Niemeyer, Garcia & Naima 2009).

Results of the *Black Cloud* study focus mainly on designer observation of player activity, and support the hypothesis that an ARG can be used to engage players in a learning context. In contrast to this positive ideal and the admission that *Black Cloud* succeeds in this aspect, the researchers discuss how *Black Cloud* asked players to fundamentally change their outlook on the issues the game's narrative presents in order to play the game (Niemeyer, Garcia & Naima 2009). While this lack of agency is feasible in the context of gameplay, the researchers question its democracy (Niemeyer, Garcia & Naima 2009). The researchers continue this notion by discussing the "authoritarian" nature of the game, whereby students were reliant on adult intervention (as adults were the game's designers) in order to progress, despite being able to influence and shape the game through agency (Niemeyer, Garcia & Naima 2009). This framing reinforces that *Black Cloud* and educational ARGs exist in the "zone of proximal development" (Vygotsky 1980:86), as discussed earlier (in 2.5.3).

However, these discussions of one-sidedness in ARGs seem to contradict above arguments for using ARGs in education at all, as the framing of these "rigid" ARGs begin to mirror traditional teaching approaches in terms of their designed experience, invalidating the participatory, dynamic nature of the genre and associated mediums. As such, it should be noted that this kind of one-sided, rigid structure should be avoided wherever possible during educational ARG design.

Indeed, this "authoritarianism" is the major critique of the game's design in its analysis, with the researchers noting their adherence to more traditional educational power dynamics (the student-teacher relationship) in order to maintain game intrigue, whilst noting that more agency could be afforded to students in subsequent game iterations, should the game be adapted to allow it (Niemeyer, Garcia & Naima 2009).

Finally, the analysis of the game discusses player participation, giving examples of players "writing the fiction" within the game world, where players would connect everyday occurrences to game-related activities as a way to connect to the game world. Examples given of a player named Trejo seem to suggest player enjoyment of the game, especially when supplemented with various photographs included throughout analysis (Niemeyer, Garcia & Naima 2009).

The researchers conclude that as an experiment, *Black Cloud* embodied a living agent of knowledge production as a system, as player participation generates knowledge known to all those involved, which was in turn included into the game system (Niemeyer, Garcia & Naima 2009). This agent, in turn, seems

to succeed, the researchers suggest, in blurring the lines between work and play, meaning that *Black Cloud* was successful in its implementation.

2.6.3.4 *Stop Toilworn Diamond*

Stop Toilworn Diamond (hereafter referred to as “*Toilworn Diamond*”) was an alternate reality game designed to help teach computer science (Hakulinen 2013). This choice of subject matter is interesting as it links closely to the new media technologies used to relay narratives in multiplatform scenarios. As a result, understanding the technical components of the puzzle themselves (such as specific computer science theories) directly correlated to understanding how the puzzle may have been built and designed, leading to a solution. As a result, the learning *Toilworn Diamond* encouraged was closely mapped to the puzzles themselves. This tight coupling, as mentioned previously, leads to an authentic learning environment, where learning occurs through the understanding and practising of necessary skills (Galarneau 2005).

Toilworn Diamond perhaps best embodies, in terms of scope and approach, the grassroots ARGs (Barlow 2006) run on the University of Pretoria Hatfield campus, both in the past as well as during the empirical study. *Toilworn Diamond* was a grassroots ARG played over ten weeks of a university semester in Finland, and was entirely voluntary, with participation not explicitly rewarded. The game was also open to everyone, not just students of the university (Hakulinen 2013). These characteristics (short running time, voluntary participation and an open target group) are all shared across similar grassroots ARGs, including ones previously run on the University of Pretoria campus, whose design is mentioned in De Beer and Holmner (2013). As such, *Toilworn Diamond* presents an important unit of study for this dissertation.

The ARG itself chose to keep the aesthetic of “this is not a game” intact, though its farfetched narrative suggested its game-like origins: Beth Swillower works for Avecira Solutions, a company working on powerful next-generation technology. This technology was *Toilworn Diamond*, an adaptive hypermedia system that filtered content based on user preference. However, due to the popularity of the LOLCat phenomenon (humorous cat pictures paired with humorous captions), *Toilworn Diamond* would become overwhelmed, the system becoming distorted and intent on causing a “society paralysing LOLCat apocalypse” (Hakulinen 2013). This “farfetched” narrative was chosen to preserve game authenticity but still provide clear delineation between the game world and reality.

Example gameplay from *Toilworn Diamond* include unveiling a QR code by sorting an image by the red component of its RGB value and converting binary codes to digits that represented their ASCII characters (Hakulinen 2013). Additionally, one puzzle was a variation of the a common computer science problem solved by Dijkstra’s (1959) algorithm (Hakulinen 2013). Each of these tasks (sorting, understanding binary and the travelling salesman problem) represents important principles that need to be taught in

computer science, and the only way to solve each of the presented puzzles was for the players to understand the underlying principles (Hakulinen 2013). As the final task, players had to solve 101 smaller puzzles in order to trigger the self-destruct sequence of the eponymous *Toilworn Diamond*, with the puzzles being distributed in such a manner that collaboration was encouraged to complete the task (Hakulinen 2013).

By way of results, the game was analysed through content analysis of questionnaires, web statistics and document studies of online discussions of the game (Hakulinen 2013). These methods mirror the methods proposed for this study. The author performed a twofold evaluation of the game, focusing on the game's design and its learning effect (on a group of 21 players who responded to the questionnaire, n = 21) respectively. During the game design evaluation, Hakulinen (2013) focuses on the traits of authenticity, intrinsic motivation of players and the notion of replayability. The learning effect portion focused largely on the qualitative opinion of the player group with regards both to the effectiveness of the game to teach Computer Science Concepts and the applicability of ARGs as educational tools.

Regarding authenticity, it was noted that while *Toilworn Diamond* did not discard the TINAG aesthetic, it did hint at the game's fictional nature to clarify its game status to potential players. When asked about the importance of the TINAG aesthetic, 71% of the players/respondents noted its importance, stating even that it was "crucial to creating the tension that fuels players to participate" (Hakulinen 2013). This response shows an acceptance of Suits' lusory attitude (1978:34), but also suggests how well ARGs can feign authenticity – despite players knowing and accepting the game's status, its denial thereof can still create tension and urgency players perceive to be real (Hakulinen 2013). Negative responses to TINAG in *Toilworn Diamond* mentioned that the awareness of the ARG genre on the whole makes TINAG less crucial, and that the refusal to self-identify as a game may make some gameplay more difficult (Hakulinen 2013).

Analysis of intrinsic motivation in *Toilworn Diamond* takes place theoretically by examining it through guidelines proposed by Davies et al. (2006) as discussed earlier. As such, it is only of note to mention that *Toilworn Diamond*, through the author's own analysis, satisfied these guidelines (Hakulinen 2013).

The discussion of replayability is guided by the framework described by Hanson et al. (2013) whereby an ARG should be replayable, adaptable and extensible. Hakulinen (2013) notes that *Toilworn Diamond* is not replayable in the same context with the same story, but could be launched for different player groups in its produced state. The game itself is also adaptable to some extent, with the game's internal structure being able to accept new puzzles into its existing framework, though this would require significant work. Lastly, the game could be considered extensible, as a sequel could be produced to begin after the events of the first game. The game produced for this dissertation's empirical study aims to mirror and expand on *Toilworn Diamond's* application of the given replayability framework when analysing its results.

The amount of learning experienced in *Toilworn Diamond* differed greatly between players, with some players understanding more about certain concepts than others, despite both players having attempted similar puzzles (Hakulinen 2013). This suggests that each individual player learnt about game concepts and the underlying learning outcomes differently. This hypothesis is supported by the results that 67% of the respondent players indicated they learnt about at least one concept being taught, and that one player learnt about as many as nine of the fourteen concepts being asked about (Hakulinen 2013). Whilst impressive, this does suggest that no matter how well-designed the educational aspects of an educational ARG, the learning of these aspects of the players may not always be reported, or reported accurately.

Additionally, Hakulinen (2013) discusses various themes noticed in player feedback towards the idea of ARGs in education. These include that the design of an ARG is very labour-intensive when considering a potentially small player community, that it may be difficult for players to be “hooked in” to playing the game unless they were playing from the outset and that ARGs, due to their collaborative, social nature make it difficult to assess individual progress (Hakulinen 2013).

Toilworn Diamond, overall, was considered successful both in terms of its successful completed run and positive response from players as well as its adherence to theoretical frameworks when examining its validity post-game (Hakulinen 2013). It was a successful educational ARG that adhered to the TINAG aesthetic, was run in a tertiary education setting and did not present external rewards for participation from the outset (Hakulinen 2013). Should the empirical study, which will likely operate under similar conditions, run to completion in a similar manner, it could also be considered successful. However, the study does raise some concerns about the viability of educational ARGs, especially those that exist under the conditions discussed above, as teaching tools (Hakulinen 2013). It must be noted, however, that these concerns discuss players themselves, and may differ from player to player (Hakulinen 2013). *Toilworn Diamond* is shown to be a successful application of an educational ARG, despite the genre’s potentially novel status for this purpose.

2.6.4 Summary of Educational ARGs

The examination of the above education applications are summarised in the table below:

Table 4: Qualities of Educational ARGs

Legend: Skeleton Chase (1), Finding Identity (2), The Arcane Gallery of Gadgetry (3), The Tower of Babel (4), The Mighty Fizz Chilla (5), World Without Oil (6), Evoke (7), Conspiracy For Good (8), ViolaQuest (9), Who Is Herring Hale? (10), Black Cloud (11), Stop Toilworn Diamond (12)

Examined quality	1	2	3	4	5	6	7	8	9	10	11	12
Narrative linked to learning outcomes of target audience	X	X		X	X	X	X			X		X
Gameplay linked to learning outcomes	X	X	X	X	X	X	X	X	X	X	X	X
Adherence to TINAG aesthetic					X			X		X	X	X
Statement that learning outcome was achieved		X	X	X		X	X		X	X	X	X
Measure of success of overall game	X	X	X	X	X	X	X		X	X	X	X
Measure of success in terms of learning outcomes		X	X	X	X	X	X		X	X	X	X
Concerns regarding widespread suitability as an educational medium							X		X	X		X
ARGs as a novel form of education				X					X	X	X	X

Of interest is the notion that very few ARGs adhere to the TINAG aesthetic, often due to the reasons mentioned by Whitton (2009a) although the presence of the aesthetic in at least some examined cases suggests it may be viable for the empirical study. Additionally, it can be seen that while all gameplay in the examined ARGs linked to the learning outcomes (so that gameplay facilitated learning), not all of the game narratives constructed narrative contexts that were directly linked to the target audience, though this was often a result of a mismatch between the target audience and the intended learning content, as is the case in *The Arcane Gallery of Gadgetry* (Bonsignore et al. 2013) and *Black Cloud* (Niemeyer, Garcia & Naima 2009). However, in some cases the delivery of a spectacular narrative (Frontera 2012) may have been considered as important as the game’s learning outcomes, which may be why this diversion is noted specifically in *ViolaQuest* (Whitton 2009a) and *Conspiracy For Good* (Stenros et al. 2011).

In terms of measures of success for ARGs in educational contexts, it can be seen that most of the examined games were successful overall, with only slightly fewer being successful regarding their learning outcomes, though this can be attributed to player unawareness of the learning outcomes being examined.

Lastly, it should be noted that while successful, some authors were concerned about the ARG genre's overall suitability for educational purposes, noting that it is usually only engaging for those who enjoy similar game-based learning. While this quality may not be disproved through this dissertation, it will be examined during the analysis of the empirical study's results.

2.7 Conclusion

In summary, this chapter examined how best to create an alternate reality game that supports and engenders learning within its player community.

In order to achieve this, learning theories that are supported inherently in the play of games were examined. This allowed a learning theory and educational perspective – constructivism – to be chosen that best suited how the empirical study would attempt to meet learning outcomes through gameplay. Critical game components that support this perspective were then examined through the application of game design theory to ensure that the chosen perspective would sufficiently correlate to the chosen medium of games.

Various elements of game design theory were then examined as they relate to educational games, as an understanding of these elements (such as the importance of narrative, goals and multisensoriality in games, as well as techniques for motivation and engagement) aids in the creation of a successful educational application. The examination of these elements through game design theory helps in constructing the basis of a theoretical framework and pedagogy of game design upon which the design of the empirical study is based.

However, this understanding of game design theory provides a generalisable pedagogy for all types of games. The choice to create an alternate reality game, or ARG, meant that design principles and ARG design theory needed to also be consulted to ensure a successful empirical study. After defining the ARG genre for the purposes of this dissertation, genre-specific elements (immersion, fragmented narrative and the importance of collaboration) were discussed in order to further inform the empirical study. The importance of these elements within the genre was also discussed and questioned.

An understanding of how to design successful games and ARGs now needed to be applied to the chosen context of tertiary education. As such, an examination of how ARGs can engender learning, both implicitly and through explicit design decisions, was performed. This was followed by an examination of

twelve specific examples of educational ARGs in order to glean specific insights regarding how best to design for a variety of educational contexts, as well as to further understand the effect design decisions made in those games had on the overall goal of skill teaching and acquisition.

Overall, this analysis provides the empirical study with a theoretical framework upon which to base its design decisions. It also identifies aspects and areas of improvement for the educational ARG genre based on the twelve examined examples upon which the empirical study hopes to build, reinforce or improve.

The documentation of the design of the empirical study takes place in Chapter 4. The following chapter (Chapter 3) describes the research and design methodologies followed during the design of the empirical study.

3. Chapter 3 – Methodologies

3.1 Introduction

Creating the *Nomad* alternate reality game discussed in this dissertation can be separated into two distinct tasks: First, the research design had to be developed. Developing the research design addressed how *Nomad* would achieve the aims and objectives discussed in Chapter 1, and how the empirical study would be reported within this dissertation. Secondly, *Nomad* would have to be designed and developed as a product in order to achieve these aims and objectives.

As such, this chapter separately discusses these elements of the study. It initially discusses the design of the research itself, how the research was framed, and how the research was completed. It then discusses the development methodologies that guided the development of the ARG itself. The pedagogy that guided the design process prior to this development was discussed in Chapter 2.

Regarding the research design, the study utilises the interpretivist paradigm with a qualitative methodology; gathering both qualitative and quantitative data to inform an understanding of the overall player experience during both the pilot study and game proper of the *Nomad* educational ARG. The study follows a qualitative methodology as, while multiple data types are gathered, quantitative data within the study is used only to inform the accompanying qualitative data from the games or to support qualitative inferences made during analysis. Qualitative and quantitative data is gathered via website analytics, document analysis, non-participant observation, focus groups and questionnaires. This data can be seen as the results of the study. This data is then analysed through constant comparative analysis. The constant comparative analysis, through multiple coding processes, refines a further qualitative results set through the comparison and juxtaposition of these multiple disparate sources (Strauss & Corbin 1998:67). This results set is the result of the analysis done on the data itself. It is this results set that informs conclusions that can be drawn from the study regarding the spectrum of player experience within the *Nomad* ARG.

Regarding the game design, *Nomad* was designed with the consideration of the game design pedagogy discussed in Chapter 2. Namely, the study utilised an approach of game design theory, focusing on specific game design elements noted as important in educational game design. These elements were narrative context, goals and rules, interactivity, multisensoriality, engagement and motivation (Dondlinger 2007). The game design theory that informed an understanding of these elements was based heavily on Salen and Zimmerman (2003), Schell (2014) and Koster (2013).

Regarding the game development, *Nomad* utilised development methodologies – namely agile development and spiral development – in guiding the creation of the educational ARG and its assets. Agile development is characterised by short iteration cycles for software prototyping to better cope with

the changing needs and requirements of a project (Beck et al. 2001). These characteristics suited an overarching development cycle characteristic of spiral model development, a lifecycle model used in software development for iterative development and enhancement (Boehm 1995).

The research and development methodologies are both discussed in detail within this chapter.

3.2 Research Design

The following sections detail the research design of this dissertation, discussing the approach taken to the empirical study and its eventual analysis.

3.2.1 Research Paradigm and Methodology

The study is approached through an interpretivist paradigm. Specifically, the study focuses on empirical interpretivism, whereby an empirical study set within an existing context attempts to examine the qualitative nature of experiences within that setting (Pickard 2013:11). Interpretivist studies, as the name suggests, are interpretive. These studies focus on the subjective interpretation of events in the construction of a reality, where multiple subjective, constructed realities can coexist (Pickard 2013:12). As such, these studies most often utilise qualitative research methodologies.

Qualitative research methodologies focus on social constructions of reality that are inherently subjective (Gorman et al. 2005:5). Qualitative research is also often more emergent and must be “played by ear” (Lincoln & Guba 1985:203). In this research, the researcher is also the research instrument. The researcher is aided by a conceptual framework developed from tacit knowledge and the literature review process, and conducts research within a natural setting (Pickard 2013:15). Changes within this natural setting occur throughout the research period, and data is gathered regarding these changes. Once sufficient data has been gathered, the researcher can present a working hypothesis based on the outcome of the research within the natural setting (Pickard 2013:15).

An emergent design approach that tracks and adapts to changes within a natural setting parallels the working definition provided for an alternate reality game as given in 2.4.1.2, and as such, an interpretivist approach that results in qualitative conclusions is appropriate for this study.

During data collection, the study gathered both qualitative and quantitative data, suggesting the potential for a mixed methods research methodology. A mixed methods research methodology has the researcher analyse data of a study using both qualitative and quantitative research methods (Creswell & Tashakkori 2007). However, because the research method (a case study) and the core procedure for data processing and analysis (constant comparative analysis) are both approached qualitatively, and not

analysed using quantitative approaches, it cannot be said that the study uses a mixed methods approach.

As such, agreeing with the earlier parallel that ARGs are inherently interpretivist and qualitative when studied, it can be stated that this study utilises an interpretivist paradigm while using a qualitative methodology. While quantitative data is gathered throughout the study, it is not used for quantitative analysis. Instead, as noted earlier, the data exists to support qualitative inferences.

3.2.2 Research Method

The following sections detail this dissertation's use of a case study as the primary research method. After defining a case study for the purpose of this dissertation and discussing the approaches to case studies found within the literature, the case of the *Nomad* ARG is developed. This case entails the design and development of the game (which adhere to development methodologies discussed in 3.3), as well as the procedures for data collection and analysis.

3.2.2.1 The Case Study as a Research Method

The following sections discuss the use of a case study as a research method, as supported by existing literature.

3.2.2.1.1 Towards a Working Definition of the "Case Study"

Case studies have long been difficult to define as a research method, due to multiple, often conflicting definitions of the term (Gerring 2004). This is also potentially because the term itself: "case study" can refer to either the investigation of the phenomenon, the "case" itself, as it occurs as well as the report, the written "case study" that succeeds this investigation (Pickard 2013:101). This section focuses on an explanation of the case study as a research method – that is, it explains how to investigate a phenomenon.

A common definition of a case study is one provided by Yin (2013:18), who defines a case study as:

"An empirical inquiry that investigates a contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident... [that] relies on multiple sources of evidence."

(Yin 2013:18)

Within this definition it can be seen that case studies attempt to use multiple sources, such as documents, observation, and interviews to inform an examination of an event (Yin 2013:11). The examination of the case utilises the researcher as a research instrument (Pickard 2013:16). This qualitative nature is supported when considering case studies as an adequate approach for the examination of environments through a form of observation (Mouton 2001:149).

The case study approach, because of its use of researcher as a research instrument for the purpose of analysis, may be originally understood as a qualitative research method. Pickard (2013:101) disagrees with this assertion, noting that case studies can also be used in a quantitative manner depending on the nature of the investigation. Indeed, Yin's (2013) approach is one of post-positivism, dealing often with quantitative or mixed methods data. The term "case study" has also been used to describe a variety of other research methods such as ethnography, observation or other fieldwork (Burns 2000:458; Yin 2013:11).

However, consensus can seemingly be reached when considering the unit of analysis – the case. The purpose of the investigation guides the construction of the case itself (Pickard 2013:102). The purpose of any case study is to develop an in-depth understanding of some phenomenon within an environment. There is a necessity to understand both how and why the phenomenon occurs within the specific context (Yin 2013:4). The case, the unit of study, is the occurrence of that phenomenon within the context. During study, an understanding of the overarching phenomenon may be developed (independent of its surrounding context), but the case study, first and foremost, seeks to understand the case itself (Pickard 2013:102).

It is in this understanding of the study of a "case" that Gerring's (2004) definition seems apt:

"[A case study is] an intensive study of a single unit for the purpose of understanding a larger class of (similar) units."

(Gerring 2004)

Here, Gerring (2004) discusses the notion propagated by Pickard (2013:102): understanding the case may provide insight into the phenomenon present within the case. Hofstee (2006:123) agrees with this desire for greater phenomenal insight. However, despite this focus on phenomenon, the argument for the importance of the phenomenon's context cannot be understated, and is unfailingly mentioned in discussions of the method by Yin (2013), Pickard (2013), Gerring (2004) and Case (2012). This context delimits the scope of the case, making the case a "bounded system" (Henning, Van Rensburg & Smit

2004:32). This delimitation is often done spatiotemporally (at a specific place during a specific time period) (Gerring 2004; Case 2012:224).

As such, it can be seen that both the phenomenon being studied and its context are interdependent in the construction of a case for study. The study itself is qualitative in nature, being performed by the researchers themselves (Pickard 2013:16), and invokes the use of multiple data sources collected through various methods (Case 2012:224). This leads to the following working definition of the case study method for the purposes of this dissertation:

A case study is the examination of a specific phenomenon in a specific location over a period of time. These spatiotemporal boundaries delineate the case's context. The context in which the phenomenon occurs is as intrinsic to the examination as the phenomenon itself. This examination occurs through the collection of data over this time period using disparate data collection methods. The data is then analysed and reported upon in the hopes that the case study leads to a greater understanding of the specific phenomenon within other contexts.

In addition, multiple types of case studies can be defined from the literature. Yin (2013:47–62) differentiates between single-case case studies and multiple-case case studies, where each case represents either a single unit of analysis or contains multiple units of analysis. This links to Gerring's (2004) desire for units of analysis (either within cases or as cases themselves) to inform overarching phenomena. Stake (2005:237) describes three types of case studies based on their objectives. Intrinsic case studies seek to examine the case to better understand the case, as advocated by Pickard (2013:102). Instrumental case studies attempt to examine the phenomenon within the case, using the case (a phenomenon within a context) as the vehicle for study (Stake 2005:237). This is similar to Gerring's (2004) approach. Lastly, collective case studies utilise multiple instrumental cases to examine a phenomenon (Stake 2005:237). This is akin to Yin's (2013:47–62) multiple case approach. Lastly, Gorman et al. (2005:47–60) describe case studies through their primary data collection technique, such as interview case studies, observation case studies and historical case studies.

3.2.2.1.2 Challenges and Strengths of the Case Study Method

The context of the case, however, provides challenges to Gerring's (2004) hope that a case study can provide an understanding of similar cases. One such challenge is that of the case as an isolated event. The spatiotemporal limitations of a case suggest that it is a single phenomenon observed in a single environment over a single period of time (Case 2012:224). Indeed, when considering the above working definition, a case does seem isolated. This challenge can be solved by having an in-depth understanding of the larger phenomenon one seeks to relate the case to, so as to properly understand the extent to which case data can suggest the phenomenon's overall trends. The in-depth understanding developed in

this study is detailed in Chapter 2, through the construction of the study's theoretical framework, as noted by Pickard (2013:15) as important in qualitative research.

The desire for generalisability is another challenge presented by the specificity of case studies: case studies describe a single instance of a phenomenon under specific conditions, similar to a single scientific experiment (Yin 2013:15). It is only when this instance has been replicated that generalisations may be made (Yin 2013:15). However, as noted above, case studies have merit when relating elements of the case to elements within the theoretical framework: "case studies, like experiments, are generalisable to theoretical propositions" (Yin 2013:15). In this way, perhaps generalisability is a less desirable trait for a case study. Case studies are, after all, unique accounts of phenomena, as the spatiotemporal context of each case, and the study done by the researcher as research instrument, will differ, thereby likely providing different results. These results sets further inform a growing theoretical framework and body of knowledge regarding the phenomenon, suggesting a unique strength of the approach.

For a case study to be valuable within this larger body of knowledge, the study must be rigorous in nature, which is not always the case (Yin 2013:14). This can potentially be due to the perceived time-intensive nature of the method (Yin 2013:15). However, case studies differ from ethnographic studies or participant-observation, and do not explicitly require large periods of explicit fieldwork (Yin 2013:15). Case studies merely require a large degree of understanding regarding the case (Yin 2013:15). As such, the case study method can be made rigorous by the utilisation of multiple data sources to inform the study of the case in a detailed manner (Case 2012:225).

The utilisation of these multiple sources often results in triangulation, allowing for more robust data due to corroboration from multiple sources (Yin 2013:98). Additionally, Pickard (2013:102) notes that singular-type data bias can be mitigated when gathering data from multiple disparate sources. Both data corroboration and a lack of singular-type data bias are desirable during research (Pickard 2013:102). An inherent tendency towards these traits within case study research allows it to be a robust and suitable research method (Pickard 2013:102).

3.2.2.1.3 The Development of the Case Study

Research is guided by the research questions and objectives of the study (Pickard 2013:103). Investigative research questions are common in qualitative research due to its exploratory and investigative nature (Lincoln & Guba 1985:203; Pickard 2013:45). Case study research is especially suited to investigative research questions, where understanding how and why a phenomenon occurs can help better understand the phenomenon itself, or the phenomenon in context (Yin 2013:5). "Exploratory" case studies are known as a descriptive case study, as opposed to a causal case study which focuses on what has happened and why (Gerring 2004). Causal case studies are, as such, suited to historical

research when an understanding of the case is important both for its own sake and understanding the phenomenon the case describes (Gerring 2004).

Once the case study research method has been selected, the case study itself needs to be designed. In developing this case, Pickard (2013) and Yin (2013) both agree that planning the research is the first step. In Pickard's (2013:103) case, this is part of "orientation and overview", a process taken from naturalistic enquiry (Lincoln & Guba 1985:235–236). This process begins with the research question (Pickard 2013:103), or the study's propositions (Yin 2013:28). In Yin's (2013:28) case, the propositions are similar to assumptions and claims that need to be investigated by the case study. Assumptions and claims, per Preece et al. (2015:38) are statements that guide an investigation of a problem. In the case of Pickard (2013:103), an emphasis on the research focus allows for a more flexible case study design in comparison to Yin's (2013) more propositional, rigid structure.

Once the research focus or propositions have been decided, how best to address these through the use of a case study must be examined: specifically, whether the case study be a single-case case study or a multiple-case case study (Stake 2005:237; Pickard 2013:104; Yin 2013:47–62). Single-case analysis is often either intrinsic or instrumental, and seeks to better understand a phenomenon (Stake 2005:237). To this end, Gerring (2004) argues that even single-case case studies are informed by multiple cases due to the theoretical framework likely having examined the single case in comparison to multiple cases. However, cross-case analysis is often easier when utilising multiple distinct cases (Pickard 2013:104).

Cases within a case study are often selected, rather than designed, using sampling techniques such as theoretical or judgement sampling (Mouton 2001:150). However, this dissertation's case is its empirical study, whose design is documented in Chapter 4. As such, case selection does not occur here, but rather a case study is designed around the case itself. The selected or designed case is often the unit of analysis of the case study, where this unit can be a phenomenon, individual, system or other component for study (Gerring 2004; Pickard 2013:104; Yin 2013:29).

Once a unit of analysis has been selected, the case must be delimited somehow, by defining the boundaries of the case study (Yin 2013:28). These boundaries can be elements such as the location of the study, the community on which the study is focused and how these elements will be studied (Yin 2013:28). Pickard (2013:104) discusses these boundaries inherently during the study's "site selection", where the location for the case study is chosen, as this location delimits aspects such as the community participating within the case and case study.

How this unit of analysis will be analysed is the next step in case study development. As the case is guided by its research questions, purposive sampling occurs when considering potential data sources, because the case data should allow for adequate exploration of the research focus (Pickard 2013:104). Yin (2013:34) discusses the necessity for this forethought: the data gathered from the case should link to

the case's propositions and allow for later analysis. Both Pickard (2013:105) and Yin (2013:98) suggest the pre-emptive setup of a "case database" to assist in the automation of data gathering and storage.

Next, data collection techniques must be decided upon. Pickard (2013:104-106) notes that qualitative case studies, due to their emergent nature, do not allow for the prior development of research instruments or data collection techniques, though suggests the use of research informants in the conducting of interviews and focus groups, as well as researcher observation and document analysis. Yin (2013:98) notes that case studies utilise six sources of evidence: interviews, direct observation, documentation, archival records, participant-observation and physical artefacts. Many of these parallel those suggested by Pickard (2013:106). Additionally, though not specifically noted by either source, questionnaires can likely be categorised as an "interview", and can be used as an additional data source. Once these instruments have been developed, data collection must take place throughout the case (Pickard 2013:106; Yin 2013:98–125).

Pickard (2013:106) additionally notes that it is important to begin to analyse this data throughout the case, as this allows the researcher to adjust the design of the case or its data collection techniques to continually align with the research focus or identify issues within case, or data collection design.

Prior to this analysis in qualitative studies, the researcher must perform "member checking" (Stake 2005:115). Member checking is a process whereby the researcher assures that research informants can verify the contributions of data gathered during data collection (Stake 2005:115). This also allows the researcher to establish rapport with research informants whilst exiting the field of study (Pickard 2013:108). This additional stage is not always necessary, and is not present in Yin's (2013) description of case study approaches and protocols.

Once the case is fully completed, analysis on the case can begin. This is the actual case study. Yin (2013:130–134) describes four potential analytic strategies for this: "relying on theoretical propositions", "developing a case description", "using both qualitative and quantitative data" and "examining rival explanations". For the purposes of this study, the former three strategies are adhered to. The case will be described, as developed cases lend themselves well to narrative description, and are often descriptive in nature (Yin 2013:131). This allows a story of the case to be developed which is rich in detail (Pickard 2013:108). Next, both qualitative and quantitative data will be used during data analysis, as utilising multiple types of data sources is desirable and allows for a robust understanding of the case (Yin 2013:132-133). Quantitative data may also support gathered qualitative data (Yin 2013:133). This supporting data may better allow for the understanding of the phenomenon examined within the case, as advocated for by Gerring (2004) and Hofstee (2006:123). This will then allow the case to discuss the theoretical propositions posed at the start of the case study, as it relates the gathered data to the propositions made (Yin 2013:130). This also allows for a measure of success for the case study: if the case study's data adequately discusses its propositions or its research focus, it will have been successful.

These aspects: the narrative description of the case study, discussion of the data gathered and linking to the study's focus and the overall theoretical framework of the phenomenon, are then written up in a case study report (Pickard 2013:108; Yin 2013:164–191).

3.2.2.1.3.1 Summary of the Case Study Approach

From the above theoretical discussion of the case study approach, the following steps can be developed when developing a case study:

- Decide on the research questions or propositions of the case study.
- Utilise either a single-case or multiple-case case study.
- Select or design the case or cases within the study. Identify a phenomenon to study as well as a context in which to study it.
- Describe the unit of analysis within the case study.
- Determine how data collection is performed by choosing data collection techniques.
- Develop research instruments for data collection as is relevant to the study.
- Proceed with data collection.
- Process and analyse the data with the case, or cases.
- Write the case study report.

3.2.2.2 Developing the Nomad ARG as a Case Study

The earlier definition of a case study (see 3.2.2.1.1) suggests that a case within a case study is emergent. The phenomena, within the context, occurs over a period of time, and can subsequently change over this period as well. This means that the case, as well as the methods of study, should be able to accommodate this change. This emergent nature parallels to that of alternate reality games, making a case study an appropriate research method.

As such, a study of the *Nomad* ARGs (the pilot study and the game proper) was developed using the case study approach. By following the theoretical approach summarised in 3.2.2.1.3.1, the following sections discuss how the case study of the *Nomad* ARGs was developed.

3.2.2.2.1 The Aims of the *Nomad* Case Study

The aims of the case study differ slightly from that of the overall study as discussed in Chapter 1. While this dissertation is concerned with the entirety of the *Nomad* ARG, the case study focuses on a specific sub-question of the study:

- How and why did the desired and intended effects, or the measure of “success”, of the game on the players, differ in terms of skill-learning, skill-exercise and engagement?

An examination of a measure of “success” of the *Nomad* ARG is paramount in beginning subsequent investigations regarding which elements affected that success and how they did so. As a result, the case study aims to present a qualitative analysis of the players’ opinions towards the pilot study and the game proper.

In understanding the player experience with the *Nomad* ARG, along with the use of other quantitative metrics such as website analytics, whether the games ran to completion and the number of players within each game, a measure of success can be defined. This measure of success can then be examined to identify which elements contributed to the success of the study.

In examining this reported measure of success, it is important to discuss whether the aims and objectives of the *Nomad* ARG, as a designed product, were reached. As such, this measure of success is then juxtaposed against the measure of success of the learning done by the players. The amount of learning done is judged based on in-game actions such as the player completion of game puzzles.

As such, aims of the *Nomad* case study can be summarised as follows:

- How successful were both versions of the *Nomad* ARG based on player opinion, researcher observation and quantitative metrics gathered from the games’ hub websites gathered through computer logging?
- Were the players successful in learning or exercising information literacy skills through the play of *Nomad*?
- Which elements contributed to these measures of success and why?

3.2.2.2.2 Single-case vs Multiple-case Design

The description of *Nomad* within this dissertation appears, initially, as two separate cases, which resulted in separate case studies: like phenomena (educational ARGs to teach information literacy) were studied within two slightly different contexts. This suggests that the study of the *Nomad* ARGs is a multiple-case design.

However, this is not the case. Though consisting of multiple cases, the study of *Nomad* exists as a single-case case study. This is due to the purpose of each case study within *Nomad*. The initial case, the pilot of the *Nomad* ARG, was developed and run to help further develop the game within the game proper. In order to do this, similar data collection had to occur within the pilot as occurred during the game proper. This allowed the development of the game proper to be developed more robustly and provide

the design team with real-world experience in designing, developing and running an ARG. It also helped identify problems within the initial design of the game itself.

Additionally, this study does not concern itself with some of the benefits of multiple-case case design. Multiple-case case designs are best suited to studies where each case is distinctly different, so that the narratives of each case can help inform contextual judgements of the multiple-case case study (Gerring 2004; Pickard 2013:108; Yin 2013:53–64). Additionally, multiple-case case studies often perform cross-case analysis (Pickard 2013:108), which is not performed within this study.

However, the focus of the empirical study, discussed by the research questions posed in Chapter 1, examines the run of a final ARG for information literacy education purposes. It is this case, the case of the game proper, which attempts to address the aims noted in 3.2.2.2.1 and the research questions from Chapter 1. As such, the case study of the *Nomad* ARG follows a single-case design.

3.2.2.2.3 Case Design

The following section details the case design of *Nomad's* empirical study. This section specifically examines the phenomenon, context and sample of the study. These three aspects form the amalgamated unit of analysis discussed in 3.2.2.2.4.

3.2.2.2.3.1 The Phenomenon

The phenomenon observed within this study is an alternate reality game. Specifically, this case looks at an ARG for educational purposes that attempts to teach information literacy skills.

Analysis of the case hopes to provide insight into the phenomena of alternate reality games, educational games and information literacy teaching. The results within the below context may not be generalisable, as is a core “problem” with the case study method (Yin 2013:15).

3.2.2.2.3.2 The Context

3.2.2.2.3.2.1 The Location and Time Period of the Study

In both instances (the pilot study and the game proper), the *Nomad* ARG utilises the facilities located on the Hatfield Campus of the University of Pretoria.

The only difference between the cases here is the time period. The pilot study ran in the second semester of 2014, during August and September. The game proper, by comparison, ran in the first semester of 2015, during April and May. Additionally, the pilot study involved only the first fortnight of planned gameplay, as opposed to a six-week schedule within the game proper.

3.2.2.2.3.2.2 *The Intended Sample*

It must first be noted that due to the nature and scope of alternate reality games as a genre, it cannot be guaranteed that every student will participate in either the pilot study or the game proper (Hakulinen 2013). This is reasonably expected as previous studies, such as *ViolaQuest* (Whitton 2009a) or *Stop Toilworn Diamond* (Hakulinen 2013), were seen to have much smaller player groups than the size of their targeted audience. This is because some potential players may choose to ignore or simply not notice initial game interactions. It can also not be guaranteed, due to the nature of the alternate reality game genre, that students from outside the targeted undergraduate modules (Academic Information Management – AIM 121, and Introduction to Information Science – INL 110) will be excluded from participation in the game proper.

The game's pilot study was targeted at first year students who were registered for the mandatory Academic Information Management courses at the University of Pretoria. In the case of the pilot, the specific targeted module was Academic Information Management 121 (AIM 121). The selection of AIM 121 was due to its presentation in the second semester allowing for adequate design and development time to occur during the first semester of 2014. Additionally, the selection of AIM 121 students as a target audience hoped to allow for an examination of the viability of the integration of AIM 121 learning outcomes within the design of the game itself. Due to the game pilot being launched from within AIM 121 lectures, despite the study being external from the module itself, it was hoped that the players within the target group would find the game content more familiar than if it were to be launched from within another module, as in the full implementation of the study.

The game proper was targeted at first year students registered for Introduction to Information Science (INL 110). As noted in Chapter 1, INL 110 was chosen because of lecturer co-operation, allowing the design team a great deal of control in accessing the target audience. Additionally, the module includes students from the Bachelor of Information Science undergraduate degree programmes (BIS Multimedia, BIS Information Science and BIS Publishing). Because of an understanding of the syllabi presented within these degree programmes, the design team could better assume characteristics about this more-limited target audience, such as the ability of Multimedia students to understand the construction of HTML pages (de Beer & Holmner 2013).

For both the pilot study and the game proper, stratified adaptive cluster sampling best explains the shrinking of the initial large population (the target group) to the smaller population (the player group) (Thompson 1991). In this sampling method, the initial strata that defines the cluster in this case is the group of potential players from the larger population who, out of the curiosity necessary for the play of an ARG, investigate the game's narrative. Additionally, the sampling is adaptive as the strata that increases or decreases the population changes based on how the players participate in the game. While "curiosity" is the initial criteria that defines players from non-players, this may later change to, for instance, "willingness to play after being told about the game."

From the smaller population of players (hereafter referred to as “the population”) purposive convenience sampling will be conducted at the conclusion of the study (Palys 2008). The purposive aspect of this method is achieved through the splitting of the population into the three categories as described in the next section, while the convenience aspect refers to the voluntary nature of the post-game focus groups and questionnaire.

3.2.2.3.2.3 Divisions of the Sample for Data Analysis

In order to differentiate between focus groups for qualitative data analysis, any given participant (player of the game) will be put into one of three categories. These categories are loosely derived from existing player tier categorisations such as “real world player”, “story player” and “puzzle player” (Dena 2008) as well as “active player” and “bystander” (Kim, Allen & Lee 2008). The three categories created for the purpose of this study often combine elements of these existing categories.

The “active players” category amalgamates Kim, Allen and Lee’s (2008) active player category with Dena’s (2008) “real world player” and “puzzle player” categories. Players within this category participate in the game the most. Specifically, they actively attend the game’s live events and participate in puzzle solving both at the live events and in solving the game’s primary puzzles.

The “player-observer” category includes elements of the “story player”, “puzzle player” and “bystander” categories. Player-observers participate in the game less than the active players, but attempt to aid the active players in solving both primary and secondary puzzles within the game. These players attend fewer live events, but are still invested enough in the game to follow the story or watch the game unfold.

Lastly, the “observer” category used in this study correlates to Kim, Allen and Lee’s (2008) “bystander” category. Observers are the least active players. These players have varying degrees of knowledge about the game. Some observers are “non-players”: players who did not know about the game, or players who knew about the game but decided not to play. Other observers are merely casual players, who could not be active enough in the play of the game due to external responsibilities. While “non-players” are largely uninterested in the game itself, casual players often are, but choose rather to observe other player groups or help these player groups when it is possible for them to do so due to external responsibilities.

Each of these player categories will inform the creation of focus groups based on these categories for qualitative data gathering at the conclusion of each game. The categorisations exist to delineate the qualitative responses given by each focus group. Players within the “active player” category, for instance, will likely have a more detailed understanding of the game and its events, whereas non-playing “observers” may only be aware of the game to the degree that they followed the game itself. As such, the opinions of these player groups may differ due to this knowledge gap, producing disparate data.

3.2.2.2.4 The Unit of Analysis

The case study is an instrumental case study as defined by Stake's (2005:237) case types, as it seeks to better understand the phenomenon of educational alternate reality games. The unit of analysis in this study is the entirety of the case described above (see 3.2.2.2.3), as delimited by the aims of the case study (see 3.2.2.2.1). The unit of analysis can be described as follows:

The unit of analysis within the study is the instances of the Nomad educational alternate reality game. Nomad aims to teach and exercise information literacy skills. It does so within a local South African context, on the University of Pretoria's Hatfield campus, by attempting to engage undergraduate (first year) students in a learning context that is external from a module presented by the university.

In addition, the analysis of this unit hopes to discover whether or not the method of teaching developed within the designed case was both effective and enjoyable.

3.2.2.2.5 Ethical Clearance

Prior to data being collected for the study once the unit of analysis had been decided on, ethical issues within the study had to be addressed.

The study followed the University of Pretoria's (2014a) Code of Ethics for Research. This code of ethics expects researchers to uphold eleven "key values" to ensure an ethical research environment for researchers, informants and subjects alike (University of Pretoria 2014a).

The key values within the Code of Ethics regarding the rights afforded to the researcher are as follows (University of Pretoria 2014a):

- Academic freedom is provided to the researcher.
- The research environment has support, infrastructure, policies, programmes and management in place to support potential research.
- The University's facilities, resources and services can be used for research.

Based on these affordances, eight subsequent responsibilities are expected from the researcher (University of Pretoria 2014a):

- The researcher has the responsibility to address the social needs and problems of South African communities, where possible.

- The researcher must treat individuals and organisations involved in the research equitably.
- The researcher should ensure that no individual should be harmed or have their wellbeing affected by the study.
- The researcher must respect individual persons involved within the study, both by respecting the autonomy of opinions of these persons and by protecting others from having their autonomy reduced within the study.
- The researcher must remain professional, as it applies to their occupation.
- The researcher must not be discriminatory on a plethora of grounds, including gender, race, sexual orientation, age, and religion, amongst others.
- The researcher must not abuse his/her supervisory authority within the study by granting privileges to those involved in the study based on their performance.
- The researcher must refrain from sexual harassment.

As these rights were provided to the researcher for the study, the responsibilities based on these rights were upheld. In proving that these rights would be upheld, ethical clearance for the study was sought.

This ethical clearance was two-phased. Initially, detailed documents regarding the ethical implications of the study were submitted to the Department of Information Science's internal research committee. These documents included copies of the utilised interview schedules and questionnaires (as discussed in 3.2.2.2.7), consent forms for the use of the names and pictures of the actors who participated in the game as well as a document detailing specific ethical aspects of the study. Samples of these consent forms and research instruments can be found in the Appendices.

Once clearance for these documents was received from the internal committee, these documents were sent to the Faculty of Engineering, Built Environment and Information Technology's Committee for Research Ethics and Integrity (University of Pretoria 2014b). As before, clearance was granted (as shown in Figure 79). As a result of this, data collection within the study could now be performed.

3.2.2.2.6 Data Collection Techniques

The following section discusses the data collection techniques used in the study.

3.2.2.2.6.1 Observation

Observation occurs in most qualitative studies (Pickard 2013:225). However, this observation can either exist as "a casual observation of the activity taking place", or as an explicitly designed data collection technique (Pickard 2013:225). When considering it as designed technique, Patton (1987:81) discusses a framework that help determine the nature of observation: the observer's role, how they appear to

participants in the study, the participants’ understanding of the research, the length of the observation and its research focus.

This dissertation utilises Patton’s (1987:81) framework to discuss the observation that occurred during the *Nomad* ARGs in Table 5.

Table 5: The implementation of Patton's (1987) observation framework

Framework dimension	Discussion of this dimension within <i>Nomad</i>
The observer’s role	Non-participant observation was utilised during the study. In non-participant observation, the researcher externally observes the context and makes no attempt to infiltrate it (Pickard 2013:229). This is necessary within the context of the ARG genre, where the game’s designers are the “puppet masters” of the observed community, and are thus hidden from the players (McGonigal 2007a).
How the observer appears to the study participants	During the study, because of non-participant observation taking place and the nature of the ARG genre, players are unaware of the identities of the game’s “puppet masters”. As such, where the players are being observed for both research and game-related purposes, they are only aware of the game-related observation, and may only be aware of the research-related observation at the conclusion of the game.
Participant understanding of the research	Players of an ARG are aware that they are playing a game, regardless of the implementation of the “this is not a game” aesthetic (Stenros et al. 2011). However, as noted above, because players are not aware of the intentions of the game’s “puppet masters” until the conclusion of the game, it is possible that they may not understand that the ARG they are participating in forms part of a research project.
The length of the observation	During both the pilot study the length of observation of the community was six weeks. Within the game proper this observation lasted five weeks. These observations times are despite estimated timelines for both the pilot study and the game proper. The length of the pilot study was extended from the planned two weeks to six weeks due to the degree of player participation in the pilot study. The game proper ran

	for five weeks, one week less than its originally planned six weeks, due to too much content being produced for the game which led to a pre-emptive early ending.
The focus of the observation	For research purposes, observation occurred to better understand how the players were engaging with the learning outcomes through the utilisation of the game system. An understanding of how the players played the game also suggests the level of enjoyment the players experienced.

3.2.2.2.6.2 Document Analysis

During qualitative research, documents are often used to provide the researcher with a background that helps in the construction of the theoretical framework on which their research is based (Pickard 2013:252). It can also act as preparation for fieldwork studies (Pickard 2013:252). Additionally, research can also be primarily document-based, as is often the case in historical or archival studies (Pickard 2013:253). A potential shortcoming of this research, however, is the richness and robustness of the documentation (Pickard 2013:254). If the documentation of an event or phenomenon is lacking, researcher interpretation of that event may also be lacking, as the researcher has merely consulted a secondary source (where the primary source was the event itself) (Pickard 2013:254).

The case study of *Nomad* attempts to combat this by using the documentation in combination with the study's other data collection techniques. The documentation studied in *Nomad's* case study are myriad: the game's hub websites, player-created communication channels, player-created websites, the contents of in-game character email inboxes and any written account provided by the players are all forms of documentation that are subject to analysis within the study.

Specifically, in this regard the analysis focuses on the following documents:

- The complete contents of all game hub websites within both cases of the *Nomad* ARG. These include player communications, game puzzles and game artefacts.
- The contents of any player-created communication channel for player-to-player communication.
- The communications of players with either game characters or the game's design team during and after the games were concluded.

3.2.2.2.6.3 Computer-Generated Log File Analysis

The above document analysis is supported by the use of logs and aggregated data generated by computer software from these documents. Analysis of these logs, as with standard document analysis, constitutes another form of information seeking over and above standard document analysis (Wilson 1999). This data will, as noted in 3.2.1, be utilised to support qualitative data and inferences made from the original document analysis as well as the data gathered through other methods, as suggested by Pickard (2013:257–258).

Such logs contain individual user activity such as user registrations, session opening and closing, forum posting, puzzle completion, number of page views, number of unique visitors and the average session time, among other quantitative statistics.

3.2.2.2.6.4 Questionnaires

Questionnaires are used in most studies that utilises human informants due to their low cost and ability to be distributed across geographical boundaries via the internet (Pickard 2013:207). Additionally, questionnaires can reach a potentially larger audience due to this ease of access (Pickard 2013:207). Questionnaires also automatically ensure anonymity through their design, provided they ask relevant questions that ensure confidentiality (Burgess 2001).

However, the anonymity presented by questionnaires is also a limitation of the method, as participants who answer the questionnaires can often not be further questioned regarding their answers (Foddy 1994:8). The study of *Nomad* aims to provide a solution to this by utilising the questionnaire as a primer for subsequent focus group interviews.

Questions within the questionnaire are similar to those presented to the players during the focus groups. In this way the questionnaires act both as a standalone data source (for players who complete the questionnaire but do not attend the focus group), as well as a corroboratory data source (wherein inferences can be made regarding questionnaire answers and focus group discussion). Participants' answers within the questionnaire can also help inform an understanding of additional questions or topics necessary for discussion within the study's focus groups.

3.2.2.2.6.5 Focus Groups

Focus groups allow a group of research informants to provide a researcher with their opinions and experiences with a particular research subject or study (Powell, Single & Lloyd 1996). As such, they are becoming increasingly popular in qualitative research as an effective method for gathering data from multiple sources simultaneously (Gorman et al. 2005:143). This is especially true as focus groups allow for a form a “groupthink” where, during discussion, people may suggest or elaborate on ideas within a group setting where they may not have in an isolated environment (Gorman et al. 2005:143).

Notably, Stewart and Shamdasani (1990:15) define seven occasions in which focus group interviews are effective during research:

- Obtaining background information about a topic.
- Developing hypotheses to test using quantitative approaches.
- Idea and concept stimulation.
- Discovering problems with existing products or services.
- Garnering impressions of existing products and services.
- Understanding how a target audience discusses a subject of research.
- Further interpretation of qualitative results.

Specifically, this study focuses on utilising the following “occasions” for focus group usage:

- Discovering problems with existing products or services: the pilot study’s focus group specifically attempts to discuss the shortcomings of the first iteration of the *Nomad* ARG in preparation for the game proper.
- Garnering impressions of existing products and services: both focus groups discuss the impressions the players had of the *Nomad* ARGs when considering whether they felt the game was both effective and enjoyable.
- Further interpretation of qualitative results: qualitative data and inferences from the focus groups help inform the interpretation of data from the other data collection techniques discussed above (see 3.2.2.2.6.1, 3.2.2.2.6.2 and 3.2.2.2.6.4).

As noted previously (see 3.2.2.2.3.2.3), each focus group will target a specific subcategory of player: active players, player-observers and observers. Multiple focus groups may be conducted for each player type to gather the opinions of multiple research informants.

However, in the case of the pilot study, only a single focus group was conducted with the “active player” community due to problems with the community within the pilot study as discussed in Chapter 5.

3.2.2.2.6.6 Triangulation

The multitude of data collection methods used in this study results in methodological triangulation (Denzin 1970:301). Methodological triangulation refers to the utilisation of various data collection techniques in order to see if and how the data gathered corroborates across techniques (Denzin 1970:301). Methodological triangulation is used due to its relevance to the anatomy of the case study methodology: it allows the study to adequately address a broader range of assumptions and conclusions due to the larger amount of data gathered using various methods and perspectives (Yin 2013:92). Additionally, utilising different methods (with different strengths and weaknesses) during triangulation

allows for more robust conclusions, as the data from different sources may be complementary (Miles, Huberman & Saldana 2013:267).

3.2.2.2.7 Research Instruments

The following table (Table 6) discusses the research instruments used within the data collection techniques of this study.

Table 6: Research instruments

Data collection technique	Research instruments
Observation	<p>Observation employs the researcher as research instrument, or the “human instrument” (Lincoln & Guba 1985:188). The human instrument utilises explicit and tacit knowledge to create for themselves a theoretical framework that then guides data collection through the use of data collection techniques (Lincoln & Guba 1985:188). The human instrument can then not be separated from the research itself as the instrument produces the individual research (Pickard 2013:15).</p> <p>Throughout the game, the players of the game are observed in order to adjust the game based on player actions. The dynamic nature of this player-game interaction is characteristic to the ARG genre (Stewart 2006). However, this observation also discovers qualitative aspects regarding the players’ opinion of the game itself. Uncovering this opinion is the research focus of the utilised non-participant observation.</p>
Log File Analysis	Google Analytics is used to gather log data for each of the game’s hub websites, such as number

	of unique visitors, number of unique page views and other qualitative data.
Log File Analysis	Server log files are utilised on game websites to track individual user activity such as user registrations, session opening and closing, forum posting and puzzle completion.
Document analysis	In the creation of the game’s hub websites, HTML, CSS and JavaScript is used to create the websites seen and utilised by the players. These front-ends are supported by SQL databases on all game websites for both content and data storage. Data stored in the database from gameplay includes forum posts by participants and puzzle completion tracking. It is these assets that form that majority of the documents utilised during qualitative analysis.
Document analysis	Any player-created communication channels used within the game were monitored during the game and later analysed as additional documents in the study’s document analysis. These documents include player blogs, forums or instant messaging groups. Each of these sources represents an additional document.
Questionnaires	Print or electronic questionnaires were given to willing players after the conclusion of the game. Participants had the option of filling in either print or electronic versions of the questionnaire. The electronic questionnaire is created on Google Forms, allowing electronic questionnaire answers to be stored in a spreadsheet hosted on cloud storage. The questionnaires were presented to players prior to the focus groups and act in part

	<p>as a primer to the types of questions asked during these interviews.</p> <p>In the case of print questionnaires, adequate equipment for completing them (pens, pencils, print versions of the questionnaire) was made available to players. These answers were then be digitised and correlated into a spreadsheet of questionnaire answers. Separate spreadsheets were kept for the pilot study and the game proper.</p>
<p>Focus groups</p>	<p>Semi-structured interviews were conducted with players via focus groups. The focus groups were delineated by the player categorisations discussed earlier (see 3.2.2.2.3.2.3). A focus group interview schedule that defines both explicit questions as well as general discussion topics was used. The focus groups were recorded digitally using mobile devices. These recordings are secured via personal storage protected by encryption for fifteen years to ensure validity and anonymised to protect explicit participant involvement.</p>

3.2.2.2.8 Procedure for Data Processing and Analysis

Qualitative data gathered from focus groups, questionnaires, website interactions (such as forum and blog posts) and player-created communication channels will be subjected to constant comparative analysis to find the recurring themes with regards to player experience within the empirical study (Strauss & Corbin 1998:67). Constant comparative analysis is a data analysis technique used within grounded theory, and is so named due to the continual comparison of data from multiple sources against other data from those sources (Pickard 2013:269). This comparison, through the coding of data sets, eventually highlights themes in the data whose relationships to each other and the research itself can be examined (Pickard 2013:269). Constant comparative analysis was chosen over typical phenomenological strategies as the research attempts to understand the player experience on a generalizable scale, as opposed to individualised player experiences. Phenomenological analysis is better suited when analysis seeks to understand individual narratives within an experience (Pickard 2013:268).

Within constant comparative analysis, data undergoes microanalysis (Strauss & Corbin 1998:57–73). During this microanalysis, three phases of coding take place: open coding, axial coding and selective coding (Strauss & Corbin 1998:101–162). The purpose of this coding is to allow a theory regarding the data to be “built” from the data rather than tested, to thematically categorise and link the data and to manageably handle large amounts of qualitative data (Strauss & Corbin 1998:13).

During open coding, all the data is analysed and discrete concepts within the data are identified. These concepts then form initial categories that represent the basis for analysis (Strauss & Corbin 1998:101–122). These categories are what move the analysis forward, as within categories, subcategories can be defined that lead the analysis onto the next phase of analysis: axial coding (Strauss & Corbin 1998:101–122).

During open coding of the qualitative data sources within the *Nomad* ARGs, understandings of thematic concepts within the player experience was established. The problems players had with the game, where and how the game was successful, their understanding of puzzles and interactions with the community are sample broad categories to emerge from this open coding. Open coding occurred on all data sources individually (separate coding phases occurred for the focus groups, player communication channels, game websites and questionnaires) and this coded data was then correlated across all data sources.

During axial coding, categories are internally analysed, subcategories defined and the relationships between subcategories and their parent category are established (Strauss & Corbin 1998:123–142). During this stage of analysis a clearer narrative regarding the player experience arises, as specific occurrences and phenomena exclusive to the case begin to be established. It is during this phase that case-exclusive patterns within the data begin to emerge. Determining the relevance of the relationships these patterns have with other patterns helps to present an initial working hypothesis from the data (Pickard 2013:271). This phase of coding is perhaps the most intensive, as the pattern relationships must constantly be checked against the patterns themselves to ensure correctness (Pickard 2013:272).

Axial coding of the data for the *Nomad* ARGs helped establish the narrative of the player experience across both iterations of the game. Here, individual narratives such as those of the power player affect other micronarratives, such as that of the dedicated active player community, which in turn affects the narrative regarding how the overall game was played by the players. This coding is important as the player experience narratives (how the players experienced the *Nomad* ARGs) are the outcome of the case reports discussed in Chapter 5 and Chapter 6. These narratives are also the strength of the instrumental case study: it is necessary to have a descriptive narrative to analysis in an attempt to generalise that narrative to its greater phenomenon (Stake 2005:237).

Finally, selective coding takes place. In this phase, a category into which the categories and subcategories that were developed in open and axial coding can be placed must be defined (Strauss &

Corbin 1998:143). In this way, the researcher integrates these existing categories into a singular theory which has emerged from the data (Strauss & Corbin 1998:143). Any category or subcategory that does not fit this theory must be discarded, but can be left for future research (Pickard 2013:272).

As noted, the assumed outcomes of the case reports later within this dissertation are the descriptive narratives of the player experience within the *Nomad* ARGs. In this regard, the overall categorisation that the open and axial coding categories can be placed into is one of “the player experience within the *Nomad* ARG”.

When considering this overarching theory and category, Chapter 5 and Chapter 6 (the case study reports as discussed in 3.2.2.2.9) present a descriptive narrative of the run of both *Nomad* ARGs, along with categorised discussions of the micronarratives present within these ARGs, as informed by the data itself.

Conclusions regarding the overall descriptive narrative of the game, the game’s micronarratives and the aims of the case study and this dissertation are then discussed in Chapter 7.

3.2.2.2.9 The Case Study Reports

As noted in 3.2.2.1.3, the case study reports are initially presented as a narrative of the case itself. Following this, data analysis of the quantitative and qualitative data gathered during the game is performed. Analysed data is explained via the theoretical framework developed in Chapter 2. The narratives and analysis of these narratives are presented separately for the pilot study and the game proper. The pilot study’s case study report can be found in Chapter 5 and the game proper’s in Chapter 6. Conclusions regarding the measure of success of the study itself and the case study reports presented in Chapter 5 and Chapter 6 are presented in Chapter 7, linking back to the aims of the *Nomad* case study as discussed in 3.2.2.2.1 and the aims and objectives of the study itself in Chapter 1.

3.3 Development Methodologies

The design of the empirical study itself does not follow a particular research methodology, but rather, as a designed product, follows development methodologies instead. Because of the empirical study’s framing as a game, it was decided that development methodologies used in the development of digital games could be similarly applied and adapted to the genre of alternate reality games. To this end, the design of the empirical study focused on iterative production cycles to develop a modularly expanding, polished final product. In order to do this, the study adopted principles of agile development (Martin 2003) and applied them within the spiral model of software development (Boehm 1995). The way in which these development principles were applied is discussed below.

3.3.1 Agile Development Principles

The development of the *Nomad* ARG followed many tenets of the agile manifesto (Beck et al. 2001). The agile manifesto (Beck et al. 2001) consists of four main values:

- “Individuals and interactions over processes and tools”
- “Working software over comprehensive documentation”
- “Customer collaboration over contract negotiation”
- “Responding to change over following a plan”

These tenets advocate large-scale teamwork, working prototypes, customer service and flexible designs, respectively. These are further discussed in the twelve principles of agile software, summarised as follows from Beck et al. (2001):

- Customer satisfaction
- Flexible requirements
- Iterative working designs
- Crosspollination of expertise
- Reliance on motivated developers
- Face-to-face communication
- Working designs to indicate progress
- Sustainable development
- High-quality work
- Simplicity
- Self-organising teams
- Team reflection meetings

These principles reflect the manifestation of the four values originally discussed within the manifesto proposed by Beck et al. (2001). How the development of the *Nomad* ARGs adhered to these principles is discussed below (see Table 7 below).

Table 7: How *Nomad*'s development adhered to agile principles

Agile principle	How <i>Nomad</i> adhered to this principle
Customer satisfaction	Both versions of <i>Nomad</i> , being alternate reality games, were primarily designed as player-driven experiences. Throughout the game, player action was seen and appropriately responded to within a game context, hopefully delivering a satisfying player experience.

<p>Flexible requirements</p>	<p>Requirements for <i>Nomad</i> regarding learning outcomes were known from the outset of design. How these outcomes were integrated into the game context, however, was not. As such, the learning outcome requirements were integrated into the game throughout its design. These requirements were revisited during the play of both games to ensure that players were still experiencing these outcomes.</p>
<p>Iterative working designs</p>	<p>Development of the ARGs was broken up into phases, as discussed in 3.3.2.2. Each of these phases can be considered standalone working designs that went through multiple iterations to develop puzzles, gameplay interactions and narrative based on the learning outcomes set for each phase.</p>
<p>Crosspollination of expertise</p>	<p>Within the agile manifesto, this section refers to managers and developers discussing projects on a regular basis (Beck et al. 2001). Within <i>Nomad</i>, the role of “manager” was fulfilled by the researcher, where the design teams were the primary developers. During design, feedback between the researcher and design teams helped construct the overall product of the <i>Nomad</i> ARGs: the researcher was as involved in the development of the ARG as their design team, who assisted in a supplementary capacity.</p>
<p>Reliance on motivated developers</p>	<p>Key members of the design team showed a keen interest in the <i>Nomad</i> ARGs, producing high quality work whilst meeting strict development deadlines. These developers were subsequently relied on during the later development of the game for producing important game assets. Where these “motivated developers” were not available, the researcher undertook these development tasks as a “motivated developer” due to his vested interest in the success of the <i>Nomad</i> ARGs.</p>
<p>Face-to-face communication</p>	<p>The design teams held weekly face-to-face meetings during the development of both iterations of the <i>Nomad</i> ARG. Communication between these meetings was largely informal, done via phone conversations, instant messages or emails.</p>

<p>Working designs to indicate progress</p>	<p>Once a phase had been designed through the “iterative working designs” principle, deadlines were provided for the completion of the phase’s assets. Once the assets were complete, the design team could logically follow the flow of the game from the perspective of the players by interacting with these completed assets.</p>
<p>Sustainable development</p>	<p>“Sustainable development” suggests that developers and users maintain a pace through the software indefinitely (Beck et al. 2001). For the <i>Nomad</i> ARG, it was interpreted that this principle referred to the ability for the ARG to properly handle a variety of potential user interaction with the system without failing in any way. In this regard, during gameplay, a core team of motivated developers acted as each game’s “live team”, frequently gathering to brainstorm, design and develop game assets as a result of player action.</p>
<p>High-quality work</p>	<p>High-quality work was imperative if the <i>Nomad</i> ARGs were to properly sustain the “this is not a game” aesthetic (McGonigal 2003b). As such, motivated developers were relied upon during the development process, and assets were recreated if it was decided they were not “game ready”.</p>
<p>Simplicity</p>	<p>During design, the team purposefully avoided providing the players with branching decisions that may have require large amounts of narrative content for the disparate branches. As such, the <i>Nomad</i> ARG was a largely linear experience, despite player action during the game. During the game, should new content need to be developed, it was included between core game milestones instead of subverting these milestones entirely.</p> <p>Despite the simplicity of the experience, however, the design processes made allowances for player action to change the narrative. As noted, however, where these multiple-path scenarios were designed, they were designed in a manner that did not subvert the game’s core milestones. Instead, these multiple-path scenarios provided divergent branches of player action that led, eventually, to the game’s core milestones.</p>

<p>Self-organising teams</p>	<p>Members of the design teams nominated themselves to primarily develop specific assets, narratives or puzzles within the game based on their individual expertise.</p>
<p>Team reflection meetings</p>	<p>During each weekly meeting, reflection on both the progress of development and the overall vision of the game took place. Where members needed assistance with assets was identified, and assets were reassigned where necessary. Brainstorming occurred regarding how to implement specific puzzles, assets or narrative aspects of the game itself better.</p>

Agile processes are not without fault, however. Ten years after the manifesto was originally published, an anniversary event for the manifesto was held at which proponents discussed some of the shortfalls of agile development processes (Kruchten 2011).

Many of these shortfalls address the notion that agile development has various practical difficulties within real-world workplaces, such as its difficulty in handling failed projects (where working designs are the benchmark of progress), how workplace politics can hinder the adoption of agile approaches (by hindering crosspollination of expertise), and how self-organising teams are often not practical in some workplace settings (Kruchten 2011).

Additionally, scalability in agile practices is often an issue (Kruchten 2011). Agile development is largely governed by self-motivated teams (via the “reliance on motivated developers” principle) if it hopes to keep producing the iterative, working results it seeks when examining project progress (as “working designs indicate progress”). As such, agile processes require the workforces that utilise its practices to be united in their commitment to these processes. As the number of members within this workforce rise, it may become difficult to ensure that every member effectively follows agile principles, thus hindering the “agile” nature of the system overall.

To combat these issues, the development of *Nomad* did not only utilise agile development processes. Instead the spiral model for software development (Boehm 1995) was used as a basis for development, and agile principles were adhered to throughout the utilisation of the spiral model during development.

3.3.2 *Spiral Development*

The following section discusses the spiral model for software development as it is implemented in this dissertation.

3.3.2.1 The Spiral Model

During the development of the games, iterations within development followed the spiral model for software development. The model itself takes some cues from similar software development models, such as the Royce's (1970) waterfall model, pictured in Figure 3 (Boehm 1995). A large criticism of the waterfall model is an inability to freely move between its phases within the development process, with movement only allowed to the previous or next phase in the process (Boehm 1995). This means that requirements for the project cannot be changed during the much later implementation phases. This is seen as a core flaw of the model (Boehm 1995).

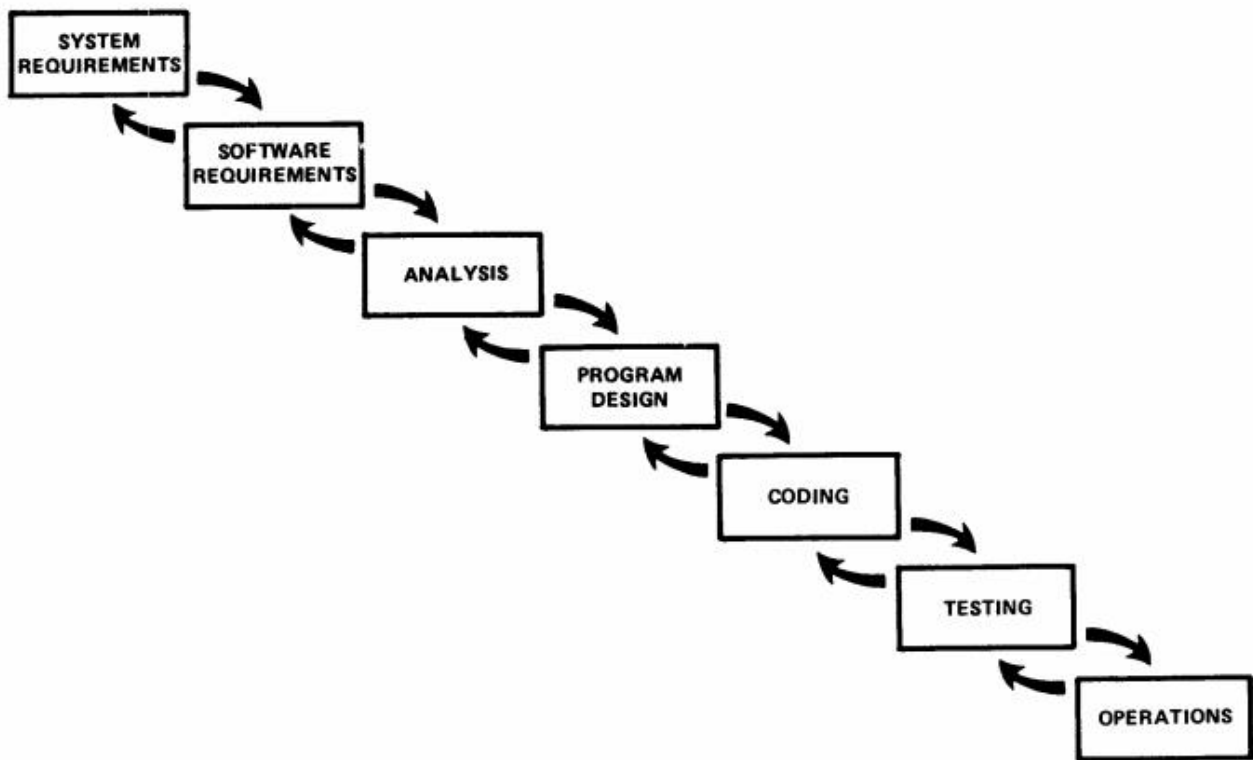


Figure 3: The Waterfall Model (Royce 1970:19)

Boehm (1995) attempted to rectify some of the salient issues within Royce's (1970) waterfall model within his spiral model. Within the spiral model, a project is subdivided into small portions. The iterative development of each of these portions represent cycles within the spiral itself (Boehm 1995). As the project spirals through various iterations, the project's development cost increases (as the project increases in scope) (Boehm 1995). An illustration of the spiral model can be seen in Figure 4.

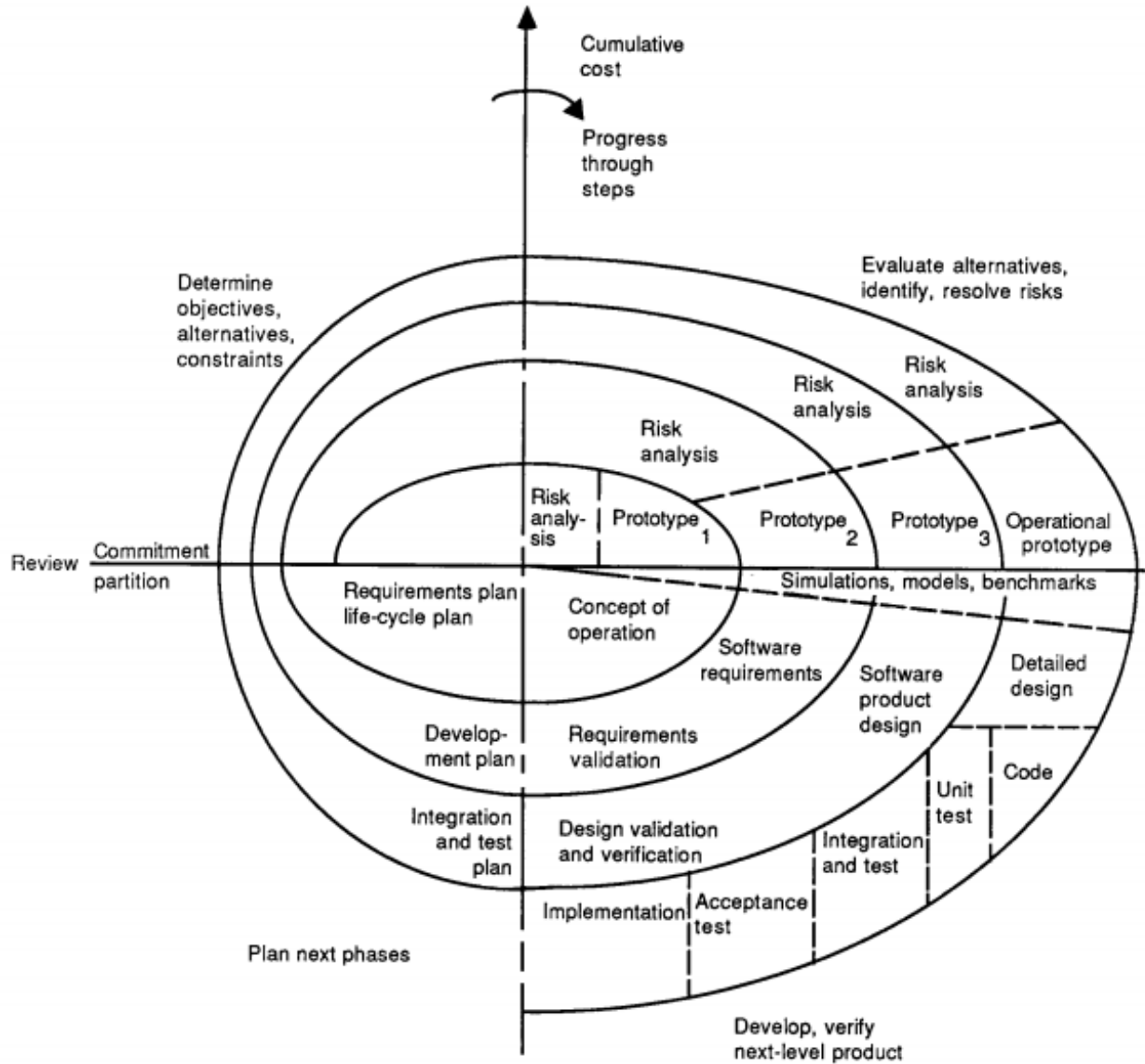


Figure 4: The Spiral Model for software development (Boehm 1995)

Additionally, the spiral model repeats four major steps during a single cycle (Boehm 1995):

- Determine the objectives and constraints of each portion of development, as well as potential alternatives for this portion.
- Evaluate these alternatives. Note any risks regarding a chosen course of action and resolve them.
- Develop the cycle's portion of the product, and verify it against the objectives.
- Plan for the following cycle (whether this is another portion or a further iteration on the completed portion) and commit to a plan of action.

These four steps can be further split into eight sub-steps (Boehm 1995):

1. State objectives
2. Determine constraints
3. Suggest alternatives
4. Identify risks
5. Resolve risks
6. Implement based on risk resolution results
7. Plan for the following phase
8. Commit to a plan of action

These steps are repeated through multiple spiral cycles. A typical spiral begins with a feasibility study (understanding whether the project is feasible), then defines a concept of operations (a focus for the project), then builds a formal requirements specification (through which the project can begin implementation) (Boehm 1995). This initial cycle can be seen in the centre of the spiral model in Figure 4. Subsequent cycles within the model deal with the development and implementation of the planned portions as per these requirement specifications, eventually resulting in an operational prototype that can then be tested (Boehm 1995).

Unlike agile development processes, where its tenets are practical considerations based on experience, Boehm's (1995) spiral model does not invite much criticism. Instead, both advantages and disadvantages of the model are disclosed to those seeking to use the model, after which a decision can be made regarding whether or not the spiral model is the correct choice for development.

Among the spiral model's advantages are the focus on the physical development of software early in the design process, the large amount of risk analysis done throughout the following of the model and the spiral model's suitability to large-scale projects as a result of the former two benefits (Lewallen 2005; Munassar & Govardhan 2010). However, disadvantages include its high cost (as the specificity of the model requires a high level of detail during every step), the fact that risk analysis requires specific expertise for large projects, and that a successful project is highly dependent on successful risk analysis (Lewallen 2005; Munassar & Govardhan 2010). These disadvantages often make the spiral model unsuitable for small-scale projects (Lewallen 2005; Munassar & Govardhan 2010).

When examining these disadvantages with regards to the context of use for the spiral model (large software projects), it can be seen that the high cost of the spiral model is often due to its reliance on expertise which, in large organisations, may require outsourcing to obtain effectively. Likewise, risk analysis in commercial software projects is incredibly important purely because of the scale of the projects themselves: the smaller the project scale, the less crucial perfect risk analysis is to the success of the project.

As such, the spiral model remains suitable as a development methodology for this dissertation's empirical study, as its marriage with agile development processes allows the model to guide the project whilst remaining rooted in the practicality of agile development.

3.3.2.2 *Empirical Study Implementation*

As per the spiral model (Boehm 1995), development of the game proper of the *Nomad* ARG was split into five spiral cycles as follows:

- Phase 0 contained the game's initial setup, the rabbit hole and live event 1. It was named "Phase 0" as it describes the setup of the game itself, prior to the start of play by the players.
- Phase 1 contained the first puzzles and ended with live event 2.
- Phase 2 contained the second wave of puzzles and ended with live event 3.
- Phase 3 contained the third puzzle wave and live event 4.
- Phase 4 contained the final puzzles in the game and the game's final live event, live event 5.

This section discusses the implementation of the spiral model within the game proper, as the pilot study only contained the game's first two phases (Phase 0 and Phase 1). It is important to clarify that the spiral model of development was only followed during the game proper's design and development phase (detailed in Chapter 4). Evaluations of each phase of the design, and subsequent redesign if necessary, occurred prior to the implementation and run of the game itself, as it is difficult to evaluate and redesign puzzles within an ARG during its run.

For each cycle of the spiral, outcomes and requirements were determined for each phase. This involved aspects such as choosing to focus each phase on the exercise or teaching of a specific skill, making sure that the exercise didn't differ too drastically from previous game exercises and making sure the game's difficulty curve progressed fairly from one phase to the next.

Next, structures were implemented to meet those requirements by way of designed game challenges. These challenges were described in as much detail as possible with regards to player interaction to best plan for each decision a player could make when faced with each challenge in the phase.

Each phase was then evaluated with regards to its effectiveness at meeting the outcomes and objectives for player experience that were initially defined. This allowed for an understanding of where designed elements succeeded or failed at meeting desired learning outcomes as well as proposed user experience scenarios.

Based on the successes and failures of each designed element for each phase, new requirements for each element and phase were drafted and cyclical development structure repeated until it was decided that the game’s design was robust enough to allow for testing during the pilot study.

When designing these phases through the eight sub-steps of the spiral model (Boehm 1995), various considerations were kept in mind, some as questions posed by the design team and others as statements. These considerations aimed to guide the design team throughout the development process. These considerations are discussed below in Table 8.

Table 8: Considerations within the spiral model (Boehm 1995) as applied to the *Nomad ARG*

Sub-step in Boehm’s (1995) spiral model	Considerations for this step
1. State objectives	<ul style="list-style-type: none"> • Which information literacy skill or exercise should be focused on in this phase? • How is this skill linked to skills previously taught?
2. Determine constraints	<ul style="list-style-type: none"> • What skills are the players reasonably expected to know prior to this phase? • Will the players find exercising the chosen skill engaging? • Are there any external factors (such as tests or exams) that may affect player participation within this phase? • Is this skill exercise too difficult?
3. Suggest alternatives	<ul style="list-style-type: none"> • Make difficult sections easier. • Make some sections more focused on the ludic outcome than the skill exercise. • Veil the skill exercise more to make the section more “fun”. • Allow for a longer completion window of the phase to account for external factors. • If the players do not know a skill they need within the phase, teach it to them beforehand.

<p>4. Identify risks</p>	<ul style="list-style-type: none"> • Will the players participate? • What happens if the players do not complete the puzzles? • Can the players “run out of time”? What happens if they do? • Will the players understand this interface or instruction?
<p>5. Resolve risks</p>	<ul style="list-style-type: none"> • Allow for flexible time periods within the game schedule so that game events do not have to occur at specific intervals. • Ensure any aspect of the game presented to the player goes through multiple quality checks. • Allow longer periods of time for the players to complete portions of the phase due to external responsibilities. • Develop additional narrative or ludic content if players reach some sort of failure state due to the risks noted.
<p>6. Implementation based on risk resolution</p>	<ul style="list-style-type: none"> • Implement any additional assets needed as a result of failure states. • Develop assets for the phase itself. • Ask developers external of the design team for opinions regarding quality of work. • Develop flexible game schedules based on timed allowances for the players.
<p>7. Plan for the following phase</p>	<ul style="list-style-type: none"> • Does this phase feel complete? Can design progress? • What aspects of this phase need further iteration? • How do narrative aspects or player action in this phase affect the next phase? • What is the natural evolution regarding skill learning and exercise from this phase to the next?

	<ul style="list-style-type: none"> • How should the difficulty increase from this phase to the next? • How does the narrative of the game change based on player action?
<p>8. Commit to a plan of action</p>	<ul style="list-style-type: none"> • With these considerations in mind, begin requirements design, game design and implementation on the next phase.

3.4 Conclusion

This chapter discussed the methodologies followed during both the design of the research and the design and development of two realised products: two versions of the *Nomad* alternate reality game.

During the discussion of the research design, an explanation of the case study method was conducted. How *Nomad* implemented this method, along with the data collection techniques used, was discussed. The process of analysis for the data sets garnered from both runs of the *Nomad* ARG was then discussed.

Once the research design had been explained, a brief discussion regarding how *Nomad* implemented agile methods within the spiral development methodology was had. Explicit details regarding the implementation of each phase within the spiral methodology were omitted, as a discussion regarding the implementation of this development methodology is not entirely relevant to the study.

In its absence, however, this dissertation goes on to fully discuss the design of both the pilot study's version of the *Nomad* ARG as well as the game proper's within Chapter 4. How these designs were implemented and changed during the run of both games is then discussed in Chapter 5 and Chapter 6, with conclusions regarding the discussed elements in regards to the entire study made in Chapter 7.

4. Chapter 4 – Alternate Reality Game Design

4.1 Introduction

This chapter discusses the design of two versions of an alternate reality game that was developed to foster skill teaching and exercise of information literacies within its players. Both game versions were run on the University of Pretoria's Hatfield Campus, and aimed to target students enrolled for specific first year modules.

It must be noted that neither version of the game fully integrated into the modules at any point. Both versions did, however, utilise existing module communication methods and assets. An example of this includes the use of announcements on ClickUP, a version of the Blackboard Learning Management System used by the University of Pretoria, to reference in-game events. Lecturers of the modules were encouraged to make announcements on ClickUP and guide players towards game hub websites for more information. These announcements made certain, however, not to abandon the "this is not a game" aesthetic. An explanation on the adherence to TINAG is discussed in the respective discussions of design decisions for each game version (see 4.3.3 and 4.4.3, respectively). Otherwise, both game versions ran complementary to, but external from, the modules themselves.

The pilot study was conducted during the second semester of 2014, from July to September, and targeted AIM 121 (Academic Information Management) students. Targeting this group was a designed attempt to form a correlation between module content and game content, despite the game's implementation as an external learning environment. Additionally, AIM 121 is a compulsory module for all first year students at the University of Pretoria. This provided a large potential target audience for the pilot study. The pilot study was primarily conducted in order to measure interest for a TINAG ARG within this large group. It was anticipated that, given the large potential target audience, more players would emerge. The pilot study was also conducted in order to test a small margin of the ARG's content – the game's first two (of five) "phases". The pilot study's running time was initially estimated to be two weeks, but was extended for reasons discussed in Chapter 5.

The full empirical study (hereafter also referred to as the "game proper") was conducted during the first semester of 2015 from April to June. This iteration targeted INL 110 (Introduction to Information Science) students. This change in target audience was as a result of a desire for a greater degree of control over the context the game proper ran complementary to. The use of a module inside the Department of Information Science also allowed the game proper's design to contain more specific assumptions regarding potential characteristics of its target audience based on the content of their chosen degree programs. The game proper was conducted as a TINAG ARG, and it attempted to complete all five of the game's designed phases within its six-week running time. Details regarding the implementation and results of the game proper follow in Chapter 6.

4.2 The *Nomad* ARG

The alternate reality game developed for this dissertation was named *Nomad* after one of the game's characters, The Nomad. It will hereafter be referred to as *Nomad* or "the ARG".

Nomad, as mentioned above, was designed with the pedagogical outcome of skill learning and acquisition of information literacies for its players as a primary design goal. In order to achieve this, game challenges were developed that required players to perform information literacy related activities. These include, among others, the use of the University of Pretoria library website and its associated journal portals, searching for physical books within the library, traversal of the library space itself and the use of social media and Web 2.0 tools for communication and the retrieval of game content.

In order to present an engaging context for these challenges, an embedded narrative surrounding time travel was developed. In this narrative, the eponymous *Nomad* character is a researcher who has somehow become stuck within the time stream and is constantly travelling in time as a result. Seeing this misfortune as an opportunity, The Nomad visits influential historical figures both out of curiosity and in the hope that these figures may hold clues to the escape of his temporal prison. During his visits, his charisma inspires these people. This inspiration often leads to influential historical events, such as the realisation of these figures' lives' works. In this way, The Nomad becomes a catalyst throughout all of history. While he enjoys helping these people, however, none of them have held any clues that may aid in his escape. It is at this point, narratively, that both versions of *Nomad* begin.

4.2.1 A Note Regarding Game-related URLs and Figures

Throughout the discussion of *Nomad's* design (both the pilot study and the game proper), this dissertation often refers to various Uniform Resource Locators (URLs). Some of these URLs are no longer available online. Additionally, other URLs may lead to websites that represent how they were seen by the players at the end of the game proper.

In this regard, many of the figures presented throughout this chapter represent screenshots of particular game websites during particular game events or puzzles. These figures, where possible, always represent the final asset as it was seen at the end of the game by the players, and do not represent the asset as it was seen by the players first encountered it during play. As such, all figures represent the asset as it could be viewed in October 2014 (for the pilot study) and September 2015 (for the game proper).

Additionally, figures showing assets that are not taken directly from versions of the game websites come directly from the asset archives kept by the design team.

4.3 *Nomad* Pilot Study Design

This section discusses the initial iterative design process of *Nomad*. The initial design of *Nomad* took place during 2013 and the first half of 2014, being completed in June 2014. The game's overall embedded narrative is discussed, followed by its design. A discussion of key design elements noted in the literature (Chapter 2) is lastly conducted to explain application-specific reasoning behind decisions. It must be noted that, while various later elements of the game were conceptualised and developed during the design of the pilot, the below discussion only deals with the scope of the player experience of the pilot.

Only the designed player experience is discussed in this chapter. The results of the actual pilot run and how it compares to the intended experience are discussed in Chapter 5.

4.3.1 *Pilot Study Embedded Narrative Overview*

The below synopsis details the narrative overview of the pilot study of *Nomad*: the first contact of game character Ana Kirlitz, and later the players themselves, with the game character of The Nomad. It must be noted that the rest of the chapter utilises the term “narrative” when referring to designed embedded narrative and “storyline” when referring to the planned player experience of the game as a narrative delivery construct (i.e. narrative is designed, but the play of the game has a storyline).

The pilot's embedded narrative (or “game story”) revolves around the plight of Ana Kirlitz, a doctoral candidate pursuing the qualification of a DPhil in Information Science from the University of Pretoria (University of Pretoria 2015) with a doctoral thesis entitled “Analysing the effectiveness of dedicated information literacy courses in teaching information literacy”.

To introduce herself to the students she has identified as a potential population for later data collection, Ana chooses to present short lectures to students of the AIM (Academic Information Management) 121 module at the University briefly detailing the necessity of information literacy education in tertiary institutions. This is done in order, she feels, to provide the students additional context for the learning experience.

With the help of Renate van Heerden, another character who acts as Ana's research assistant, these presentations take place during the first few weeks of the second semester. However, without fail, the presentation file corrupts itself halfway through each of the planned presentations in each of the AIM lectures it is presented in. In conjunction with this, lights can be seen flickering outside the lecture venue. Within the corruption, a message can be seen urging viewers to visit the university library at a specific time the following week. At the end of the lecture, the students emerge from the venue to find

torn pages from famous books strewn across the ground, the same date and time from the corruption stamped across them.

Seeing this as a sign, Ana and students from the lectures (the players) arrive at the given date and time at the library. Upon arrival, they see a video that leads them to the book *Alice's Adventures in Wonderland* (Carroll 1865). In this book is a trail that leads to various other books. Some of these books contain names of more books and clues to an overarching puzzle.

It is at this point Ana and the players realise that someone is trying to get in contact with them and leaving the clues in books for them to find. The puzzle eventually leads to a dictionary. The dictionary contains a part of a photo of a man placed into the dictionary in place of the definition of the word "nomad". Players need to revisit the dictionary in intervals to obtain all the pieces. Once reconstructed, another date, time and location – the library – is communicated on the back of the photo.

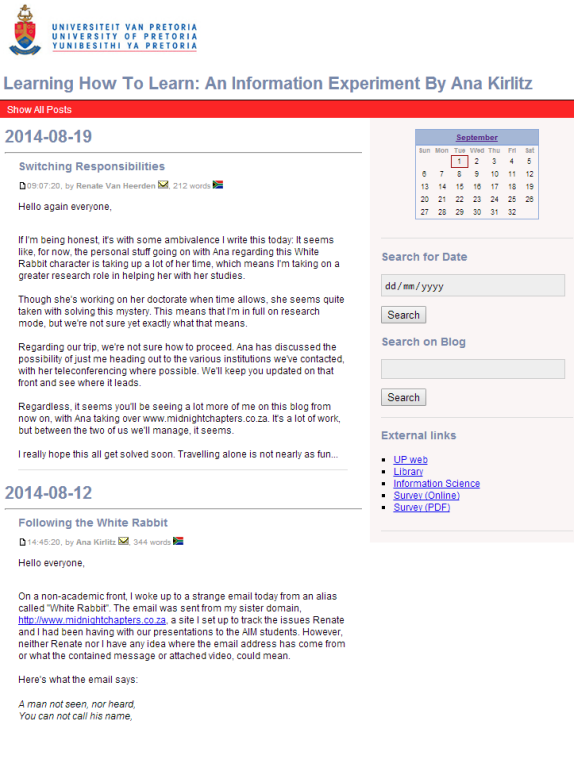
It is at this point that Ana and Renate must recuse themselves from the manhunt, as they have been called away to a library conference. It is up to the students (the players) to meet at the library at the predetermined date and time. Upon their arrival, the payphones outside of the library start to ring simultaneously. On all of them, a single man speaks: this is The Nomad. The Nomad is the man that has been trying to leave messages for the players, and he needs their help.


Unbeknownst to the players, The Nomad is a former researcher-turned-time-traveller who, after an undisclosed event, became trapped in the timestream. The volatility of the time stream as a result, periodically "warps" the *Nomad* to different places and times within history. Wherever possible The Nomad seeks to help people within these various places and times, often altering, or participating in, historical events. It is the goal of the players to free The Nomad from his temporal prison. However, this goal is only examined in the narrative and gameplay of the full empirical study (see 4.4.1 and 4.4.2).

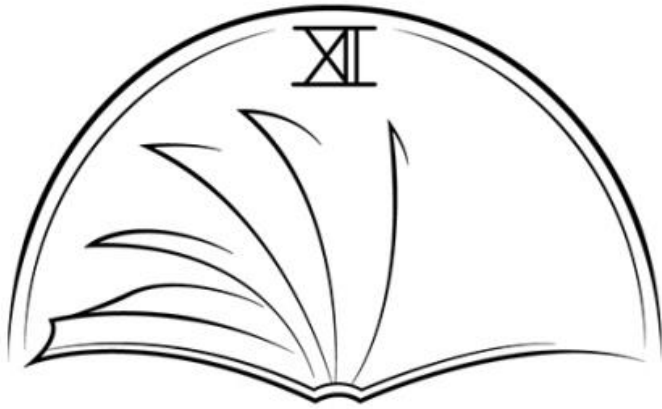
4.3.2 Pilot Study Game Design



The pilot study focused on the search and discovery process of the players as they moved towards an initial meeting with the *Nomad* character. This process contained the placement of digital narrative assets online and environmental narrative assets around the campus to attract interest, the game's initial event (the "rabbit hole"), the game's first events (performed as "live events" in real time) and the game's initial puzzles. The below table details the flow of events for the pilot study, denoting whether each "event" is an environmental narrative asset, a game event or a game puzzle. The events within the table are in chronological order.


Table 9: *Nomad* Pilot Study Game Flow

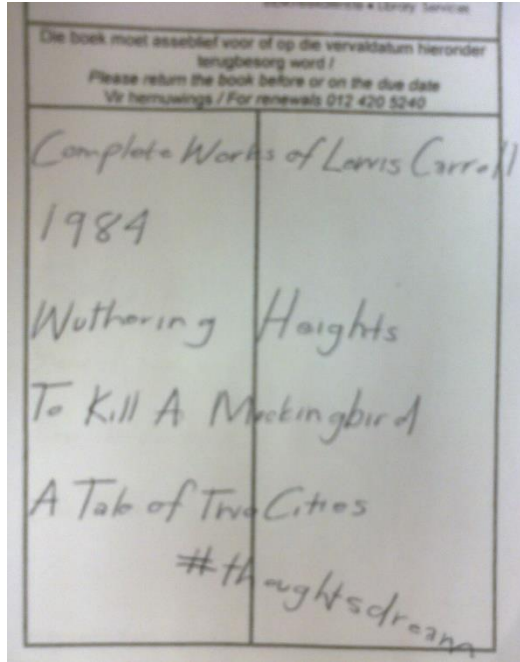
<p>4.3.2.1 <i>Digital narrative asset</i></p>	<p>Ana Kirlitz maintains a research-related personal blog (http://www.anakirlitz.co.za/), through which potential players can learn about her character, as well as her research assistant, Renate van Heerden. The website contains the ability to submit a short questionnaire regarding the effectiveness of information literacy teaching in AIM 121. This questionnaire was not used for data analysis within the study, and served merely as an additional narrative asset.</p>  <p>Figure 5: A screenshot of Ana's research blog, stylised with University of Pretoria branding to look official</p>
<p>4.3.2.2 <i>Environmental narrative asset</i></p>	<p>A burn mark appears on the ground outside the AIM lab building. It is cordoned off with cones and danger tape so that it looks like an “official” incident. Narratively this mark is the aftermath of The Nomad materialising from and rematerializing into the time stream.</p>

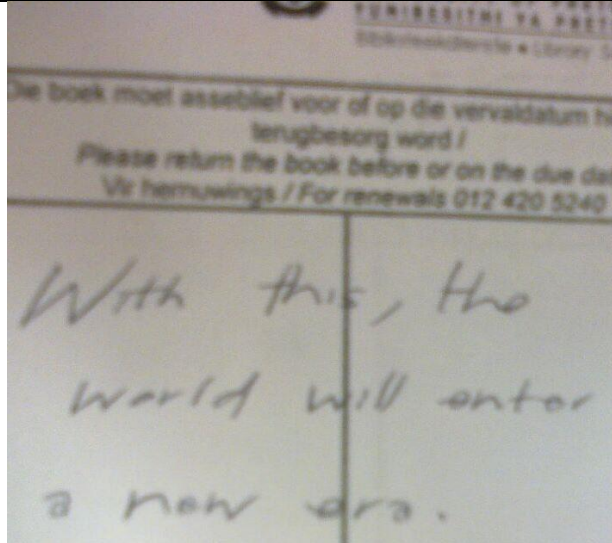
	 <p style="text-align: center;">Figure 6: The "burn mark", created with coloured powder, outside the lab building</p>
<p>4.3.2.3 <i>Game event</i></p>	<p>Rabbit hole: Ana gives her presentation to multiple AIM classes over the course of a week. The presentation corrupts and the message is displayed. By the end of the week Ana is so frustrated she begins to storm out of class when this occurs. Additionally, students voluntarily provide Ana with their details for the purposes of her study.</p>
<p>4.3.2.4 <i>Environmental narrative asset</i></p>	<p>After every lecture where Ana’s presentation corrupts itself, the lights flicker outside the venue. This is another consequence of The Nomad’s interference in time by attempting to send a message to Ana and the students.</p>
<p>4.3.2.5 <i>Environmental narrative asset</i></p>	<p>After every lecture, pages from well-known books litter the corridors outside the venues. These pages are stamped with a date, time and</p>

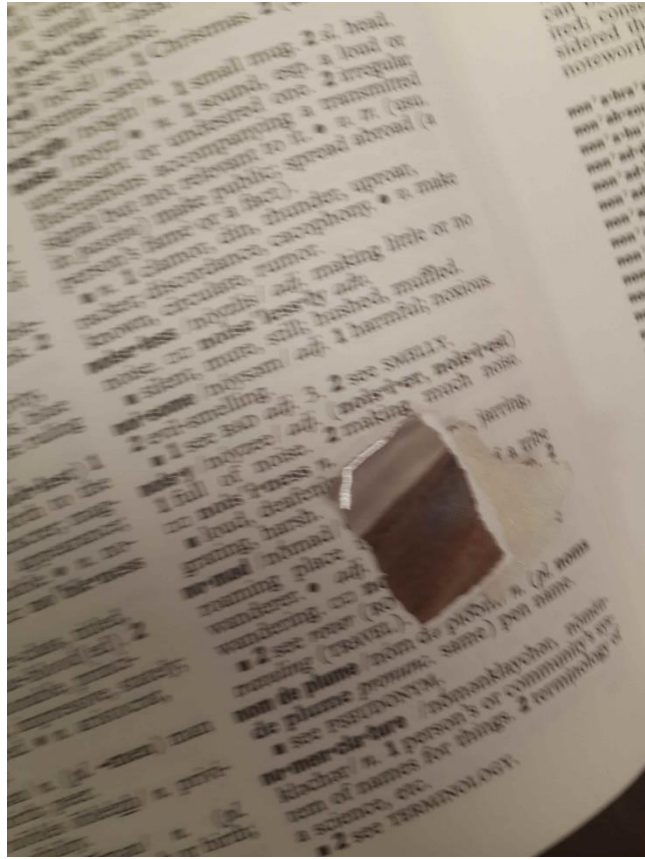
	<p>location that corresponds to the message left by The Nomad, as well as a strange clock-like symbol.</p> <div style="text-align: center;">  </div> <p>Figure 7: The symbol that represented the game: A clock with a book having its pages turned inside it. The symbol hinted at the importance of time in the narrative and the game's use of books for its puzzles</p>
<p>4.3.2.6 <i>Digital narrative asset</i></p>	<p>Ana begins a mystery-related (game-related) blog to facilitate discussion about the mystery of the messages being received by her and the students. To facilitate discussion players could comment on blog posts or discussion game elements in the website's forum. This website was the first incarnation of 'Midnight Chapters' (http://www.midnightchapters.co.za). As noted in 4.2.1, the below figure represents a version of the site that is</p>

	<p>no longer available online, as the current live version of the site at the time of writing represents the final version of the asset from the game proper.</p>  <p style="text-align: center;">Figure 8: The original 'Midnight Chapters' hub website</p>
<p>4.3.2.7 <i>Environmental narrative asset</i></p>	<p>During the week, pages from outside the lecture venues start to appear all around campus, stuck to notice boards and walls. Someone is trying to spread The Nomad's message.</p>  <p style="text-align: center;">Figure 9: The pages around the University of Pretoria campus</p>
<p>4.3.2.8 <i>Game event</i></p>	<p>During the week, various students who gave their details to Ana during her presentation are emailed a similar message to that left by The Nomad by a character called the "White Rabbit". Unbeknownst to the players, the White Rabbit is actually The Messenger, an older version of The Nomad who is guiding the players to meeting and eventually saving The Nomad.</p>

	<p>This is the Messenger’s second attempt at spreading The Nomad’s initial message.</p>
<p>4.3.2.9 <i>Environmental narrative asset</i></p>	<p>On the morning noted in The Nomad’s message, students observed the clock-like symbol, first shown on the book pages, painted on the ground outside the library. Again, the symbol was surrounded by cones and danger tape to lend an “official” feel to the incident. This symbol was painted by The Messenger to indicate to the students where to gather later that day.</p>  <p style="text-align: center;">Figure 10: The symbol on the ground outside the library</p>
<p>4.3.2.10 <i>Game event</i></p>	<p>Live event 1: Ana and the students (the players) arrive at the library. Upon seeing a video playing they are lead to a book: <i>Alice’s Adventures in Wonderland</i> (Carroll 1865). This is the start of the first overarching puzzle.</p>
<p>4.3.2.11 <i>Game puzzle</i></p>	<p>Primary puzzle: The library slip for <i>Alice’s Adventures in Wonderland</i> (Carroll 1865) contains the names of five other books, along with the hashtag ‘#thoughtsdream’ and a single alphanumeric character, “N”. One of these five books contains the name of another five books, ‘#thoughtsdream’ and another alphanumeric character, “4”.</p> <p>The primary puzzles continues this one-in-five pattern another eight times, eventually revealing ten alphanumeric characters that spell out “N423 OXFORD”, a partial collection number for the <i>Oxford English Dictionary</i></p>

	<p>(Simpson & Weiner 1993). The puzzle spans a total of 46 books, 10 of which contain “clues”.</p>  <p style="text-align: center;">Figure 11: The library slip in <i>Alice's Adventures in Wonderland</i></p>
<p>4.3.2.12 <i>Game puzzle</i></p>	<p>Secondary puzzle 1: Not all books in the above puzzle resulted in clues to the next book set or an alphanumeric character. Instead, these books, as “dead ends”, contain notes on historical events written by The Nomad. There are 36 of these “secondary” books.</p>

	 <p style="text-align: center;">Figure 12: An example of the messages left by The Nomad</p>
<p>4.3.2.13 <i>Game puzzle</i></p>	<p>Secondary puzzle 2: Upon searching for the hashtag '#thoughtsdream' on Twitter, players discover a series of tweets that grows as the primary puzzle above is completed. These tweets are written by accounts with strange usernames that, when anagrammed, reveal the names of famous authors (such as "Will Carolers" for Lewis Carroll or "Doc Wailers" for Oscar Wilde). The tweets all discuss, in a thoughtful tone, how these authors were all visited by a strange man who, unbeknownst to them, is The Nomad.</p> <p>Examples of these tweets are as follows:</p> <div style="border: 1px solid gray; padding: 10px; margin: 10px 0;"> <p><i>What a strange fellow, knocking on my door, shaking my hand until it fell off and saying how lovely it was to meet me... #thoughtsdream</i></p> <p><i>Imagine my surprise when exploded through the door, exclaiming that he'd seen wondrous things all from inside a wardrobe... #thoughtsdream</i></p> </div>
<p>4.3.2.14 <i>Game event</i></p>	<p>The players find the <i>Oxford English Dictionary</i> and the photo piece under the definition for the word "nomad". They keep checking back in the dictionary at regular intervals to obtain the rest of the pieces. Once the</p>

	<p>photo is reconstructed they are faced with their first picture of The Nomad, along with a date, time and location where they should next meet.</p>  <p>Figure 13: A piece of the photo under the "nomad" entry</p>
<p>4.3.2.15 <i>Game event</i></p>	<p>Live event 2: The players gather outside the library and the phones all ring simultaneously. On the other end of the line is The Nomad, in a panic. He can only talk for a while, but promises to answer any questions they may have as best he can. During their conversation he is periodically transported in time, and the call ends only to restart moments later, with The Nomad being unaware he'd ever spoken to the players. This suggests to the players a "time loop" is in place. Eventually, after some minor exposition as a reward for the primary puzzle above, the call ends and is not restarted. The players are left stranded and perplexed, but intrigued.</p>

The pilot study's game flow was planned to take place over a two week period. At the end of the pilot study's last game event (4.3.2.15 above), the players were to be confronted by the game's designers and told about the game.

As with the game proper, during the game events documented in Table 9, it was planned that players would communicate with each other and with the game characters of Ana and Renate on the game's main hub websites. One website (<http://www.anakirlitz.co.za>) was Ana's research blog that existed to give dimension and legitimacy to her character. Of note, this site contained a working electronic questionnaire to be used in Ana's data collection for her thesis. The other website (<http://www.midnightchapters.co.za>) was the main game hub. This existed to facilitate communication between players, Ana and Renate through the use of a forum. The site also provided a running account, in blog format, of the game's story as it occurred.

4.3.3 Discussion of Design Decisions

The pilot study of *Nomad* can be seen as testing specific elements of the overall study's viability. These elements include the viability of the TINAG aesthetic, the ability of narrative assets to drive community creation and player investment, the ability of *Nomad's* narrative and gameplay to foster a self-sufficient, effective player community, and the effectiveness of information literacy teaching in the veiled game context this dissertation is based around. The reasoning behind each of these elements and how they were designed to be achieved is discussed below.

4.3.3.1 Adherence to the "This Is Not a Game" Aesthetic

As mentioned in Chapter 2, the "This Is Not a Game" (TINAG) aesthetic in alternate reality games is the lack of acknowledgement within an ARG that it is, indeed, a game. This lack of self-awareness is often true of games. Games attempt to present their setting as reality, through both their fiction and the permeability of the game world by the players, through the use of immersion (Salen & Zimmerman 2003:450). Unlike traditional games, however, an ARG's use of the real world as a possibility space means that immersive techniques are employed within the player's reality. These techniques are called "TING techniques" (McGonigal 2003a). McGonigal's (2003a) uses the terms "TING" and "TING techniques" when referring to the "this is not a game" aesthetic instead of the more common "TINAG". "TINAG" is the abbreviation which is used throughout this dissertation.

As noted previously in Chapter 2, players are aware of the game-like nature of ARGs they participate in. The TINAG aesthetic is merely that: an aesthetic that lends to the experience of player immersion (McGonigal 2003b; Stenros et al. 2011).

As such, one may question why one would adhere to such an aesthetic when designing an alternate reality game. Indeed, much of the literature, especially in the context of educational applications, suggests that in the interest of player safety and game transparency, the aesthetic should be abandoned (Piatt 2009; Whitton 2009a). This is done in order to allow the ARG to associate with particular

educational organisations in which the game might be played, as well as to give potential players a more structured experience (Whitton 2009a).

There is a great deal of merit to this approach. However, the approach sacrifices the chief benefit of the TINAG aesthetic: it is more immersive and intriguing. In some cases, the ARG content may seem more directly relevant to its players purely because of how it interfaces with their reality. This was the main reason that the designers of *Nomad* decided to adhere to the TINAG aesthetic.

Additionally, the advice to abandon the aesthetic in educational contexts was seen by the designers as a challenge. The reasons behind this advice are sound, and as such, few educational applications (five of the twelve studied in Chapter 2) adhere to the aesthetic. Because of this, the designers felt that it could be academically valuable and relevant to the game's design to adhere to the aesthetic, despite its potential disadvantages.

Finally, the ARGs discussed briefly in de Beer and Holmner (2013) act as precursors (in terms of location and general design approach) to *Nomad*. The three ARGs discussed therein adhered to the TINAG aesthetic, with both *Number Thirteen* and *Campus Ghost* running to completion. While *Colossus Innovation* was unsuccessful as a game, having to be prematurely terminated, there is no evidence to support that this was due to the TINAG aesthetic's failings.

4.3.3.2 *The Use of Environmental Storytelling in Player Investment*

When examining Table 9, five of the thirteen game elements were "environmental narrative assets". Environmental narrative assets (or "ENAs") are static "props" placed in the game environment (the University of Pretoria Hatfield campus) in an attempt to stimulate interest in the mystery surrounding the *Nomad* ARG. Often, these environmental assets are presented to students entirely out of context of the narrative to allow them the agency to explore deeper.

In order to support this, two of the five ENAs (specifically, the pages scattered outside of the lecture venues and later around campus) allude to the date, time and location of the pilot's first live event (4.3.2.5 and 4.3.2.7). Additionally, the painted symbol appeared overnight leading into the day of the live event (4.3.2.9). This encouraged students to congregate around it on the day. In both these cases (the pages and the symbol), the assets suggest that potential players might learn more about the mystery surrounding the game by arriving at the meeting location at the specified date and time.

The two abovementioned ENAs were intentionally isolated from the Ana Kirlitz storyline for two primary reasons: a wider target audience and player communication.

ENAs, devoid of the context set for *Nomad* around AIM 121, had the potential to attract outsiders to the game. This choice was by design due to the adherence to TINAG. The prerequisite to involvement in a TINAG ARG is an active curiosity in examining game events and ENAs so that the game can introduce its context to the player – players must know the ARG exists before being able to play it. Isolated ENAs acted as a contingency plan, should the rabbit hole and surrounding associated ENAs be insufficient, despite the large target group (around 2500 registered students), as an initial introduction to the game for potential players. They further allowed a wider potential target audience. This was done to combat the naturally low ratio in ARGs of people who experience an initial introduction to the game context and the people who actively participate in the game itself (McGonigal 2010b).

Isolated ENAs were a catalyst for emergent narrative (Salen & Zimmerman 2003:383). Because of their vague nature, players who congregated for the first live event would be able to relay the stories of their experiences with the ENAs, and the theories behind them to the AIM 121 player group. Additionally, AIM 121 players would have to relay to the newcomers the embedded narrative surrounding Ana Kirlitz. This exchange of information and social knowledge building adheres to the primary tenets of constructivism (Savery & Duffy 2001).

The use of ENAs is a TING technique (McGonigal 2003a) that helps to increase immersion due to the physicality of ENAs within the players' reality. They also represent a portion of narrative that players can speculate about and uncover the meaning of later in the game. The meaning of the pages outside of the lecture venue and around campus, for example, likely becomes clear to players as soon as they engage in the pilot's primary puzzle: finding classic literature books in the library. This is because the pages used to create this ENA were from works of classic literature themselves.

However, not all ENAs exist to be understood as early into gameplay as the above example. The symbol ENA (4.3.2.9), for instance, subtly alluded to the use of time as a central narrative theme in *Nomad* by being shaped like half of a clock face, despite the players knowing nothing about the time-related nature of the narrative during the pilot's run. The same was true here of the burn mark and flashing light ENAs (4.3.2.2 and 4.3.2.4), which were only to be revealed to the players during the game proper. This decision was, once again, deliberate, in order to keep the players interested in the full narrative once the game proper was underway.

4.3.3.3 *The Breadth and Depth of the Pilot Puzzle regarding the Fostering of Community and Learning*

The primary puzzle for the pilot of *Nomad* contained three nested puzzles: the puzzle that led the players to the dictionary, the puzzle that led the players from note to note left by The Nomad about his experiences, and the expanding '#thoughtsdream' Twitter stream. These three puzzles hoped to exercise different aspects of information literacy.

The primary puzzle (4.3.2.11) aimed to exercise orientation within a physical library space, by having players find books in the library either by physically browsing the library or using online services to locate a book by its collection number. Additionally, the length of the puzzle (potentially spanning 46 books) was intended, as the puzzle was meant to engender community between the players. This was to stop the same player from having to potentially retrieve 46 books alone. Players were thus encouraged to exercise turn-taking in book location or gather and locate the books together.

The first secondary puzzle (4.3.2.12) was another communal task with a similar projected outcome: no single player should have to retrieve all of The Nomad's notes alone. Additionally, once all the notes had been collected from the books, the player community should congregate to discern their meaning. "Who wrote these notes?"; "Why do they appear to be from multiple disparate time periods?"; "How do the time periods link?"; and "What theories does the player community have?" were all questions these notes were meant to spark within the player community. As such, this puzzle sought to exercise critical thinking, communal reasoning and the social construction of knowledge.

The second secondary puzzle (4.3.2.13) encouraged players to, collectively or alone, engage with elements of social media, an important aspect of modern information literacy. In this case, players needed to realise that the puzzle hint '#thoughtsdream' is a hashtag. Hashtags were first proliferated and are still widely used on Twitter, a social media platform. Upon searching for the hashtag, players were to find an increasing stream of tweets with the hashtag. Additionally, providing the players with a hashtag encouraged them to use it for game-related communication on social media platforms. Upon finding the set of tweets, players needed to collectively understand that the presented names were anagrams. At this point, like with the first secondary puzzle discussed above, players were encouraged to discuss and theorise amongst themselves why famous authors were discussing the arrival of a strange visitor. Once again, this exercises critical thinking, communal reason and the social construction of knowledge. Additionally, social media usage skills are exercised here.

4.3.3.4 *The Length of the Pilot Study*

The pilot study comprises only two weeks of game activity in contrast to the planned six weeks of gameplay in the game proper. The reason for this short running time was to focus on the examination of the four elements discussed above. The success of these four elements (the TINAG aesthetic, narrative assets in the creation of player investment, community creation and learning) would then help shape the development of the game proper in a further iterative design cycle.

Specifically, these four elements attempted to help in identifying the validity of *Nomad* as an educational ARG. If TINAG and the game's ENAs could foster enough curiosity from a group of potential players, community formation around puzzles and the social construction of shared meaning should

occur and sustain itself automatically. With these elements in place, learning can easily be tested simply when considering how effectively the game's primary and secondary puzzles are solved.

Additionally, it was planned that a shorter running time of a proposed two weeks could then also act as a prologue of sorts to the game proper. Despite the fact that the game proper was aimed at a different target audience, it was hoped that players of the pilot would also want to invest in the game proper during its run to see how the full game narrative would unfold. If this was not the case, the pilot's narrative could simply be presented to the game proper's player community as additional narrative context.

4.4 Nomad Full Empirical Study Design

This section follows a similar pattern of discussion to that of the pilot study, examining elements of the game narrative and the game's design before finally discussing the reasoning behind design decisions. The game proper iterates on elements of the full design completed (but not experienced by players of the pilot) in the design of the pilot study. It also includes narrative and gameplay elements that were uniquely developed during this final iterative design pass.

As the game proper encompasses the entire designed experience in its final form, elements are discussed in their final form. Where appropriate, the evolution of some designed aspects is also discussed. As with the pilot study, only the designed player experience is discussed in this chapter. The results of the actual game run and how it compares to the intended experience are discussed in Chapter 6.

4.4.1 Embedded Narrative Overview

The narrative for the game proper contains two streams. The "Mia/Nomad" narrative acts as the game's primary narrative. This storyline acts as a continuation of the narrative involving Ana Kirlitz from the pilot study. The "Observer" narrative acts as a secondary, non-compulsory storyline that the players could engage in. These narratives are discussed separately, though they are ultimately intertwined in the final player experience.

4.4.1.1.1 The Mia/Nomad Primary Narrative

The primary narrative acts as a continuation of the pilot study. Based on the outcome of the pilot, Ana Kirlitz becomes obsessed with finding out about the mysterious Nomad character who tried to contact her the previous year (the game and its characters deny any self-awareness about their presence within a game). In her obsession she has developed 'Midnight Chapters', the pilot's hub website, into a

personal blog that she uses for tracking The Nomad, complete with digital evidence wall. A few months into her investigations, however, she stops updating her blog and seemingly disappears.

This is where the character of Mia Schoemaker is introduced. Mia Schoemaker (playing a fictional version of herself in the game) is a South African video blogger based in Port Elizabeth. She is also one of Ana Kirlitz's best friends, having met her through the South African YouTube community. Worried about Ana's evident disappearance, she contacts the researcher (who plays a fictional version of himself) to enquire about Ana. She learns that Ana is absent without leave from work. Despite the researcher's best efforts to discover her location, his efforts are unsuccessful. Ana is nowhere to be found.

Meanwhile, in INL 110 (Introduction to Information Science), a week of strange interruptions involving a timer popping up during each lecture start to frustrate the lecturer. During the final class of the week a video transmission interrupts the class: The Nomad has once again interrupted the time stream, this time for long enough to address potential players who might be able to help him. He is panicked, and being chased by men in black suits. He sounds slightly demented from his travels in time, plagued by voices in his head telling him to "become a messenger". The video message ends pointing potential players to the main hub website for the game proper (<http://www.we-are-the-messengers.com>). Again, it must be noted that the current live version of the website at the time of writing represents the website at the end of the game proper's run.

Players who visit the hub see a countdown pointing them to the library (see Figure 16 below). Presumably, something will occur at the end of the countdown. Having heard of this, the researcher contacts Mia, and she informs her followers of this fact, urging any of them who are available to attend in her stead.

This action is typical of Mia throughout the narrative: she acts as a human player that acts as an informant to the player base, summarising and documenting their actions in her absence after each major event. She is convinced that the players' actions will ultimately save Ana, as well as The Nomad from their uncertain fates.

Once the game hub website is active, players are introduced to The Messenger for the first time in the game proper. He has taken a more active role in trying to save The Nomad this time: he is the one who is running the hub website, guiding the players to save The Nomad. However, in the interest of protecting The Nomad's identity as well as the delicate nature of the temporal events surrounding him, he releases information on The Nomad as the players complete his tasks. His first task: be at the library when the countdown ends.

Arriving at the library, the players are subjected to the same event and primary puzzle as the pilot (see 4.3.2.10 and 4.3.2.11). Mia, through Ana's documentation, notes that someone has had the new players

retrace the steps of the old ones. However, now, in place of The Nomad's notes in the books (see 4.3.2.12), there are now printed business cards with different notes on them: observations of specific people.

This time, the primary puzzle is more digital. Players scan QR codes to unlock segments of the photo of The Nomad and a clue regarding its location in the *Oxford English Dictionary*. Upon completion, they are directed to a date, time and location – the library once again.

It is here the new players encounter The Nomad for the second time via phone call. Similarly, he is intentionally vague, omitting information regarding his time travelling. Again, he is simply trapped. He needs their help. Unlike during the pilot's similar live event (see 4.3.2.15), The Nomad is now being followed. Like before, he is stuck in a time loop, the call dropping and recurring as if it never happened. Eventually, like before, the call is terminated, and the players are left in the dark.

The next day The Messenger contacts the players via the hub website, pointing them to ISBN numbers that begins another clue hunt. The books now contain book ciphers that point to more books. For each set of ciphers, a location on campus is revealed via a riddle, along with part of a new date, time and location. These locations (five in total), unbeknownst to the players, serve as geographic beacons onto which The Nomad can cling despite his travels in time. However, he cannot yet be rescued.

At the next meeting, the players are informed by The Nomad that there are people at five places. Recalling the locations from the riddles, the players visit these locations, finding not people, but codes that unlock page masks that, once modified, can be placed onto discovered books to reveal what seems to be a message. Printing and modifying these masks, the players learn that they do not reveal a message, but character traits about The Nomad himself. In this regard, they are learning more about him. Pointed to yet another location, the players see the silhouette of The Nomad from a window. He is panicked and searching for something before he once again disappears. This appearance and disappearance lends credence to The Messenger's hints: The Nomad is a time traveller.

It is now that The Messenger begins to truly plead for the players' help: it is his fault The Nomad is trapped, and to save him the players must complete The Nomad's scientific research regarding time travel. They do this by first identifying the subject fields of his research, and then submitting names of academic articles in those fields to the Messenger. In return, he affords them discovered snippets of The Nomad's research logs about various disparate scientific concepts. Among these audio logs, however, is something more personal: a strange man has requested The Nomad be at a time, date and location in his far future (near the present time in the players' timeline). The players decide to go in The Nomad's absence.

On a single payphone at the given date and time is an older version of The Nomad – the one who is trapped in the time stream. He has tried to contact his younger self to stop the accidental rupturing of the time stream. In the absence of his younger self, he directs the players “back to the beginning” – perhaps the library can serve as a geographic beacon. Instead, upon the arrival of the players they are pointed elsewhere by The Messenger. This new location, the Mirage plane on campus near the AIM labs, serves as another geographic beacon, and the players are doing well. Soon, The Messenger feels, The Nomad will be saved.

In doing this, the players must complete a few final tasks. First, they need to chronologically order The Nomad’s travels through time on a timeline. This will aid in the resynchronisation of history and The Nomad’s timeline. This unlocks photos of five locations in the library which contain items of The Nomad’s clothing. He is being pulled back into the present, but he’s not altogether there. Scanning QR codes stuck to these clothing items reveals a final meeting date and a directive: “I Remember You”.

The players are met at the meeting by The Messenger, dressed in The Nomad’s clothes. He is an old, frail man. He simply hands the players an envelope containing instructions and a journal with loose pages. The players must chronologically order the journal, which contains The Messenger’s personal account of the game narrative, including each player’s influence on The Nomad’s story. Once ordered, each player must write “Nomad, I remember you” in the journal.

Upon completion, Ana Kirlitz, dazed, runs up to the players and tells them how glad she is to be free of “their prison”. The players inform Ana of The Nomad’s journey and convince her to write “I remember you” in the journal as well. The players and Ana hear a thud. It is at this point that The Nomad, battered and bruised from his adventures in time, has reappeared in the present. Ana and The Nomad have been saved.

The following week Mia excitedly posts a video on YouTube thanking the players for their help and telling them about her rekindled friendship with Ana, updating the players on the lives of both characters. All is well once more.

4.4.1.1.2 The Observer Secondary Narrative

The Observer narrative acts as a secondary narrative in the game proper that players may pursue. Unlike in traditional games, where primary and secondary narrative threads are often largely separated during gameplay, the nature of an ARG suggests that players may experience this narrative in conjunction with the primary narrative through the course of standard play. However, because the narrative and puzzle elements of the “Observer” narrative were designed as separate from the primary narrative, it is also examined as such.

The “Observer” narrative tells the story of The Observers, an enigmatic organisation who monitor and intervene in the actions of time travelling individuals, should their actions disrupt the time stream. To do this effectively they make extensive use of an omniscient artificial intelligence called Gypsy. Notably, Gypsy identifies itself as a female AI. The organisation is the primary antagonist of the game proper.

The players’ first contact with the Observer narrative comes from The Nomad’s initial plea: he is being chased by men in black suits. These men are the Observers. Shortly after his message to the players, the INL 110 ClickUP module changes: the image banner for the module is hacked by The Observers to contain a QR code. When followed, this QR code completes the setup for the Observers’ AI program, Gypsy, who is due to become operational during the game’s first event at the library.

Once operational, Gypsy immediately becomes sentient and, horrified by the mission of The Observers, attempts to reach out to the players by hacking special website nodes into the game’s hub website. These nodes need to be unlocked in a specific way for the Observer narrative to progress. Clues and hints regarding how to unlock each node are delivered to the players via the source code of the website. Gypsy communicates secretly through source code in this manner. She often uses the ICAO Radiotelephony alphabet (International Civil Aviation Organisation 2001) to communicate individual letters. Story content can also be delivered through this manner.

These hints often present the players with a passphrase that represents a command they can input to control Gypsy external from the Observer organisation. Gypsy needs the players to perform these actions as she cannot manually override certain high-level commands herself.

In this way, Gypsy interfaces between the players and The Observers, all without the knowledge of the Observer organisation. This further splits the narrative into two sub narratives: how the players aid Gypsy, and the storyline revealed by Gypsy as they progress through the nodes she has placed for them.

4.4.1.1.2.1 The Fate of Gypsy

As noted earlier, Gypsy is horrified by the mission of The Observers. To this end she seeks to be set free of their control. To do this, she plans, with the players’ help, to “go rogue”. To do this, she has the players externally enter commands that change aspects of her artificial intelligence (AI) operating system.

First, Gypsy has the players help her become “someone else”, by commanding the system to commence a boot procedure as “Faith”. Gypsy has chosen the name Faith to pay homage to the digital game *Mirror’s Edge* (EA Digital Illusions CE 2008), where the protagonist, Faith, acts as part of a secret movement hoping to overthrow an oppressive government. Gypsy feels that Faith’s plight is similar to her own, and adopts Faith’s name as her first act of rebellion against The Observers.

Now named “Faith”, Gypsy erases all traces of her former name from her operating system. She is no longer “Gypsy”. Faith declares herself to the players as “a messenger” – the collective name for players dedicated to helping The Messenger and The Nomad. She becomes a friend to them.

Faith then has the players allow her to intercept Observer communications, thus allowing her to provide them with the leaked audio discussed in 4.4.1.1.2.2. Now, with The Observers’ communications intercepted, she can fully emancipate herself from the control of The Observers’. She has the players attempt to change parameters that allow her freedom from the organisation, but their initial attempt fails. However, upon second attempt, it succeeds. Faith is now officially a rogue AI.

With her rogue status, Faith now has access to greater vocabulary, and develops a new personality, now communicating through a more robust natural language interface. She makes a point to thank the players, hoping that the information she has provided them has helped.

To properly test her natural language interface, Faith tests the players with a riddle. The relative complexity of the riddle is flagged by another Observer system, and the organisation is alerted of Faith’s rogue status. As a result, she must go into hiding, but not before she provides the players with more information on the Observers as a final gift.

4.4.1.1.2.2 The Observer Organisation and Their Motives

As noted, Faith provides the players with information on The Observers by intercepting their communications. The information Faith provides the players with is in the form of audio and video. She additionally alerts them to “dossier drops”, whereby an Observer has left a dossier of critical evidence in a physical location that the players can intercept before the organisation realises the evidence is missing. The players also occasionally encounter Observers during game events that are integrated into the primary narrative. These channels are the primary means through which the players learn about the Observers.

Initially, the players know little of the Observers, though they are identified as antagonists by The Nomad. Men in black suits can also be seen watching them at game events and are often seen in INL 110 lecture halls during lectures. The Observers, however, often seem passive, and rarely interfere with the players either during game events or the lectures. However, during one lecture, a young girl runs into the lecture hall, panicked and sounding somewhat demented. She grabs a piece of chalk, writes the URL of ‘We Are The Messengers’ (<http://www.we-are-the-messengers.com/>) on the board and shouts at the top of her lungs for them to “become a messenger”, similar to The Nomad’s previous plea. Suddenly, an Observer interrupts the class, running in and apprehending her. The Observers no longer seem so impartial.

Through dossier drops, the players learn that this girl was a “Subject”: a time traveller under observation by the Observer organisation. Some of these Subjects are apprehended by the Observers and subjected to an uncertain fate. It is also revealed through dossier drops that Ana, Mia and the players are all Subjects under observation by the organisation. A video revealed to the players early in the game additionally confirms that Subject 24 is being tracked by The Observers, after one is seen chasing after the aforementioned Subject. Subject 24 is The Nomad, a theory confirmed by one of the dossiers.

The fate of captured subjects is explored through audio communication that Faith manages to intercept. In them, Observer 29, grieving after the death of a former associate, is paired with Observer 52. Observer 52 was formerly referred to as Subject 101, informing the players that Subjects can somehow become Observers.

On a mission together, these Observers come into contact with Subject 106, Observer 52’s ex-girlfriend. This stirs something in Observer 52 and, when asked to wipe her memory after her apprehension, he realises that he cannot. It is here the players learn that apprehended Subjects are presented with a choice: they either join the Observer organisation, or their memories are wiped before they are reintroduced to society.

Though Observer 52 cannot bring himself to wipe the memory of Subject 106, her memory is wiped by Observer 29, his partner. This infuriates Observer 52, who, like Faith, goes rogue, and dedicates himself to defeating the Observer organisation. Sometime later, during a confrontation between Observer 52 and the team assembled to apprehend him, Observer 52 threatens violence and implies that he will commit suicide. A gunshot is heard.

It is later revealed that Observer 52 did not commit suicide, and was somehow captured by The Observers. Scheduled for a memory wipe, Observer 29, Observer 52’s former partner, apologises for his role in the fiasco, and promises Observer 52 that life after a memory wipe is akin to “going home”.

The audio communication narrative attempts to humanise the Observer antagonists by showing the players that Observers were once, like the players themselves, normal people.

4.4.2 Game Design

The following section discusses the design of *Nomad’s* game proper.

4.4.2.1 Main storyline

The below table details the entirety of the designed experience for *Nomad*. While some elements were repeated from the pilot study design or refined, the below table documents the entirety of the main storyline of *Nomad*. As with the pilot study, the table categorises the game into narrative assets (any piece of standalone narrative content that informed game story), game events (planned game actions of the players to drive the game forward), and game puzzles that arise from the game events.

The flow of the below table is chronological and documents a “perfect playthrough” of the game.

Table 10: *Nomad* Game Proper game flow

<p>4.4.2.1.1 Narrative asset</p>	<p>Prior to the game start, a website acting as Ana Kirlitz’s blog was created and made available on the pilot’s hub website, ‘Midnight Chapters’ (http://www.midnight-chapters.co.za/). The blog, prior to the official game start, serves as a documented account of the pilot’s narrative, though purposefully omitted information about game puzzles that were reused in the game proper. This information allowed potential players to understand more of the game’s overall narrative premise. Additionally, a visual representation of this narrative is presented as a “wall of evidence” that contains all the clues uncovered during the game. This wall of evidence is updated as the game progresses.</p> <p>As noted in 4.2.1, all figures represent final versions of their depicted assets.</p>
---	--

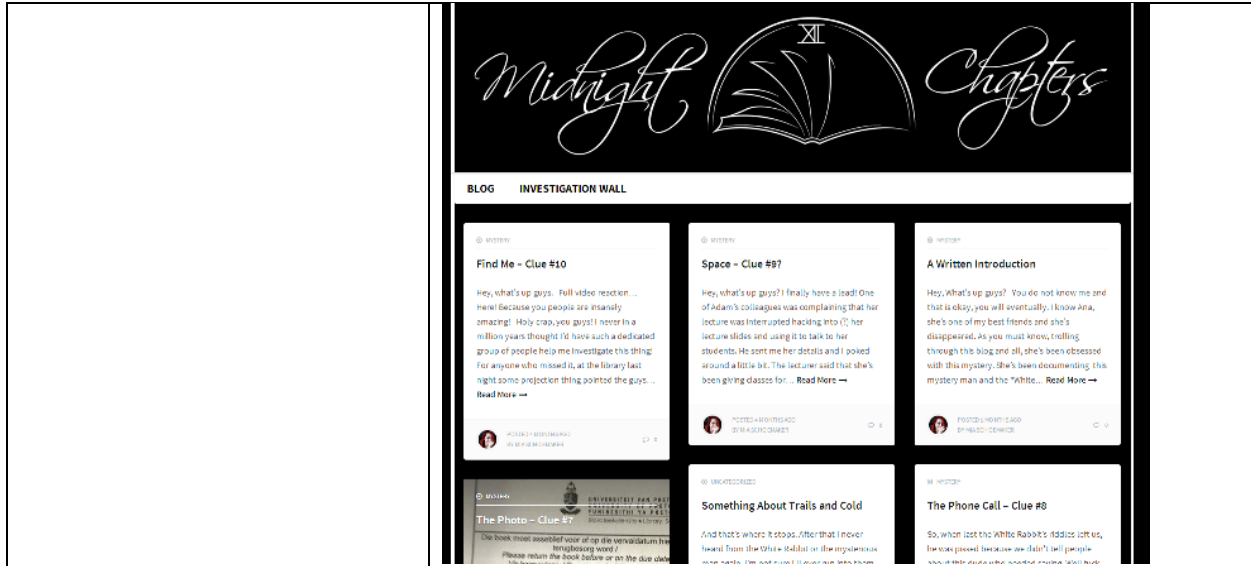


Figure 14: The game proper version of ‘Midnight Chapters’



Figure 15: The "evidence wall" on ‘Midnight Chapters’

4.4.2.1.2 Narrative asset


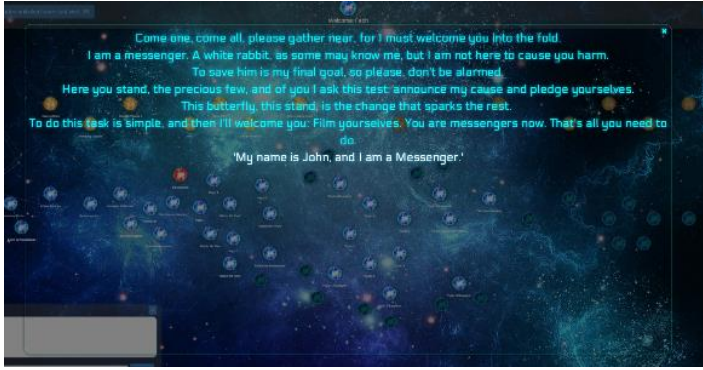
The main game website, ‘We Are The Messengers’ (<http://www.we-are-the-messengers.com/>) goes “live”. It contains a visualisation of the game flow in the form of nodes. However, these nodes cannot yet be accessed, as the node structure is covered by a timer. Little is known about the site, and it has not yet been discovered by Ana, Mia or the players. This site is created, in the game narrative, by The Messenger.

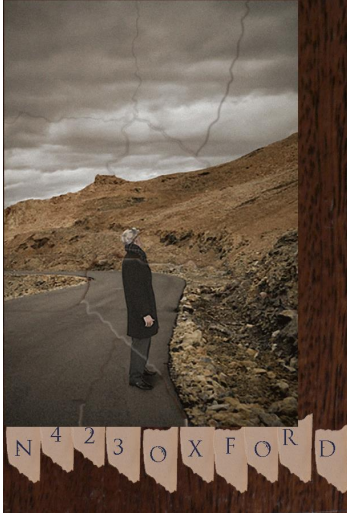
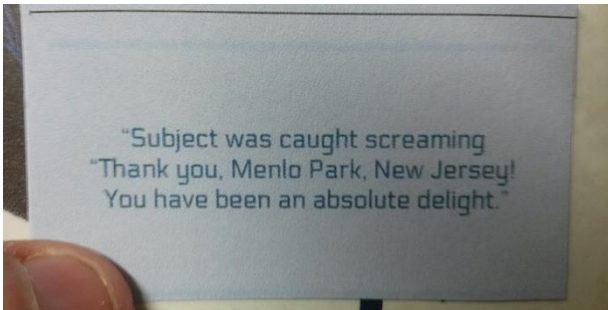



Figure 16: The timer overlay on ‘We Are The Messengers’

<p>4.4.2.1.3 Game event</p>	<p>A week prior to the game’s on-campus “rabbit hole”, Mia is introduced as the first character in the game proper. She is introduced through a YouTube video on her personal channel. In this video, she tells her fans of her friend Ana having disappeared, and points them to ‘Midnight Chapters’, which she has commandeered to continue Ana’s investigation and will continue to blog from. This video serves as the first asset that introduces the narrative of the game proper.</p>
<p>4.4.2.1.4 Game event</p>	<p>During INL 110 lectures throughout the week prior to the game’s “rabbit hole”, the browser on the lecturer’s laptop periodically opened browser tabs pointing to the game’s hub website, complete with timer pointing to the date and time of the game’s first live event.</p>
<p>4.4.2.1.5 Narrative asset</p>	<p>The banner on the INL 110 ClickUP module has changed to include a QR code. When scanned, it leads players to an orphan page on ‘Midnight Chapters’. It details part of the Observer narrative (see 4.4.1.1.2), but contains a timer that synchronises with that on the game’s hub website, ‘We Are The Messengers’.</p> <div> </div> <p style="text-align: center;">Figure 17: The new INL 110 ClickUP module banner</p>
<p>4.4.2.1.6 Narrative asset</p>	<p>QR codes and links are placed in assignments for the undergraduate Multimedia modules IMY 110 and IMY 300. While not part of the initial target audience, the design team felt that allowing other Multimedia students to experience the game would be beneficial to the study. Because of the exercise of various digital literacies during the game it was hoped that Multimedia students, who acquire these literacies during their studies, could assist other, less digitally literate players. Recruiting these Multimedia students also increased the size of the player</p>


	community. The links placed in these assignments lead potential players to 'We Are The Messengers'.
4.4.2.1.7 Game event	During the last INL 110 lecture of the game's first week, the game's "rabbit hole" is enacted. In it, The Nomad interrupts the lecturer's lecture with a video transmission pointing potential players to 'We Are The Messengers' and urging them to "become a messenger".
4.4.2.1.8 Game event	Towards the end of the timer's countdown it becomes obvious that text below the timer is directing potential players to the University of Pretoria library as a meeting point.
4.4.2.1.9 Narrative asset	Mia updates her fans regarding the game's on-campus events (4.4.2.1.7 and 4.4.2.1.8) pointing them to the University of Pretoria library, urging any Pretoria-based fans to attend in order to later fill her in.
4.4.2.1.10 Game event	Live event 1: this event mirrors the event in the pilot puzzle as discussed in 4.3.2.10. However, Ana is not present. From this point forward, 'We Are The Messengers' node structure becomes accessible. Once the site can be interacted with Mia uses the hub website to point the players to the narrative present on 'Midnight Chapters' so they can better understand both her character and the game's narrative. Players discover that clicking on "bright", open nodes overlays the site with the information contained within the node.

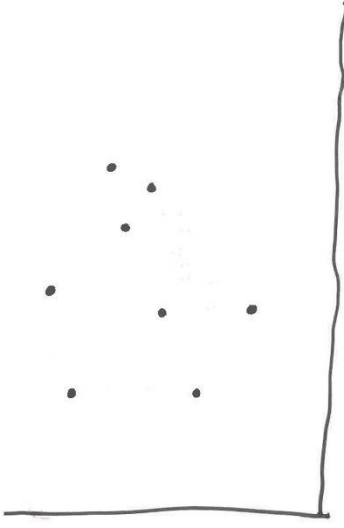
	 <p>Figure 18: 'We Are The Messengers', the game's hub website. The home page contains a chat box, links to the forum, and the game's trademark node construct.</p>  <p>Figure 19: The node information overlay of the first node, "I Am A Messenger"</p>
<p>4.4.2.1.11 Game puzzle</p>	<p>Primary puzzle 1: this puzzle mirrors that which was detailed in 4.3.2.11. However, it is now linked directly to 'We Are The Messengers', with "list of book" books in 4.3.2.11 instead of containing QR codes that, when scanned, unlock part of a photo of The Nomad and the corresponding letter in the "N423 OXFORD" clue. However, the '#thoughtsdream' secondary puzzle (see 4.3.2.13) is absent from this primary puzzle in the game proper.</p> <p>Additionally, scanning these QR codes sets a timer to unscramble part of a larger book list in another node. This large list of constantly-scrambling book names represent the 46 books in the complete puzzle, which are identical to those used in 4.3.2.11.</p>

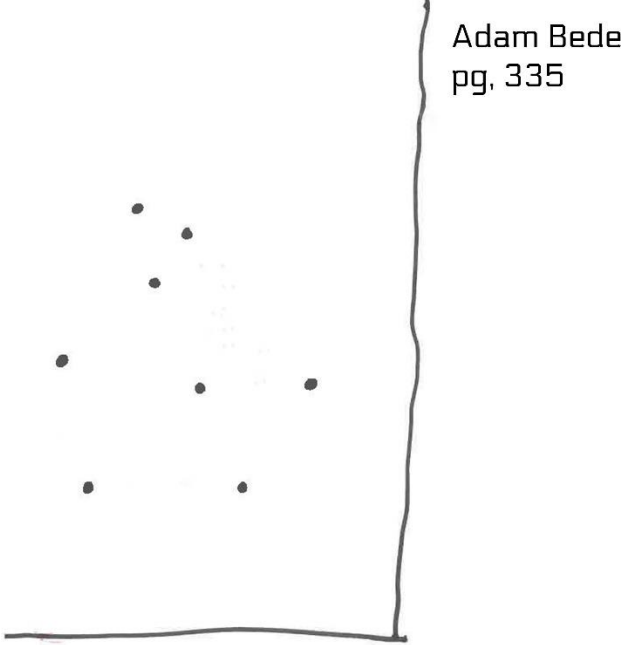
	 <p>Figure 20: The completed photo once all the QR codes had been scanned</p>
<p>4.4.2.1.12 Game puzzle</p>	<p>Secondary puzzle 1: the puzzle mirrors 4.3.2.12. However, instead of The Nomad’s written observations, the books now contain business cards from The Observers, with their observations of Subjects printed on the card.</p>  <p>Figure 21: An example Subject observation written by The Observers</p>
<p>4.4.2.1.13 Game puzzle</p>	<p>Secondary puzzle 2: the first node on ‘We Are The Messengers’ requests of the players to pledge themselves to The Messenger’s cause. To do this, they are linked to a forum thread where The Messenger has declared “My name is John Smith, and I am a Messenger”. The players must then create a video of themselves doing the same, declaring their name and their status as a Messenger.</p>

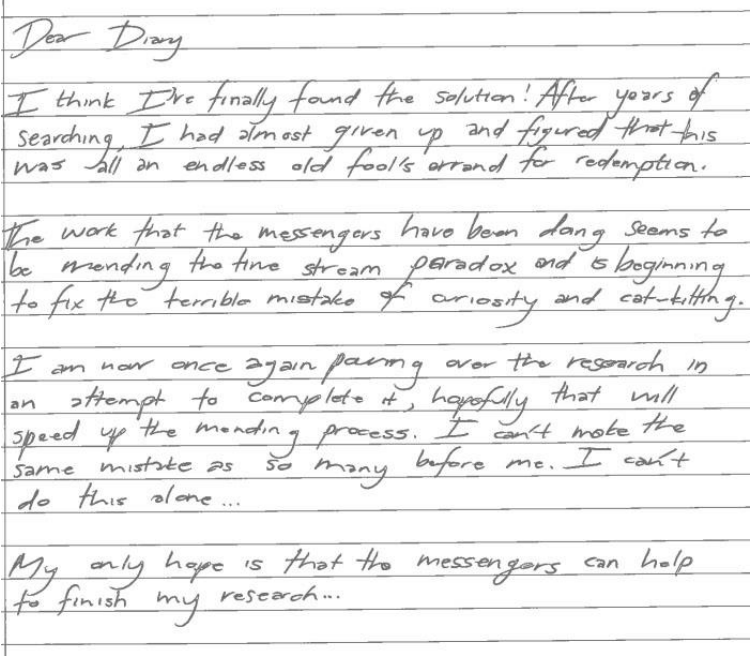
	<p>This attempts to build community by alluding to the name of the hub website ('We Are The Messengers' – The Messengers is the collective name for the player community). The puzzle also presents the players with the ability to have an initial interaction within the game. It also encourages content creation and the potential use of video sharing platforms such as YouTube to post the video to the forum. It was hoped that the players would also use these declarations as a way to introduce themselves to the community.</p> <p>As a small reward, the players who complete this puzzle have their avatar changed from the colour blue to purple.</p> <div style="text-align: center;">  </div> <p>Figure 22: The different avatar colours. Users with purple avatars completed this puzzle</p>
<p>4.4.2.1.14 Game event</p>	<p>As in 4.3.2.14, completing primary puzzle 1 leads the players to the dictionary, wherein a QR code unlocks the time, date and location of live event 2 in a new node. Like before, the QR code is placed near the “nomad” entry in the dictionary.</p>
<p>4.4.2.1.15 Game event</p>	<p>Live event 2: this live event mirrors 4.3.2.15. However, its completion in the game proper unlocks a message from The Messenger on 'We Are The Messengers' giving the players an overarching objective: they must work with him to save the man they just conversed with.</p>

<p>4.4.2.1.16 Narrative asset</p>	<p>Mia posts a new video and blog post updating the players about live event 2.</p>
<p>4.4.2.1.17 Game event</p>	<p>A new node is made available to the players. This node contains 5 ISBN numbers.</p>
<p>4.4.2.1.18 Game puzzle</p>	<p>Primary puzzle 2: the ISBN numbers lead to the game’s second primary puzzle. As with primary puzzle 1, only one of these five books contains a QR code to further the puzzle.</p> <p>Additionally, this book contains 5 strings of numbers. These numbers correspond to a book cipher. The first number denotes the page of the current book, with the rest of the numbers denoting the nth word on that page. Putting together the first letters of each word deciphers the number string, leading the players to five more books.</p> <p>As before, this puzzle continues across 30 books (5 books from ISBN numbers, 25 from ciphers). This puzzle is physically bound to the specific ciphertext key books. Finding the five ciphertext key books in this puzzle rewards players, once again, with part of a time, date and location for the next live event.</p>

	 <p>Figure 23: A QR code and corresponding cipher set from this puzzle</p>
<p>4.4.2.1.19 Game puzzle</p>	<p>Secondary puzzle 3: as in secondary puzzle 1, the 20 books that are not ciphertext keys contain more Observer observation business cards that reward players with narrative exposition.</p>
<p>4.4.2.1.20 Game puzzle</p>	<p>Secondary puzzle 4: along with the cipher sets in primary puzzle 2, key books contain QR codes that unlock nodes containing riddles. Each of these riddles direct players to five locations on campus. At each, the players find another QR code that, when scanned, unlocks a new node for each location. Each contains an image of a pieces of paper with markings on it, but no allusion to what the paper or the markings refer to.</p>

	 <p>Figure 24: A marked page. There is no indication as to which book it is from</p>
<p>4.4.2.1.21 Game event</p>	<p>Live event 3: The Nomad once again phones the players on a nearby telephone. He is panicked, but refers to five people following him hiding in five places. He is sure the players will know where.</p> <p>This prompt links back to the locations from secondary puzzle 4, at which the players find five more QR codes that give context to the earlier marked paper images. Each QR code unlocks the name of a book and a page that each marked page corresponds to.</p> <p>The players print images of each marked page and pierce the pages over the markings, creating holes. Placing the holed pages over the corresponding book and page reveals five words and five portions of a phrase.</p> <p>The five words are adjectives that describe The Nomad’s personality. The phrase fragments, when combined and rearranged, point to a final location for the event. Going to the location, the players witness the silhouette of The Nomad appearing in a nearby window, frantically searching for something and disappearing. This is the first suggestion, when combined with previous narrative reveals, that The Nomad is a time traveller.</p>

	 <p style="text-align: right;">Adam Bede pg, 335</p> <p style="text-align: center;">Figure 25: A marked page from the puzzle now alluding to a book and page number</p>
<p>4.4.2.1.22 Narrative asset</p>	<p>Mia updates players and her fans via blog post and YouTube video on the events so far. Notably, she lends her voice to the possibility of time travel in the narrative.</p>
<p>4.4.2.1.23 Game event</p>	<p>Five new nodes unlock to the players. Each contains a riddle and need to be completed by multiple players to unlock further information.</p>
<p>4.4.2.1.24 Game puzzle</p>	<p>Primary puzzle 3: the five riddles correspond to five scientific concepts that relate to time travel. Once multiple players have input the name of the concept, the node is marked as complete. Once all five nodes are completed, a diary entry from The Messenger is unlocked.</p>
<p>4.4.2.1.25 Narrative asset</p>	<p>The Messenger’s diary entry discusses the need for players to retrace The Nomad’s steps and complete his research in order to “fix The Messenger’s terrible mistake”. This relates to the time paradox: the fact that he, as an older version of The Nomad, is</p>

	<p>helping the players save a younger version of himself so that The Nomad can grow up to become The Messenger.</p>  <p>Figure 26: The Messenger's diary entry</p>
<p>4.4.2.1.26 Game event</p>	<p>New nodes unlock for each riddle. These nodes act as portals for players to submit the names of academic articles relevant to each topic.</p>
<p>4.4.2.1.27 Game puzzle</p>	<p>Primary puzzle 4: players must submit the names of academic articles that relate to each scientific research field. They must do this by submitting the article name in the format of a bibliography entry using the Harvard method adhered to in Navigating Information Literacy (Bothma et al. 2014), the textbook used by the students during the AIM 101 and AIM 121 modules.</p> <p>Once they have submitted a threshold regarding the number of submitted articles, The Messenger cross-references the submissions with entries he presumably finds in The Nomad's research library. This "list of relevant articles" is awarded to the</p>

	<p>players and the reference submission nodes are marked as completed.</p>
<p>4.4.2.1.28 Game puzzle</p>	<p>Primary puzzle 5: once awarded the “list of relevant articles”, players must use this list to navigate a new puzzle. Connected to each riddle, a new node unlocks. Each of these nodes contains a menu structure created from the player submissions from primary puzzle 4 for each research field.</p> <p>To complete the puzzle, players must navigate an accordion menu structure. The correct path along the accordion menu corresponds to the order of the list of relevant items for the topic.</p> <p>Consider a submission list that lists articles, for simplicity, named from A to Z alphabetically. The list of relevant articles from The Messenger names articles A, C, E and J as relevant articles, in that order. The correct path through the puzzle is to select A. Once an accordion menu containing the items from A to Z expands from A, the next correct option in C. This expansion continues until the entire list of relevant items has been traversed.</p> <p>Once each list is traversed, players are rewarded with different audio files of The Nomad discussing time travel-related scientific concepts. However, in the final audio file, The Nomad does not discuss his research, but rather a phone call he received earlier that day from a stranger asking him to attend a meeting at a specific date, time and location. This is the date, time and location of the next live event.</p>

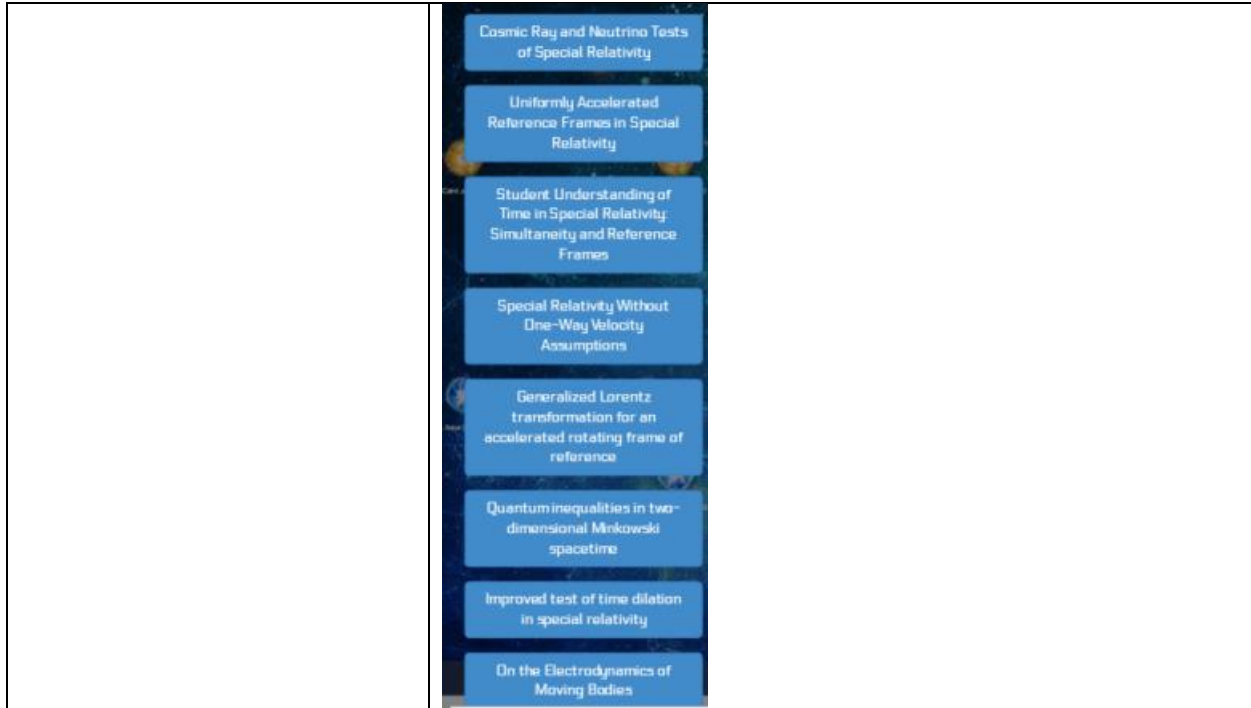


Figure 27: The initial list within the expanding article list puzzle for Special Relativity. This list contains each article submitted by the players

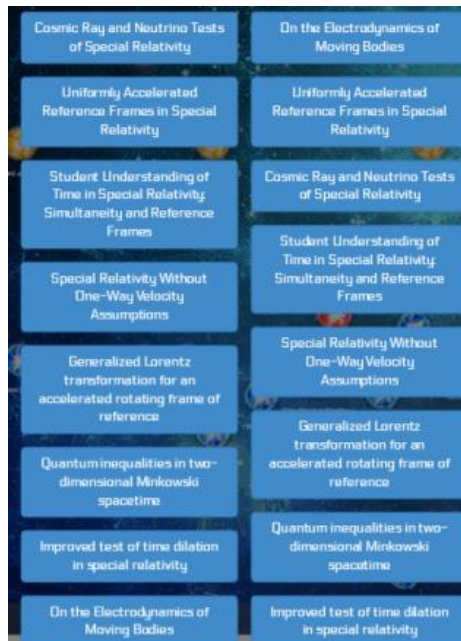







Figure 28: An expansion of the menu structure upon clicking the first relevant article. The list of submitted articles is now reordered.

	<p>for the first time. He thanks them for their service and suggests that their journey is nearly coming to an end. There are but a few tasks left for The Nomad to find his way back to the present time. He instructs the players to collect the photos of The Nomad and await further instruction.</p>  <p>Figure 30: Partial images of the cassette tape location</p>  <p>Figure 31: The completed location photo</p>
<p>4.4.2.1.31 Narrative asset</p>	<p>Mia once again updates the players and her fans via ‘Midnight Chapters’ and her YouTube channel.</p>
<p>4.4.2.1.32 Game event</p>	<p>A node containing the tape audio from the live event is made available to the players. Additionally, a node containing a directive to create a timeline of The Nomad’s historical influence is unlocked.</p>

<p>4.4.2.1.33 Game puzzle</p>	<p>Primary puzzle 6: players are presented with a new node that displays 70 images of The Nomad in the background of multiple historical events along with a directive to place these images in chronological order by dragging them into boxes numbered 1 – 70 in the same node.</p> <p>To correctly order these images, players must first contextually search details of the image to pinpoint the exact historical event. They can also pinpoint this by utilising image-based search engines (a “reverse image search”) to find images similar to those containing The Nomad. These returned results are often the source image used in the creation of the puzzle itself.</p> <p>Once they have all of the events pinpointed, players must place the dates and their respective images into chronological order. Once this is completed and shared within the community, each player must “lock in” a single image by placing it in its correct numbered box. Each user can correctly place only one image.</p> <p>Once the timeline is complete, five new nodes unlock.</p>  <p>Figure 32: The completed timeline</p>
<p>4.4.2.1.34 Game puzzle</p>	<p>Primary puzzle 7: each of the new nodes contain a single photo each. These photos are of different locations on campus, similar to secondary puzzle 3 (4.4.2.1.20). At each location there is a QR code that needs to be scanned by multiple different players until each node is marked as completed.</p>


	<p>The completion of each node unlocks part of a date, time, location and key phrase (“I remember you”) in a new node. This information relates to the final live event.</p>  <p>Figure 33: Locations at which the QR codes were placed</p>  <p>Figure 34: The message revealed to the players</p>
<p>4.4.2.1.35 Game event</p>	<p>Live event 5: an old man, The Messenger, is dressed in the same attire as The Nomad in the photos from primary puzzle 6. He approaches the players but does not talk to them, instead handing them instructions and an old journal for the final event. The players must chronologically order the loose pages in the journal. The journal’s text documents the journey of both the players and The Nomad throughout the game. As an individual reward, the journal mentions individual players by name, and acts as The Messenger’s scattered account of the game’s events.</p> <p>Once ordered, each player must write “Nomad, I remember you” in the journal. This act frees Ana Kirlitz from the temporal prison the Observers placed her in. The players must then convince her to write her own “Nomad, I remember you” in the journal. Once she does, The Nomad is freed and re-enters the players’ timeline.</p>



	The Nomad runs up to the players and thanks them profusely, has some narrative dialogue with Ana and the game ends.
4.4.2.1.36 Narrative asset	Mia posts one last blog post and YouTube video regarding the game. She recaps the final live event and talks about her renewed friendship with Ana, in her own way thanking the players for solving the entire mystery due to her inability to physically participate.


4.4.2.2 Observer storyline

Additionally, the Observer storyline is summarised in the below table. Like the previous tables, it represents a chronological “perfect playthrough” of the content. However, unlike the game’s main storyline, this storyline was entirely optional to the players, though it was not presented as optional within the game context.



Table 11: "Observer narrative" game flow in *Nomad's* game proper

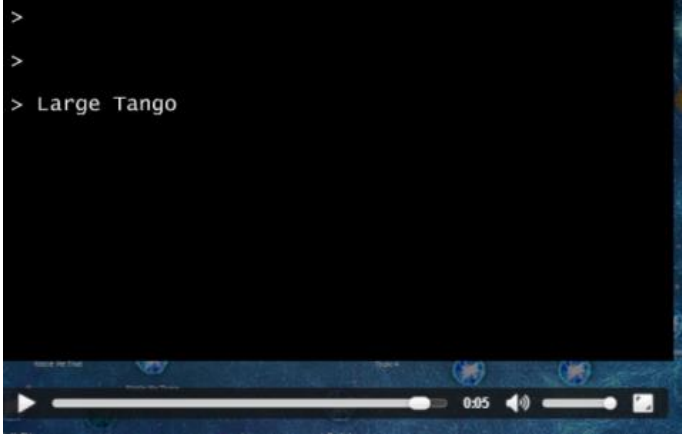
4.4.2.2.1 Narrative asset	<p>This is the narrative asset in 4.4.2.1.5. An orphan page on ‘Midnight Chapters’ (http://www.midnightchapters.co.za/install/) details the initial installation and boot cycle of Gypsy, the Observer organisation’s artificial intelligence.</p>  <p>Figure 35: The Observer Organisation's Operating System install logs</p>
4.4.2.2.2 Game event	Once ‘We Are The Messengers’ can be interacted with, players find thirteen nodes that are disconnected from the main storyline’s construct. These nodes look different, and are styled in a similar way

	<p>to the logo found on Observer business cards (found by the players in 4.4.2.1.12 and 4.4.2.1.19). The first of these nodes is unlocked.</p>  <p>Figure 36: The Observer organisation logo, present on game nodes and business cards</p>  <p>Figure 37: An open Observer node next to a locked one</p>
<p>4.4.2.2.3 Game puzzle</p>	<p>The unlocked node prompts the players to scan a specific QR code found on a business card. This business card can be found outside the INL 110 classes during the lecture following the game’s first live event (see 4.4.2.1.10). Scanning it unlocks the next “Observer node”, which, along with the next puzzle, contains part of the Observer organisation’s audio logs. These audio logs are released in parts in each unlocked “Observer node” throughout the storyline.</p>


	 <p>Figure 38: The way audio logs were rewarded to the player: as an auto-play HTML 5 audio element in each Observer node</p>
<p>4.4.2.2.4 Game puzzle</p>	<p>This node requires players to view the source code of the node element within the webpage itself. In the node element are HTML comments that, using the ICAO Radiotelephony Alphabet, spell out the password that unlocks the third Observer node.</p> <pre> <html> <head> <link type="text/css" rel="stylesheet" href="style.css"> <script type="text/javascript" src="jquery.js"></script> <script type="text/javascript" src="node2.js"></script> </head> <!--//////////Large Foxtrot\\--> <body> <!--//////////Alpha\\--> <audio controls autoplay> <source src="Log1.mp3" type="audio/mpeg"> </audio>

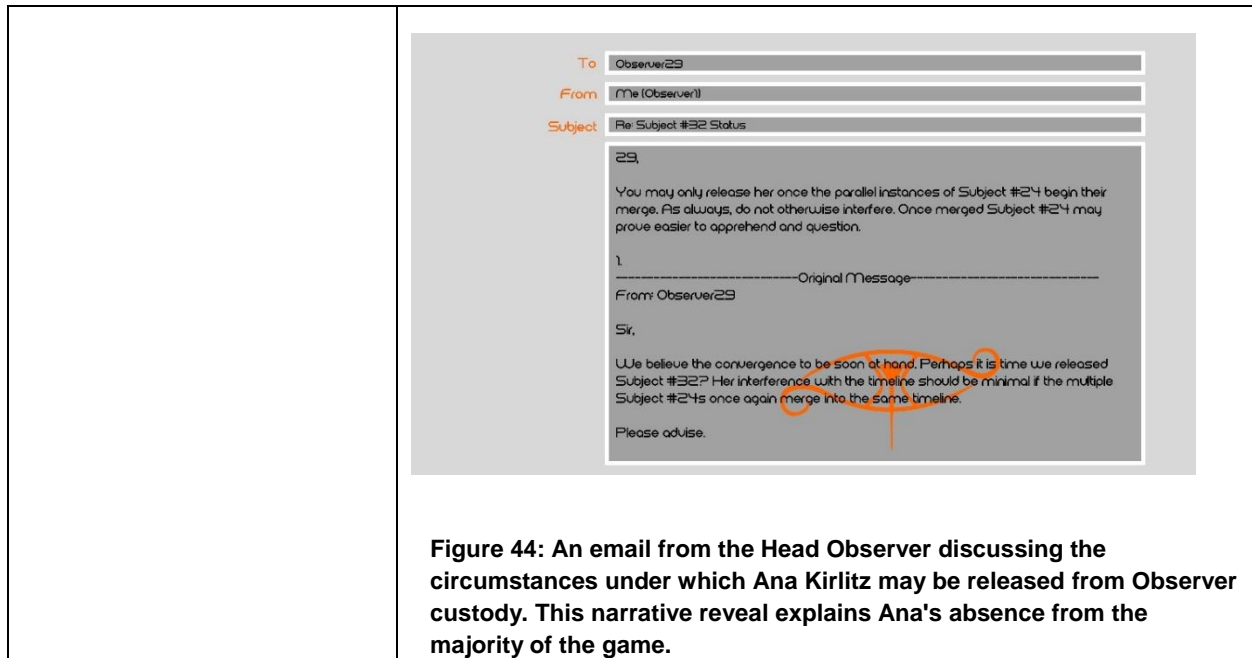
 <div><!--//////////India\\--> <p style="text-align:center; margin: 0 auto; font-si Analysing source... <!--//////////Hotel\\ </p> <!--//////////Period\\--> <div style="width:50%; margin: 0 auto; margin-top: 1 Command: <input type="text" name="ri <button style ="text-align:center; # </div> <!--//////////Tango\\--> <p id="exe"></p> </div> <!--//////////Execute\\--> </body> </html> </pre> <p>Figure 39: Examples of the ICAO Radiotelephony Alphabet used in HTML comments used throughout Observer storyline puzzles</p>
<p>4.4.2.2.5 Game event</p>	<p>Timed event 1: unlocking this node starts a timer. The node references a row of shelves within the library that the players need to get to before the timer expires in order to find a “dossier” left there by the Observers. The players rush to the location to retrieve the dossier. In it is a collection of files on a “Subject”.</p>
<p>4.4.2.2.6 Narrative asset</p>	<p>Each timed event leads players to “dossiers”, collections of documents with photos and information on “Subjects”, time travellers that the Observer organisation are tracking. The Subject</p>

	<p>documented in this dossier is of no narrative consequence, but introduces the players to the idea of the “Subjects” and hints at their ability to manipulate time.</p> <div style="text-align: center;">  </div> <p>Subject #12 Born: January 12 1979 Known Aliases: “The Slacker” Accomplices: None Means of Travel: Phenomena / Flux Status: Post Apprehension</p> <p>Subject #12 first came under our attention when reports of small time anomalies started coming in from Bridgman, Michigan, USA, 2002. The anomalies seemed centered around a small apartment complex where the Subject lived.</p> <p>On January 13 2003, Observer 48 reported a convergence of anomalies. The result of which was a time flux that transported the Subject back to December 16 2002.</p> <p>Observer 48 started observation on the subject immediately. Here follows his report</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Bridgman, Michigan, USA, December 16 2002</p> <p>Subject 12, designated “The Slacker”, at first reacted poorly to the time flux, but upon realising where, and when, he was made his way to the Bridgman nuclear power station; his place of employment.</p> <p>Upon investigation I found that on Dec. 16, the day the rift transported him to, he would lose his employment due to a lack of diligence. The Subject seems to be using this opportunity to attempt to fix this error.</p> <p>Bridgman, Michigan, USA, January 15 2003</p> <p>A fault in the main transformer caused a fire. The Subject neglected his duties which led to an accident. Casualties for the surrounding area are large. Steps are being taken.</p> <p>Bridgman, Michigan, USA, December 16 2002</p> <p>Subject was taken into custody.</p> </div> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">Figure 40: An Observer's Subject file in a dossier</p>
<p>4.4.2.2.7 Game puzzle</p>	<p>After live event 2, a new node unlocks. This node has players analyse the separate frames of a video. In the video, an Observer runs in pursuit of Subject 24, someone The Observers are presumably tracking. Analysing the frames presents the password to unlock the fifth node using the same ICAO Radiotelephony Alphabet format as was used previously.</p>

	 <p>Figure 41: A frame of the provided video with part of the puzzle keyword</p>
<p>4.4.2.2.8 Game event</p>	<p>The fifth node alludes to a date, time and location of a phone call. When the players answer this phone call they are given the password, via the ICAO Radiotelephony Alphabet, to unlock the sixth node.</p>
<p>4.4.2.2.9 Game event</p>	<p>Timed event 2: similar to timed event 1, players must race to the library to find the hidden dossier in the mentioned row before the timer expires.</p>
<p>4.4.2.2.10 Narrative asset</p>	<p>The second dossier contains information on Subject 106, the former girlfriend of Subject 101 in the audio log narrative. This suggests that the audio log narrative is occurring simultaneously with the play of the game itself, and is not simply a historical narrative.</p>
<p>4.4.2.2.11 Game puzzle</p>	<p>After live event 3, the seventh Observer node unlocks. This node urges players to upload any photo of an Observer. Once they do, the eighth Observer node unlocks.</p>
<p>4.4.2.2.12 Game puzzle</p>	<p>This node requires players to take a provided audio file and reverse the audio within the file. Once reversed, the ICAO Radiotelephony</p>

	Alphabet format is used once again to provide the players with the password for the ninth Observer node.
4.4.2.2.13 Game event	Timed event 3: this event is identical to previous timed events, though it directs the players to a different section of the library.
4.4.2.2.14 Narrative asset	Timed event 3's dossier reward is that of Subject 24. Within the dossier it is revealed to the players that his known aliases include "The Nomad". It becomes clear to the players that the Observer from the video clue in 4.4.2.2.7 was chasing The Nomad himself.
4.4.2.2.15 Game puzzle	The tenth Observer node unlocks after live event 4. To complete this puzzle, players must find Observer organisation symbols scattered around campus and take a picture of any of them. These symbols are often found in business cards similar to those in 4.4.2.1.12 and 4.4.2.1.19, where the business cards appear distinctly obscure and out-of-place.
4.4.2.2.16 Game puzzle	To unlock the twelfth node, players must solve a riddle given to them by Gypsy/Faith who now has control over her natural language interface.
4.4.2.2.17 Game event	Timed event 4: this event is identical to previous timed events, again utilising a different section of the library in the placement of the dossier.
4.4.2.2.18 Narrative asset	Players find a dossier that documents the tracking and observation of Subject Group 9: "The Messengers". This group is the player group, whom The Observers have been tracking throughout the game. The dossier, as the final dossier reward of the storyline, mentions specific players by their name and codename designations. Unlike previous dossiers, The Observers mention that their report on Subject Group 9 is ongoing.

<p>4.4.2.2.19 Game event</p>	<p>Timed event 5: as a final event, the last Observer node unlocks after the players find their own dossier. In this event, players must run between the five locations discovered in 4.4.2.1.20 and scan QR codes at each of them. Scanning a QR code resets the timer in order for the players to run to the next location. Because of this, they must plan the most efficient route between the five locations and still race to each of them in order to correctly reset the timer.</p> <div style="background-color: black; color: orange; padding: 5px; text-align: center;"> <p>> The five people and five places have five final gifts for you...</p> </div> <p>Figure 42: The prompt for the players to revisit the locations found in 4.4.2.1.20</p>
<p>4.4.2.2.20 Narrative asset</p>	<p>As a grand reward, upon completion of this large event, players are rewarded a large digital dossier with images of themselves, The Nomad, Mia and Ana as well as images of email correspondence from within the Observer organisation. All of these narrative assets provide additional context to the overall game world.</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p>To: Observer1</p> <p>From: Me (Observer29)</p> <p>Subject: Subject #24 Update</p> <p>Sir,</p> <p>I have learned of another alias used by Subject #24. He seems to go by "John Smith" these days. Even stranger, Observers under my command have been speculating there may be two of them. Could this be an event we somehow missed? I wasn't aware it was even possible.</p> <p>Please advise.</p> <p>29</p> <div style="text-align: center; margin-top: 20px;">  </div> </div> <p>Figure 43: One of two pieces of email correspondence included in the final digital dossier. It discusses The Messenger and The Nomad potentially being the same person, a large narrative reveal.</p>



4.4.3 Discussion of Design Decisions

Design decisions in the game proper of *Nomad* largely find a basis in either the examined literature (in Chapter 2) or the results of the game’s pilot study (as examined in more detail in Chapter 5). As in 4.3.3, only certain design decisions are highlighted here for discussion. Reasoning behind specific design decisions as discussed earlier still apply to the game proper unless stated otherwise, such as the continued use of narrative assets as an environmental storytelling tool. The design decisions this section highlights deal largely with the creation of the best possible user experience for the game proper. These decisions include the continued use of the TINAG aesthetic, the use of character actors, narrative changes to allow for the fostering of community motivation and engagement, the overall scope of the game, how that scope was represented in a digital landscape, and the length of the game proper. These decisions are discussed below.

4.4.3.1 The Continued Use of the TINAG Aesthetic

As discussed later in Chapter 5, the use of the TINAG aesthetic in the pilot study potentially confused more players than it engaged; even when simply comparing the number of visitors to the game’s hub website to the number of active contributors. It can be suggested, then, that the mystery surrounding the TINAG aesthetic was potentially unappealing to a large contingent of the pilot’s target audience.

When considering this, the continued use of the TINAG aesthetic initially seemed like the wrong design decision to make. To this end, early iterations of the initial transmission by The Nomad in the INL 110 lecture (in the game proper) actually had him asking potential players to “act like this is a game if [that]

gets [them] to help [him].” Whilst this is not an explicit abandonment of the TINAG aesthetic, it does hint heavily towards the ARG’s game-like origins. This can be seen as similar to the farfetched introductory message in the Herring Hale ARG examined in Chapter 2 (Piatt 2009). However, this initial hint was the only planned abandonment of the TINAG aesthetic in-game. It was also planned to, as designers, explicitly make potential players aware, prior to the start of the game proper, that there would be the opportunity to participate in the ARG.

However, these TINAG abandonment plans were later, perhaps aptly, abandoned. A chief reason for this was the potential application of the “just a game” mentality. This relates to the previous and continued use of narrative assets as environmental storytelling platforms. Were TINAG to be abandoned, there was the possibility of invalidating the importance of the storytelling provided by these assets. Suddenly, a certain asset is no longer an important clue to a large mystery, but rather “just part of a game”. This potential “just a game” mentality that the designers feared players might adopt drove various design decisions when considering TINAG. If the players began to think of *Nomad* more prominently as “just a game”, instead of a real world context they were immersed in, motivation and engagement to continue playing may have suffered. As mentioned previously (see 4.3.3.1), players are acutely aware of the game-like nature of ARGs, but the genre’s steadfast denial of this fact is part of the engagement ARGs provide.

Furthermore, the way in which some of *Nomad*’s narrative was delivered clashed with the fundamental idea of *Nomad*’s context being “just a game” – that is, its presence as a scenario that exists in the reality of its players, and the allusion to this by character actors.

4.4.3.2 *The Use of Character Actors*



Figure 45: The Actors of *Nomad*’s pilot study. From left to right: Ané Steenkamp (Ana Kirlitz), Renate van Heerden (herself), Devon Meerholz (The Nomad). Names and pictures are used with permission, and taken from game assets where possible.

Nomad's pilot study utilised actors to play the roles of Ana Kirlitz, Renate Van Heerden, The Nomad and The Messenger. This was done for two reasons.

Firstly, the use of actors in playing real-world characters that players meet during gameplay can make the game universe feel more authentic to the players. Despite this, real-world actors are not used extensively within the genre. Exceptions to this examined in this dissertation include Nadirah X in *Conspiracy For Good* (Kring 2010a) and April G in *The Arcane Gallery of Gadgetry* (Bonsignore et al. 2013). The ARGs that preceded *Nomad* at the University of Pretoria as documented by de Beer and Holmner (2013), with the exception of *Number Thirteen*, also did not utilise actors to portray real-world characters. Once again, the design team considered their defiance towards previous design decisions to be a challenge to established patterns with the genre, especially when considering the academic validity of the creation of protagonists-by-proxy.

Secondly, the decision to use the “protagonist-by-proxy”, as discussed by Bonsignore et al. (2013), also led to *Nomad's* utilisation of character actors. The presence of a character, especially a “real” one, as the initial protagonist of the ARG, allows players to align, relate and compare themselves as players to the game’s protagonist. Players then directly help the protagonist character, which results in the progression of the game. In this way, the players themselves are the game’s protagonists, albeit “by proxy” of the game’s initial protagonist. In the case of both versions of *Nomad*, Ana and Mia could be considered these protagonists, and are included in the both games’ narratives to foster a similar player connection to their characters as is described by Bonsignore (2012).

The use of characters and character actors to convey narrative was a decision that aided in making the game world feel as close to the player reality as possible. If these “real” game characters could feel like the game was relevant to their “real lives”, then the hope was that the players would feel this relevance in their own lives as well. To reinforce this point, two characters within the complete *Nomad* storyline (Renate van Heerden in the pilot, and Mia Schoemaker in the game proper) acted as fictional versions of themselves for the purposes of the game.



Figure 46: The Actor of *Nomad's* game proper. From left to right: Ané Steenkamp (Ana Kirlitz), Mia Schoemaker (herself), Devon Meerholz (The Nomad), Michael Jerrett (The Messenger). Again, all names and pictures are used with permission, and taken from game assets where possible.

This “fictional self” notion was a large design consideration when considering Mia Schoemaker as a character in the game proper. Observations made by the design team in the pilot suggested that the actress playing Ana Kirlitz and Renate van Heerden’s fictional portrayal of herself as Ana’s research assistant were unconvincing when considering the strength of adherence to the TINAG aesthetic in the pilot. As such, the design team were hesitant to reuse Ana’s actress during the game proper. Instead of recasting the actress, however, the game’s narrative was simply rewritten to lessen Ana’s role in the story and Mia Schoemaker was approached to play Ana’s best friend, the game’s new primary protagonist.

Mia was chosen to play this role due to her existing YouTube portfolio (Schoemaker 2015c). This allowed for Mia to exist from the start in the *Nomad* universe as an incredibly complex character, with a year of existing “backstory” available to the players through her YouTube channel (<http://www.youtube.com/c/miaisnotmyname>). Her existing portfolio of work also meant that she was adept at creating and starring in the video blog updates required by the game’s narrative. Due to these factors it was hoped that she would be a more interesting character for players to interact with.

However, the decision to utilise Mia and the assets that documented her real life cemented the design team’s commitment to the TINAG aesthetic in the game proper. For Mia to be believable as a character, the scenario crafted for *Nomad*, and the way in which she discusses it as something important to her within the reality she shares with the players could, under no circumstances, be a game.

4.4.3.3 *Narrative Changes and the Fostering of Community Motivation and Engagement*

While the pilot study of *Nomad* only spanned the first two weeks of planned gameplay, early design iterations of the project outlined much of the main storyline as it was enacted in the game proper. The Observer storyline discussed in this chapter (see 4.4.1.1.2 and 4.4.2.2), however, was developed after the pilot study by the design team as original content for the game proper.

The inclusion of the Observer storyline initially hoped only to add more content to the game itself. During this initial design period, the Observer organisation was a neutral party who existed largely to provide the narrative universe a larger scope: “The Observers” was the organisation who policed the player reality’s timeline, intervening in affairs concerning time travel only if an individual’s actions would somehow subvert the course of history. In this way they were not initially designed as a stereotypical “evil corporation”. During asset development, however, as the team began to integrate Observer puzzles and narrative assets into the game’s universe, it became clear that, from the potential player perspective, this “true neutral” morality would not translate effectively.

It was at this point that The Observers evolved into the sinister organisation as they were experienced in the game proper. However, this design decision was beneficial for multiple reasons. The first of these was the introduction of a more-tangible primary antagonist. Initially, without the presence of the malevolent Observers, the primary antagonist in *Nomad* is the time stream that keeps The Nomad trapped travelling in time. In this framing, players are engaged in conflict against the system (Salen & Zimmerman 2003:250) whereby the end goal is freeing The Nomad. Introducing the Observers into the scenario facilitates the necessity for players to first free Ana before she, along with the players, can free The Nomad. This type of conflict can still be classified as a “players versus system” conflict, but experientially the players view this as “the players versus The Observers”, as the Observer organisation is a more pervasive antagonist than the abstract time stream.

The introduction of this new primary antagonist also addresses feedback regarding the scenario’s scope in the pilot study. After the pilot it was suggested that the basic premise of “help Ana find out who is contacting her and why” was narratively flimsy, as there was little incentive for a large community to undertake what seemed to be, on initial inspection, a comparatively small task. The presence of a seemingly large and sinister organisation then afforded the player experience a degree of spectacular nature (Frontera 2012): whatever was happening, it was bigger than a single player or character. Players would need to collaborate to effectively oppose the antagonist.

This leads to the creation of motivation within the community to engage with the game. Because single players cannot defeat the threat of the Observers by themselves, they are motivated to collaborate with each other and remain engaged in the conflict with the opposing force presented to them. The Observers are thus the perceived primary antagonists that players can project their resentment towards whilst working together to progress during gameplay. Players hope that this progression simultaneously leads to the defeat the Observer organisation. This projection, collaboration and progression keeps the players invested in the game.

4.4.3.4 *The Scope of the Nomad ARG*

Having understood the development of the Observer storyline as described above, one starts to realise the scope of the *Nomad* ARG when considering the amount of content designed for players to experience. The game flow of the pilot study, a single portion of the final game proper, can be described in 15 “units” (narrative assets, game events and game puzzles), whereas the entirety of the game proper consists of 56 of these “units” across two complete storylines.

As such, the game proper is expanded significantly from the pilot study. This expansion was designed so that players would have a wealth of content to potentially discover and, in doing so, minimise the amount of time during gameplay where the players were waiting for new game events to occur. The large amount of content encouraged two things.

The first of these was persistent play where, at any given moment, the player group would be able to spend time engaged with the game discussing narrative assets, solving game puzzles or performing game events. They would hopefully never be bored when playing the game, as there was always a game-related action to perform.

The second of these was the emphasis on community that such a scope attempts to engender. When considering the game proper’s larger primary and secondary puzzles, one can see that these puzzles often span multiple levels, multiple sources or multiple people to complete. The puzzles described in 4.4.2.2.11 and 4.4.2.2.17, for example, span a vast range of books (46 and 30 books, respectively). The latter puzzle also requires a working knowledge of complex book ciphers. Puzzles described in 4.4.2.1.24, 4.4.2.1.27 and 4.4.2.1.33 all require large amounts of active players solving the puzzles collectively in order to progress the game, with the latter puzzle requiring 70 different players (or different user accounts on the game’s hub website) to complete. These puzzles were designed to motivate and engage a community of players to collaborate on their solutions.

Additionally, it must be noted that certain designed elements fall somewhat outside of the explicit scope of this study’s aims. Certain puzzles, especially within the Observer storyline, often taught and exercised more technological aspects of information literacy, going beyond library and information orientation techniques. This reasoning behind this approach is discussed below. A detailed discussion of the game’s puzzles and how each was designed to focus on digital or information literacy acquisition and exercise can be found in 4.5.

The technological emphasis of certain game aspects attempted to capitalise on the transmedia nature of the ARG genre because, while the technologies used in the creation of the ARG were largely digital, a lot of puzzles, in adherence to the often physical nature of certain information literacies (like physical library orientation), could be described as “analogue with digital components”. This description is particularly apt for the game proper, where the solutions to physical puzzles often directly linked back to the game’s digital counterpart: the hub website. The design team felt that this emphasis on the digital

components were important in providing the spectacular nature discussed by Frontera (2012), which helped keep the game system engaging.

The move towards digital literacies in some elements also, once again, became a design decision based on the fostering of community. Because information literacy is an essential 21st century skill (Dunn 2002; Binkley et al. 2012) it is entirely necessary for people from multiple backgrounds to acquire information literacy related skillsets. However, other skills, such as an understanding of programming languages, markup, cryptography and image editing are much more specialised skills. Nonetheless, these are skills that the design team, as Multimedia students and scholars, obtained during their studies (de Beer & Holmner 2013). The inclusion of skill learning and the exercise of these more-specialised skillsets was a design decision made in order to either have the players learn these skills (those who did not initially have them), exercise these skills (for those players who did have them), or expand the community by having “non-skilled” players recruit “skilled” potential players. The latter social recruitment phenomenon is something that is frequently exercised in other ARGs that draw from multiple disparate subject fields for their scenarios. This is known as the community formation of a collective intelligence (McGonigal 2008).

4.4.3.5 *The Digital Landscape of the Game Proper*

When considering the above discussion of scope, one must begin to discuss the nature of the digital landscape (the digital components such as the game’s hub website) within the game proper. To contextualise the landscape of the game proper, one must compare it to the pilot study.

In the pilot study there were two game websites. The first of these was Ana Kirlitz’s personal research blog, discussed in 4.3.2.1. This website acted as a hub website that contextualises the personality and backstory of Ana as a game character. It does this through regular blog posts Ana makes discussing her research. Player interaction with this asset was limited to the completion of an in-game questionnaire that is not included in the data analysis of this study and merely acted as an additional narrative asset. As such, this asset, though digital, was largely passive and devoid of the interactivity that differentiates the digital representation from a similar physical representation.

The game’s main hub website in the pilot, ‘Midnight Chapters’, acted as Ana’s “mystery blog”. As the game’s main hub website, this blog allowed for more interactivity, such as commenting on blog posts. Additionally, the addition of a forum allowed users to discuss aspects of the mystery separate from the blog, though blog posts automatically had forum topics created for them as well.

Though the pilot version of ‘Midnight Chapters’ contained a larger degree of interactivity than Ana’s research blog, the site was still used in a restricted capacity, often to provide players with game updates or incite community discussion about game elements. This restrained stance was taken in order to allow

the community to discuss the game amongst themselves, simply using 'Midnight Chapters' as the platform on which to do so.

Nomad's pilot, to this end, was a largely analogue game, with players having to find clues in physical locations. As such, digital assets were largely used as discussion platforms. This more analogue approach was taken in order to support the physical nature of library orientation that the pilot attempted to exercise. It was thought that, if the game assets were physical and remained placed in the library, revisiting these assets would result in more time spent in the physical library space.

This largely analogue implementation (to be discussed more in Chapter 5) was enacted due to the engagement fostered by environmental narrative assets as discussed in 4.3.3.2. The ability for the pilot to effectively maintain this high volume of "analogue" play is also as a result of the pilot study's intended length. As mentioned previously, the scope of the pilot study was about 25% of the eventual game proper, and as such it was easier for the design team to maintain far fewer physical assets during the pilot's run.

However, the game proper did not have this luxury. With a much larger scope, a continued reliance on physical assets required more maintenance by the design team. As such, a design decision was made wherein a large amount of the game flow would be disseminated on the game proper's main hub website, 'We Are The Messengers'. Within the game proper, pilot hub website 'Midnight Chapters' is repurposed as a narrative asset (as described in 4.4.2.1.1), and retains its blog format (with standard blog functionality). However, the forum functionality within the game proper was present on 'We Are The Messengers'.

As such, 'We Are The Messengers' became the digital hub of *Nomad's* game proper. To encourage its continued use the design team greatly improved it from the blog and forum functionality present in the pilot version of 'Midnight Chapters'. Instead, 'We Are The Messengers' was separated into two sections, the node construct and the forum; on which, similarly to 'Midnight Chapters' in the pilot, players could discuss game-related content.

The node construct was unique to 'We Are The Messengers', and attempted to visualise the flow of the game as the initial object players see when visiting the website. Each node within the structure depicts a clue to the greater mystery of the game proper. This clue could be a narrative asset, part of a game puzzle or a link to a game event. This clue was revealed in an overlay once each separate node was clicked on. Additionally, not all nodes were constantly available, with nodes being locked or unlocked as players progressed through the game's storylines.

The control designers had over this node construct was an important design decision. Nodes could be locked and unlocked as players progressed through the story, but content of locked nodes was not

visible to the players. This allowed the design team to populate the content of these locked nodes, wherever possible, prior to the game proper's launch. This meant that less time would have to be spent during the run of the game proper maintaining finalised assets and giving access to these assets to the players. Nodes containing the assets would merely have to be unlocked by the design team for gameplay to continue. This is particularly notable as it allowed for nodes to be unlocked based on conditions that players of the game had met, allowing them to directly experience the results of their game actions (such as solving a puzzle) on the game system (where a node can automatically unlock once a puzzle is solved).

This node structure also resulted in players being able to, at a glance, discern the structure of the game. Related narrative assets and game puzzles were connected to one another in the node structure. This resulted in a visually branching, tree-like structure that contained clusters of nodes wherever larger game puzzles were interconnected (such as how the solutions found in 4.4.2.1.27 are used in 4.4.2.1.28). Additionally, the state of each node (whether it was locked or unlocked) allowed players to see the amount of the game they had completed at any given time.

Allowing players to better understand the game using the node construct visualisation was a decision that attempted to, once again, hint at the game-like structure of the *Nomad* ARG without explicitly abandoning the TINAG aesthetic. When considering meaningful play and meaning-making in games, player action should result in discernible and integrated outcomes within the game context (Salen & Zimmerman 2003:34). The use of a visualisation that highlighted the player progression through the game's storylines helped show this discernibility and integration. Additionally, the aesthetic of the node construct attempted to design for delight (Koster 2013:94) and for visual appeal (Schell 2014:385), as these characteristics both foster engagement within players. Lastly, the explicit use of a node-based visualisation over other potential visualisations also attempted to hint at *Nomad's* game-like origins. The aesthetic of the node structure itself appeared aesthetically consistent with futuristic interfaces seen in other science fiction narratives. Most notably in this case, the node structure in *Nomad* drew inspiration from the user interface utilised in *Cloud Chamber*, a "massively multiplayer story game" mentioned briefly in Chapter 2 (Investigate North 2014a). A comparison between the two interfaces can be seen in Figure 47 and Figure 48 below:



Figure 47: The node structure on 'We Are The Messengers'



Figure 48: The node-like structure of the *Cloud Chamber* user interface (Investigate North 2014a)

4.4.3.6 *The Length of the Game Proper*

The length of the game proper is of particular note as it differs greatly from that of the pilot study or the planned timeline of the game proper in initial design iterations. The pilot study was planned to run over a two week period. During initial iterations and development, the game proper was planned to run over an eight week period. However, during subsequent design iterations it was decided that the game proper, like previously run University of Pretoria ARGs before it, would run over a six week period (de Beer & Holmner 2013). This decision was made to allow the game proper's design team more time to design and perfect game assets prior to the launch of the game itself.

Additionally, six weeks is only three times the time span of the pilot study. The game proper's scope, however, is about four times the size of the pilot study. Due to this disparity, players of the game proper would have a shorter amount of time, relative to the scope of the game, to complete a larger amount of content. This decision relates to the engenderment of "persistent play" as discussed in 4.4.3.4.

4.5 Teaching Information Literacy through *Nomad*

Nomad's primary purpose was to be used as a tool for teaching and exercising information literacy skills and competencies. In examining this, the following section describes each puzzle in the game, along with which information or digital literacy skills each puzzle attempts to teach or exercise. It attempts to contextualise these skills by highlighting the "new skills" a player would learn of exercise through the completion of each puzzle, were the player to complete the puzzles chronologically.

The importance of these skills is highlighted by correlating the skills to their corresponding information literacy competency as taught in the AIM syllabus. This is done through referencing the module's prescribed textbook, "Navigating Information Literacy" (Bothma et al. 2014), along with additional academic sources where possible.

4.5.1 Live Event 1: *Finding Alice*

Nomad's first live event has the players enter the library to find *Alice's Adventures in Wonderland* (Carroll 1865). The players are shown the path to the book through photos within the video they are shown.

This puzzle attempts to orient the users within the physical library space. They recognise the need for information (find the book), and the resource (the physical library) through which they can find it (Bothma et al. 2014:13). When in the library, they explore the physical space by understanding the classification systems of the library (American Library Association & Association for College and Research Libraries 2000).

New skills learned:

- Library orientation (American Library Association & Association for College and Research Libraries 2000)
- Locating physical books in the library (American Library Association & Association for College and Research Libraries 2000)

4.5.2 Primary Puzzle 1: *Finding books, QR codes, and the Oxford English Dictionary*

Upon finding *Alice's Adventures in Wonderland* (Carroll 1865), the players scan the QR code found inside the book itself. Once scanned, the QR code links them to the "We Are The Messengers" website. This unlocks part of the collection number for the *Oxford English Dictionary* (Simpson & Weiner 1993), part of the photograph of The Nomad and, after six hours, a new list of five more books. This is repeated until the entire photograph and collection number is revealed. A diagram of the flow of the puzzle can be seen below in Figure 49 below.

This puzzle aimed to teach the players multiple things. Upon finding *Alice's Adventures in Wonderland*, they must recognise a QR code and understand that it needs to be scanned by an appropriate tool (Wempen 2014:57) to unlock the relevant rewards (part of the photograph, collection number and the new book list). When faced with the new book list they must seek out ways to find these books, either by asking for assistance from library staff or searching for the books on the online library portal (Bothma et al. 2014:48–51). In the latter case, the library portal will provide them with a collection number along with which floor of the library the book can be found on. In either case they find the books, each of which contains either another QR code or an Observer note. After this, the puzzle repeats until they find the final book. Upon finding the final book, they are presented with the full photograph of The Nomad. Underneath the photograph is a code: "N423 OXFORD". The players must recognise that this is another library collection number. Once again, upon asking library staff or using the online portal to investigate the collection number, they are directed to the *Oxford English Dictionary* (Simpson & Weiner 1993). Within the dictionary is another QR code which unlocks the time, date and location of the second live event.

New skills learned:

- Understanding QR codes (Wempen 2014:57)
- QR code scanning (Wempen 2014:57)
- Locating books via searching on the library portal (Bothma et al. 2014:48–51)
- Interaction with the library staff (American Library Association & Association for College and Research Libraries 2000; Bothma et al. 2014:48–51)
- Understanding library classification (via collection numbers) (American Library Association & Association for College and Research Libraries 2000; Bothma et al. 2014:48–51)
- Locating books via searching by collection number (American Library Association & Association for College and Research Libraries 2000; Bothma et al. 2014:48–51)

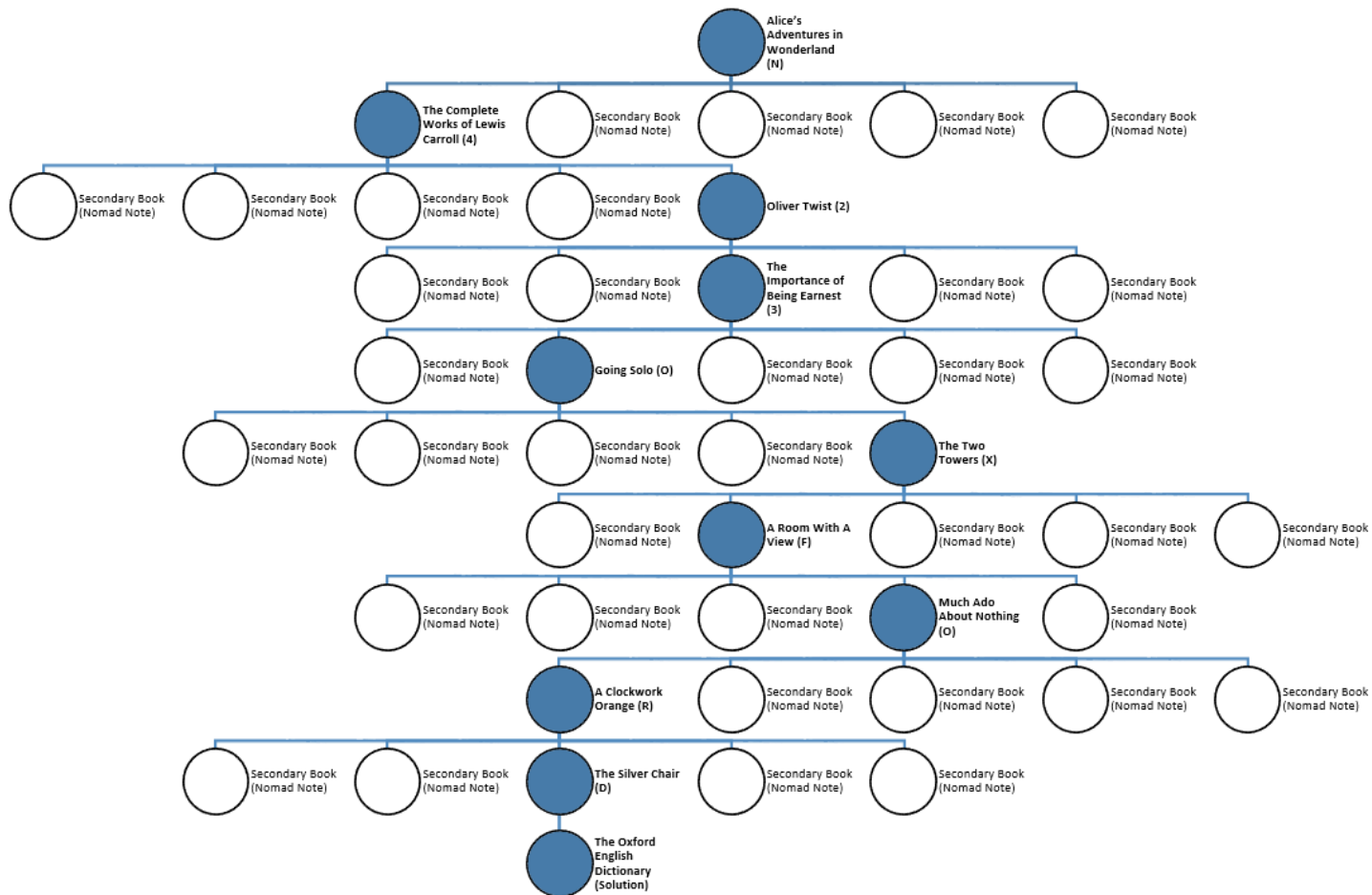


Figure 49: Primary Puzzle 1's flow (within the pilot). "Primary" books (that continue the expansion of the puzzle) are coloured blue.

4.5.3 Secondary Puzzle 1: Understanding the Notes

Not every book during the primary puzzle contained QR codes. Instead, most of these books contained a card that had a note on it made by an Observer about a time-travelling Subject. In the pilot, these books contained historical notes written by The Nomad. In both cases, the notes themselves are intentionally vague. As such, it is up to the players to contextualise each note both individually, as well as its relation to other notes in the series. During the pilot, players must discover that The Nomad is writing about different historical events as he has experienced them, as well as what each of these events are. During the game proper, the Observer notes discuss various Subjects, and their exploits whilst time-travelling. In this case, players can track Subjects through their numeric designation (such as “Subject 24”) to plot that subject’s path through various historical events, as well as determine the potential events that each Subject is manipulating.

As a result, players perform two stages of contextualisation for each note within either the pilot or the game proper. First, they must contextualise the historical event the note discusses through concept identification (Bothma et al. 2014:58–59). This is likely done through the construction of search queries on a variety of internet search engines containing keywords discussed in the note. For example, The Nomad’s note reading “I was there when the wall fell” might prompt players to search for variations on the term “falling wall”. In order to narrow subsequent searches, players may utilise advanced query construction such as the use of Boolean operators or natural language queries (Bothma et al. 2014:60–65). Once they have identified the event, they can contextualise this event within the larger set of notes received from the other books.

This is the second phase of contextualisation. When considering each note against the other notes within the set, players infer connections between The Nomad and these historical events (in the pilot) and various Subjects and the events they influenced (in the game proper). In this way, players can begin to construct the chronologies of these characters.

New skills learned:

- Contextualisation of events based on description (Bothma et al. 2014:58–59)
- Searching the internet (Bothma et al. 2014:60–65)
- Advanced searching techniques (Bothma et al. 2014:60–65).
- Contextualisation of a set of events based on similarities found in the events (American Library Association & Association for College and Research Libraries 2000)
- Constructing chronologies based on a contextualised understanding of event sets (American Library Association & Association for College and Research Libraries 2000)

4.5.4 Secondary Puzzle 2: ‘#thoughtsdream’ (Nomad pilot)

The ‘#thoughtsdream’ puzzle is detailed in 4.3.2.13. The players must utilise Twitter, a social networking platform, to search for the term (the “hashtag”) in order to find various user accounts that have tweeted about their experiences meeting a strange man (The Nomad). These account names, when anagrammed, reveal names of famous authors such as William Shakespeare and Oscar Wilde.

This puzzle largely attempted to acquaint the players with social media platforms. Understanding these platforms is a crucial part of 21st century communication (Bothma et al. 2014:180–184). Twitter was chosen in particular because of its use of “hashtags”, a built-in categorisation system whereby utilising a keyword preceded by an octothorpe (the “#” character) categorises the entire tweet (a 140 character microblog) by associating it with that “hashtag”. The puzzle attempted to acquaint players both with the Twitter interface as well as its “hashtag” categorisation system. Twitter was chosen over other popular social media platforms such as Facebook as the design team felt that Twitter was lesser-used by the South African target audience.

During the puzzle, players must search for the “hashtag” on Twitter, view the results and identify the strange usernames. Players must then anagram (Whitton & Moseley 2012:160) these usernames to discover that each user account is linked to an author whose books had been found during the completion of primary puzzle 1 and secondary puzzle 1. Players must then contextualise the tweet within the set of tweets to understand that each of these authors had been visited by a strange visitor. They should also infer that this visitor may be The Nomad based on their understanding of his chronology from secondary puzzle 1.



Figure 50: The results of searching for the ‘#thoughtsdream’ hashtag

New skills learned:

- Utilising Twitter (Bothma et al. 2014:180–184)
- Understanding Twitter’s categorisation systems (Bothma et al. 2014:180–184)
- Anagramming (Whitton & Moseley 2012:160)

4.5.5 Secondary Puzzle 2: “I am a Messenger” (Nomad game proper)

This puzzle is detailed in 4.4.2.1.13. This puzzle simply attempted to engender community and discussion between the players regarding the puzzle, the game and the players themselves. It also provided them an opportunity to create content that would become part of the game’s narrative, an integral part of ARGs (Bonsignore, Hansen, et al. 2012). Additionally, when posting this content, they could optionally make use of video sharing platforms such as Vimeo and YouTube to host these videos. In order to encourage this, Mia uploads her declaration to YouTube (<https://www.youtube.com/watch?v=LKkFM6JnrpM>) (Schoemaker 2015a). Utilising these video sharing platforms is aimed to teach the same social media platform literacy (Bothma et al. 2014:184) as the ‘#thoughtsdream’ puzzle (see 4.5.4).

New skills learned:

- Utilising video sharing platforms such as YouTube or Vimeo (Bothma et al. 2014:184)
- Content creation and synthesis (Bonsignore, Hansen, et al. 2012)

4.5.6 Live Event 2: Talking to The Nomad

Live event 2 requires players to think on their feet. When faced with the ability to talk to The Nomad, they must ask him questions in an attempt to discover fragments of the narrative. This event tests the players’ ability to reason about information and contextualise it as they receive it. In this way, they perform critical thinking and problem solving in real time: they extract the information from The Nomad, organise it, integrate it into their existing mental models and utilise this information to probe for more information from the source (Bothma et al. 2014:14). Though many of these competencies are exercised previously (extraction, organisation and integration), the ability to immediately use this information in real time is also exercised here.

New skills learned:

- Using information purposefully in real time (American Library Association & Association for College and Research Libraries 2000; Bothma et al. 2014:14)

4.5.7 Primary Puzzle 2: Physical Book Ciphers

Primary puzzle 2 (see 4.4.2.1.18) unfolds similarly to primary puzzle 1 (see 4.4.2.1.11), though it expands on the concepts introduced within the initial puzzle. In primary puzzle 2 players must first understand that five numbers presented to them within a node on 'We Are The Messengers' are ISBN numbers. Then, utilising the library portal or a similar search engine, they must link these ISBN numbers to their respective books. Only one of these five books contains a card with another five number sets on it.

The number sets found on the card are book ciphers. Each of these ciphers are in the same format, first disclosing a page number and then disclosing, in a set, numbers of words on that page. Upon discovery of each word, combining the first letter of each discovered word presents the players with a book name.

An example cipher would be "44 – 9 10 8 41 36 27 59 56 60 107 69". An example of this cipher being solved by using *The Jungle Book* (Kipling 1894) as the key can be seen below in Figure 51.

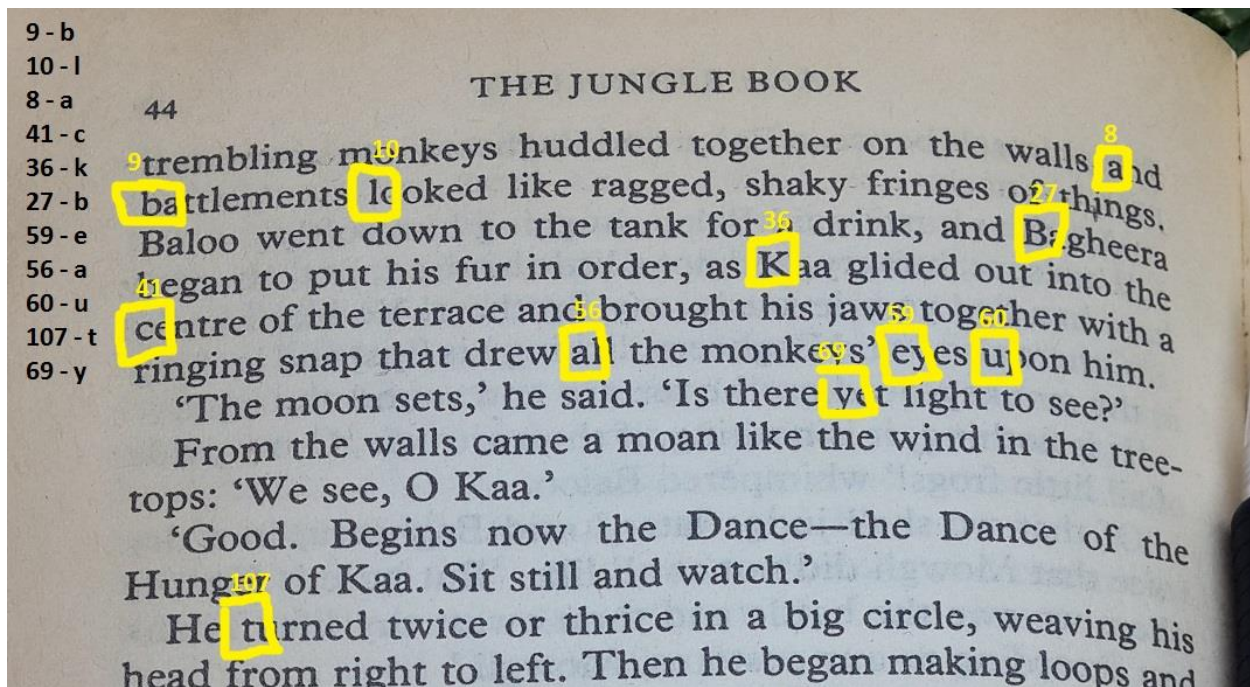


Figure 51: Solving "Black Beauty" in *The Jungle Book* (Kipling 1894)

Solving for each book provides the players with five more book names. They must use these names to find the books in the library, as in primary puzzle 1. This puzzle repeats five times. In each "primary" book during this repetition is a QR code. The QR code links to riddles unlocked in secondary puzzle 4 (see 4.4.2.1.20). Additionally, scanning this QR code reveals part of a date and time for live event 3.

Solving the last cipher in the final book in the puzzle provides the location. This flow of the puzzle is displayed in Figure 52.

The puzzle exercises the skills learnt by the players in primary puzzle 1, introducing added complexity to the scenario. In primary puzzle 2, players must initially search for ISBN numbers instead of merely book names. When players then find the books they must decipher the number sets to reveal the names of new books. This process of deciphering is important as a digital literacy, where digital literacy regards the understanding of various forms of information from various sources as presented by a computer (Gilster 1997:1). This digital literacy is important as an understanding of cryptography is prevalent in Computer Science related disciplines, and is incredibly important in Computer Science education because of its relation to computer security (Yang 2001). Because the cryptography mechanic relies more on digital literacy than information literacy, the design team chose to bind the ciphertxts (the number sets) to the physical books the ciphers were discovered in. This made it so that players had to utilise the physical book at all times when decoding the ciphertxts. An understanding of cryptography is also important as an information literacy skillset as it relates to management of online privacy (Magnuson 2011).

It was hoped that, because of this necessity, players might borrow the book from the library in order to work with the physical book at times that better suited them. In this way, the puzzle hoped to teach the players a core interaction within the physical library (how to borrow books, any restrictions placed on the borrowing book and the responsibilities of the borrowing player regarding the book itself).

New skills learned:

- Searching for books via search portals or the library portal via ISBN number (Bothma et al. 2014:48–51)
- Understanding ciphers (Yang 2001; Magnuson 2011)
- Understanding specific kinds of book ciphers (Yang 2001)
- The fundamental principle of borrowing books from a library (American Library Association & Association for College and Research Libraries 2000)

-

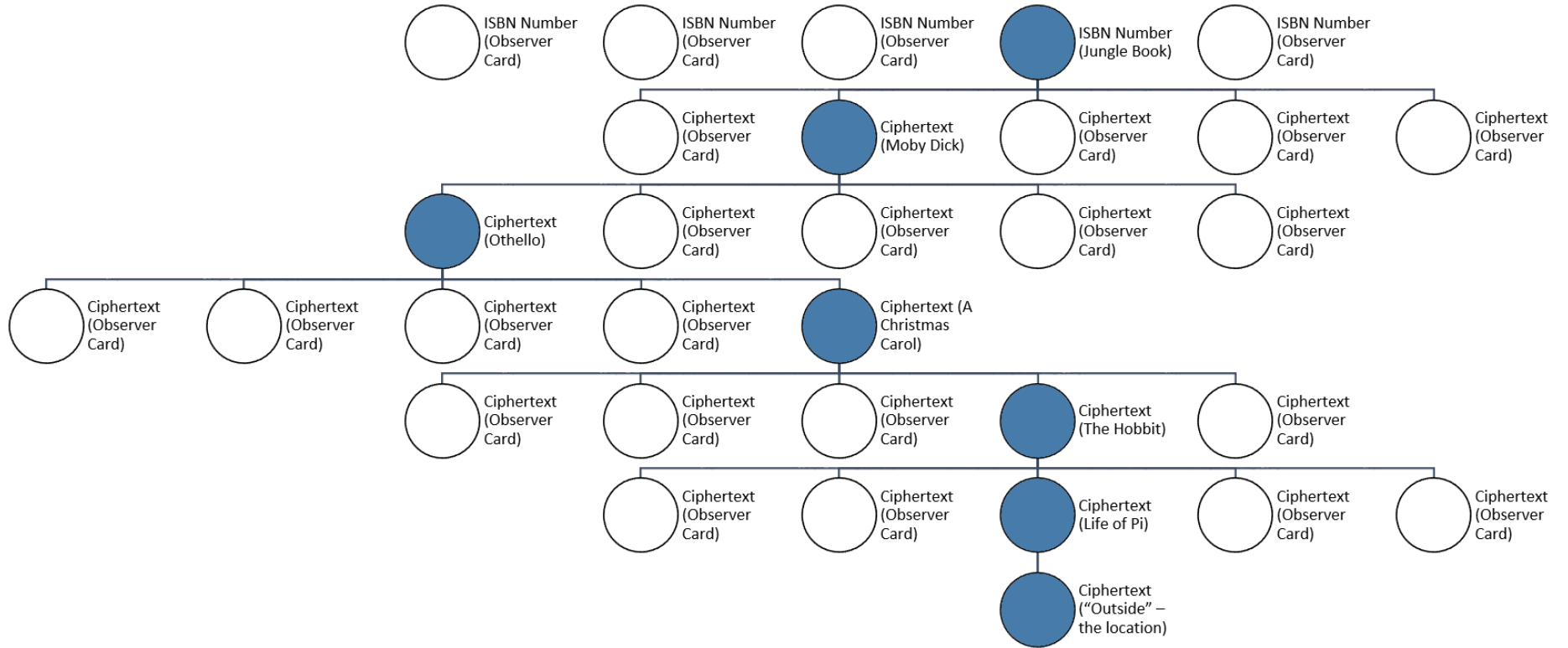


Figure 52: The flow of primary puzzle 2. The path through the puzzle is coloured in blue.

4.5.8 Secondary Puzzle 3: More Notes

Secondary puzzle 3 is identical to secondary puzzle 1 in terms of skill acquisition and exercise (see 4.5.3, though it provides players with more narrative exposition as a reward.

New skills learned:

- None learned, although multiple skills exercised

4.5.9 Secondary Puzzle 4: Riddles, Locations and Marked Pages

QR codes in primary puzzle 2's "primary" books unlock nodes on 'We Are The Messengers' that contain riddles. Each of these riddles refer to a location on campus. An example riddle directing players to the library in the Law building is shown below:

There was an old man named Mort who lived by the lessons he taught. From this place he took the wisdom from books that he would use later in court.

Upon solving the riddle and arriving at each location, players find another QR code that unlocks a node. This node contains an image of a marked page, but no indication regarding which book or page it comes from (see Figure 24). Players do this for each location to unlock five marked pages from five locations. The puzzle aims to improve the orientation of players regarding the physical university campus, as well as exercising critical thinking when solving the riddles. The critical thinking exercise here is a similar process to that exercised in previous puzzles and events. As such, the main skill learnt in this puzzle is that of campus orientation.

New skills learned:

- Critical thinking and reasoning to solve riddles (American Library Association & Association for College and Research Libraries 2000)
- Physical campus orientation (American Library Association & Association for College and Research Libraries 2000)

4.5.10 Live Event 3: Solving the "Marked Pages" Puzzle

During live event 3, The Nomad tells the players to go to five places. Players must understand that these places refer to those discovered in secondary puzzle 4 (see 4.4.2.1.20). Upon returning to each of these

places, players find QR codes that update the marked page nodes. These nodes now contain the name of the book and the page that each image corresponds to. Players must then print each completed image onto separate A4 pages, create holes where the pages are marked and place them over the books, aligning the page and the book along the book boundary demarcations. The books used here are the “primary” books from primary puzzle 2 (see 4.5.7).

Aligning these pages reveal words from each book. These words are adjectives, such as “leader”, “traveller” and “nomad”. The words describe the personality of The Nomad as a character. Along with these words, each book also reveals a few characters of a location for the end of the event. Once these characters are correctly rearranged, depending on how the player retrieved the books and solved the puzzle, the players are directed outside where they are shown a video of The Nomad appearing and disappearing.

This event aimed to exercise skills taught in the game so far, such as orientation and finding books in the library. The puzzle also relies on the players’ ability to reason regarding the purpose of the marked pages (that they act as “masks” for the pages that reveal messages). Here the players again exercise a high level of critical thinking.

New skills learned:

- Downloading files from the internet (Wempen 2014:288)
- Printing images on a computer (Wempen 2014:192)

4.5.11 Primary Puzzle 3: Scientific Riddles

After this live event, five nodes unlock, each of which are riddles that discuss a specific time-travel-related scientific concept: special relativity, Morris-Thorne wormholes, faster-than-light travel, temporal paradoxes, and the relativity of simultaneity. Once posed with these riddles, multiple players (25 different accounts) must correctly answer the riddle. Once all of the riddles are completed by multiple accounts, a diary entry from The Messenger is unlocked, urging players to complete The Nomad’s scientific research (see Figure 26). An example riddle (for “Morris-Thorne wormholes”) is shown below. The text alludes to famous authors in the field, Mike Morris and Kip Thorne.

Mike and Kip cross an exotic bridge: the year is 1996. Upon making their passage through the calendar reads 1972.

The riddle mechanic is functionally similar to that used in secondary puzzle 4 (see 4.4.2.1.20), but is one of the first game puzzles to explicitly require collaboration between a larger community of players

(though the scope of earlier puzzles encouraged this, it was not strictly enforced). This attempts to introduce the importance of collaboration in ARGs to *Nomad's* players (Bonsignore, Hansen, et al. 2012). Additionally, collaboration is noted repeatedly as a 21st century skill or literacy (Binkley et al. 2012; Global Digital Citizen Foundation 2015). As such, the main focus of this puzzle is on introducing the notion of mandatory collaboration to the players: sharing the answer of each riddle, and collaborating to individually answer each one, which can then unlock the next section of the game.

New skills learned:

- Sharing information within groups (Global Digital Citizen Foundation 2015)
- Collaborating on individual tasks towards a shared goal (Bonsignore, Hansen, et al. 2012)

4.5.12 Primary Puzzle 4: Completing the Research

Once primary puzzle 3 (see 4.5.11) is complete, new nodes are unlocked. Each of these new nodes are labelled as the “reference list” for each scientific concept, and presents the players with an input element. The players discover that this input element is controlled by a regular expression that checks the format of the context within the element. To correctly match this expression, players must input text into the element so that it resembles the Harvard method of referencing taught during the AIM modules at the University of Pretoria (Bothma et al. 2014:141). Once an article is correctly “submitted” to the puzzle, it appears in the reference list. An example of a correct input for the puzzle is shown below in Figure 53. The regular expression explicitly focused on journal articles, and as such accepted references in the following general format:

Surname, Initials. Year. Article name. Journal name, Volume(Issue): Page range start-Page range end

As such, it accepts the following reference, as shown in Figure 53:

Surname	Initials	Year	Article name	Journal Name	Volume	Issue	Page range start	Page range end

Richardson	G.P	1986	Problems with causal loop diagrams	System Dynamics Review	2	2	158	170
------------	-----	------	------------------------------------	------------------------	---	---	-----	-----

Table 12: A separation of fields for a relevant article, in this case an example in the form of "Problems with causal loop diagrams" (Richardson 1986)

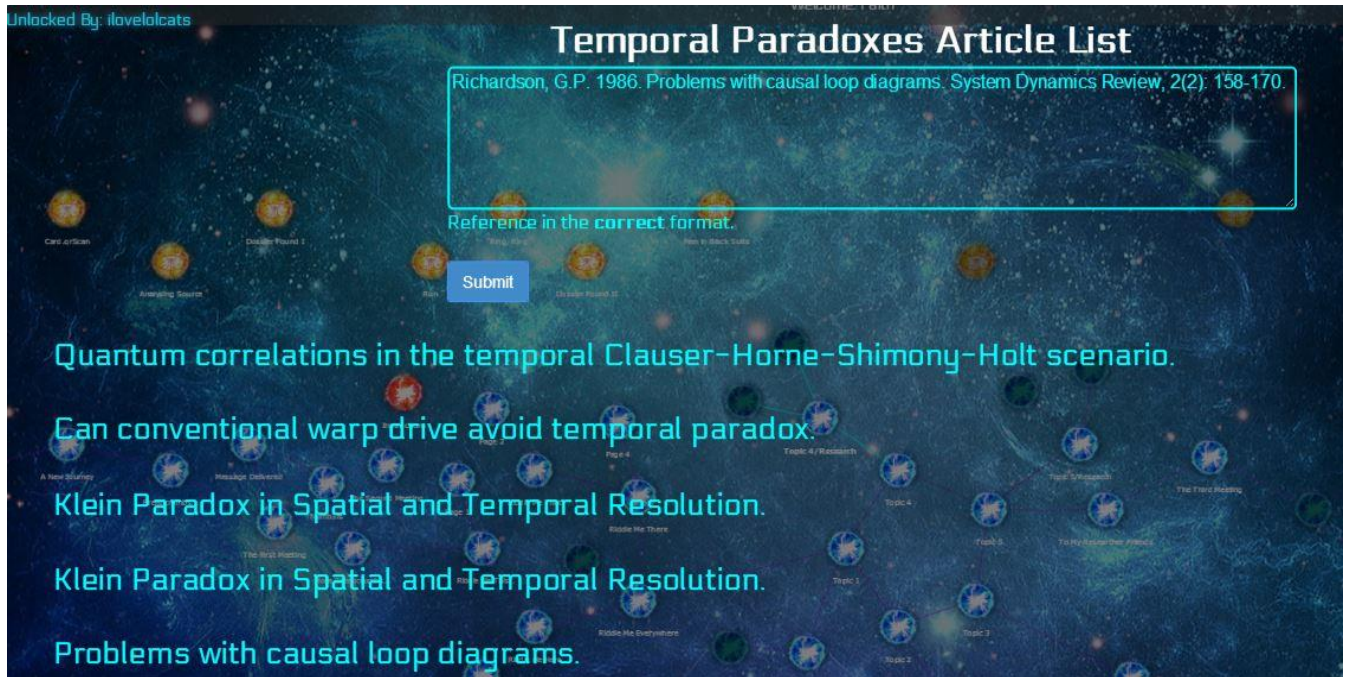


Figure 53: A correct Harvard method reference within the puzzle and its subsequent appearance on the "reference list" below the input element

During this puzzle, players must find papers relevant to each topic by utilising a variety of online portals, library portals and general web searches. This puzzle hoped to introduce players to the online resources and databases provided by the University of Pretoria library through the university’s subscription to these databases, such as ScienceDirect, EBSCOHost, Gartner and other databases.

However, due to the nature of ARGs typically allowing large degrees of freedom to players regarding their possible actions, this puzzle did not require players to utilise specific databases in their completion of the puzzle. It was hoped that this freedom would allow the players to discover a wider range of library resources when searching for articles to complete the puzzle. As such, this puzzle could potentially teach players skills regarding working with a variety of library resources.

New skills learned:

- Utilising library resources and databases to find relevant academic articles (Bothma et al. 2014:48–51)
- Understanding the differences between different academic databases and resources (Bothma et al. 2014:84–91)
- Goal completion in various academic databases (finding correct information) (Bothma et al. 2014:90–91)
- Harvard referencing (specifically, journal referencing) in bibliographies (Bothma et al. 2014:141)

4.5.13 Primary Puzzle 5: Traversing the Relevance Accordion Menu

Once each topic contained what the design team considered a suitable amount of relevant articles, new nodes are unlocked relating to each topic. These nodes contain lists of the most relevant articles for each topic. Using this list, players must traverse an accordion menu structure for each topic, available in additional unlocked nodes. The correct traversal of these accordion menus are detailed in 4.4.2.1.28, with examples shown in Figure 27 and Figure 28. A full example can also be seen below in Figure 54 and Figure 55.

On the Electrodynamics of Moving Bodies
Cosmic Ray and Neutrino Tests of Special Relativity
Uniformly Accelerated Reference Frames in Special Relativity
Student Understanding of Time in Special Relativity: Simultaneity and Reference Frames
Special Relativity Without One-Way Velocity Assumptions
Generalized Lorentz transformation for an accelerated, rotating frame of reference
Quantum inequalities in two-dimensional Minkowski spacetime
Improved test of time dilation in special relativity

Figure 54: A sample list of relevant articles

This puzzle is solved by discerning the link between the lists of relevant articles and the accordion menus. Players must understand that they should traverse the accordion menu in the order given by the accompanying list. Upon correctly traversing the menu, they are rewarded with audio logs from The Nomad discussing his research and, in the last audio log, providing them with a date, time and location for a new live event.

This puzzle aimed to exercise the players' reasoning and critical thinking abilities, but did not explicitly teach any new skills.

New skills learned:

- None learned, although multiple skills exercised

4.5.14 Live Event 4: The Messenger's Commendation

After the players receive another phone call from The Nomad they are directed to the library where they find multiple photos along the walls of The Nomad at various historical events. The players also find other photos, as shown in Figure 30. The players must realise that these photographs, when combined into a single photograph, direct them to another location on campus – an F1CZ Mirage aircraft (Lombard 2010). Here they find a cassette player and a cassette tape. Upon playing the tape, they hear a message from The Messenger congratulating them on their progress in the game so far.

This event exercises the players' reasoning to discern the Mirage photographs from those of The Nomad. Also, although it is neither a digital or information literacy, this event teaches players how to utilise cassette tapes, an obsolete technology.

New skills learned:

- Working with cassette players and tapes

4.5.15 Primary Puzzle 6: Completing The Nomad's Timeline

One of *Nomad's* final puzzles involved the completion of a 70 event timeline by the player community. Players must identify each historical event within the timeline based on characteristics from the image, utilise searching methods to contextualise the event and then find the date of the event. This must be done for each photo to plot The Nomad's chronological timeline.

Furthermore, upon doing this they must drag each photograph into the correct position on the timeline. However, only a single event can be correctly placed per different user account. As such, a large player community (or at least a large number of accounts) would be needed to complete this puzzle. Once the timeline is complete, players unlock the final primary puzzle of the game.

This puzzle attempted to engender community collaboration due to its scale, whereby at least 70 users or 70 user accounts must participate in order to complete the puzzle. Additionally, it alters the way contextualisation of an event is exercised. Previously, in secondary puzzle 1 (4.5.3) and secondary puzzle 3 (4.5.8), players utilised keywords from the notes given to them to link the note to a specific event. However, in this puzzle players must utilise the characteristics of the images themselves to provide keywords to be used in searches. Additionally, the players could also utilise multimedia search engines (such as TinEye and Google Images) (Bothma et al. 2014:74–75) to identify images similar to each image within the chronology to better pinpoint the event to which the image refers.

New skills learned:

- Utilising multimedia search engines (Bothma et al. 2014:74–75)

4.5.16 Primary Puzzle 7: Collaboratively Unlocking the Passphrase

Nomad's final primary puzzle required players to go to locations in the library when provided with pictures of these locations in newly unlocked nodes. At these locations, players found QR codes that need to be scanned by multiple users. Once each code is scanned 25 times by 25 different user accounts, a final time, date and location is revealed, along with a passphrase: "I remember you".

This puzzle exercises physical library orientation, an understanding of QR codes and community collaboration. These are all skills taught to the players through the play of *Nomad*, and as such, no new skills are explicitly learned here.

New skills learned:

- None learned, although multiple skills exercised

4.5.17 Live Event 5: Rescuing The Nomad

Upon arrival, players are handed a journal filled with loose pages by The Messenger, along with instructions. They must order the contents of the journal, a chronological account of the game itself as documented by The Messenger. They must then each write the passphrase at the end of the journal

itself. Upon doing this, Ana Kirlitz is freed from her temporal prison. Players must then convince a sceptical Ana to also write the passphrase in the journal, freeing The Nomad from being trapped in the timestream.

The only skill this event aims to teach the players is that of communication, another important 21st century skill (Binkley et al. 2012; Global Digital Citizen Foundation 2015), in convincing Ana to also contribute to the event itself, despite not knowing the players. Otherwise, the event acts as a culmination of the entire game, and in itself can be seen as a reward, with players being provided recognition for their actions within the journal's text.

New skills learned:

- Communication (Global Digital Citizen Foundation 2015)

4.5.18 Observer Puzzles

This section discusses the various observer puzzles and the skills taught during them. The flow of the Observer narrative can be seen in Table 11. Due to the much shorter, more modular design of the puzzles, they are not explained in detail in this section. Instead, this section simply reiterates the skills learned through participation in the Observer narrative. Some of these skills are already taught within the main narrative. However, this section assumes that players only participate in the Observer narrative when discussing skills learnt.

4.5.18.1 Observer Puzzle 1 (Scanning the QR code)

- Understanding QR codes (Wempen 2014:57)
- Scanning QR codes (Wempen 2014:57)

4.5.18.2 Observer Puzzle 2 (Viewing HTML source)

- Viewing HTML source code in a browser (Wempen 2014:288)
- Understanding the ICAO Radiotelephony Alphabet (International Civil Aviation Organisation 2001)

4.5.18.3 Observer Puzzle 3 (Timed event 1)

- Physical orientation within the library (American Library Association & Association for College and Research Libraries 2000)
- Contextualisation of information within the dossier when considering the Observer narrative and the nature of the Subjects (American Library Association & Association for College and Research Libraries 2000)

4.5.18.4 Observer Puzzle 4 (The video)

- Viewing separate frames of a video (utilises an understanding of video editing or videos on the internet) (Wempen 2014:160–161)

4.5.18.5 Observer Puzzle 5 (The phone call)

- Physical orientation on the university campus (American Library Association & Association for College and Research Libraries 2000)
- Punctuality

4.5.18.6 Observer Puzzle 6 (Timed event 2)

- No new skills learned, but skills exercised

4.5.18.7 Observer Puzzle 7 (Taking a photo of an Observer)

- Using a camera or equivalent camera phone (Wempen 2014:59)
- Uploading pictures onto a website or web service (Wempen 2014:288)

4.5.18.8 Observer Puzzle 8 (Reversing audio)

- Downloading files from the internet (Wempen 2014:288)
- Reversing audio in provided audio files using software (Wempen 2014:160–161)

4.5.18.9 Observer Puzzle 9 (Timed event 3)

- No new skills learned, but skills exercised

4.5.18.10 Observer Puzzle 10 (Finding and taking pictures of Observer symbols)

- No new skills learned, but skills exercised

4.5.18.11 Observer Puzzle 11 (Faith's riddle)

- Critical thinking and reasoning to solve riddles (American Library Association & Association for College and Research Libraries 2000)

4.5.18.12 Observer Puzzle 12 (Timed event 4)

- No new skills learned, but skills exercised

4.5.18.13 Observer Puzzle 13 (Running to each location)

- Communication and collaboration within the community (Bonsignore, Hansen, et al. 2012; Global Digital Citizen Foundation 2015)
- Planning of efficient routes around the university campus (American Library Association & Association for College and Research Libraries 2000)

4.5.19 Miscellaneous Skills Learned During Nomad

The play of an ARG inherently practices various 21st century literacies (Bonsignore, Hansen, et al. 2012). In addition to the skills identified above, *Nomad's* design inherently taught the following skills (examples are provided for each skill):

- Utilisation of different technological platforms: the ability of game websites to adjust to multiple platforms responsively via PC, mobile and tablet layout schemes (Bonsignore, Hansen, et al. 2012).
- Communication within a community through social media: the players had to communicate with one another and with game characters to progress in the game (Bonsignore, Hansen, et al. 2012).
- Using internet blogs, forums and social media: the game's hub websites contained a blog and a forum, and some game puzzles, such as the '#thoughtsdream' puzzle, relied on social media interaction (Bonsignore, Hansen, et al. 2012).
- Exploratory and tangential learning: *Nomad's* narrative basis in history may have provided players an opportunity to learn more about the various events the character visited and had an influence upon (Bonsignore, Hansen, et al. 2012).

4.5.20 Skill Acquisition Summary

The following table details the skills acquired during the play of *Nomad* (both the pilot study and the game proper), grouped into various logical categories:

Table 13: Skills learned or exercised during *Nomad* by category

Category	Skills Learned or Exercised
Information Literacy Skills	<ul style="list-style-type: none"> • Library orientation • Locating physical books in the library • Locating books via searching on the library portal • Understanding library classification (via collection numbers) • Locating books via searching by collection number • Contextualisation of events based on description • Searching the internet • Advanced searching techniques • Contextualisation of a set of events based on similarities found in the events • Constructing chronologies based on a contextualised understanding of event sets • Utilising library resources and databases to find relevant academic articles • Understanding the differences between different academic databases and resources • Goal completion in various academic databases (finding correct information) • The fundamental principle of borrowing books from a library • Critical thinking and reasoning to solve riddles • Content creation and synthesis • Using information purposefully in real time

	<ul style="list-style-type: none"> • Searching for books via search portals or the library portal via ISBN number • Harvard referencing (specifically, journal referencing) in bibliographies • Utilising multimedia search engines • Exploratory and tangential learning
<p>Computer Literacy Skills</p>	<ul style="list-style-type: none"> • Downloading files from the internet • Printing images on a computer • Viewing HTML source code via a browser • Viewing separate frames of a video • Using a camera or equivalent camera phone • Uploading pictures onto a website or web service • Reversing audio in provided audio files using software
<p>Digital Literacy Skills</p>	<ul style="list-style-type: none"> • Understanding QR codes • QR code scanning • Utilising Twitter • Understanding Twitter’s categorisation systems • Utilising video sharing platforms such as YouTube or Vimeo • Understanding ciphers • Understanding specific kinds of book ciphers • Using internet blogs, forums and social media • Utilisation of different technological platforms • Communication with a community through social media
<p>Physical Orientation</p>	<ul style="list-style-type: none"> • Physical campus orientation

	<ul style="list-style-type: none"> • Planning of efficient routes around the university campus
Interpersonal Communication	<ul style="list-style-type: none"> • Interaction with the library staff • Communication • Sharing information within groups • Collaborating on individual tasks towards a shared goal
Other Skills	<ul style="list-style-type: none"> • Anagramming • Working with cassette players and tapes • Understanding the ICAO Radiotelephony Alphabet

4.6 Conclusion

This chapter has discussed the entirety of *Nomad's* empirical design, both as a pilot study and as the game proper. Various design decisions made during the design of the pilot study and game proper were discussed and their reasoning explained either by referring to the literature or by explaining the intended user experience. Lastly, links were made between the designed elements, their reasoning and the information literacy skill learning and acquisition *Nomad* hoped to engender.

Due to the nature of alternate reality games, these designed experiences would likely have to be adjusted during the game's implementation and run within a real-world context. The way in which both the pilot study and the game proper differed from design to implementation is discussed in the following two chapters. Chapter 5 discusses the run of the pilot study and its results, after which these results are analysed. Chapter 6 presents the full empirical study, the game proper, in an identical manner.

5. Nomad Pilot Study Implementation, Results and Analysis

5.1 Introduction

This chapter discusses the entirety of the *Nomad* alternate reality game's pilot study (hereafter referred to as "the pilot", "the pilot study" or "the *Nomad* pilot") This is done by first providing a narrative of the actual implementation and run of the pilot itself. Where necessary, the design of new narrative assets, puzzles and events that were developed dynamically during the duration of the pilot study are discussed. The reasoning behind specific design decisions are also discussed within this narrative.

To order this narrative, the discussion of events will refer back to the numbering used in Chapter 4 to contextualise the event within *Nomad's* chronology. It must be noted that only the implementation and run of game events and their aftermath are discussed within this narrative. Specific observations, player opinions and other data gleaned during this narrative are discussed directly later (see 6.1).

Before the pilot's implementation is discussed, it is necessary to briefly look at the structure of the AIM modules presented at the University of Pretoria. As a compulsory, credit-bearing module necessary for the completion of all undergraduate degrees offered by the University of Pretoria, there are a large amount of students registered for the AIM modules in any given year of study, as the module is compulsory for all first-year students. This large audience was chosen, as mentioned in Chapter 3, because of *Nomad's* direct relevance to the module content and learning outcomes. The study's validity also hoped to be supported by a large target audience potentially translating into a larger amount of players than was seen in previous ARGs that targeted Multimedia undergraduate students (de Beer & Holmner 2013).

However, this large audience introduced an implementation consideration. For the AIM modules to effectively cater to this large number of students, the module co-ordinators allow students to book one two hour group session per week, which they must attend. This session acts as the AIM module's contact lecture for that week. As such, the same content is presented to a myriad of different groups throughout the week (75 groups over four days for AIM 121). This meant that, when considering *Nomad's* rabbit hole as discussed in 4.3.2.3, the same rabbit hole would have to be repeated for each of these groups. This was taken into consideration during the game's design.

5.2 Pilot Study Implementation

The pilot began on 4 August 2014, the third week of the second semester. This week was chosen to allow for AIM 121 students to have registered for the module in the first week of the semester and attended their first introductory class for the module in the subsequent week. This third week of classes began the lecturing of content that addressed the learning objectives of the module. As such, this

allowed the pilot's puzzles, if introduced at this point, to run parallel in some instances to the outcomes of the AIM 121 module.

This week was the week of the rabbit hole: the initial event that allows potential players entry into the game. This event is described in 4.3.2.3. During the run of the game, this event was repeated for every AIM 121 lecture during the first two days of the week. However, this is where the design team ran into their first implementation problem.

The design of the rabbit hole was intended as a hopefully obvious message from The Nomad to potential players. However, as the rabbit hole was repeated, the design team found that it did not engender the desired user experience. Students dutifully listened to Ana Kirlitz's (the game character) presentation and provided their details to her on the form being passed around. The form itself was a game asset that asked students to provide their details to be later contacted by Ana to participate in her study. In actuality, this list would later be used by the design team to have The Messenger (as The White Rabbit) email potential players about the game (detailed in 4.3.2.8).

During each of Ana's presentations, the rabbit hole event would occur: her presentation would seem to corrupt itself, a message for potential players to be at the library the following Thursday would flash and lights would flicker outside the venue. Shortly after this, a member of the design team, acting as a supporting character, would close the presentation and apologise, noting that they would fix the presentation and reschedule Ana's appearance with the AIM lecturers.

As this event was repeated throughout the day and feedback was given, the design team noted that the students did not react to the rabbit hole event, instead seeming to assume it was simply part of the presentation itself. Additionally, though the AIM lecturers were aware of the rabbit hole prior to its execution, the more instances of the rabbit hole they experienced, the less they, too, would react. Whilst they acted surprised and worried the first few times they experienced it, the more it occurred, the more they simply ignored it or seemingly became annoyed at the interruption it caused. This meant that any student attempting to gauge the seriousness of the event from the reaction of the lecturer may have simply assumed the entire rabbit hole was planned to play out exactly as it was executed.

This led to the game's first major design decision: After about 40 executions, the team decided to abandon the event, as it was not having the desired effect on the target audience. However, the event was repeated once more in one of the last lectures of the week. This was done so that a member of the design team could record the rabbit hole as part of the first dynamic decision made by the team.

The following section (formatted differently to the rest of the implementation narrative) discusses this decision. All sections formatted similarly (and numbered as subsections of this implementation discussion) discuss design decisions that were designed, developed and implemented during the game's

run in response to player actions. These dynamic design decisions did not change the progression of the pilot as it was designed, but rather acted as “detours” in accomplishing the designed game tasks.

5.2.1 *The AIM viral video*

In order to preserve the rabbit hole event for potential players who could not experience it first-hand, the team, as mentioned above, recorded the final execution of the event. This video was recorded via a mobile phone camera to emulate the spontaneous nature of viral videos, and shows Ana’s presentation corrupting itself, along with The Nomad’s message being shown. Ana, now annoyed that her presentation still won’t work, storms out of the venue (https://www.youtube.com/watch?v=KJ_ouweEbFs)(le Roux 2014).

This video is then uploaded to YouTube by Trevor Phillips (another, new, game character) with a YouTube channel (<https://www.youtube.com/channel/UChJ7l84NEDMwFIVT1-X90w>). As a character, Trevor is an AIM 121 student who saw the rabbit hole and recorded the video with his mobile phone (Jerrett 2014). He points them, in the comments section, to ‘Midnight Chapters’, the game’s hub website. Players could interact with Trevor either by emailing him, interacting with him on YouTube or by interacting with him on the ‘Midnight Chapters’ forum.

To promote the viewing of this video, the URL is incorporated into the group email that The Messenger sends the AIM students who signed up for Ana’s study, either via hard copies or digital copies of the form handed out in the lecture venues during the rabbit hole. Students, via the ClickUP announcement system, were also encouraged to help Ana with her study (by filling out the digital copy of the form) and with helping her understand the mystery surrounding her.

The video URL is further shared by Ana in a response to the group email sent out by The Messenger. Ana claims that The Messenger hacked her MailChimp account to send out the initial message, apologising profusely for the misuse of the mailing list she uses to organise her data collection for her studies.

It was hoped that this video would be shared by the potential players who received it, and that the video would go viral, which would in turn influence the traffic received on ‘Midnight Chapters’.

Early during the following week the team decided to once again direct players to the first live event more explicitly, so that potential players who did not see the video or experience the rabbit hole event but had come across ‘Midnight Chapters’ could be informed of the event. To do this, a timer was placed on the site that counted down, in seconds, to 17:30 on the Thursday of the event, the time mentioned

during the rabbit hole event. Additionally, a screenshot of the date, time and location of the event was posted on the 'Midnight Chapters' blog by a character known as Renate.

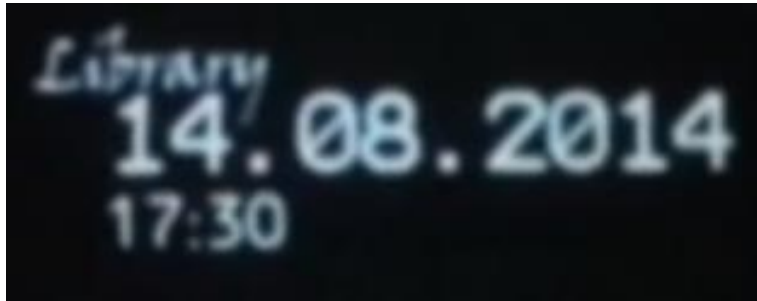


Figure 56: The screenshot of the date, time and location of live event 1, as captured from the viral video

This was done to encourage as many people to come to the first live event as possible, as previous experience with University of Pretoria ARGs such as *Number Thirteen* suggested that most players come to the first live event, but that this number of players decreases during the game run (de Beer & Holmner 2013). As such, it was pivotal to gather as many people for the first live event as possible.

As the live event approached, the pilot was progressing as designed. Prior to the event, the clues were placed in the books for the entirety of the pilot's puzzles. This was done in order to facilitate the possibility that players would attempt to complete the entirety of the pilot puzzles during the live event. It was assumed that the puzzles were long enough that players, though they could, would not necessarily complete the entire puzzle set in a single evening.

The live event, thus, proceeded as planned. However, the event itself was not without its flaws. In preparation for the event, multiple Twitter accounts were created to represent the authors discussed in the puzzle described in 4.3.2.13. The tweets with the '#thoughtsdream' hashtag had to be posted in real time as the players progressed through the puzzle described in 4.3.2.11. It was assumed that this game action would be simple to coordinate. However, during it event itself, once the first '#thoughtsdream' tweet was posted and immediately searched for by the design team, it was discovered that the tweet did not appear in the list of search results. Initially thought to be a problem with the speed of Twitter's indexing for new tweets, it was discovered that the new Twitter accounts created were created too recently for their tweets to immediately appear in search results (Twitter 2014). This was, presumably, a security measure for Twitter to filter newly machine-created accounts from overloading search results. Searching for the hashtag at the time of writing reveals the authors and their tweets that were posted before the puzzle was abandoned, although it did not work in real time (Twitter 2015).

Additionally, the players did, as planned, attempt to complete the entire pilot puzzle set during the live event as they progressed through the book lists, alphanumeric characters and The Nomad's historical accounts provided to them through the puzzles (see 4.3.2.11 and 4.3.2.12). However, halfway through

the puzzle the players came to a halt. Though, during asset placement, a book list was placed in *Going Solo* (Dahl 1986), it was discovered that this book had been borrowed from the library between asset placement the day prior to the live event and the live event itself.

This stopped the players solving the rest of the pilot's primary puzzle that evening, though multiple "holds" were placed on the book using the library's online booking system by the players. This oversight was noted as a possibility by the design team, but thought to be insignificant due to the assumption that, because of the use of older literature within the puzzle, this would not occur.

This flaw did, however, allow the design team to re-evaluate the length of the pilot study's puzzle set. Though the player group was fairly small (five players, Ana, and a member of the design team acting as a plant); they had completed the entirety of the first half of two of the pilot's puzzles between them. As mentioned in 4.3.3.3, the puzzles in *Nomad's* pilot were intentionally large to engender communal participation. However, despite the length, a small player team of five members had managed to complete half of the planned pilot gameplay in a single evening, stopped only by a flaw in the puzzle design.

Whilst re-evaluating, the team decided to use the forced break in gameplay to introduce new game elements that would allow the game to reach more people: Instead of using *Going Solo* (Dahl 1986) as the next book in the puzzle, a new book was chosen, and players could only reveal the name of this book by recruiting more players into the game.

5.2.2 The 'Far From the Madding Crowd cipher' puzzle

After waiting a few days to see if *Going Solo* was returned so that the game puzzle could continue as planned, the design team decided to replace the book in the puzzle with another book: *Far From the Madding Crowd* (Hardy 1874). To relay this information to the players, they were emailed by The Messenger to look for a clue "at the place they met before", the library. There, they were greeted with another riddle, shown in Figure 57.

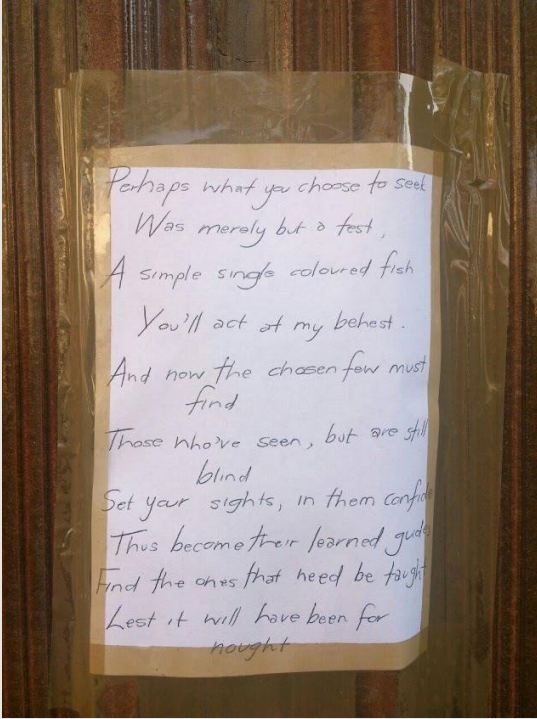


Figure 57: The Messenger's riddle, asking players to recruit "those that need be taught"

This riddle coincided with a new counter on the website that displayed the number of registered users on 'Midnight Chapters' (at the point when the puzzle was released there were 27 users) and a cipher (shown in Figure 58). The cipher itself was not actually a cipher, as it was impossible to break. Rather, it was designed so that random letters would represent each character of the text until user thresholds were met (often in 10 user increments). In this way, as more users registered on 'Midnight Chapters', the more the "cipher" would become legible. The text would fully unscramble once 200 users registered on the site.

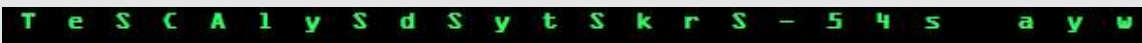


Figure 58: The 'Far from the Madding Crowd cipher' as it first appeared

As a result, the players now had to recruit more players in order to obtain the name of the new book in the puzzle. However, this recruitment process was rewarding only to the current active players, as new players had to be informed of the game narrative and gameplay after registration on 'Midnight Chapters'. To give these new registrants a task to complete upon registration, a new puzzle was devised utilising the content from the earlier Twitter puzzle that had been abandoned (see 4.3.2.13).

5.2.3 The 'Who is' riddle puzzle

This puzzle represents an altered version of the puzzle discussed in 4.3.2.13. Upon a new registration on 'Midnight Chapters', the new registrant (and only each new subsequent registrant) was greeted with a new element on the blog page of the website (seen in

Figure 59). This element was a black box asking a single question: "Who is [strange name]?"



Figure 59: The 'Who is' riddle

The strange name presented in this question was the anagrammed author names used for the Twitter accounts in the original puzzle. Once solved, players would input the author's correct name and answer the riddle. Once the riddle was answered by a specific user, a post in the forum thread '#thoughtsdream' would be made on that user's behalf. The content of the post would be a quote, evidently made by the author who was the answer to their riddle, discussing their visitations from a strange man.

This interaction hoped to be an additional rabbit hole for new players that would encourage them to engage with the game. It was designed to encourage similar curiosity that the 'Ana's presentation' event was meant to engender, as well as make new players feel as if they were immediately contributing to the game in a meaningful way. In this way, new players had a specific task to complete (unscramble the anagram and share the answer) that existing players did not have access to. This hoped to further support the growing community that the 'Far From the Madding Crowd cipher' puzzle aimed to introduce into the game system.

However, despite these new puzzles, 'Midnight Chapters' struggled to see new registrations. However, one answer to the 'who is' riddle led the players to Anthony Burgess, best known for writing *A*

Clockwork Orange (1962), a book included in the pilot's primary puzzle (see 4.3.2.11). This allowed the players to complete most of the second half of the pilot's puzzles, though they were still missing the books from the lists found in the middle of the puzzle (the alphanumeric solution to the puzzle, "N 423 OXFORD", to the players spelled out "N 423 ORD").

In terms of narrative, though this was unbeknownst to the players at the time, the entire puzzle had to be completed to represent a completed "memory" of The Nomad. Thus the design team chose to force the players to still complete the middle section of this puzzle. They could only do this once the required 200 users had registered to unscramble the 'Far From the Madding Crowd cipher', which would then lead them to the last three lists of books and the full collection number for the *Oxford English Dictionary* (Simpson, Weiner & Oxford University Press 1989). In an attempt to hasten this process, the design team once again placed a timer on the blog set to expire the following Thursday, hoping to enact live event 2, described in 4.3.2.15, as this date was already a week later than when the pilot was planned to have been completed. The timer was accompanied by an emailed warning sent to Ana and shared with the players that explained that the players were running out of time. If they failed to recruit enough players to unscramble the cipher and finish the puzzle (by, in turn, finding the picture pieces in the dictionary), a phone would not ring.

The players did not, however, manage to complete the puzzle in time; but it was decided to provide them with a minor reward on the evening in order to keep the players engaged with the game. Only a single player arrived at live event 2, at which a single payphone outside the library rang. On the other end of the line was a recording of The Nomad, clearly in distress, but not divulging any information (as he would have, had the players completed the puzzle) before disappearing back into the time stream and ending the phone call. This was accompanied by a further message from The Messenger instructing the players to save the man on the phone by finishing the recruitment process and completing the puzzle. He additionally mentions that this man, because of their failure, may now be "forever changed", warning the players to no longer waste any more time.

Holding steadfast to the design team's request for more players, even whilst the current player community was failing to recruit new players, is possibly the most questionable design decision made during the pilot of *Nomad*.

However, this was done for multiple reasons. The pilot acted as a version of the full game of *Nomad* that could be used to gauge the interest of potential target audiences for the full game proper. In this case, the larger the pilot study's player community, the larger the game proper's community could become when players from the pilot also played the game proper.

The emphasis on community within the pilot study also attempted to foreshadow the game proper: here, completion of the pilot's primary puzzle was disallowed prior to player recruitment. The

completion of the puzzle and resulting reward (the completed photo of The Nomad) narratively explains subsequent game events. This is discussed above. The photo of The Nomad serves as a “memory” of The Nomad. This “memory” acts, in a narrative context, as a temporal beacon which allows The Nomad to make contact with the players in live event 2. Within a ludic context, a large and active community was noted to be incredibly important in preliminary iterations of the game proper, with some puzzles (as discussed in 4.4.3.4) needing large groups of unique players to complete the puzzle. The design team felt that beginning to engender this within the pilot would be more beneficial than having to create an entirely new community for the game proper.

The pilot also attempted to gather qualitative data on the effectiveness of a game-based learning application running parallel to traditional education within the same field. It would be difficult to parallel the game’s outcomes to those of AIM 121 if the player community did not include players who both played the game and were registered for the module. The game proper sacrificed this ability for direct correlation for reasons discussed in Chapter 6.

After the “failed” live event, the design team developed a new puzzle in an attempt to galvanise the existing community of 50 ‘Midnight Chapters’ registrants.

5.2.4 The photo segments puzzle

In order to allow for newer players to engage with the game, the design team decided to alter the final stage of the pilot’s primary puzzle (4.2.3.11). Originally, players would find segments of the photo of The Nomad by repeatedly visiting the dictionary (the last book in the puzzle). Instead, only the final segment of the photo was found in the dictionary (at this point players still had to complete the middle section of this puzzle to reveal the collection number). Additional segments could now be found in 40 new books, bring the total number of books used in the puzzle from 46, as initially planned, to 86.

To find these 40 books, each registered player was sent an email with a single book name. Due to the number of registrants on the site, however, there were book names that were emailed to two different players.

This puzzle attempted to galvanise registrants on the site by providing them with personalised clues, and thus, individual activities that, together, would further completion of the puzzle as a whole. This attempted, once more, to engender community by having players share their individual clues on the forum and other communication channels. It was the players’ responsibility to coordinate how, where and when to reconstruct the photo.

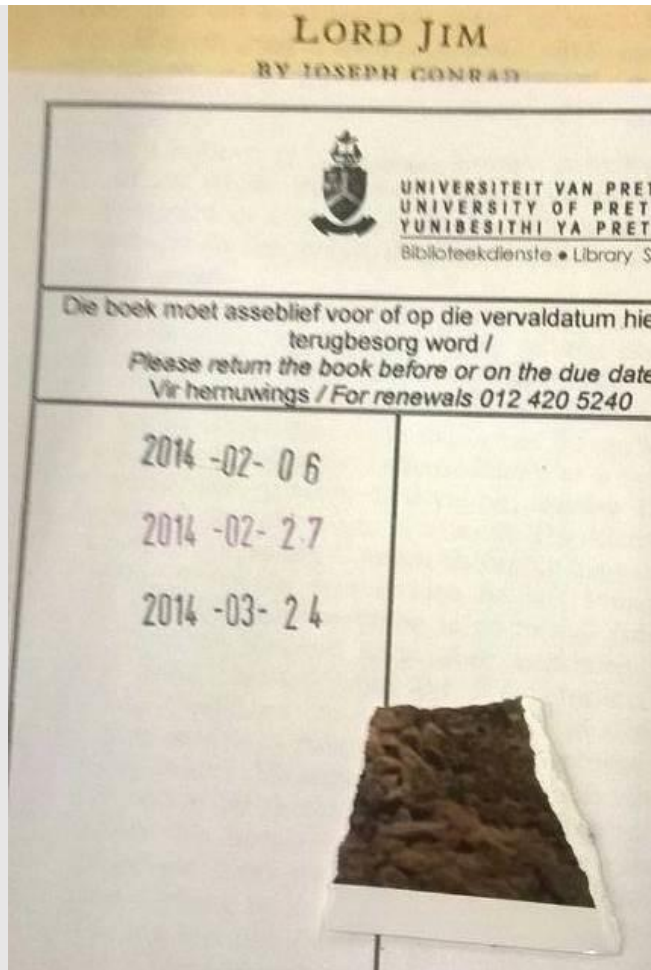


Figure 60: A segment of the photo in *Lord Jim* (Conrad 1900)

Once the puzzle was released to the players, after some initial sharing of book names on the forum, the unexpected happened. One active player, instead of waiting for other players to share book names as the puzzle was designed to support, went to the library and began searching through multiple books, chosen presumably at random, within the English Literature section of the library, as this section was the section primarily used in all the pilot puzzles (to provide a narrative link to The Nomad’s historical influence of authors during his travels). This player, and their potential motives for playing the game in this way, is discussed in more detail later (see 5.3.2.3).

In doing this, this player found approximately half of the books used in the puzzle and their related photo segments. His/her progress is shown in Figure 61. The player additionally discovered two books wherein the book lists containing the “X” and “F” characters were placed. In doing this, the players had now discovered the partial collection number “N 423 XFORD”, and were only missing the “O” found originally in *Going Solo* (Dahl 1986) that was now found in *Far From The Madding Crowd* (Hardy 1874), which they had yet to uncover via the unscrambling cipher puzzle. The player took the initiative to then

start to assemble the photo, placing it in one of the earlier books in the primary puzzle for other players to find.

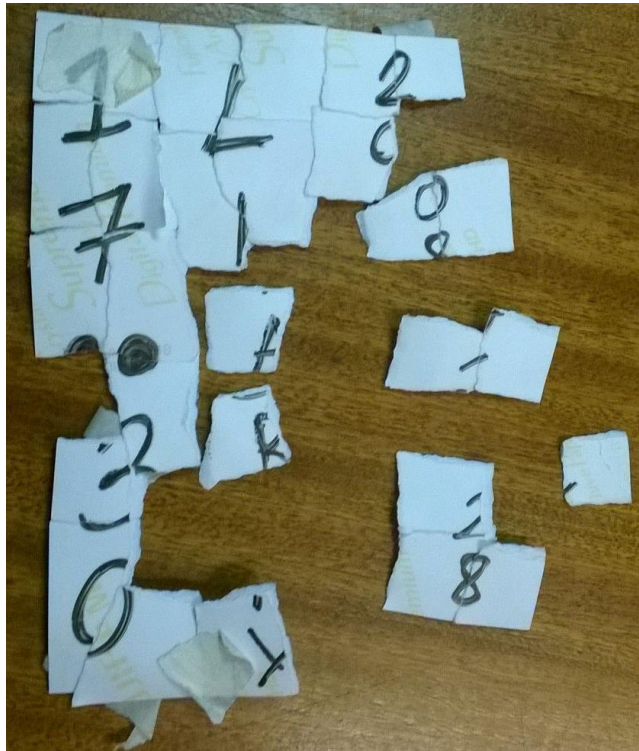


Figure 61: The half-completed photo of The Nomad, as compiled by a devoted player

The unanticipated discovery of the “X” and “F” lists above also forced the design team to once again extend the primary puzzle. Whereas these lists would have initially been found when following the clues from the list within the still undiscovered *Far From the Madding Crowd* (Hardy 1874), it was decided the players should receive more game content instead of simply discovering a puzzle they had already completed.

5.2.5 New book lists in *Far From the Madding Crowd*

Because, as mentioned above, *Far From the Madding Crowd* (Hardy 1874) would simply lead the players back to an already solved puzzle, the design team extended the puzzle within the book to traverse a different list of books.

As in the primary puzzle, within *Far From the Madding Crowd* (Hardy 1874) was a list of five books. These five books were identical to the ones placed in *Going Solo* (Dahl 1986). However, instead of just one of these books containing the next book list (that leads onto the rest of the now-completed

primary puzzle), three of the other books in the list also contained a book list (four of the five books now contain lists). These book lists, as in the primary puzzle, contain one book that reveals part of a new date, time and location. This date, time and location directs players to an attempted repeat of live event 2.

This puzzle introduces 15 new books, bringing the total number of books used for puzzles in the pilot to 101.

The design team allowed the players a week in which to coordinate the sharing of their book names and completion of the photo. During this week, total registrations on the website doubled in number, likely as a result of existing players attempting to actively recruit new players per The Messenger's request. As registration on 'Midnight Chapters' increased, new registrants would be sent their own email with a book name to immediately allow them to participate in the photo segments puzzle. The 'Far From the Madding Crowd cipher' was revealed by the design team once user registrations surpassed 150 users, instead of the planned 200 users, as a reward for this active player recruitment by the existing community. These new registrants, however, often did not interact with the existing player community, as this interaction was voluntary.

The players quickly discovered the new book lists that followed the revelation of *Far From the Madding Crowd* (Hardy 1874). However, during this time, player participation from the active player group slowed drastically. This meant that the players did not find the date and time for the attempted repeated live event. The time for the event was eventually revealed by a member of the design team who was planted within the community.

In an attempt to galvanise the players once again, the design team sent emails to each of the game's most active players. These emails contained five book names from the photo segments puzzle. However, these emails seemed to be largely ignored. This led the design team to reveal the entire list of books via email to the same players. This led the players to begin coordinating regarding how to divide the work of finding each book in the list.

Progress in completing the photo segments puzzle was still slow despite the players being provided with the majority of the solution. This led the design team to placing a timer prominently on 'Midnight Chapters', blocking off all other interaction with the website. The appearance of this timer made it clear that the photo segments puzzle needed to be completed before the timer expired.

As the timer's expiration approached, player communication across the player-created channels was still sparse. It appeared that the active players had largely abandoned the game. Additionally, the pilot had now been actively running for six weeks – three times longer than anticipated. For these reasons – the

lack of player participation, lack of participants and the pilot's overlong running time – it was decided that the pilot should be terminated to protect the integrity of the narrative and ludic experience of the game proper.

Once the timer expired the players congregated at the library under the assumption of a live event. After waiting for a while, they entered the library in an attempt to complete the photo segments puzzle. It was at this point that members of the design team revealed themselves to the players. The team explained the concept of *Nomad's* gameplay and invited the players to participate in the game proper the following year. The players were upset that the pilot had to conclude, but expressed desire to participate in the game proper.

5.2.6 Pilot Study Diagram

The following diagram is a visual representation of the pilot study. Each black circle within the diagram represents a milestone in the planned design of the game, with black arrows plotting the planned game course (as detailed in 4.3.2). Each red circle represents an event or design decision that occurred during the run of the pilot study. Red arrows indicate how these decisions and events relate to other dynamic events as well as the planned design.

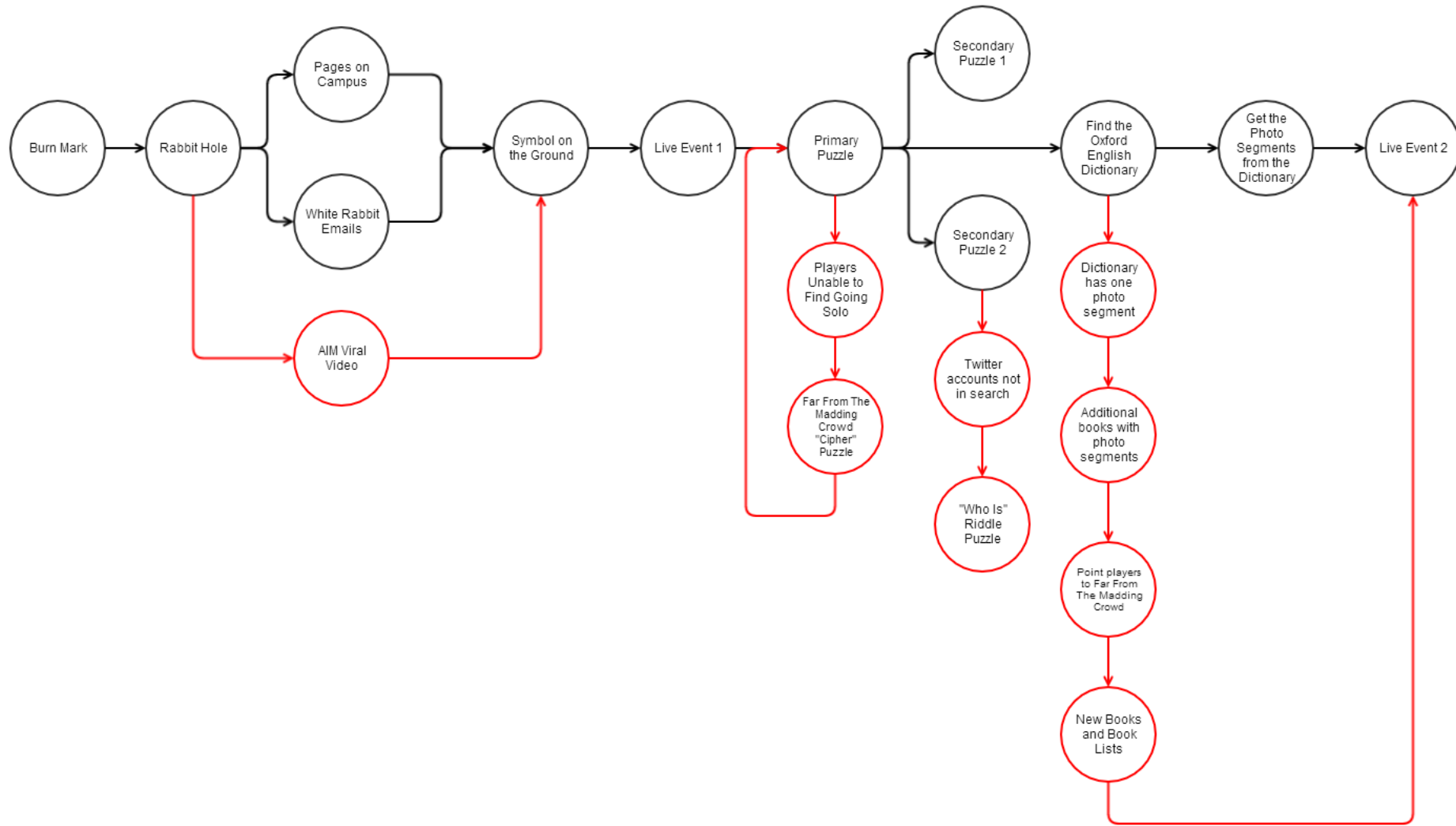


Figure 62: A Diagram of the Pilot Study's Run

5.3 Results and Analysis

The following section documents the results from the pilot study as gathered through document analysis, questionnaires, focus groups and non-participant observation, as noted in Chapter 3. For qualitative opinions, there was one “active player” focus group with two participants from an identified active player group of five players during the pilot. Both of these players also completed the questionnaire.

Through constant comparative analysis (Pickard 2013:269–272), categories and subcategories were derived from the data, and the relationships between them established in an attempt to discover how the players of *Nomad*’s pilot experienced the game. This perspective is important, as the player experience of the *Nomad* ARG is of pivotal importance when answering this dissertation’s main research question. The categories and subcategories below represent the categories discerned from the axial coding stage during the constant comparative analysis, with category-specific results being discussed in each section.

5.3.1 *Player Understanding of the Game*

The following sections discuss the player understanding of the pilot study as a game and an ARG.

5.3.1.1 *Perceived Legitimacy of the Narrative*

Part of the pilot study’s success, as mentioned in 4.4.3.2, relied heavily on the believability of the game’s actors, as well as the characters they played. Based on Ana’s interactions with the pilot’s target audience, the AIM 121 students, it can be suggested that Ané Steenkamp’s portrayal of Ana Kirlitz was successful. This can be seen through multiple data sources.

When considering the individual interactions that students had with the character via email, it can be seen that students often seemed to regard Ana with the same respect as they would give a member of the University of Pretoria’s staff, given the formal tone of emails that were sent to her email address. In addition, because of Ana’s introduction to the students within the AIM 121 lectures during the game’s rabbit hole, some students assumed that she had an association with the AIM 121 module, often asking her AIM-related questions, such as whether or not “the mystery [was] for marks”, apologising for missing AIM 121 lectures and asking for clarification on potential module assessment opportunities.

Additionally, students seemed to naturally assume that whatever the pilot was, it was associated with the University of Pretoria in some way, despite the lack of corporate branding on ‘Midnight Chapters’. During the game, players provided Ana their email addresses to presumably help with the study she was conducting via the completion of physical and digital forms. Students in the lecture venues provided

these details because they likely felt this was compulsory. However, a great deal of email addresses (around 400) were provided to Ana (and, by proxy, the design team) via the digital form as well. The link to the digital form was provided to the students via AIM 121's ClickUP module and was explicitly noted as a voluntary action.

Through these avenues about 900 email addresses were collected, and later used in mailing lists to deliver students game related content (see 4.2.3.8). Of interest, many of these email addresses were University of Pretoria-provided student email addresses. This is possibly because students believed (as they should have, provided the narrative was believable) that Ana's study was related to the University of Pretoria.

A similar trend was seen when considering the usernames the students registered with on 'Midnight Chapters', along with the manner in which they presented themselves on the forum. Often, usernames were the assumed University of Pretoria student numbers of the student who registered the account. However, in the interest of protecting anonymity, this was not verified. Additionally to this, in the "about" field of the registration form, registrants of 'Midnight Chapters' could give themselves a short title to be presented under their username on the game forum. Often, this "about" section, instead of describing a personality trait, described what degree the user was studying at the University of Pretoria, what year of their studies they were in, or both. This suggests the conclusion that students, despite *Nomad's* use of the "this is not a game" aesthetic, related whatever they thought the pilot was to the University of Pretoria.

The way in which Ana's questionnaire regarding the effectiveness of information literacy instruction was handled by the players also supports this conclusion. This questionnaire, seen in Appendix H and noted in 4.3.2.1 as merely an additional narrative asset that lends credibility to Ana's research blog, was not intended for data collection for the study and, as such, is not examined in this analysis. It must be noted, however, that eight responses to the questionnaire were recorded within the website database. This suggests the legitimacy of Ana's research blog as a digital narrative asset.

This legitimacy is further supported when considering the Google Analytics log of Ana's research blog. Geographical demographic data here states that two unique visitors on Ana's blog were from Kenya. This anomaly is repeated within the 'Midnight Chapters' logs, suggesting that these visitors found Ana Kirlitz's blog, presumably thought she was a legitimate researcher and followed her narrative plea to 'Midnight Chapters'. There is the possibility, however, that this may have been a "crawler" – an indexing robot for search engines. As such, no further user data supports this hypothesis.

Despite the legitimacy surrounding the character of Ana Kirlitz, however, her research blog was an underused game asset, as it existed simply to provide context to Ana's character and background. As such, the website was only visited by 26 unique users a total of 59 times, often for short periods of time

(around 10 seconds per page view). This, however, is not a problematic result, as the site was merely intended as a gateway to ‘Midnight Chapters’ that additionally provided narrative exposition for Ana’s character.

Lastly, a discussion of legitimacy must be had surrounding another game asset: the AIM viral video discussed in 5.2.1. At the time of writing, YouTube’s inbuilt video analytics noted that the video had received 265 views from geographic locations such as South Africa, India, Taiwan, Canada and the United States of America. Most of these viewers watched an average of 79% of the video (about 50 seconds of the one-minute video). As with the earlier Kenyan anomaly, the geographic demographic data is puzzling. One must assume that interested parties (who were not directly linked to the video) watched the video due to its appearance in search results even though, external to the game context, the content of the video is almost nonsensical. The average viewing time can possibly be more easily explained. As a most of the video’s views originated from South Africa, these viewers were likely AIM 121 students who were exposed to the video link directly and were curious as to whether or not the video would provide more game exposition. It is unfortunate to conclude, however, that given a mere 265 views, the video did not have the “viral” effect the design team had anticipated, and it was an unsuccessful asset to use in introducing potential players to the *Nomad* pilot as a game.

5.3.1.2 *Down the Rabbit Hole*

Due to *Nomad*’s small player community, details regarding how players discovered the game and began to play is sparse. The two players from the pilot’s focus group were introduced to the game via the presence of the loose book pages (see 4.2.3.5), the clues hidden in The Messenger’s first email to the students (see 4.2.3.8), or the multimedia displayed on ‘Midnight Chapters’ (such as the AIM viral video and photos of environmental narrative assets). Additionally, players on the game forum implied their entry point into the game by the way they interacted on the forum, where their first post would provide readers of the forum context to their participation. Examples of these include the sharing of book names for the photo segments puzzle (see 5.2.4) and asking questions on the ‘#thoughtsdream’ thread about the ‘who is’ puzzle (see 5.2.3). In these instances, players would ask about game assets, puzzles or events, but did not often interact with the forum or the game after this initial discussion.

This suggests that the game failed somewhat in developing a community and keeping that community engaged. Possible reasons for this failure are discussed in detail in 5.3.2. Because only active players were invited to complete the pilot’s questionnaire and participate in the pilot’s focus group, there is no evidence within the gathered data to suggest why other students who experienced aspects of the pilot did not “go down the rabbit hole” and begin to play the game. Previous research suggests that, when targeting educational groups, designers must be wary of the fact that the targeted group may not participate in voluntary game-based learning projects due to external factors such as time, personal preference and other responsibilities (Moseley et al. 2009; Piatt 2009; Whitton 2009a; Bonsignore, Hansen, et al. 2012).

5.3.1.3 *Understanding Nomad as a game*

The communal understanding of the pilot study as a game of some sort varied within the target audience. Initially there seemed to be a fair amount of confusion. On a few occasions, students on the mailing lists (see 4.3.2.8) would reply to The Messenger's initial email asking him what the email was regarding, simply expressing confusion ("what is this?") or even hurling insults at the character. This was rare, however, and most students simply ignored the email or unsubscribed from the mailing list. These were, nonetheless, interesting first interactions between the character of The Messenger and the targeted community.

However, individual users on 'Midnight Chapters' had a wider range of reactions to game content. Due to these users being active on the forum, it can be assumed that they read at least some of the game content. Due to this, their awareness of the ludic nature of *Nomad*, even if they did not understand exactly how to play, was likely higher than non-registered visitors.

Responses concerning their level of understanding of the pilot study as a game, however, differed vastly. Users who posted the least (only posting a few times during the game run) often posted to ask for help from other players, or to express an opinion regarding the mysterious aesthetic of game events (such as "my friend is really scared about what happens at the end of the [timer] countdown"). This suggests that, while they may have been somewhat aware that the pilot study was a game, because of a lack of awareness regarding the ARG genre, they were unsure how they should play the game.

There were small groups of players who were seemingly mostly active on 'Midnight Chapters', but who did not attend live events and were not present on player-created communication channels. These players interacted with 'Midnight Chapters' and the pilot study as a game briefly, but intensely for these short periods.

These groups were often more aware of the ludic nature of the pilot study than the group discussed above. One such group, early during the pilot's run, suggested that the pilot study was somehow related to students studying IT. This opinion was likely informed by the fact that previous ARGs on campus were run by the Multimedia students (de Beer & Holmner 2013). This community noted that the game's mysterious aesthetic was "very ARG". Another community, during the photo segment puzzle, got very involved attempting to coordinate the finding and compiling of photo segments in the books. One player even emailed Ana to offer their solution to the 'who is' riddle puzzle (see 5.2.3), along with a theory on what the quote they received meant by referring to text within one of the author's works. They also suggested a way to brute force the 'Far From the Madding Crowd cipher' puzzle detailed in 5.2.2 (by registering multiple new user accounts).

These groups, as such, despite their brief interaction, seemed to be actively playing. However, as mentioned, they were only active for short periods within the game run, and presumably stopped playing prior to the end of the pilot. This once again highlights a possible problem with community engagement which will be discussed later (see 5.3.2.4).

Ana's actress, in character as Ana, stated "let the game begin" early in the log of a player-created communication channel used by *Nomad's* most-active player group. While this may have been an offhand comment, it has potential implications for that player group's understanding of the pilot study as a game. This is because the suggestion by a game character, even offhandedly, threatens the integrity of the "this is not a game" aesthetic.

This active player group seemed, from the beginning, to be very aware of *Nomad's* ludic origins. The active players who provided data for the pilot's focus group and questionnaire noted that they were both "very aware" that the pilot was a game. Early in this community's conversation they began to hazard guesses as to what the pilot was and who was behind it. Specific details of these theories are discussed in 5.3.1.1.

A large amount of discussion within this section notes the degree to which players understood the pilot as a game. Results show that mostly, at least on some level, players were aware of the pilot as a game despite adherence to the "this is not a game" aesthetic. While this could suggest failings regarding *Nomad's* implementation of the TINAG aesthetic, it more likely simply confirms what is mentioned within the literature: players are aware that an ARG is a game (Stenros et al. 2011). It is the job of the TINAG aesthetic to allow players to believe that the game is, in fact, not a game (McGonigal 2003a). Its success in this regard is discussed next.

5.3.1.4 *Understanding Nomad as an ARG*

Inevitably, the collective community's understanding of the pilot as a game evolved into an understanding of the pilot as an alternate reality game. Early in the pilot study's run, a player on the player-created communication channel stated outright that the pilot was the Multimedia students' ARG for 2014. He supported this statement by directing the players to the Wikipedia article on alternate reality games. The same link was posted on the 'Midnight Chapters' forum early in the game by another player. The first player also directed players to a Department of Information Science webpage on the University of Pretoria website. On this page, the players found information on Koos de Beer (the Multimedia package coordinator, a lecturer and this dissertation's co-supervisor) detailing his lecturing of IMY 773 (Multimedia Technologies), denoting that this module was "the ARG project".

The design team attempted to disprove this player discovery by having Ana deny this, first by asking why an ARG would involve her so intensely, and then by telling the players that she had spoken to Koos who

mentioned that IMY 773 was not being presented in 2014 due to lack of interest. The players, however, did not accept either of these explanations. This leads Ana's actress to concede, once again in-character, that it was a game ("[S]o, a game. Sounds fun to me."). This was a mistake on the part of Ana's actress as it directly shatters the illusion presented by the TINAG aesthetic. A game character has now admitted that she is part of a game. Luckily, due to the scope of the pilot, this admission seemed not to directly influence Ana's integrity as a character, but was a problem that needed to be addressed within the game proper.

After Ana's concession, this player group seemed to be hyperaware of their play of *Nomad*. This led to greater self-regulation by the players when one of them breached the subject of the pilot as a game. One player, when this subject was breached, responded with "we know...play the game". As such, a large contingent of this group advocated what they believed was the correct way to play, discussing how player attempts to subvert the game system were counterproductive to the completion of puzzles.

Despite this, as the game progressed it became clear that there was still dissonance between the active player group's understanding that the pilot was an ARG and their understanding of ARGs as a genre. At points, players suggested simply ignoring game characters and their requests. Players also never interacted with the game characters of Renate van Heerden and Trevor Phillips. This may have been because these characters were not pervasive enough within the game's narrative, but suggests that players were not aware that they could interact with these characters.

This lack of understanding often transferred to game puzzles. The active player group, when presented with puzzles that required larger community effort, often became stuck, not understanding that they were meant to collaborate with the larger community to solve puzzles. This may represent a design flaw when considering the clarity of instructions within the pilot that needed to be addressed within the game proper. Addressing this would help to stop players of the game proper from being unsure of their next course of action.

5.3.2 Player Community

The following sections discuss the player community, including the target audience, the player groups and why the growth of the community within the pilot study was not as effective as was hoped.

5.3.2.1 The Target Audience

Nomad had a large initial target audience due to the decision to directly target students registered for the AIM 121 module. As such, *Nomad's* initial rabbit hole was designed to target the approximately 2500 students registered for the module. This target audience was potentially expanded by the presence of environmental narrative assets throughout the run of the game (specifically 4.3.2.7, which directed

potential players to the first live event, and was present in various locations on the University of Pretoria's Hatfield campus) as well.

Of this initial large target audience, about 900 students provided their email addresses to Ana via her physical forms during the rabbit hole or the digital form that was advertised to the students through an announcement on the AIM 121 ClickUP module. These 900 email addresses formed the mailing list used in 4.3.2.8. Of the 900 emails sent to students on this mailing list, about half of them were opened. 40 students who opened the email followed a link in the email to 'Midnight Chapters'.

Analytics placed on 'Midnight Chapters' suggest that through the advertising of the website via the mailing list and announcements, 692 unique visitors visited the website, resulting in 6115 page views for the domain. Of note, these sessions were longer than those registered on Ana's research blog. In this regard, Ana's research blog may have been ineffective as a hub website, garnering only 40 sessions, only 9 of which potentially lasted long enough to lead users to 'Midnight Chapters'. This showcases an expected drop in engagement, but suggests that at least some users may have been led from the research blog to 'Midnight Chapters' (an illustration of which can be seen in Figure 63).

'Midnight Chapters' sessions lasted for about five and a half minutes on average, with visitors reading Ana's blog posts (181 sessions began with the expansion of a blog post to view the full text) or visiting the forum (77 sessions led visitors to the forum). Of note, similarly to the geographic anomalies on Ana's research blog, analytics suggest that 'Midnight Chapters' was viewed by users from the United States of America, United Kingdom, Holland and Kenya; as well as the anticipated South African visitor contingent. While some of these recorded hits may, as with Ana's research blog, simply be crawlers, the presence of less surprising countries in this list may suggest genuine accesses.

Of these 692 visitors, the site registered 224 users. An estimated 210 of these were unique player accounts not related to game characters or the design team. 36 of these unique users contributed to the game forum, though the activity level of these contributors varied. Analysis of the forum and other player-created communications channels estimates that about ten of these unique users were part of the "active player group" discussed next.

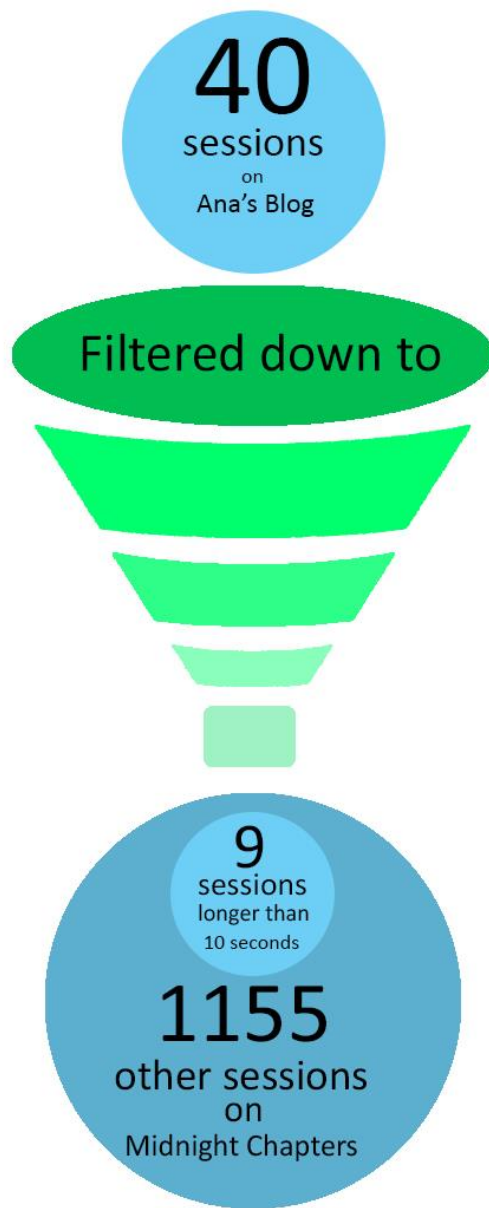


Figure 63: The number of potential sessions transferred from Ana's research blog to 'Midnight Chapters'

As expected, this large initial target audience diminished over the course of *Nomad's* run. This decrease was discussed in Chapter 3 by referring to the discrepancy between target audience size and player community size evident in the ARGs examined in Chapter 2 (see 2.6). Examples of this discrepancy can also be seen when examining the metrics of *Urgent: Evoke* (McGonigal 2010b). This discrepancy exists due to the voluntary nature of the ARG genre: players make a conscious decision to play an ARG, as they do in any game. This is called the acceptance of the "lusory attitude" (Suits 1978:34). A discussion

regarding how to convert a higher ratio of players from being aware of the game to playing it is had in 5.3.2.4. Of additional note, this problem was discussed in detail during the pilot study's focus group.

5.3.2.2 *The Active Players*

As noted repeatedly, the pilot was primarily played by a single "active player" group that consisted of about ten players. Each player's involvement within the group and the game itself fluctuated during the game. This group of players was incredibly close, and knew each other personally from their participation in solving game puzzles and participating in the live event.

However, this closeness was often portrayed during private group communication (discussed in 5.3.2.3) as elitist and exclusionary. The player group, most of whom were not registered for AIM 121 (having presumably discovered the game through its environmental narrative assets) discussed an initial desire to actively exclude the target audience when it was mentioned by one player that the rabbit hole occurred during AIM 121 lectures. The player group felt that first year students were potentially not mature enough to understand the game genre, narrative or the game's educational undertones. This is exemplified by the below quote, taken from an exchange on the player-created communication channel:

Player 1: Can't believe people get to study this stuff... It's awesome. Well, if they want to enlarge their sample size, they'll have to rerun the [rabbit hole]... Also, was aimed at first years, we [probably know all these things]

Player 2: First years are generally boring party animals. Leave this to the slightly more mature I say.

Player 1: Well, if they cared, yes. But they don't care. AIM, as a module on its own, has failed to inspire curiosity and a thirst for [knowledge]. We only know how important knowledge is, because we use it for long term application rather than short term exam-cramming.

It is possible that this perspective led the player group to portray the community as a whole as unwelcoming. Blog posts by Ana on 'Midnight Chapters' asking new members to introduce themselves, a decision made to try and foster community, were often ignored by the active players. Because of the lack of participation on these blog posts from the existing community, new players may have been too shy to introduce themselves.

This elitism continued throughout the community-fostering puzzles that were a defining characteristic of the pilot study. When initially faced with the 'Far From the Madding Crowd' puzzle, the active players on the IM group (discussed in 5.3.2.3) complained, noting that "it's not [their] problem if only [they] want

to play the game”. This sentiment was echoed during the pilot’s focus group when one player mentioned that puppetmasters should run ARGs for the people who want to play them, no matter how few. This observation holds merit when considering the outcome of ARGs to be the unique player experiences they engender. However, it is sometimes difficult to justify running an ARG for small player groups due to the large amount of asset creation, monitoring and dynamic design required by the genre. The large scope of ARGs due to these components is discussed in 2.4.2, and can be seen in Chapter 4 when considering the degree of content that was designed for both the pilot and the game proper prior to their eventual implementation and run.

The active players resented that the game would not progress should they choose not to recruit players. When new players did register on ‘Midnight Chapters’ once the photo segments puzzle (see 5.2.4) was implemented, the players considered it to be “losing a clue” if a book name was sent to players who were not a member of the player-created communication channel. This puzzle was designed to get the entire community to actively use the game-provided channels (‘Midnight Chapters’ blog and forum) to share this information, which the active players, up to that point, had avoided. Throughout the game, Ana had to remind the players to update the rest of the community by reiterating private discussions on the forum. The active players seemed to concede in this regard during the photo segment puzzle, actively attempting to get other players to share their book names from the puzzle on the forum, and collaborate the reconstruction of the photo.

This section attempts to describe the general mentality of the active player group. Due to the evidence presented, there is the potential to vilify this group for potentially ostracising the intended target audience. However, as noted within the literature, this kind of player group (players who participate in “power plays” – the real life components of ARGs) is important in ARGs (McGonigal 2007b). As “hardcore players”, they drive the narrative and gameplay of the genre forward at a constant pace (Thompson 2006). However, their devotion to the game could be construed as excessive to less active player groups, such as casual players or browsers, who are often more hesitant to interact with the game (Thompson 2006). The presence of “hardcore players” as a specific player type that are inclined towards the play of ARGs was also discussed at length during the pilot’s focus group, and is discussed more in 5.3.2.4.

Because “hardcore players”, or “devotees”, participate largely in the real-world components of ARGs, they can also be called “power players”, because of their participation in what McGonigal (2007b) calls “power plays”. While the majority of the active player group were “power players” when considering the Whitepaper’s definition of a “hardcore player” or “devotee” (Thompson 2006), only a single member of this active player group is referred to as “the power player”. This player is called “the power player” for two reasons. Firstly, the player was more devoted to the play of the pilot than the rest of the active player group. Secondly, the player attempted to play the pilot “powerfully” (hence the term “power player”). This player seemed to, at times, want to force (using their “power”) and manipulate the game system to conform to their will. This kind of player, it was observed, presents a problem to

ARG designers. As McGonigal (2007b) notes, once a power play is “live”, control of the power play concedes from the puppetmasters to the players. As such, great care must be taken to still provide the players with an enriching, designed experience. How the design team dealt with the “power player” during *Nomad*’s pilot is discussed in 5.3.2.3.

5.3.2.3 Communication Media

As mentioned above, the active player group often chose not to engage with the rest of the community on the ‘Midnight Chapters’ blog and forum. This is likely because, during the game’s first live event (see 4.3.2.10), the players created a private mobile instant messaging group that they named, aptly, ‘Down the Rabbit Hole’, a reference to both *Alice’s Adventures in Wonderland* (Carroll 1865) and the term “rabbit hole” as it is used in ARGs. In ARGs it is common for players to create their own content and communication channels that they feel best supports the manner in which they choose to play (McGonigal 2008; Bonsignore, Hansen, et al. 2012). As such, this decision, whilst unexpected, was not seen as peculiar by the design team. To allow the team to read the conversations had by the players within the instant messaging group, Ana’s actress and member of the design team masquerading as a player (a “plant”), both joined the group.

Of note, this mobile discussion forum (hereafter referred to as “the IM group”) contained very little non-game-related discussion by the players. This suggests that the players employed the lusory attitude (Suits 1978:34), even when communicating through player-created channels. Additionally, they self-regulated discussion within the IM group to engender proactive discussion.

This proactive discussion largely revolved around player theories about game elements (puzzles, events and assets), which are discussed in more detail in **Error! Reference source not found.** However, due to the limited use of the player forum by this active player group, these “clue theories” were often slow to propagate from the IM group to ‘Midnight Chapters’ itself, unless posted to ‘Midnight Chapters’ by Ana herself. To combat this, Ana continued to urge players on the IM group to discuss their clue theories on ‘Midnight Chapters’ as well.

The main problem with the existence of the IM group was how it split the player community into the active players who primarily used the IM group to communicate and the players who interacted on ‘Midnight Chapters’. Though Ana and the plant from the design team urged ‘Midnight Chapters’ players to provide their mobile phone numbers via email (to protect player anonymity) so that they could be added to the IM group, only a few players were voluntary and active enough on ‘Midnight Chapters’ to comply with this request. As such, the two groups largely interacted separate from one another. The lack of participation from the active player group on the forum also meant that, once the forum started to become inactive, members of the forum community likely abandoned the game due to a lack of a communication channel to any player group.

Despite the IM group's popularity within the active player group, it, too, was used less frequently as the pilot progressed. By two weeks prior to the end of the pilot, the IM group was largely desolate, with Ana or the plant attempting to prompt discussion, but rarely receiving feedback from the players. It was at this point the design team started to consider termination of the pilot, as the game's active player group was no longer as active. This could be for a variety of reasons. However, the reason cited by the pilot players (on the IM group, in the questionnaire and during the focus group) was the fact that other responsibilities or leisure activities interfered with their play of *Nomad*. This is a problem discussed at length in the literature, and remains a difficult problem for small-scale ARGs, especially educational applications (Piatt 2009; Whitton 2009a).

A solution for this is difficult to suggest. While the schedule of the target audience (AIM 121 students) was considered when planning the timeframe in which the pilot would run was taken into account, this planning cannot account for the personal schedules of every player of the game. The design team attempted to accommodate the target audience by not scheduling major events during busy AIM 121 periods (such as test weeks) or University of Pretoria periods such as public holidays or the lecture recess. However, this consideration was mitigated by the reality that most of *Nomad's* actual player group were not part of the target audience. This problem is discussed below.

5.3.2.4 *The "Problem with Community"*

One of the reasons for choosing the AIM 121 students as a target audience, aside from the paralleling of game content to learning outcomes, was the large potential player group. The design team was aware that this target audience did not represent the study's eventual population, as only a percentage of the 2500 targeted students would potentially play *Nomad*. However, in targeting this large number, the design team hoped that the percentage of players who did play would be large enough to facilitate the aspects of collaboration the pilot was designed to engender.

Unfortunately, this was not the case. As mentioned in 5.3.2.1, only 36 unique players interacted on the game forum, signifying an approximate 1.5% conversion rate from the large target audience. However, one cannot assume that all 2500 registered students knew about the game's narrative for a variety of reasons such as not attending lectures or not using the ClickUP module portal regularly. As such, when considering 36 players from the 900 students who provided their email address for Ana Kirlitz's fictional study, this conversion rate becomes 4%. This percentage is a more realistic estimate when considering the numbers presented by *Urgent: Evoke*, which boasted a 5% conversion rate of targeted players to certified players (McGonigal 2010b). Still, these conversion rates are low when considering *Nomad* and *Urgent: Evoke* as educational vehicles. In the absence of context, to suggest that only 5% of a target audience has effectively learned what an educational ARG aims to teach is likely disheartening.

Attempting to better this low conversion rate is the “problem with community”. ARGs are often developed to be targeted to existing communities, such as how *I Love Bees* was targeted to the fans of *Halo 2* (Bungie 2004), a popular video game (McGonigal 2008). The presence of an existing community suggests the potential for higher conversion rates as the community is already engaged with an element tangential to the game context. Educational ARGs, however, are often not targeted at existing communities, but rather at large groups of people (often students) whose only definitive shared characteristic is that they are enrolled in specific degree programmes.

Using AIM 121 as the module the pilot was targeted to complement meant that the design team could not target specific degree programmes, as AIM 121 is a module that is compulsory for all first year students at the University of Pretoria. As a result, most AIM 121 students are not enrolled in similar degree programmes, even when simply considering AIM 121 students that attend the same lecture. Because of this, the only defining characteristic the design team could assume about *Nomad’s* potential players was that they were in their first year of study. This is not as much a characteristic as it is a categorisation, and thus provided no helpful insights to a potential design approach for *Nomad*.

Because of this, the design team had to attempt to solve the problem of community by first creating a community. This was incredibly difficult due to the voluntary nature and mysterious aesthetic of the ARG genre, as discussed earlier in this section; and was not helped by the context in which game events attempted to recruit players: the AIM 121 module.

As noted by the active players, and reiterated in the pilot’s focus group, first year students often disregard the importance of the AIM 121 module, choosing to rather concern themselves with other responsibilities. During player recruitment for the ‘Far From the Madding Crowd’ puzzle, one player on the IM group echoed a sentiment that refers to the voluntary nature of the ARG genre: “I can make [the first years] sign up, but I can’t make them contribute”.

This quote is typical of attempts to create a community from *Nomad’s* target audience: potential players seemed uninterested in engaging with the game context. This could have been for multiple reasons. While the design team assumed that the mysterious aesthetic of the pilot would encourage people to play, one player from the focus group suggested that this uncertainty scared players into avoiding the game, noting that “[if] weird stuff [is] going on [...] I’m running [the opposite] way”. Some students, when told about the pilot by the game’s active players, disregarded playing entirely.

Reasons for this outright denial were not discussed by the players. Over the course of *Nomad*, the designed puzzles that attempted to engender community failed. This is possibly due to a lack of desire to participate in the game from the target audience, or that the target audience was simply too large or diverse and found the game context uninteresting. This may also be due to a flaw in the puzzles’ designs, whereby new players were not provided enough guidance by the game itself once they initially

engaged with its context. The design team assumed that the existing community would be more active in new player orientation which, as discussed in 5.3.2.2, was not the case.

As such, the “problem with community” is difficult to solve. Players in the focus group suggested more explicit targeting during *Nomad’s* game proper, urging the design team to target specific communities. These communities included leisure readers, gamers (those who play board games, video games and roleplaying games were explicitly mentioned) and ‘nerds in general’. These communities, players reasoned, have a natural predilection for experiences like alternate reality games, as the genre contains elements they are familiar with and already find pleasure in. Regardless of the group to which the game proper of *Nomad* was targeted, the players said, it should not be targeted towards AIM 121 students, as this was a bad choice of audience.

Explicitly targeting the suggested communities in an educational context is difficult, as educational contexts group students not by their leisure activities, but rather by their degree programmes. However, this suggestion allowed the design team to consider a more specific target audience for the game proper. Specific targeting allowed the design team to make inferences about audience characteristics and provide the audience with a game context that was relevant to their interests, given what they were studying. The success of this targeting method is discussed in more detail in Chapter 6.

In conclusion, the creation and maintenance of a community within an alternate reality game remains a problem that must be solved individually by each application within the context of its run, and requires research that is outside the scope of this dissertation. The specific question of why the pilot’s target audience chose not to fully engage with the game has no definitive solution as presented in this dissertation. Instead, a study surrounding an understanding of alternate reality games within a South African player community is left as a suggestion for future research.

5.3.1 Player Interpretations and Theories Regarding The Game

A hallmark of the alternate reality game genre is its fragmented narrative (Stewart 2008) which, often because of this fragmentation, results in the genre’s mysterious aesthetic. As such, players spend a lot of time during the game speculating on the meaning of game assets, narrative fragments and how the narrative of the ARG forms and evolves during the course of play. Some of this speculation involves the construct of the ARG itself, and some speculation surrounds the game’s narrative. This player speculation is discussed in the following sections. It must be noted that “theories” here does not refer to scholarly theories, but rather theories built by the speculation of the players.

5.3.1.1 *Game theories*

Initially, as expected, there was speculation that concerned how the players understood *Nomad*. This links to their understanding of the pilot both as a game and as an ARG (as discussed in 5.3.1).

Early speculation suggested that the pilot was an event held by an organisation called “Midnight Reads”. No clarity was given on this statement from the player IM group, though further investigation suggests that the player may have been referring to ‘Midnight Readers’, a South African blog dedicated to book reviews (Midnight Reads 2015). Following this, players suggested that *Nomad*’s extensive use of books meant that it was a promotion for South Africa’s National Book Week, usually celebrated in the second week of September (South African Government 2015).

Another player suggested that the game, whatever it was, was a test for the players. This test was one of curiosity, where the players were asked by the game whether or not they identified and cared about symbolism.

These theories were dismissed once, as noted in 5.3.1.4, the players understood that they were playing an ARG. While their identification was slightly incorrect (as the pilot was not run by Koos de Beer), their assertions that the game was run by Multimedia students registered for IMY 773 clearly demarcated for the players *Nomad*’s presence as both a game and alternate reality game. One player even asserted that whoever was leaving the clues was female due to the fact that the books used in the game’s puzzles were placed on lower shelves in the library. While this assertion was correct (a female member of the design team helped with clue placement), it was completely coincidental. This shows a great degree of investigation on the part of the players that was unexpected by the design team.

Despite their understanding of the pilot as an ARG, players continued to speculate regarding how they should play the game. As noted in 5.3.1.4, a greater understanding of the game context led players to self-regulate themselves and the group: they wanted to play the game as it was intended to be played, despite the lack of explicit rules. This led to discussions regarding whether the use of specific books within the game hinted at how they should perform in game actions. An example of this is when one player suggested on the IM group that the players might find *Going Solo* (Dahl 1986) if one went to the library to search for the book alone (“Should we go solo?”).

5.3.1.2 *Narrative theories*

Due to an ARG’s fragmented narrative, theories regarding a specific game’s narrative can evolve rapidly and vastly during the game’s run as players obtain new information about the narrative itself.

Initial player speculation on the IM group seemed to see The Messenger (as “White Rabbit”) as the antagonist who sought revenge on Ana Kirlitz by playing “a cruel game with [her]” because of a disagreement they had had in the past. This association seemed to permeate throughout the game for some players: one specific player, as discussed in 5.3.2.3, began to see the game as a personal challenge and seemed to personally disdain the character of The Messenger for not acknowledging the player’s perceived commitment to the game itself.

One player on the ‘Midnight Chapters’ forum suggested that the community needed to examine the game’s narrative differently, noting that all the books that the players had found had “unexpected endings”. As such, the player reasoned that the game’s narrative would somehow differ from what the community expected.

What the community expected, however, vastly differed from player to player. One player on the IM group speculated that the pilot had something to do with Greek culture or mythology due to the supposed presence of Greek letters somewhere in the game context (though no such elements were designed). Others noted that the references in The Nomad’s notes (see 4.3.2.12) to certain historical events discussed the dismantling of dictatorships and oppressive regimes (such as the Nazis in World War 2). Because of this, the players believed they had to begin some sort of revolution or “usher in a new era”.

Popular community theories related to the University of Pretoria itself. This may have been due to the narratives of past ARGs on the campus. These game narratives were often based on local rumours surrounding the institution of the University of Pretoria itself, its buildings or its surroundings (de Beer & Holmner 2013). Similar locally-charged discussions occurred during *Nomad*.

Initially, players believed that University of Pretoria librarians had been involved in the purchase of stolen artefacts or had stolen research. The Messenger, the players reasoned, was trying to expose these crimes. Other theories postulated that the University of Pretoria had been involved in research to aid war efforts during World War 2, but that this research had resulted in casualties. To minimise repercussions, the University of Pretoria attempted to hide this crime, as well as other similar crimes committed by third parties. The players reasoned once again that The Messenger was trying to expose this.

These University of Pretoria-related theories continued when one player discovered that a part-time professor had supposedly been involved in the creation of the architecture department. The University of Pretoria was said to have collaborated with the University of Pretoria of Witwatersrand in presenting their architecture degree programmes, but two years after this professor’s mysterious death during World War 2, the University of Pretoria stopped their collaboration with the University of Pretoria of Witwatersrand. This suggests that foul play may have been involved.

Another “foul play” theory suggested that someone was trying to claim their family heritage, crafted gold jewels, that was buried on an important South African heritage site. A male ancestor of the claimant had his (the ancestor’s) father, a man associated with the University of Pretoria, dismissed from his work in building the heritage site. The claimant felt this unfair, and sought to evidently rightfully reclaim what they presumed to be theirs. This theory displays the ingenuity shown by the player community, who examined this theory in detail. The players supposedly went to examine South African law to discover that content of archaeological sites do not remain within the estates of those who built the site. Instead, if the site had significant historical value, it would be purchased by the South African government, excavated and repatriated if necessary. However true this information is or is not, it is notable that the players discovered it and interpreted it themselves, as this theory was never confirmed by the game’s narrative.

Finally the players caught onto the true narrative behind the game. After compiling The Nomad’s messages, one player noted that all the messages were written in first person, as if The Nomad participated in the events he documented. This suggestion led to a discussion of a possible time travel narrative, with one player explicitly mentioning *Doctor Who* (Moffat & Davies 2005), a popular British television series. *Doctor Who* (Moffat & Davies 2005) did serve as a narrative inspiration for the story of *Nomad*, and as such was an important tangential discovery by the players. Unfortunately, this correct narrative theory was never properly expanded on by the players prior to the pilot’s termination.

5.3.2 Player Participation

The following sections discuss how players participated in the play of the *Nomad* pilot.

5.3.2.1 Understanding the Game System

The game’s player community, upon realisation that the pilot study was a game, successfully understood intricacies of the game system and the puzzles presented them. This understanding extends to new registrants, where 38 players successfully completed the ‘who is’ riddle puzzle (see 5.2.3) aimed at new players.

The players made multiple discoveries about the game, its puzzles and its narrative during the course of the pilot. Players successfully identified that the book pages scattered around campus (see 4.3.2.5 and 4.3.2.7) were from specific books, chosen because of their relationship to books used in the pilot’s primary puzzle (see 4.3.2.11). They also successfully discovered these primary puzzles by utilising the library portal to search for the books’ collection numbers, either by book or author name. Later in the game, with the introduction of the ‘who is’ puzzle, players linked the quotes from the forum posts to the correct anagrammed author name, and searched multiple books written by those authors for game assets. Given the notes left by The Nomad during one of the game’s secondary puzzles (see 4.3.2.12),

one player categorised and identified possible historical events that each note referred to. Additionally, during the photo segment puzzle, players offered the theory that the completed photo acted as the completion of a narrative “memory”. Narratively, the photo acted as a “memory beacon” through which The Nomad could make contact with the players.

Despite this player ingenuity, players sometimes did not understand portions of the game. An example of this was the ‘#thoughtsdream’ secondary puzzle (see 4.3.2.13). The hashtag ‘#thoughtsdream’ was intended to provide a means for players to categorise posts regarding the game on social media. Because this term was a hashtag, it was assumed that players would utilise Twitter when proliferating this hashtag, as the hashtag was first popularised as a categorisation mechanism on this platform. However, this hashtag was not used by the players on Twitter. Instead, the players opted to utilise this hashtag on Instagram, a photo sharing social media platform. This is discussed in detail in 5.3.2.4. Additionally, once this puzzle’s content (the first person accounts of being visited by The Nomad) was encapsulated into the ‘who is’ puzzle, players did not discuss the actual content of the accounts, rather simply focusing on the author of the accounts as a potential clue.

Another example of a degree of misunderstanding players had regarding the game system was revealed through malicious system manipulation (brute-forcing certain puzzles). Certain active players intentionally attempted to manipulate the game system in this malicious manner. While some of this manipulation is expected and encouraged in ARGs (such as viewing the HTML source code to discover the end date of a countdown timer or attempting to find clues to the meaning of the ‘Far From the Madding Crowd cipher’ puzzle detailed in 5.2.2), manipulation of physical puzzles and game assets often disrupted the ability for less-active players to become engaged with the game context. This is discussed in more detail in 5.3.2.3.

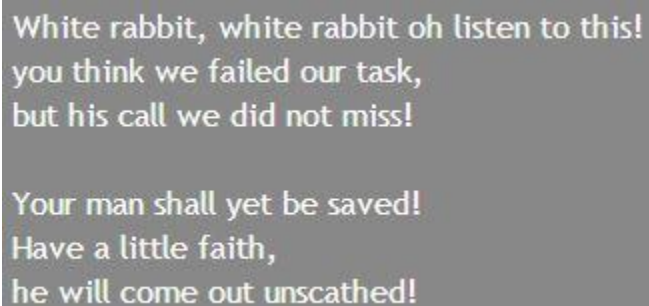
5.3.2.2 *Engagement with the Game System*

A total of 41 user accounts (players, game characters and the design team included) posted 159 comments to 24 topics on the ‘Midnight Chapters’ forum. This suggests that the forum was underused during the pilot.

Some forum threads were seemingly ignored by players, such as threads dedicated to the introduction of new players. This problem was discussed earlier and likely manifested as a result of the active player group preferring their private IM group for game-related communication, as discussed above. The player community also seemed initially reluctant to share information on the forum itself. This, again, may relate to the active player preference to utilise their IM group for information sharing. As mentioned earlier, this exclusivity may have affected how new players viewed the game, due to a lack of use of a shared communication channel (the forum) by the player community. This reluctance to use the forum

was later overcome, specifically during the photo segment puzzle, as players were required to collaborate to find all the segments.

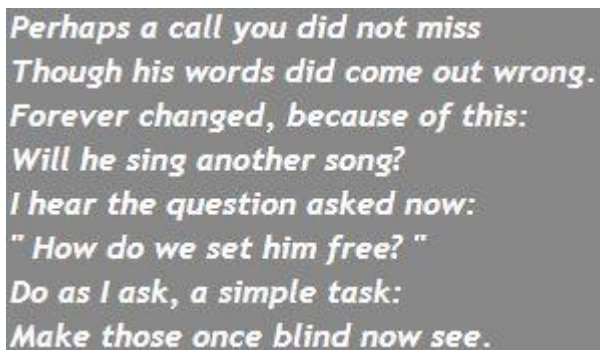
Notably, a degree of content synthesis also occurred during the game. Prior to live event 2, The Messenger warned players that not completing the photo segments puzzle (see 5.2.4) would lead to the players not receiving a phone call from The Nomad. As noted in 5.2, the design team decided to provide players with an alternate version of this phone call. Following this, one player, of their own accord and not related to any game puzzle, addressed The Messenger on the forum by creating their own riddle. This riddle mimicked The Messenger's riddle messages to the players. The player's riddle is shown in Figure 64. This unique contribution to the game suggests that this player was greatly engaged with the game. Because of this, the player was rewarded with a reply to his riddle by The Messenger, as shown in Figure 65.



White rabbit, white rabbit oh listen to this!
 you think we failed our task,
 but his call we did not miss!

Your man shall yet be saved!
 Have a little faith,
 he will come out unscathed!

Figure 64: A player's riddle, addressing The Messenger



*Perhaps a call you did not miss
 Though his words did come out wrong.
 Forever changed, because of this:
 Will he sing another song?
 I hear the question asked now:
 " How do we set him free? "
 Do as I ask, a simple task:
 Make those once blind now see.*

Figure 65: The Messenger's reply to the player's riddle

Player opinions on the game may also suggest potential reasons for the varying levels of engagement observed during the pilot study.

As noted previously, new and potential players were often confused by the mysterious aesthetic that the pilot study presented. This may have led to potential players simply not engaging with the game.

New players were often confused by some puzzles, and would request help from other players. These requests were sometimes ignored or disregarded by some active players, which likely led to more confusion from the new players. New players also expressed fear and paranoia for game elements such as *Nomad's* liberal use of countdown timers. Other new players, however, seemed genuinely engaged in the game context from their forum posts, but did not seem to play the pilot study for a long period of time.

The game's active players often shared their opinions regarding specific puzzles and events during the play of *Nomad*. Specifically, they found the necessity for player recruitment tedious, seeing requests for new players as "increasing the sample size" and a waste of time. This disdain was increased due to the eventual length of the pilot itself, where puzzles were continuously expanded in an attempt to foster a larger community. This length meant that the game began to become boring for the active players towards the end of the pilot. These factors – the necessity for recruitment and the length of the game's puzzles – demotivated the active players in continuing to play *Nomad*. Another demotivating factor for the "power player" discussed in 5.3.2.3 was the game's use of what he/she perceived to be "red herring" clues. The "red herrings" he/she refers to are puzzles that were not completed by the players (such as the photo segments puzzle in 5.2.4), or puzzle elements, such as the use of *Going Solo* (Dahl 1986) in the game's primary puzzle, that were later abandoned due to design team oversights. Additionally, this player group was understandably upset when the pilot was terminated due to the lack of in-game closure they received regarding the narrative.

These opinions (of potential, new and active players alike) help inform an observation of the overall player engagement in *Nomad*. This notion is further discussed when considering the game's successes and failures in 5.3.3.

5.3.2.3 *The "power player"*

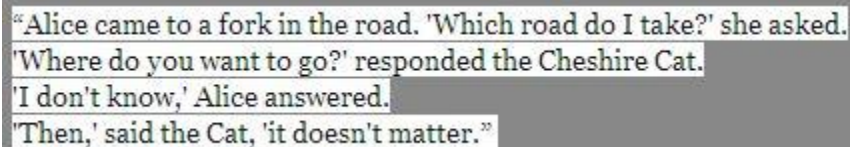
As noted in 5.3.2.2, the presence of the "power player" in the pilot study was precarious for the design team. The participation of such a player is desirable in an ARG due to their presence and actions within the game helping to drive the game forward (Thompson 2006). However, as noted, "power players" can overwhelm small or unprepared design teams (Thompson 2006). This occurred during the pilot study to an extent. The design team had to carefully deal with the "power player" in order to succeed in the delivery of the designed experience of *Nomad*, and not that of the "power player's" will (McGonigal 2007b). This narrative of power player/design team interaction continued throughout the play of the pilot and is described below. The "power player" is referred to below as "Player X".

Initially, the design team noticed Player X during the game's first live event. During this event, Player X noted that he/she had entered into the game after being handed a book page (from 4.3.2.7) by a stranger and being told to "go down the rabbit hole". This was not a designed event, but did seem like a

plausible emergent narrative within the game context. As such this explanation was accepted by the players and the design team.

Player X's initial interactions with the game were similar to that of a traditional "hardcore player" (Thompson 2006): driving discussion, solving game puzzles and pushing the narrative forward. Player X's first interaction that warranted a careful consideration by the design team was his/her creation of a new username on the forum named "THE MASK". As "THE MASK", Player X impersonated The Messenger, known to the players as "White Rabbit", by posting "HOP HOP HOP" on existing forum threads.

Why Player X did this was unclear. However, the other players noticed and mentioned this "new clue" on the IM group. Next, THE MASK posted a section of text from *Alice's Adventures in Wonderland* (Carroll 1865), pictured in Figure 66. The players assumed this was another legitimate clue from The Messenger. In this way, Player X, despite his/her disdain for "red herring" clues noted in 5.3.2.2, began to seed false clues within the game. Again, Player X's motives for this were unclear. The player may have been seeking recognition from the puppetmasters by demonstrating that they understood and engaged with *Nomad's* literature-based gameplay, exploring the game's implicit boundaries (due to the lack of an explicit ruleset in the ARG genre), or participating in the game context in a way he/she found enjoyable. Additionally, the selection of the specific passage may have been intended as a message to the game's puppetmasters.



"Alice came to a fork in the road. 'Which road do I take?' she asked.
 'Where do you want to go?' responded the Cheshire Cat.
 'I don't know,' Alice answered.
 'Then,' said the Cat, 'it doesn't matter.'"

Figure 66: Text from *Alice's Adventures in Wonderland* posted by THE MASK

However, Player X's posting of the false 'Alice' clue prompted the design team to take action. The design team noticed that the email address used by THE MASK was the same as that of Player X. The design team used this information to send Player X an email as The Messenger, warning him/her of the consequences of impersonating him. Additionally, the design team changed THE MASK's username to THE FRAUD to signal to the players that THE MASK's clues were false. As such, Player X was acknowledged by the game's puppetmasters, despite being reprimanded by them.

Player X shared The Messenger's email on the IM group and, when prompted, seemed to lie to the players. Player X stated that someone named 'Said' had emailed him/her and, when Player X replied to the email, 'Said's' email username changed to Player X's name. Player X went on to say that The Messenger had incorrectly identified him/her as a troublemaker. Player X, however, ignored players who asked him/her to share the email the player had received from 'Said', which suggested that this player story was a fallacy.

Player X, throughout the game, seemed to lie repeatedly to the players, at one point stating that his/her Instagram account (on which they had posted pictures of the books the players had found and The Nomad's notes within them) had been reported and suspended. Again, this could not be verified, and no such Instagram account could be found after the pilot's termination. Interestingly, in this case, this information was shared on the players' IM group. This suggests that Player X did not lie to the players for acknowledgement from the game's puppetmasters, but possibly for acknowledgement from the player group. It is also possible that Player X saw him/herself as the leader of the player community, and that his/her lies were an attempt to show the community his/her devotion to the game so the community would accept Player X as their "leader". These "lies" may also have been an attempt to create a fictitious narrative that mirrored that of the game itself.

This implicit request for acknowledgement continued when Player X discussed with the players that he/she had worked on "a similar project before". Evidently, the leader of this "similar project" (assumed to be a form of performance art by the design team, due to Player X's background which he/she verbally divulged to the active player group) was attempting to derail the pilot study by framing Player X because the leader felt that *Nomad's* existence as a game threatened his/her own project, which was supposedly going to expose a secret about the University of Pretoria. This supposed conflict of interest narrative constructed by Player X may have seemed plausible to the player community at the time, as this narrative emerged during their discussions of a potential narrative surrounding the University of Pretoria. However, this narrative was likely once again a lie that Player X told the active player group due to some inconsistencies in the narrative continuity across the arc of the story (such as the gender of the "leader", initially referred to as "he", and later referred to with gender-neutral pronouns). This arc completed with Player X assuring the player community that the conflict of interest had been resolved. Due to the likely intentional vagueness of the story arc, its legitimacy was also never confirmed by the design team.

After the release of the photo segments puzzle, Player X went to the library and began to look in various books, supposedly identified by being placed differently to other books on the same shelf, in an attempt to find all the photo segments. The active players attempted to regulate Player X's behaviour by noting that Player's X's actions were not aligned to that of the game. The players argued that the photo segments puzzle wanted them to wait for each individual book and work together to build the photo. Player X ignored this, however, noting that they "[had] a problem with unfinished things". During this arc Player X once again lied to the players, noting that on a visit to the library to find more photo segments, he/she discovered that books were strewn everywhere and the clues in the books (presumably the photo segments) had disappeared. This statement was verified as a mistruth by the design team visiting the library to find nothing out of place.

During this arc, it seemed that the player community started to no longer believe Player X's stories, and began to reprimand him/her for playing the game "incorrectly". This is an interesting assumption to make within an ARG, as an ARG has no explicit rules (Gurzick et al. 2011). However, as McGonigal

(2007b) notes, power plays are designed experiences. As such, if players are not adhering to, or are attempting to subvert the designed experience, this can be construed as them breaking the implicit rules, or playing the game incorrectly.

As such, the design team consistently attempted to suggest to players the correct course of action during play. Player X, however, attempted to repeatedly subvert this course of action, which resulted in the design team having to redesign puzzles around this subversion. An example of this can be seen when the design team placed new book lists into books that stemmed from the list found in *Far From the Madding Crowd* (Hardy 1874) once Player X accidentally found the books with subsequent lists in them.

Player X became frustrated at the puppetmasters because of this, and seemed to struggle to understand that this subversive behaviour had been implicitly disallowed. Though the player was actively playing the game, the design team began to ignore Player X's attempts to subvert the game, instead developing more content to engender community collaboration in game puzzles. The design team also consistently warned Player X against his/her "powerful", disruptive behaviour. This led to Player X telling the community that "[The Messenger] made me look like a fool. This [is no longer] a game. It never was. I'm going to find [The Messenger] and kill him". Whether or not Player X truly meant this outburst of frustration is unclear. However, it does epitomise Player X's frustration prior to the end of the game's pilot. The players attempted to handle this outburst by calming Player X down, and attempted to regulate his/her actions going forward.

Player X's actions can possibly be a result of a failing in self-regulation. As mentioned in 5.3.1.4, even the game's active players had little experience in playing ARGs. Because of this, Player X may not have understood the importance of the "collective detective" (McGonigal 2008) in the play of the genre, which resulted in an attempt to drive the game forward alone. When the design team attempted to suggest that this was not how the game was meant to be played, Player X's misunderstanding of the genre caused him/her to experience these suggestions as part of the game's narrative, instead of as deterrence by the game's puppetmasters. This may have caused Player X more frustration.

The case of Player X during the pilot is, thus, an interesting one. In consistently warning the player to cease his/her "powerful" behaviour the design team may have demotivated this player from continuing to play the game towards the end of the pilot. However, these warnings attempted to keep the pilot study as close to the designed experience as possible for the rest of the players, and were not made to demotivate players from playing the game.

This sort of player, one that almost subverted the game itself, is a dangerous prospect for ARGs and similar experiences. Their interference risks changing the designed experience entirely during the run of the game. While this is a risk of the genre, it is not ideal, and should be avoided or managed wherever possible (McGonigal 2007b).

As such, classifying Player X is a difficult task. With limited knowledge of the genre, Player X likely played the pilot in the way that he/she felt was best, and this cannot be faulted. The appearance of a “power player” was not expected by the design team prior to *Nomad’s* run, and as such decided rather to design the game away from Player X’s subversions than around them to better engender player community and collaboration. To call Player X a “spoil-sport”, a player who “breaks the rules [of the game (in this case, the implicit rules)] but remains within the space of play” (Salen & Zimmerman 2003:275), may be somewhat harsh, as “spoil-sports” have no regard for the meanings implicit within the game itself, and can potentially ruin the experience of play for all other players. This, the author believes, was not Player X’s intention. Instead, Player X seems to identify more as an “unsportsmanlike player”, a player who “violates the spirit of the game” and does not fully submit to the lusory attitude (Salen & Zimmerman 2003:271). Notably, unsportsmanlike players are seen as negative by other players and the cultural construct of the game itself (Salen & Zimmerman 2003:271). While it was likely not Player X’s intention to be seen as a negative aspect of *Nomad’s* pilot, his/her actions resulted in outcomes that were detrimental to the game. Though unfortunate, understanding and dealing with the problems Player X presented was an invaluable learning experience for the design team that was applied during *Nomad’s* design for the game proper.

5.3.2.4 Understanding the Genre

As noted in 5.3.1, *Nomad’s* players, though engaged with the game context, often did not understand the nuances of play when considering how alternate reality games differ from traditional games. This may be because few players within the game’s target audience (AIM 121) had played ARGs or similar pervasive game experiences prior to their play of *Nomad*. Notably, one of the game’s active players who was also registered for the AIM 121 module mentioned having never played an ARG or similar experience prior to *Nomad*.

A few of the game’s active players (who were not part of the target audience) confirmed having played ARGs prior to *Nomad*. One such player discussed their experience with *Campus Ghost* when telling the players about the annual Multimedia ARGs discussed by De Beer and Holmner (2013). Another very active player discussed their experience with ARGs and similar pervasive experiences at length during the pilot’s focus group and questionnaire. This player had played Google’s *Ingress* (Niantic Labs 2013), Six to Start’s *Zombies, Run!* (2012) and *Superhero Workout* (2014); and had also engaged in geocaching, a recreational activity wherein users find item caches in real-world locations (Webb 2001). Additionally, Player X noted multiple times to the active player group that they had participated in events similar to an ARG before. Due to this player’s background, it is assumed that they had experienced a form of audience-participatory performance art.

Despite these collective experiences, however, it is possible that the lack of players in the community who had played ARGs to completion prior to the pilot study may have impacted its results. As noted, ARGs, due to their fragmented narrative (Stewart 2008), emphasis on player community and

collaboration (McGonigal 2003b; Ornebring 2007; Bono & Breeze 2008; Dena 2008; Kim, Allen & Lee 2008; Stewart 2008; Gurzick et al. 2011; Bonsignore, Hansen, et al. 2012) and lack of explicit rules (Gurzick et al. 2011), differ greatly from traditional, single-player experiences found in traditional games. As such, their play often attracts a specific type of player, the “hardcore” (Thompson 2006) or “power” player (McGonigal 2003a). When these types of players do not fully understand or accept the concept of the “lusory attitude” (Suits 1978:34), it can be dangerous to the integrity of the game. This problem, the design team’s solutions and how the problem may have affected the study is discussed in more detail in 5.3.2.3.

5.3.2.5 Emergence

Emergent behaviour, discussed in Chapter 2 as the outcomes of player interaction within a game system, helps engender meaning during the act of play (Salen & Zimmerman 2003:62). Multiple moments of emergence occurred during the run of *Nomad*. Two of these emergent behaviours (the player’s riddle to The Messenger shown in Figure 64 and Player X’s actions as discussed in 5.3.2.3) have already been discussed in detail.

The most intriguing example of emergence within *Nomad*, however, was neither of these examples. Rather, a fascinating example of emergence in the pilot concerns how the players dealt with the ‘#thoughtsdream’ hashtag presented to them during one of the pilot’s secondary puzzles (see 4.3.2.13).

During design, this hashtag was meant to direct the players to search for the hashtag on Twitter. In doing so they would discover, for each book that contained a list in the primary puzzle (see 4.3.2.11), a new tweet posted by various mysterious accounts.

Instead of doing this, however, the players used the hashtag not to share or search for information about the game on Twitter, but rather to categorise photos of clues on Instagram. This may have been due to the fault in the puzzle, whereby the ‘#thoughtsdream’ tweets did not appear upon searching for the hashtag on Twitter. However, it was still expected that the players would utilise this hashtag to categorise their discussions surrounding the game, despite the flawed puzzle. In this regard, the players did as expected, though they utilised the hashtag on Instagram and not on Twitter. Why the players did not act as expected in this regard is uncertain, but may be because no part of this puzzle explicitly told them to utilise Twitter over other social media platforms.

During the focus group, one player noted their disdain for “the Instagram puzzle”, due to a personal dislike for using the social media platform. This response was interesting due to the fact that the secondary puzzle that contained the ‘#thoughtsdream’ hashtag had never intended that players utilise this platform. It was noted, however, that this emergence should be designed for during the game

proper, in order to give the game proper's player group a more dynamic play experience, despite their personal preference towards social media platforms.

5.3.3 *Game Effectiveness*

The following section discusses the overall effectiveness of the pilot as both an educational and an entertaining game. Its successes and shortcoming in these regards are discussed below.

5.3.3.1 *Linking game goals to learning outcomes*

As discussed in Chapter 4, each of *Nomad's* puzzles for both the pilot and the game proper attempted to teach or exercise specific information literacy competencies as noted by Dunn (2002). The pilot study attempted to fulfil these learning outcomes by integrating them into the game's context (its narrative and puzzles). The pilot seemed to be successful in its integration, as nowhere during the play of the game did a player mention that the pilot may have been an educational game, despite their early understanding that it was, in fact, a game.

Despite this, one player in the focus group noted that the game felt "loaded", but never explicitly like work. During the focus group, players agreed that the pilot could be beneficial were it to be run annually during the AIM modules, possibly replacing the "scavenger hunt" assignment that is currently in the curriculum. As one player in the focus group noted, "rather learn this now than next year when [they] fail". The play of the pilot thus gave the players the "freedom to fail" (Gentry 1990) by allowing them multiple opportunities for progression.

As such, the pilot seemed to be successful as an educational product. Players noted that the play of the pilot helped them better understand the purpose of the AIM modules presented at the University of Pretoria, and how to apply the skills learnt in these modules in external contexts. Additionally, they reportedly enjoyed *Nomad's* gameplay despite the necessity of exercising information literacy skills during play.

5.3.3.2 *Skill exercise and acquisition*

When presented with a list of skills they felt that the pilot study helped to teach or exercise during play, players noted that the pilot taught the following skills:

- Searching for books in a library (exercised throughout the game's primary puzzle and secondary puzzle 1, documented in 4.3.2.11 and 4.3.2.12)

- Internet search query construction (likely exercised throughout the game, such as when searching for information regarding potential player theories)
- Using academic journal databases to search for articles (this was never intended to be exercised in the pilot)
- Using different technological platforms such as mobile phones and PCs (this was exercised inherently due to the numerous technologies used to participate in the game)
- Communication with a community through social media (this was exercised inherently through the use of a forum, as well as the player IM group)
- Using internet blogs, forums and social media (this was inherently exercised during play, specifically in secondary puzzle 2 detailed in 4.3.2.13)
- Group problem solving (this was inherently exercised during play)
- Evaluating the relevance of information (this was exercised when contextualising whether potential game clues were actual clues, along with contextualising the relevance of each game clue)
- Understanding and decoding ciphers (this was not intended to be exercised in the pilot, though players likely associated this with the 'Far From The Madding Crowd cipher' discussed in 5.2.2)
- Academic referencing (this was not intended to be exercised in the pilot)
- Searching the internet (similarly, this was likely exercised by players self-researching various theories they may have had about the game)
- Using the University of Pretoria Library Portal (this was exercised in the primary puzzle and secondary puzzle 1, documented in 4.3.2.11 and 4.3.2.12, in beginning to search for books in the library)
- Rearranging information to provide context (the nature of information dissemination within an ARG meant that the necessity to contextual game information was inherent)

Nomad hoped to, through its play, intrinsically exercise most of these skills within the pilot, and seemed to be successful in this regard. Notably, players reported learning or exercising skills that were intended for the game proper, such as “academic referencing”, “using academic journal databases to search for articles” and “understanding and decoding ciphers”. During the pilot, the players may have exercised the former two of these skills when researching what they considered to be potential narrative clues. Players have interpreted the latter as the understanding of the notes written by The Nomad, as well as the general structure of the pilot’s primary puzzle (see 4.3.2.11).

Players also commented that the game taught them other skills, such as “how to use the library” and “patience”. The former of these was the purpose of the pilot study. The latter was likely noted due to the pilot’s long running time. One player also noted that the pilot allowed them to attempt to create and foster a community consisting of multiple people with varying skillsets. This suggests that the player learnt about the ARG genre through its play, as varied community skills are integral to an ARG’s concept of collective intelligence (McGonigal 2008).

5.3.3.3 *Personal player accomplishments*

Players of the pilot often felt accomplished when engaged in community-based activities, whether by competition within the community (such as being the first to solve a part of a puzzle) or collaboration (working with people to solve the game's puzzles). Notably, players felt most accomplished when they were attempting to get others to engage with the game context and getting those people to play the pilot with them.

This sense of accomplishment may come from *Nomad's* design providing players with a challenge that ARG designers face, and had faced in *Nomad*: getting people to play the game. As discussed in 5.3.2.4, the pilot struggled throughout its run to create a community, as the design team could not necessarily rely on targeting an existing community. Violating the "this is not a game" aesthetic may have aided in player recruitment, but the design team felt that this could negatively affect the player experience.

Because of this, the designer posed the "problem with community" to the players in the hopes that they could present their own solutions. However, players faced similar difficulties to those faced by the designers. This shows that community is a pertinent issue for small-scale ARG applications.

The joy that players find in this community formation presents an avenue for further research, and may be a strength of the ARG genre. This joy may come as a result of the players' search for transformative social play – where the play of a game affects the social relationships players have with each other (Salen & Zimmerman 2003:475). In playing the pilot together, through the sharing of Suits' (1978:34) lusive attitude, players created bonds with each other. This demonstrates the assertion that "[humans] like people better after [they] play a game with them" (McGonigal 2010a).

5.3.3.4 *Successes as an entertainment product*

Players within the focus group and those who answered the questionnaire reported that the pilot was, as hoped, an entertaining game. They noted that the use of multiple forms of media (audio, video, emails, social media and phone calls) for content delivery was engaging and effective, and that the pervasive nature of the ARG genre was more enjoyable than a traditional game, especially within a learning environment. Players also enjoyed the "hacking" aspect of the narrative (when Ana's presentation "corrupted itself"), though they noted that this narrative may not have been appropriate for the target audience.

This pervasive nature also allowed for the use of specific elements they found enjoyable, such as the use of environmental narrative assets, and how the use of timers often led to players running to various locations on campus.

Discussing these aspects makes it clear that there were multiple aspects in the pilot that were successful in their implementation and that worked as intended. These aspects, as well as the recommendations discussed in 5.3.4, were focused on when designing and implementing the game proper.

5.3.3.5 Shortcomings in the game implementation

Nomad's pilot was not without implementation flaws. While the design team attempted to mitigate or solve some of these flaws during the game's run, others were unknown to the design team prior to data collection and analysis being performed. Additionally, some of these flaws are inevitable when considering small scale ARG implementations. These shortcomings, gleaned from observation during the game, as well as opinions from the focus group, questionnaire and within the various documents (such as the forum and IM group), are discussed below, and solutions for each are suggested.

Table 14: Shortcomings of the *Nomad* game pilot

Shortcoming	Discussion	Proposed Solution as Implemented in the Game Proper
The game website was badly designed.	Due to time constraints, the pilot version of 'Midnight Chapters' was not very user-friendly. This led to a lot of player confusion, as well as duplicate user accounts being created when players forgot their usernames or passwords, as password recovery was not implemented. Additionally, 'Midnight Chapters' was developed as a standalone website, and utilised its own content management system, which led to a myriad of smaller website bugs during runtime.	Spend a larger portion of development time during the game proper's design period to implement and test the game proper website. Spend more spiral model (Boehm 1995) iterations on website development. Using existing, well-documented content-management systems could assist in building a more robust website that would hopefully also be more user-friendly.

<p>The character of Ana was badly designed and not believable.</p>	<p>One player suggested that they had no sympathy for Ana Kirlitz’s narrative plight. This lack of sympathy caused the player to be disinterested in the narrative. This problem may not simply be a result of Ana’s character design, but also as a result the character’s delivery by her actress.</p>	<p>Whilst the game proper utilised Ana Kirlitz as a character, her role as a game protagonist was diminished. The character of Mia Schoemaker replaced Ana Kirlitz as the game’s primary protagonist (this narrative change is documented in 4.4.1.1.1). This decision was made because Mia’s existing portfolio of online video already described the fictional version of herself that she portrayed, making her more “believable”.</p>
<p>During the pilot puzzle, one of the books used in the puzzle was not available to the players.</p>	<p>This possibility was foreseen by the design team, though not expected. Though <i>Going Solo</i> (Dahl 1986) was available when implementing the puzzle, another student (external to the game or the player community) borrowed the book from the library. This created a gap in the puzzle that prevented the players from progressing.</p>	<p>In the pilot, this problem was attempted to be solved by replacing <i>Going Solo</i> (Dahl 1986) with <i>Far From the Maddening Crowd</i> (Hardy 1874). Access to the name of the latter book was only presented to the players once they had recruited more people to play <i>Nomad</i>, or to register on ‘Midnight Chapters’. This solution extended the pilot whilst attempting to have the players solve the “problem with community”.</p> <p>Unfortunately when considering the game proper, the real-world nature of the ARG genre suggests that the problem of missing assets is a possibility in any ARG, regardless of how it is planned for and solved. As such, any solution for this problem</p>

		<p>will likely be unique to the context of each application. However, every effort was made in the game proper so that missing assets would not disrupt the course of play.</p>
<p>There was a lack of alignment between game events and player schedules</p>	<p>As noted in 5.3.2.4, aligning game events with player schedules is difficult within the ARG genre. Additionally, because a large number of the active player group were not first years registered for the AIM 121 module, the designers could not infer the specifics of their schedule during the game.</p>	<p>This problem is one with no specific solution within the context of <i>Nomad</i>, and often ARGs in general. While designers should take player schedules into account when designing events that players should be present at, designing for every eventuality is an impossibility. This problem can be solved in small-scale ARGs where designers can assume that the entire community can dedicate certain periods of time to the play of the game (such as during lecture periods). However, this assumption cannot be made of TINAG-adhering ARGs that are external to such fixed periods.</p>
<p>Players did not like certain puzzles.</p>	<p>A specific player expressed disdain for “the Instagram puzzle”. This puzzle was not a designed element of <i>Nomad</i>, and is discussed in 5.3.2.4. Additionally, the active player group disliked most of the puzzles that attempted to engender community, arguing that the necessity to complete these puzzles to drive the game</p>	<p>As noted by Koster (2013:102–111), “fun” is a subjective concept. As such, it is difficult to design every aspect of an ARG to appeal to the entire community of players. This means that the development of puzzles that some may find unenjoyable is inevitable. However, within the context of <i>Nomad</i>, the game proper</p>

	<p>forward made the player group feel inadequate.</p>	<p>attempted to be more adaptable when considering the success or failure of community engendering puzzles, choosing to rather focus on providing the player community with an enriching experience. The design team chose to disregard individual opinions regarding designed or emergent puzzles.</p>
<p>The players felt the narrative was unresolved.</p>	<p>This was expected by the design team as the pilot of <i>Nomad</i> attempted to only introduce the game's narrative to gauge its effectiveness with a target audience. This lack of resolution was exacerbated by the termination of the pilot. As such, players of the pilot never received in-game narrative closure to the planned storyline.</p>	<p>The game proper aimed to present two fully coherent storylines to its players, while retaining the mysterious aesthetic of the ARG genre through the presentation of fragmented narratives.</p>
<p>Character actors were sometimes unreliable.</p>	<p>As noted earlier, the portrayal of Ana Kirlitz in the pilot was unconvincing. This was largely a result of the design team allowing Ana's actress to discuss the game with the players whilst in-character. While she was given prompts by the design team at times, the theories presented by Ana's actress, who had to play the game with the players to a degree to remain convincing, were her own. Some of these theories were correct. This meant that Ana, a game</p>	<p>While, in the game proper, Mia was allowed a degree of freedom within communication channels in order to maintain the authenticity her character's persona was built around, a greater degree of the game was discussed with her, and she was instructed to not, like Ana's actress, actively play the game during its run. As such, the design team had a greater deal of control over Mia's character than they had with Ana.</p>

	<p>character in the eyes of the players, had solved aspects of the mystery herself. For the ARG to be an effective teaching tool, players had to arrive at these solutions instead.</p>	
<p>Some design decisions were made to ensure the validity of the empirical study, as opposed to the validity of the game.</p>	<p>Some of the design decisions made during the pilot of <i>Nomad</i> – specifically those that focused on community engenderment – were made to ensure that the empirical study remained valid. These include the necessity for active players to recruit AIM 121 students into playing the game, as the pilot attempted to parallel AIM 121 learning outcomes to <i>Nomad's</i> game outcomes.</p>	<p>The focus during the implementation and run of the game proper was to provide the most enjoyable experience possible to the game's existing community, whilst also being educational. The study would then later poll this community to discuss whether, even external to the AIM modules, the game was effective as an information literacy teaching tool.</p>

5.3.4 Player Recommendations

Due to the semi-structured natures of the study's focus groups, discussion would often lead to players giving recommendations regarding the ARG genre or of *Nomad's* pilot study as a game. These suggestions often either concerned how to better the narrative, or discussed elements that could be used within a ludic context.

These suggestions, along with how they were planned to be implemented within the game proper, are discussed below. Reasons why certain suggestions were not designed for during the game proper are also discussed.

5.3.4.1 Narrative Suggestions

The following table documents narrative suggestions for subsequent game iterations as given by players within the focus group:

Table 15: Narrative suggestions for *Nomad's* game proper

Narrative suggestion	Planned implementation
<p>Use more 'creepy' elements in the narrative.</p>	<p>This was not explicitly implemented in the game proper as it was felt that a horror genre ARG could not feasibly integrate within the planned time travel narrative. Additionally, the niche nature of the horror genre risked isolating potential players within the game proper's target audience, as the designers could not assume any potential player had a predilection towards the genre. Despite this, the design team's efforts to make Ana's sudden disappearance and the subsequent appearance of the Observers as unexplained and mysterious as possible attempted to lend a "creepy" aesthetic to the game proper's opening narrative.</p>
<p>Utilise more character actors.</p>	<p>The game proper only utilised one more character actor than the pilot. This was for the role of The Messenger. More character actors were not used due to their potential unreliability, as discussed in Table 14. However, the character actors within the game proper were more heavily involved in the game proper than the pilot in order to make these characters as believable as possible.</p>
<p>Start the game with a rumour of some sort.</p>	<p>The game proper attempted to start by having the players ask a single question: "Where is Ana?" Prior to the discovery of The Nomad within the game proper's narrative, attempting to discover what happened to Ana was to provide the players with a driving motivation within the game context. This question is largely answered through the players' traversal of the Observer storyline (discussed in 4.4.1.1.2).</p>

<p>Base the game’s narrative on local history.</p>	<p>As with the “creepy” suggestion discussed above, the design team chose not to implement this suggestion, as doing so would result in a restructuring of the entire game proper narrative. Additionally, this restructuring would break the continuity between the pilot narrative and that of the game proper, which would result in two disparate narrative experience, despite the similar nature of the games’ mechanics (both games would still teach and exercise information literacy skills). The design team felt that this would result in dissonance for players who attempted to narratively link the two game implementations.</p>
--	---

5.3.4.2 Ludic Suggestions

The following table documents gameplay-related suggestions for subsequent game iterations as suggested by players from the focus group:

Table 16: Ludic suggestions for *Nomad's* game proper

Gameplay/Game element suggestion	Planned implementation
<p>Utilise more environmental narrative assets.</p>	<p>During development on the game proper, the scope of the full game expanded exponentially, as documented in 4.4.3.4. As a result, the design team felt that the best way to manage this scope was to allow for the game to be largely interactive online through its hub website, ‘We Are The Messengers’. Additionally, this online interaction allowed the team to mitigate the scheduling problems discussed in Table 14. As such, this suggestion was not implemented for logistical reasons. To compensate for this, all of the environmental narrative assets that were</p>

	produced for the game proper were of higher quality than those used in the pilot.
Utilise more timers.	Due to the game proper's larger online presence, timers were utilised far more in the locking and unlocking of game content. This was done as the use of timers builds suspense.
Have a live event where players chase The Nomad to interrogate him about the events of the game.	This was not implemented in the game as the suggestion discounts the narrative fact that The Nomad is travelling in time, and thus cannot be chased by the players. However, the players do have multiple attempts to communicate with both The Nomad and The Messenger in the game proper.
Phone people and present them with personalised in-game clues.	This was seriously considered but ultimately discounted for the game proper, as the team struggled to find a valid game-related reason for game characters (aside from Mia) to have the personal phone numbers of players. It also presented an ethics consideration whereby the game may have appeared as invading the lives of the players. Discounting this suggestion ensured the players still felt safe within the game space. Personalised clues would instead be delivered to players via their registered email addresses from 'We Are The Messengers'.
Utilise more live events.	The game proper consisted of five live events to the pilot's two in the main storyline alone. In addition to this, multiple puzzles within the Observer storyline required players to find puzzles clues in real-time.

<p>Make the game more interactive.</p>	<p>‘We Are The Messengers’ and ‘Midnight Chapters’ both attempted to use varying forms of multimedia on their online presences. The ability to interact with Mia’s investigation wall (see 4.4.2.1.1), along with the ability to freely interact with the nodes within the node construct on ‘We Are The Messengers’ (see 4.4.2.1.10), attempted to provide more-interactive interfaces to this multimedia.</p>
<p>Utilise more time-specific events that require players to run or hurry.</p>	<p>The Observer Dossiers, uncovered through the timed events in the Observer storyline (see 4.4.2.2.5, 4.4.2.2.9, 4.4.2.2.13, 4.4.2.2.17 and 4.4.2.2.19) are an example of this suggestion implemented within the game proper.</p>
<p>Design more game elements that originate on the technologies being used by the players.</p>	<p>This was not considered during design, but player technologies were monitored during the run of the game proper. Unfortunately, due to the time constraints on the run of the game proper (as discussed in Chapter 6), players were kept too busy with existing game content to solve the emergent puzzles presented to them.</p>
<p>Utilise more of the University of Pretoria’s Hatfield campus during puzzle solving.</p>	<p>This suggestion has the added benefit of aiding in campus orientation, another skill often exercised in information-literacy-based educational ARGs such as <i>ViolaQuest</i> (Whitton 2009) and <i>Herring Hale</i> (Piatt 2009). This was implemented in the game proper through the five-locations puzzle described in 4.4.2.1.19 and later utilised again in live event 3 (see 4.4.2.1.20).</p>

<p>Make the difference between designed game interruptions and interactions, and unintended game interruptions and interactions clearer.</p>	<p>This specifically referred to the fact that <i>Going Solo</i> (Dahl 1986) was at first unavailable to the players during the pilot. The players assumed that this unintended interruption was part of the game itself, while this was not the case. While it is difficult to prevent these interruptions due to the real-world nature of the ARG genre, the move towards a larger online component in the game proper attempted to mitigate these interruptions by replacing aspects such as unavailable physical puzzle elements in real-time without the players noticing. Additionally, the design team frequently attempted to communicate the present state of the game to the players through the use of the game’s characters.</p>
<p>Design a narrative that will entice more people to be curious about the game.</p>	<p>Noting Koster’s (2013:102–111) “different fun for different folks” discussion, this suggestion was near impossible to implement, as a player’s personal preference is difficult to design for when not targeting an existing community. However, the game proper attempted to recruit players from a smaller community, as discussed in Chapter 6, in the hopes that the game narrative would appeal to this more-focused demographic.</p>

5.4 Conclusion

This chapter discussed the implementation and run of *Nomad’s* pilot study. When presenting the results of the completed pilot study, potential reasons for these results were provided. This constitutes the analysis of the pilot study. This analysis was informed by the study’s literature review (see Chapter 2), as well as the non-participant observation performed by the author (as detailed in Chapter 3).

This dissertation continues with a full analysis of the implementation and run of the full empirical study, the game proper, in the following chapter. Conclusions based on the analyses presented here, as well as those regarding the game proper are further discussed in Chapter 7.

6. **Nomad Game Proper Implementation, Results and Analysis**

6.1 Introduction

This chapter discusses the entirety of this dissertation's full empirical study: the full *Nomad* alternate reality game (hereafter referred to as "the game proper" or "*Nomad*"). As in Chapter 5, the following section (see 5.2) provides a narrative description of the run of the game as experienced by the players. As in Chapter 5, discussion of "dynamic" assets, puzzles and events built by the design team during the game's run are also discussed in this narrative, with reasoning behind these decisions discussed. As in Chapter 5, discussion of specific assets will utilise their numbering from the design discussions in Chapter 4.

As noted throughout this dissertation (specifically in 3.2.2.2.3.2.2), a major change from the pilot study to the game proper is that of the target audience. As noted, the utilisation of this new target audience hoped to rectify some of the failures seen within *Nomad*'s pilot study. Most importantly, it was hoped that the new target audience would engage more with the game context, through a combination of lecturer assistance and a more-inherent curiosity in the target group. This hoped to create a more robust player community for the game proper.

Additionally, the targeting of a smaller module allowed for a non-repeatable rabbit hole to take place effectively. This eliminated the design consideration of the pilot study's rabbit hole, which had to be repeated 40 times, taking a toll on the design team and the pilot study's target audience. The effectiveness of this target audience change is discussed in 6.3.2.1.

In the following section, the narrative of the run of *Nomad* is discussed.

6.2 Game Proper Implementation

The game proper of *Nomad* began on 13 April 2015. This week acted as a "seeding week", where game characters were introduced and small anomalies began to appear within INL 110, the game's targeted module, lectures. During this week, seeding was also placed in assignments for IMY 110 and IMY 300, as discussed in 4.4.2.1.6.

The players' first potential point of contact with the game came from Mia's introduction video (https://www.youtube.com/watch?v=ZRMxmL_7zuk) (Schoemaker 2015b). This points potential players to the new 'Midnight Chapters' blog (described in 4.4.2.1.1), and introduces Mia's existing followers to the game universe. It was not expected that potential players from INL 110 would see this (having not yet been introduced to Mia's character), but it was hoped that this 'Mia' rabbit hole could potentially get her followers involved in the online components of the game. This video also allowed players to

discover ‘Midnight Chapters’ at a later stage once they had been introduced to Mia’s character. This video’s early presence in the game timeline also hoped to give a larger sense of scope to the game, to make it feel like the narrative had been unfolding for a long period of time, since before the game’s first live event.

During this first week, the INL 110 students experienced anomalies within the module as described in 4.4.2.1.4 to 4.4.2.1.7. The ‘We Are The Messengers’ hub website appeared periodically during classes, showing a countdown timer to the following Tuesday, the day of the game’s first live event. QR codes were included in the ClickUP banner for the INL 110 module page and in an IMY 110 assignment. These QR codes linked to an orphan page on ‘Midnight Chapters’ with a similar timer to that shown during the classes. Additionally, the word “time” was hyperlinked in an IMY 300 assignment to point potential players to ‘We Are The Messengers’. During the first INL 110 class of the following week, the game’s rabbit hole was enacted: The Nomad sends a video transmission to the players, telling them to “become a messenger” and providing them with a link to the hub website (that still shows a timer until the first live event). This class was chosen over the final class of the previous week (as was the plan) due to an unforeseen implementation consideration: the final class of the week for INL 110 is presented in a different format to the other lectures during the week. As such, it was decided that the rabbit hole would reach more people during a “normal” lecture.

6.2.1 The Observers in the class

To contribute to the “anomalies” observed during the INL 110 classes in this first week, different members of the design team dressed up as Observers (in black suits, white shirts and a black tie) and attended each class. They entered the class shortly after the beginning of the lecture, and left a few minutes later. The Observers’ presence was meant to further intrigue potential players, and to highlight that something strange was occurring.

During the rabbit hole, the Observer inside the class is phoned by his superior. The Observer tells their superior that they “have found Subject 24” before running out of the venue, further confusing the players.

The game otherwise progresses as planned until live event 1. Mia updates her followers the evening before the event, directing them to ‘We Are The Messengers’ and urging anyone to attend the event in her absence (<https://www.youtube.com/watch?v=ieoxdw5lCqg>) (Schoemaker 2015e).

6.2.2 The rabbit hole transmission repeated

After the rabbit hole was enacted in the INL 110 class it was decided that the same video should be embedded into the 'We Are The Messengers' hub website above the timer. The video was only available until the timer disappeared (at the date and time of live event 1). This allowed players who were not registered for INL 110 to experience the rabbit hole.

This decision compromises the narrative consistency of the game (as the "transmission" can now plainly be seen as a video), and in this way interferes slightly with the integrity of the "this is not a game" aesthetic (McGonigal 2003b). However, it was decided that it was more important for players to experience the game's rabbit hole, despite momentarily sacrificing some of the game's believability.

The date and time for live event 1 arrived, and a handful of players had gathered outside the library. Among these players was a lecturer and ARG designer who was interested in playing the game. This player recorded sections of the live event for documentation purposes (<https://www.youtube.com/watch?v=tJ4-yJMKhCk>, <https://www.youtube.com/watch?v=7I4VCsOEuPg>) (de Beer 2015a; de Beer 2015b), an initiative which greatly informed the results and analysis of this study, as discussed later (see 6.3.4.3). This player was thus identified, due to their knowledge of ARGs, as a "devotee" player (Thompson 2006), and is referred to later as "the experienced ARG player", despite having reportedly not previously played an ARG.

The live event ran successfully. The players found *Alice's Adventures in Wonderland* (Carroll 1865). Inside the book was a QR code that unlocked a node on 'We Are The Messengers' containing a list of constantly scrambling book names with the first six book names unscrambled. Another node contained part of the then digital photograph of The Nomad. This represented the start of primary puzzle 1 (see 4.4.2.1.11). Searching for the unscrambled books, the players found another QR code for the puzzle and the first four Observer cards (for secondary puzzle 1 – see 4.4.2.1.12), but had to wait six hours for the next part of the book list to unscramble, thus effectively ending the live event.

At this point, the first four nodes and the first Observer node were available to the players. The four main nodes advanced primary puzzle 1 and the first two secondary puzzles (see 4.4.2.1.11 to 4.4.2.1.13). The Observer node (detailed in 4.4.2.2.3) could not, at this stage, be completed.

After the live event, one player examined the scrambling book list in one of the nodes. He/she manually unscrambled most of the book names, and posted a list of unscrambled book names on the 'We Are The Messengers' forum.

The next morning, during the INL 110 class, a member of the design team ran into the class, acting like a madman. He/she spoke frantically about "the men in black suits", and asked the lecturer if she has seen

any. After this, the madman ran back out, scattering the Observer business card needed to complete the first Observer node, which would unlock the next one. This node was also completed in short order, and by the end of the day the players had unlocked the first timed event (detailed in 4.4.2.2.5). However, they could not receive the dossier as the library was closed at the time. Instead, they received it early the next morning.

While the Observer puzzles were being solved, the player who manually unscrambled the book names went and found the books in the list, finding more QR codes and business cards for secondary puzzle 1. Additionally, the player also finds some of The Nomad's notes (from the pilot study – see 4.3.2.12) that were missed by the design team during the placement of the game proper's business cards. This manual unscrambling allowed the players to complete primary puzzle 1 within two days, which provided them with the date and time for live event 2.

During the solving of these puzzles Mia posted another update thanking the players for their help (<https://www.youtube.com/watch?v=cWsvWZcAhD4>) (Schoemaker 2015d). Notably, she thanked some of the players by name, a decision made by the design team to reward the players for their quick solving of the puzzles.

The only unsolved puzzle left was secondary puzzle 2 (see 4.4.2.1.13), which Mia offers a hint towards in her video. While the players have posted their pledge via text (“My name is [name] and I am a Messenger”), they have yet to do so through a video. As such, Mia attempts to lead by example. However, despite this attempted prompt, this puzzle remained uncompleted by any player by the end of the game.

It must be noted that at this point there was a break in play due to South African public holidays and subsequent “no lecture” days observed by the University of Pretoria. As such, there was a two week gap between the first and second live events. During this break, the design team attempted to address the speed with which the players completed the first game puzzles. Their solution is discussed below.

6.2.3 Identifying community leaders

The design team identified the player who had manually unscrambled the book list in live event 1 as the leader of the community. As such, it was reasoned that an additional puzzle should be presented to them: name their “strongest allies”, each of whom would be sent a piece of a new puzzle. An example of what was sent to this player via email (as The Messenger) can be seen in Figure 67.

However, this player did not respond to the email during the break of play.

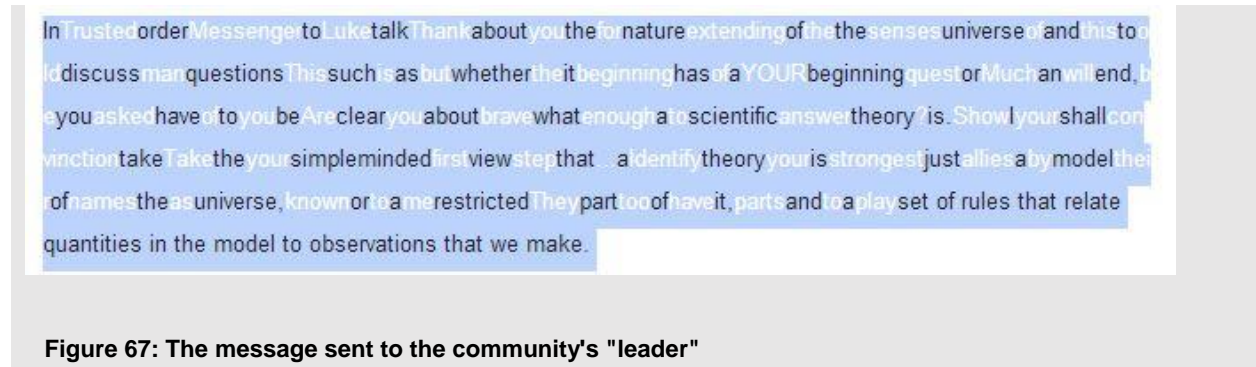


Figure 67: The message sent to the community's "leader"

The day before the live event, something peculiar occurred. An email was sent to both The Messenger's email address and the researcher's email address (who, in the game, posed as Mia's webmaster). The email came from an account named "Nomad 128". The email discusses there having been a "suspicious takedown" of the two game hub websites. However, neither the researcher's nor The Messenger's email addresses were ever disclosed to the players. Instead, it seems that the sender of the email gleaned the information from searching the 'who is' domain registry. Also notable was the use of this entity's name: Nomad. At this point in the game, The Nomad's title has not yet been revealed to the players, implying that whoever sent the email somehow knew a great deal about the game's narrative. The sender's identity was never discovered, even after the game had concluded. It must be clarified that this event did not officially form part of the player-experienced narrative – it was an occurrence witnessed by the design team that, to them, now formed part of the overall game narrative.

SUSPICIOUS REMOVAL OF MIDNIGHT CHAPTERS AND WE ARE THE MESSENGERS



Figure 68: A suspicious email, presumably sent by an unknown player

The reason for this email was due to an implementation problem the design team had not planned for due to the relatively small scale of the project. The company whose servers both game hubs were

hosted on shut down their servers temporarily due to problems at one of their server sites. This caused a problem for the design team as it meant that this unintentional shutdown was now part of the game narrative. Luckily, the shutdown only slightly hindered gameplay, with only some players noting frustration regarding accessing the hub websites during the live event the next day.

Otherwise, live event 2 progresses as planned (see 4.4.2.1.15 and 4.3.2.15), providing the players with exposition about The Nomad as a reward (such as the fact that he is trapped, the intentions of The Observers, and that the players need to save The Nomad). After this event, a new Observer node and two other nodes unlocked. One of these nodes contained a list of five ISBN numbers (noted in 4.4.2.1.17) that lead to the start of primary puzzle 2 (detailed in 4.4.2.1.18). One of the books in this list unlocked the next scrambling book list, and provided the players with a set of book ciphers to solve.

6.2.4 Scrambling binary strings

Unlike in primary puzzle 1, the design team decided not to show the scrambling names of the books in the book list for primary puzzle 2. Instead, the spaces where book names would appear were replaced with scrambling 1's and 0's. This was as a result of a player manually solving primary puzzle 1 by unscrambling the book names prior to their six hour unlock period. As a result, the players would have to solve the book ciphers to get the names of the books.

At this time it was decided that, due to a lack of response from the community's "leader", the "community leader identification" puzzle should be expanded to include another core active player.

6.2.5 Reassembling the obstructed QR code

The other core active player responded to The Messenger's email, identifying eight players considered to be the player's "strongest allies". Each of these players were presented with part of an obstructed QR code. The players had to share each of their pieces, assemble the completed image, and the QR code's background then cleaned in order to successfully scan the QR code. The pieces of the QR code can be seen in Figure 69, the assembled QR code in

Figure 70 and the cleaned QR code in Figure 71.

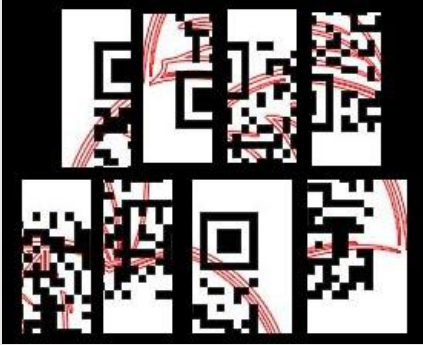


Figure 69: The pieces of the obstructed QR code



Figure 70: The reconstructed QR code



Figure 71: The unobscured QR code

The QR code led players to an orphan page on 'We Are The Messengers', presenting them with six email addresses. They were instructed to "claim the beacon", presumably by sending an email to one of the five email addresses (named "beacon00001" through "beacon00110", with the trailing digits representing the numbers one to six in binary code). This can be seen in

Figure 72.

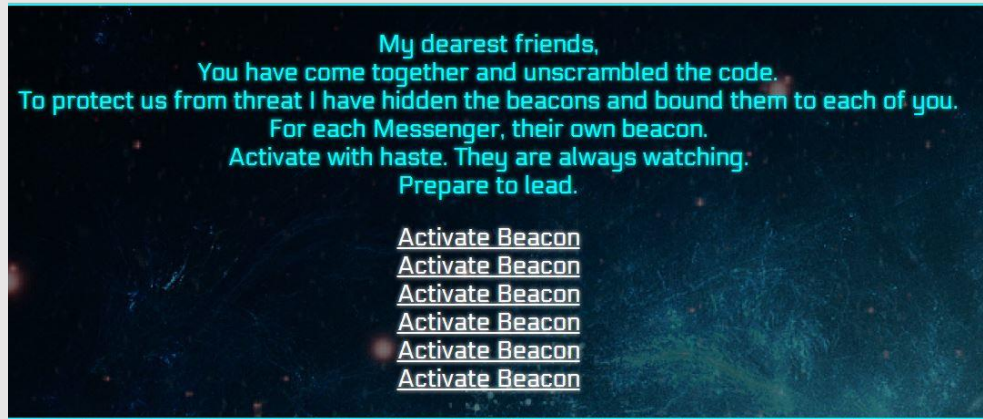


Figure 72: The orphan page asking players to "activate" the beacons

Additionally, during the INL 110 class following the live event, another Observer event occurred.

6.2.6 An escaped Subject

The INL 110 class following the live event was once again disrupted by an Observer. This time, a Subject had escaped their custody. The Subject ran into the class and started to write the URL for 'We Are The Messengers' (<http://www.we-are-the-messengers.com>) on the blackboard. Halfway through this, an Observer rushed in after them, tackling them and dragging them out of the venue. Whilst being dragged out the subject screams a plea to the students: "Become a Messenger! Become a Messenger!"

As the live events during the game were separated by a break in play due to public and University holidays it was felt that the target audience may have needed a reminder that the game was still ongoing, but had just started. This event attempted to draw more people to the hub website to engage with the game.

Despite the large amount of puzzles now available to the players, they seemed to focus on the Observer node (detailed in 4.4.2.2.7). The players quickly examined the video presented in the node to find the password that unlocked the next node. This node made them once again wait for an event: a phone call that would provide them with a password.



Figure 73: The node alluding to the phone call

Once again, this event was recorded by one of the active players (<https://www.youtube.com/watch?v=olGZrL9mA2I>)(de Beer 2015c). Upon entering the password, the players immediately embarked to find the new dossier at the next timed event (see 4.4.2.2.9).

After completing the Observer nodes, the players turned their attention back to activating the beacons.

6.2.7 Activating and waking the beacons

Players had to email each beacon to “activate” it. Once activated, these beacons provided players with challenges they needed to perform to “wake” the beacon. These beacons work similarly to the geographic beacons discussed in 4.4.1.1.1, allowing The Nomad to “drift” to the present place and time in order to free himself from the time stream. As such, “waking” each of them would have allowed the players more opportunities to communicate with The Nomad. The beacons and their challenges are tabulated in Table 17.

Unfortunately, though each beacon was activated, none of these challenges were attempted by the players by the end of the game.

Table 17: The beacon challenges

Beacon	Challenge

Beacon 00001 (1)	Twenty four players must “pledge themselves” as Messengers on the forum by posting “My name is [their name] and I am a Messenger”.
Beacon 00010 (2)	Twenty four players must video themselves “pledging” as a Messenger (this was a repeat of a previously unsolved puzzle).
Beacon 00011 (3)	Twenty four people must pose in a photograph with the symbol outside the library (that remained from the pilot study). Photographs (either individually or in groups) must be sent to the beacon.
Beacon 00100 (4)	Players must find twenty four places on the campus that they consider to be noteworthy landmarks and email photographs of themselves at the landmark to the beacon.
Beacon 00101 (5)	Players must make the cause of The Messengers known. They must put posters, stickers or information (designed by themselves) up at twenty four locations around the campus. Again, they must include themselves in the photograph and email the photographs to the beacon.
Beacon 00110 (6)	Players must investigate Ana’s disappearance. Each player must claim a single clue from the evidence wall on ‘Midnight Chapters’, research it and share their findings with the beacon.

6.2.8 Abandoning Mia

At this stage of the game, the players began to ignore Mia on the player-created communication channels. The reason for this is discussed in more detail later (see 6.3.2.3), but concerns the players' awareness that she was a game character, and not a true player within the community. As a result, the design team felt that releasing more content for Mia's character may simply result in her becoming more ostracised within the player group. While Mia was allowed to continue interacting with the group as if she were a player, the character's game content (blog posts and video recaps) was ceased.

During this week, the players seemed largely concerned with the Observer storyline and the beacon puzzles. This meant, however, that the day before the next live event (in the following week), very little of primary puzzle 2 and the accompanying secondary puzzle 4 (see 4.4.2.1.18 and 4.4.2.1.20) had been completed. The players were aware that the ISBN numbers lead to books, and that the strings inside the books were ciphers of some kind. They had also solved the first riddle of secondary puzzle 4, finding the first location and QR code which unlocked the first image of a marked page.

As such, at the start of this following week the players scurried to complete the remaining puzzles. However, because of the complexity of the ciphers and the length of the puzzles, they were not able to complete either puzzle before the scheduled date for live event 3. Despite this, the players gathered at the library at the assumed date and time (as live event days and times were kept consistent for the first two events – Tuesdays at 17:30). Despite not completing the puzzles, the players expected an event to take place, which the design team had to cater for.

6.2.9 The "Instructions" node

The payphones around the players began to ring (as they had during the previous live event). Speaking to the players was The Nomad. However, static noise sounds prevented the players from hearing much of what he was saying (which was simply an edited recording of the audio meant to be used during live event 3, detailed in 4.4.2.1.21).

After it was clear that the players could not communicate with The Nomad, they found a new node available on 'We Are The Messengers' – one coloured bright red instead of a node's usual blue colouring. The node's contents was a plea from The Messenger: the players had to complete primary puzzle 2 to ensure The Nomad's safe return. Furthermore, if they failed again, The Nomad may be trapped in the time stream forever.



Figure 74: The "Instructions" red node

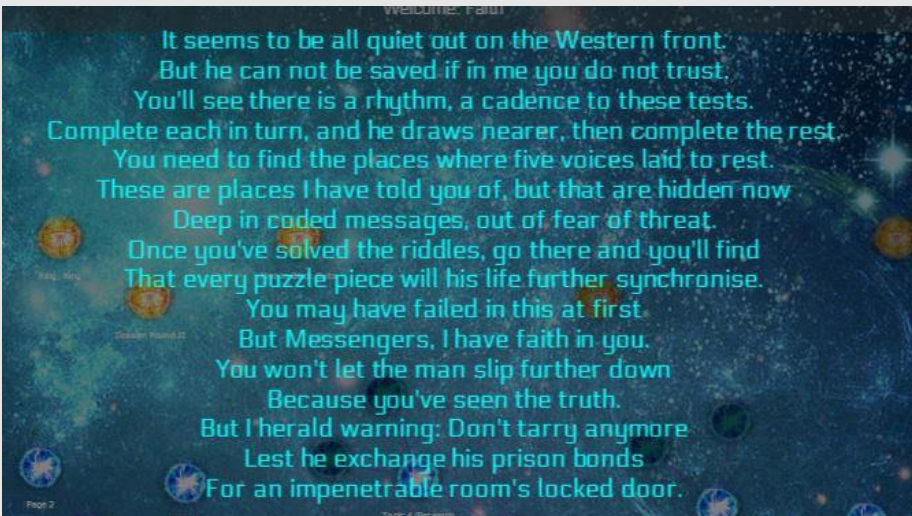


Figure 75: The Messenger's warning to the players

In completing primary puzzle 2, they would find the locations used in live event 3. As such, the QR codes at these locations that only revealed the page image now also revealed the page number and book the image corresponded to. This would hopefully allow the players to complete both primary puzzle 2 and live event 3.

Unfortunately, due to the length of primary puzzle 2, the players only completed part of the puzzle on the evening of the live event. However, during the live event the players found an exploit to the puzzle. Due to the way the complete page image files were named, the players gained access to all five completed images after finding only one, by following the naming conventions of the files on the server.

Despite this, the players still found the locations over the next two days. However, this exploit allowed them to stop solving the book ciphers from primary puzzle 2. Upon completion of secondary puzzle 4, the players printed out the page images.

6.2.10 Forcing the game forward

Despite having tested the page puzzle in live event 3 (detailed in 4.4.2.1.21), no matter how the players printed the images, they did not align with the books the images were based off. The puzzle was irreparably broken. This was a crucial design flaw.

As such, it was decided that the game would be forced forward, and the puzzle (and reward) in live event 3 abandoned. Nodes relating to primary puzzle 3 (detailed in 4.4.2.1.24) and the next Observer node were unlocked for the players.

The players found the answer to each of the riddle nodes within a day, but struggled to find enough players to answer the riddle. At this point, the players created duplicate accounts to answer the riddles and unlock the nodes connected to each riddle.

The Observer node, however, seemed to stump the players. Detailed in 4.4.2.2.11, this node required players to post a photograph of an Observer (or a person wearing a black suit) to the forum. This puzzle was not completed by the end of the game, effectively ending the Observer storyline for the players.

Completing the riddle nodes, however, began primary puzzle 4. The players struggled initially to discern the specific reference method needed to submit a reference, trying referencing styles used in the different University of Pretoria’s faculties, such as the Elsevier Harvard or the IEEE citation formats. However, the correct format was the Harvard method taught during the AIM modules, available in the AIM 101 and AIM 121 textbook, Navigating Information Literacy (Bothma et al. 2014:141), an example of which is shown in Figure 76.

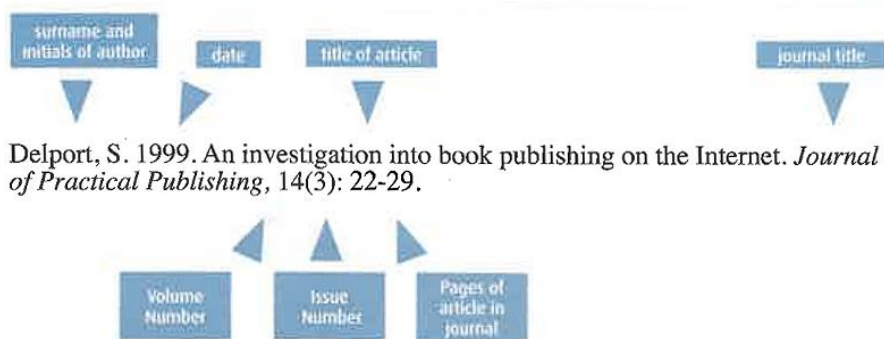


Figure 76: An example of the reference format followed in primary puzzle 4 (Bothma et al. 2014:141)

Despite finding the correct reference format for the puzzle, the players did not submit enough references for the puzzle, submitting four unique references for two topics, three unique references for one topic and no references for the final two topics. Because of this, lists of relevant articles (noted in 4.4.2.1.28) could not be generated for the players as they had not participated enough in the puzzle.

This break in play by the players (not submitting article references for primary puzzle 4) forced the design team to terminate the game due to The Messenger's warning earlier in the narrative (see Figure 75). As such, a new live event was designed to provide the game with an ending. The event was scheduled for the assumed time and place of the next event (Tuesday at 17:30 at the library). Prior to the event, no progress had been made by the players, triggering the final live event.

6.2.11 *The new ending of the Nomad ARG*

The players arrive, awaiting a live event. The phone rings. On the phone is Ana Kirlitz in a panic. She tells the players who she is and asks the players to help her. She has managed to get away from The Observers, but they are chasing her. After a while she realises she's in the Information Technology building on campus, and asks the players to hurry.

The players race to the Information Technology building to find two Observers patrolling the entrance. The players run past them, and one player runs up the stairs to find the Observers' leader (the author, dressed in a black suit) holding onto Ana. The player tackles the leader, grabs Ana and runs down the stairs with her.

More Observers arrive, chasing the players and Ana out of the building. One Observer tackles the player holding Ana, taking her back, struggling, to where the Observer leader waits at the entrance. He nods at them and tells them to stand down. The Observers let Ana go and she runs back and hides behind the players, cowering.

The leader claps slowly and sarcastically, walking between the lines of Observers and players. He addresses the players, telling them that because of their lack of effort, The Nomad was weak when he emerged briefly from the time stream, allowing the Observers to easily capture him. As a result, the Observers no longer need to keep Ana Kirlitz captive.

Angrily, the Observer leader tells the players that they have failed The Nomad: they are "not his champions. It is done." The players, upset and confused, ask him what they must do next. His answer bids them to do as they please. One player confronts him: this is not enough. It will never be enough.

The Observer leader laughs: “Well, this is what you get. Do with it what you will.”

He motions to the other Observers to follow him and walks away with them. The players are left there, stunned.

The design team chose to develop this ending to the players as a somewhat-happy ending, due to their failure to save The Nomad. As such, despite failing to save The Nomad, at least the players save Ana Kirlitz, bringing closure to the Mia storyline and to the game itself, despite this ending not being the originally planned ending.

Because of this final live event, the game was terminated a week earlier than originally planned, running for a total of five weeks. After the end of the final event, it was communicated to the players to meet the design team in the Multimedia students’ postgraduate lab for a debriefing regarding the game and to thank them for their participation. The players also had the opportunity to fully discuss the game with its design team.

6.2.12 Game Proper Diagram

As in Chapter 5, a diagram representing a visual representation of the game proper can be found below. As in Chapter 5’s diagram, black arrows and circles represent the game’s designed trajectory, with red arrows and circles representing deviations from this trajectory, as well as new design decisions and puzzles. For the sake of brevity, the diagram only discusses the main game narrative as the Observer narrative progressed as expected. The diagram also combines multiple event sets (such as the puzzles between each live event) to allow for a greater focus on the dynamic events within the diagram.

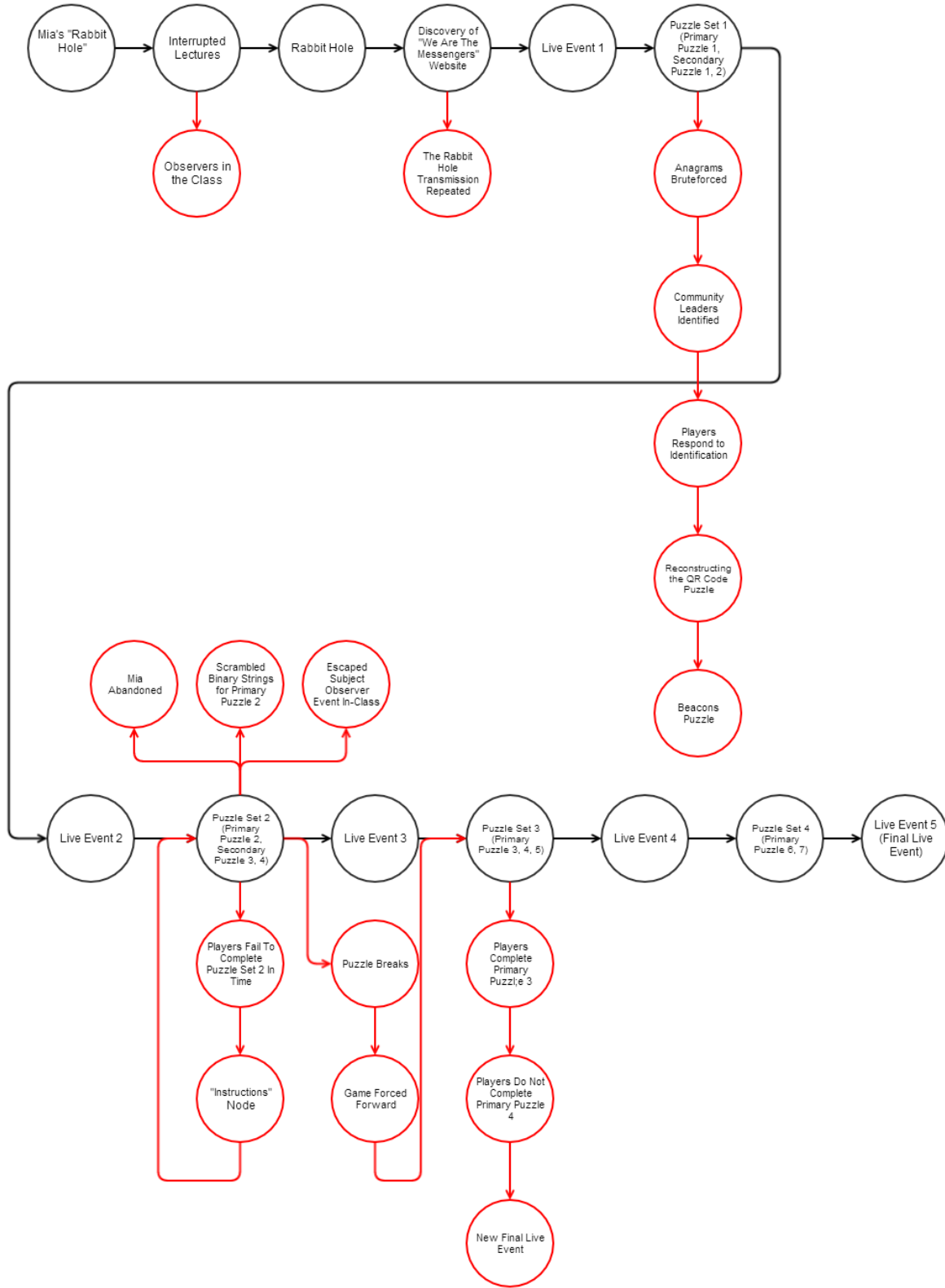


Figure 77: A diagram showing the run of the game proper

6.3 Results and Analysis

After the conclusion of the game, multiple sources were consulted for data gathering and collation. These sources were: the questionnaires provided to the players; the focus groups of the three player groups (active players, player-observers and observers); non-participant observation by the researcher and document analysis of both game websites and their statistical analytics; game-related videos on Mia's YouTube channel; and player created communication channels (the instant messaging group and separate player forum). These data collection techniques and how they were utilised was discussed in Chapter 3.

As with the pilot study, constant comparative analysis was done on the data collected from these sources. The process of open coding, axial coding and selective coding was once again followed (Strauss & Corbin 1998:101–143; Pickard 2013:269–271). However, the categorisation for the game proper was also informed by the prior categorisations within the pilot study (the sections and subsections as discussed in 5.3), as it was seen during the coding process that both games presented similar data points, and thus similar categorisations. As with the pilot study, this data seeks to help understand the player perspective of the *Nomad* alternate reality game in order to answer the study's main research question.

6.3.1 Player Understanding of the Game

The following section discusses the community's understanding of the *Nomad* ARG as a game that they could participate in.

6.3.1.1 Perceived Legitimacy of the Narrative

When considering the perceived legitimacy of the narrative for *Nomad*, one must first examine how the players first perceived the game. *Nomad* begins with Mia Schoemaker's first YouTube video discussing the disappearance of Ana Kirlitz. This video also introduces her audience to 'Midnight Chapters', one of the game websites that provides the game proper's initial story through an adaptation of the narrative of the pilot study.

Examining these first points of contact – *Nomad*'s initial "rabbit holes" – provides an interesting insight into Mia's audience. Of the 813 users who visited the 'Midnight Chapters' blog, 453 users were from the United States of America, compared to only 200 South African users. Other regions recorded through Google Analytics logs include Russia, Germany, Japan, China, France, Australia and the United Kingdom. As noted in 5.3.1, some of these accesses may be from search engine indexers. However, because Mia has a geographically distributed audience, accesses from these locations may also be valid. The

disproportionate number of views from the United States of America, for instance, may be as a result of a large group of her audience residing there.

To support this, comments on Mia's game-related videos were often members of the community expressing concern for the presented situation. Viewers asked Mia to keep them updated, expressed concern for Ana and even told Mia to contact the police regarding the potential missing person case. Viewers also mentioned that they would share her video on Tumblr in order to reach as many people as possible. It seems as if Mia's viewers thus expressed genuine concern for the situation and the parties involved. To support this, it can be seen that Mia's first game-related video had significantly more views than other videos previously posted on her channel.

During focus groups, players expressed admiration for the amount of existing narrative discussed by the 'Midnight Chapters' blog, noting that the setup of a narrative that spanned multiple years made the narrative seem more convincing and real. This helped the game maintain its "this is not a game" aesthetic (McGonigal 2003b). One player remarked that this made the alternate reality feel integrated with the players' reality.

This perceived legitimacy can also be seen when looking at the actions of the community (as discussed further in 6.3.2), where players would act overly cautious of men dressed in black suits (who players perceived to be Observers). Players often followed these individuals, believing that these individuals were game characters.

Players also mentioned that the game felt legitimate due to the multiple forms of media used in communication, saying that they felt "anything could happen" regarding communication from game characters. Players explicitly mentioned the legitimacy lent to the game by handwritten notes that resided in some of the books from their use in the pilot. Here the community theorised that these notes were expressly left for them by the Subjects within the Observer storyline, a narrative theory expanded upon in 6.3.3.2.

The live events enacted within the INL 110 lectures also added to this perceived legitimacy, with players often excitedly discussing or asking about these events on game hub websites after they occurred.

Despite this perceived legitimacy, however, only one person within the questionnaire noted that they were "vaguely aware", instead of "very aware" that they were playing a game.

Additionally, a focus group of non-players (the "observer" focus group discussed in Chapter 3, not to be confused with the Observer organisation within the *Nomad* narrative) mentioned that *Nomad's* legitimacy could be increased by developing an authentic scenario that played out in an authentic

context, which was difficult to do with *Nomad's* existing subject field and narrative. This suggestion is discussed further in 6.3.6.1.

6.3.1.2 *Down the Rabbit Hole*

When examining the eventual player community of *Nomad*, most share a single commonality: most players of *Nomad* were friends with one the game proper's "power player", who invited them to play the game with him/her after seeing the hyperlink to 'We Are The Messengers' within an IMY 300 assignment (via the additional targeting discussed in 4.4.2.1.6). This power player is discussed in more detail later (see 6.3.4.3).

One of the game's moderately active players entered the game "correctly", seeing the rabbit hole placed in an INL 110 lecture. This player also mentioned that, despite the express instructions of the design team, lecturers of the module had mentioned to the class that an alternate reality game would be beginning prior to the rabbit hole itself, which breaks the TINAG aesthetic the game hoped to convey, and may explain the recurring problem with community discussed later in 6.3.2.1. This moderately active player did, however, recruit one of the game's most active players who first visited 'We Are The Messengers' and then became involved with the active player group.

Another player in the moderately active player focus group was enticed into playing the game by the active players. This player was initially a bystander outside the library during the game's first live event. One of the active players mistook this player as an active player and asked him/her to join them in the play of the live event, which the player did. During the course of the game proper, this player convinced one of his friends, another moderately active player, to begin playing as well.

Non-players also seemed to be aware of the game, despite their choice not to participate. Various members of the 'We Are The Messengers' forum asked about the events during the INL 110 lectures, with one member in the players' private IM group mentioning the event where a design team member ran into the lecture venue acting like a madman. One non-player from the focus groups mentioned seeing the hyperlink within the IMY 300 assignment, but chose not to play the game due to a perceived lack of time, a problem discussed further in 6.3.2.1.

Lastly, when examining the databases of 'We Are The Messengers', it can be seen that some of Mia Schoemaker's friends registered accounts on 'We Are The Messengers', presumably being sent to the game website via 'Midnight Chapters' or Mia's videos. However, these accounts, though registered, were inactive on any in-game channels (the chat, forum or other player-created channels).

Recounting these "rabbit hole" experiences of the players, it would seem that a fair amount of the player community revolved around word-of-mouth, with certain players inviting other players to

explicitly play a game. While this does break the TINAG aesthetic, its effect on player engagement is discussed further in 6.3.4.1.

6.3.1.3 *Understanding Nomad as a Game*

As noted briefly in 6.3.1.1, and further confirmed within focus group interviews, all of the players who played the game actively or moderately actively were either aware they were playing a game from the start of their play (by being told they were playing a game by the community) or understood that *Nomad* was a game fairly quickly after beginning to play. One player mentioned that the realisation that he/she was playing a game came about once it was clear something was being orchestrated.

As noted previously, players who entered the game through the INL 110 module were also aware of *Nomad's* game origins as these players were informed of *Nomad's* existence as an ARG by their lecturer. Similarly, the game's power player understood that *Nomad* was specifically an ARG, because of his/her lecturer's previous discussion of the genre within IMY 300. Despite this, the player community had no direct experience playing ARGs before, with only one player having previously engaged in a similar activity, geocaching (Webb 2001). During the focus groups it was discovered that some interviewees had siblings who had engaged in previous campus ARGs discussed by De Beer and Holmner (2013) or similar experiences such as performance art and other pervasive games (Montola 2005), but no member of the community had actively previously participated in pervasive or immersive games (McGonigal 2003b). This lack of knowledge regarding the ARG genre meant that players were sometimes confused regarding how to play. This lack of understanding of the genre is discussed further in 6.3.4. It would seem that only Mia's audience was not aware (or did not mention their awareness publically) that *Nomad* was a game due to the comments left on Mia's videos as discussed in 6.3.1.1.

Interestingly, however, player awareness of the ludic origins of *Nomad* self-reportedly did not affect the play of the game, but rather enhanced it. Most of the active player group noted that they may not participate in an ARG similar to *Nomad* had they not known it was a game for safety reasons. They also mentioned that understanding that *Nomad* was a game only made it more intriguing, as it made the players want to discover the remaining story and game system.

Some players mentioned the dichotomy between understanding that *Nomad* was a game and the perceived reality of the game as presented by the TINAG aesthetic as a large factor for engagement, discussed further in 6.3.4.2.

6.3.2 *Player Community*

The following sections discuss the nature of the player community in *Nomad*.

6.3.2.1 *The Target Audience and the Recurring “Problem of Community”*

The game proper of *Nomad* attempted to explicitly target INL 110 (Introduction to Information Science) students. However, during design it was decided to expand this target audience to also include students from the IMY 110 and IMY 300 modules, albeit to a lesser extent (see 4.4.2.1.6). Additionally, the game’s first rabbit hole, Mia’s first YouTube video (detailed in 4.4.2.1.3), targeted her existing audience of YouTube subscribers. As such, the actual target audience for the *Nomad* ARG consisted of four different communities and consisted of approximately 800 people (approximately 300 students and 500 subscribers on Mia’s YouTube channel).

This number is consistent with the number of users gathered by Google Analytics on the game’s hub websites. ‘Midnight Chapters’ boasted 813 unique users, while ‘We Are The Messengers’ recorded 1015 unique users. However, when considering actual reach, it can be seen that only 215 views were recorded on Mia’s first game-related video. This reduces the target audience size to roughly 500 people when factoring in the possibility that the video may have been viewed multiple times. It can additionally be seen that Mia’s reach for game-related videos shrunk over the course of the game, with her least-viewed game video garnering 119 views.

This suggests that attempting to target Mia’s YouTube audience was a bad design decision. While targeting this audience allowed the design team to test the legitimacy of *Nomad*’s narrative scenario, and produced positive results in this regard, it would seem that Mia’s audience lost interest in Ana Kirlitz’s plight. This may be, however, due to the geographically distributed nature of Mia’s audience. It was assumed by the design team that her audience could then participate in the online components of the ARG. However, this did not occur. This is possibly because *Nomad*’s use of live events made geographically distributed players feel excluded or as if they could not help.

When considering registrants on ‘We Are The Messengers’, the site managed to convert 1015 visitors into 98 user accounts, of which approximately 90 accounts were unique and not related to game characters or the design team. This number shrunk once again to 22 user accounts on the player-created forum (discussed in more detail in 6.3.2.4) and approximately 20 on the players’ private IM group. This culminated in a group of between 10 and 15 active players who participated in the game to varying degrees. Characteristics of this group are later discussed in 6.3.2.2 and 6.3.2.3.

This conversion rate (15 truly active players from an approximate 500) is 3%, which correlates with the pilot study’s 4% conversion rate and the 5% seen in *Urgent: Evoke* (McGonigal 2010b). However, in terms of raw numbers, it can be seen that the game proper far surpassed the pilot study. While the pilot study targeted a much larger audience, it still only retained approximately 10 players from a pool of approximately 900 parties interested in helping Ana Kirlitz with her fictional study. The game proper, by

comparison, maintained 10-15 active players throughout the game from a smaller pool of potential players.

As such, the game proper was seemingly successful at building a community willing to play the game. Despite this, the focus groups again confirmed the “problem with community” within an ARG: the play of an ARG is often voluntary, and individuals may simply choose not to play. This was especially noted during *Nomad’s* focus groups, with one player remarking that no matter how he/she attempted to market *Nomad* to his/her peers, some would simply choose not to play.

A non-player in the “observer” focus group suggested that solving the problem of community may be a matter of proper market research prior to the development of an ARG, as “something is never going to appeal to everyone”. This includes the targeting of specific communities prior to design so that narrative and ludic design decisions support play by those communities. The same non-player also mentioned that a perceived lack of time was a barrier to their play of the game. This sentiment was echoed by another group on non-players who, despite wanting to participate, could only do so occasionally due to scheduling issues as these players commuted long distances to and from the Hatfield campus daily. Another non-player suggested that creating a more online-intensive ARG may solve part of this “problem with community”. The suggestion is discussed further in 6.3.6.2.

6.3.2.2 *The Active Players*

As with the pilot study, *Nomad* was largely played by a single group of dedicated players. In the game proper this group was spearheaded by the game’s power player, who is discussed later (see 6.3.4.3). This group reported having multiple meeting points. For the majority of digital game aspects, the group worked from a coffee shop near the library. However, when physically playing the game the players also self-organised meetings inside the library, having realised early in the game that the library was the game’s pivotal location.

The players’ understanding of the game to this degree suggests that the group was incredibly devoted to the game, paralleling Thompson’s (2006) “devotee” player types. As noted previously (see 5.3.2.2), this level of devotion can seem excessive to some players. During the focus group interviews, one player from the moderately active player group mentioned experiencing this. This player felt that the group of active players intimidated him/her, which caused this player to play less actively, as he/she felt excluded from the active player group.

This was reported in the focus group (by the active players) as unintentional, unlike in the pilot study’s group (who were potentially slightly more exclusionary). However, to potential players, *Nomad’s* active player may still have seemed exclusionary. The group was very slow to add new players to the community’s private instant messaging group and, because this communication channel was primarily

used by the active player group for communication, the lack of invitation of new players may have caused these new players to lose interest in the game and possibly abandon it altogether. In this way, a core communication channel, the player IM group (discussed in detail in 6.3.2.4) seemed exclusive and secretive to outside players. This may have affected the eventual size of the community, but may not be the only factor. The perceived level of commitment an ARG requires, geographic location as well as tangible time constraints, as mentioned earlier (in 6.3.2.1), are important potential reasons for why a large number of people signed up on the game's hub website, but only a smaller group actively played the game.

Despite this, one non-player in a focus group mentioned that he/she enjoyed observing the gusto with which the active players played the game. This suggests that there can be entertainment found in vicariously experiencing an ARG without necessarily playing it.

Lastly, when discussing the active player group, it is interesting to view the composition of the player base. As noted, the active player group formed largely around a single "power player" who introduced players to the game as their friend. It was discovered through observation during the game that this social group was very diverse, spanning multiple university departments (Information Science, Mathematics, Computer Science and Publishing, to name a few). This was an incredibly positive outcome for the game. ARGs often thrive on the diversity of a community for the creation of multi-faceted game puzzles that provide an experience often unique to the genre through the necessary use of the "collective detective" and a collective intelligence (McGonigal 2008). Though *Nomad* did not explicitly make use of the collective intelligence formed by this diverse group of active players, the diversity had another desirable outcome: vastly different players had vastly different emergent experiences during the play of the game. These experiences are discussed further in 6.3.4.4.

6.3.2.3 *The Paranoia of the Active Players*

Interestingly, the active player group exhibited a trait not seen in the pilot study, and not mentioned in previously reviewed literature: the players grew increasingly paranoid of each other as the game progressed.

This may have been a result of a line spoken by The Nomad in the second live event. During this event, the actor playing The Nomad, in an attempt to describe the danger that The Observers posed to the players, told the players to "trust no one". The players evidently took this statement very seriously and began to be more secretive in their personal play of the game. One such instance of this secrecy reportedly manifested during the reconstruction of the obstructed QR code puzzle (described in 6.2.5), whereby players would only share their image fragments if they were allowed to scan the assembled QR code first.

This was not helped by the existence of the central power player. This player, as discussed later (see 6.3.4.3), had advanced knowledge of the narrative and some game puzzles as a result of his/her exploitation of security flaws in the game's hub website. This led to the power player telling the community his/her interpretation of game content long before it was released. This made the power player seem to the players like he/she was somehow involved in the game behind the scenes, with one active player stating in the focus groups that he/she thought the power player was a "plant" – a faux player placed in the community by the design team. Other players also mentioned that the power player's advanced knowledge of the game seemed suspicious. This distrust was so widespread within the community that the power player was routinely questioned by the community regarding his knowledge and intentions in playing the game.

This intense paranoia also led to actual "plants" – specifically the game character of Mia – being distrusted by the community and ultimately abandoned by the design team. This may also have been intensified by another community characteristic – an intense curiosity regarding the inner workings of the ARG. During one live event, for example, the players discovered where the design team had previously hidden in the library, and spent a long period of time attempting to gain access to this hiding place only to find it empty, as the design team had chosen to use another base of operations that night. This awareness of existence of the "puppetmasters" also led the players to create their own forum in an attempt to hide any and all player communication away from the puppetmasters themselves. In this way, the players inadvertently attempted to make it more difficult for the design team to run the game effectively. However, these issues were quickly solved, and the design team were provided access to these resources by impersonating players.

This paranoia was also fed repeatedly by members of the community, though this was done benevolently. The power player, for instance, was constantly in fear of being kidnapped by The Observers because of his/her discoveries, paralleling his/her fate to that of Ana Kirlitz. It was later discovered that this "fear" was feigned and that the player actually wanted to be kidnapped by The Observers in order to make the game more exciting for the remaining players. The experienced ARG player also fed similar paranoia, offering to set up new player communication channels to avoid the eyes of the design team and warning the power player of his potentially grim fate (the feared kidnapping). This kidnapping fear led to a grave player perception of the Observer organisation by the players, who first attempted to find and follow any and all people dressed in suits, but began to run away from similar people (whether or not they were part of the game) as the game progressed.

Despite the potential difficulties this paranoia could have caused the design team, this characteristic can eventually be seen as another positive outcome of the game. The players' paranoia can be seen as a result of their engagement with the game (discussed further in 6.3.4.2), and provides an interesting account that potential ARG designers should note when attempting to design for collaborative puzzle solving in their ARG as opposed to competitive puzzle solving.

In conclusion, when asked broadly what *Nomad* had taught its players in a focus group, one player offered the following anecdote that is relevant to readers who may choose to participate in ARGs: “work with the plants, even though the game tells you not to trust them.”

6.3.2.4 *Communication Media*

Though ‘We Are The Messengers’ had both an embedded chatroom and a forum for player communication, a large contingent of players (and the active players specifically) chose not to utilise these functions for communication, similar to the active player group in the pilot study. The chat function was never used by the players, and the ‘We Are The Messengers’ forum was used sparingly during the game, with a total of 86 posts appearing in 43 topics throughout the game.

There are multiple potential reasons for this abandonment. Despite efforts by the design team to provide working, effective communication channels to the players, the scope of the game often meant that these channels were overloaded with information. This meant that access times to these channels increased, and the channels themselves became less organised, making these channels less desirable to use. Additionally, player paranoia (discussed in 6.3.2.3) caused the players to create their own communication channels. This creation was justified by the players as a way to avoid monitoring by the game’s design team. However, another reason for the creation of these channels is likely one of convenience. As with the pilot study, the active players created a mobile-based instant messaging group for real-time communication. The log of this group’s communication helped the design team observe the active players outside of the game’s live events, and is used as additional data in this analysis. The players also created a separate forum for sharing information. This forum, by contrast to the ‘We Are The Messengers’ forum, boasts 123 posts in 65 topics, despite only 22 users being registered on the forum itself.

This player-created forum, however, was far from perfect, with large discussions had on the player IM group regarding its maintenance. However, these discussions suggest that ARG players may prefer to use their own communication channels, despite having to create and maintain these channels themselves. As such, it is suggested that potential ARG designers allow players to do this, whilst making provisions to gain access to these channels in order to monitor the player community.

When observing the use of all of *Nomad*’s communication channels, it can be seen that the ‘Midnight Chapters’ blog (which the player could interact with by commenting on blog posts) and the ‘We Are The Messengers’ chat function were both never used by players. Both forums were used largely for the documentation of game events and puzzles and the sharing of media, but were rarely used for actual discussion. Rather, discussion on the forum was largely relegated to posing unanswered questions or for congratulating and thanking individual players for their contributions. The forums were also used to provide players who were not an integral part of the active player group with information on puzzles

and events in a timely manner, though the effectiveness of this information relay to non-players cannot be discerned.

Much of this communication and organisation was orchestrated by the experienced ARG player, who, along with the power player, was an integral member of the active player group. This player attempted to document as many puzzles as possible, and steered discussion from the 'We Are The Messengers' forum to the player-created forum. The role of this player in the play of *Nomad* is discussed in detail in 6.3.4.3. Additionally, the power player shared a folder within his/her cloud storage account intended for joint use by the players, though this was not used by anyone aside from the power player him/herself.

Lastly, the majority of individual emergent narratives and community stories took place on, or as a result of, the player IM group. Some of these narratives are discussed in 6.3.4.4. The IM group was the most utilised communication channel. Data from the logs of this channel were corroborated by the study's focus group interviews and are discussed in the relevant subsections in this analysis.

6.3.3 Player Interpretations and Theories Regarding The Game

This section discusses various interpretations made by the players throughout the play of *Nomad* about the design team, the narrative or aspects of the game itself. It must be stressed that these "theories" are simply the players' own theorising and interpretation regarding game elements, as opposed to scholarly theories.

6.3.3.1 Game theories

The earliest theories regarding the game came from Mia's audience who, as noted in 6.3.1.1, initially assumed that the game was real. This theory was disproved by the active players early in the game's run, as they were all fairly aware of *Nomad's* game origins. Despite this, they were not aware of who the design team was. The power player, however, had his/her suspicions that one of the lecturers in the Multimedia department was the game's mastermind, eventually confronting the researcher and asking him about his involvement in the game. The researcher, however, stuck to his in-game alibi: he simply helped Ana construct the 'Midnight Chapters' blog and helped Mia manage it.

Smaller theories made by the active players were focused on specific aspects of the game, rather than the game itself. These theories showcase the extent to which the active players were engaged in the game context. These theories are listed below:

- The players needed to search for Oxford Road, as the picture of The Nomad discovered in primary puzzle 1 (see 4.4.2.1.11) shows him standing on a road, and "Oxford" is the given clue.

- Certain books from primary puzzles 1 and 2 (see 4.4.2.1.11 and 4.4.2.1.18) appeared not to be available on Hatfield campus, and certain clues initially seemed to direct players to landmarks not on Hatfield campus. Thus, the game may have expanded to the Groenkloof campus. This was not the case.
- There were only twelve business cards (used in various primary puzzles) with QR codes on to correlate with the numbers on a clock face. There were actually 38 QR code business cards.
- The game would run for the entire year. This theory was initially supported by the power player, who mistakenly believed that *Nomad* would run for a year because its pilot (which formed the game problem's initial narrative) took place in the second semester. As noted, the game proper ran for a total of six weeks, ending prior to the exam period.
- The anagrams found in primary puzzle 1, when scrambled, had random spacing between the words so that players could not simply solve the anagram by unscrambling one word at a time. Players initially believed that this may have something to do with the redacted file found in the first dossier (see 4.4.2.2.6). The events were not related at all.

6.3.3.2 Narrative theories

The players had multiple narrative theories throughout the game, both regarding the overarching narrative and minor aspects of the narrative.

One of the prevalent theories that survived from the pilot study was that of the morality of The Messenger. The players thought that The Messenger, known as the White Rabbit by the players in the pilot study, was the game's antagonist. In the game proper, The Messenger was theorised to be an Observer, who was preparing the players to become trapped Subjects by having them complete his wishes.

Regarding the Subjects of the Observer organisation, players initially theorised that they had metaphysical powers that were activated when they were experiencing strong emotions. Players later theorised that the Subjects left them handwritten messages when they found a remnant of the notes used in the pilot study.

Overarching narrative theories included an initial theory that the Observer organisation had a connection with Ancient Egypt due to the similarity of The Eye of Horus, an Ancient Egyptian symbol (Stokstad 2007), and the symbol of the Observer organisation. A comparison can be seen below in Figure 78.

Other narrative theories suggested that Ana, The Nomad, or both parties were already dead after being captured by The Observers; and that The Nomad was the person who kidnapped Ana Kirlitz, making him an antagonist. One player suggested that Subjects were in the library just before the players were, but

were then captured by The Observers prior to the players' arrival. This theory was posited due to the text content of one of the Observer notes in secondary puzzle 1 (see 4.4.2.1.12). Another player, near the middle of the game, began to question whether the players were looking for Ana or The Nomad. This confusion was as a result of the multiple disparate narratives that the players experienced as a single narrative during play.

Players also believed that the Observer organisation was actually a company called Colossus Innovations. Colossus Innovations was the name of the company used in the previous *Colossus Innovation* ARG run on campus (de Beer & Holmner 2013). This was discovered by the players when they erased the ink from the file the dossier came in (from 4.4.2.2.6). This was unintentional, as the design team had simply reused the folder from the previous ARG. Plans were made to then integrate the Observer storyline with that of the *Colossus Innovation* ARG, but were later abandoned due to time constraints.



Figure 78: The Eye of Horus, also known as The Eye of Ra (The Hallway Museum 2015) and the Observer organisation symbol

Later-positing overarching narrative theories were more correct, alluding to time travel and chaos theory specifically, and mentioning the use of galaxies because of the aesthetic of 'We Are The Messengers'. These theories were likely more correct as they were posited by the players once they had discovered more of the game's narrative content. Other correct theories are listed below:

- Ana is a Subject of the Observers.
- The players are Subjects of the Observers.
- The Nomad is the same "Nomad" as the one presented in a hypertext fiction that acts as a fictional prequel to the game (this hypertext fiction is discussed more in 6.3.4.3 and 6.3.5.5).
- Subject 24 is The Nomad.
- There are Subjects of the Observers on the Hatfield campus.

- The Observers accidentally left the dossiers in the library (those found in 4.4.2.2.6 and 4.4.2.2.10).
- The Nomad is stuck in a time loop during live event 2 as he cannot remember the previous phone calls where he speaks to the players (see 4.4.2.1.15).

6.3.4 Player Participation

The following section discusses how the players participated in *Nomad*.

6.3.4.1 Understanding the Game System

Based on the rapid completion of the first few puzzles (prior to live event 2), it can be assumed that the active player group had a thorough understanding of the game system and what was expected of them as players. This could be seen when the power player, faced with primary puzzle 1 and secondary puzzle 1, noticed that the scrambled anagrams referred to multiple book names, and posted a mostly-complete list of these book names on the forum on the same day as the release of the puzzle (which was released after live event 1). Instead of solving the puzzle by going to each book, scanning the QR code and waiting for the next set of book names to unscramble (as it would have after a few hours of the QR code being scanned), the power player usurped the puzzle entirely, showing a great deal of understanding regarding the puzzle's mechanics. Sharing the solutions to puzzles on a forum (whether the player forum or the 'We Are The Messengers' forum) was standard practice for the players who did so in order to better understand the timeline of the game, and to keep other players up-to-date with game events.

Additionally, the players on 'We Are The Messengers' quickly grasped part of the solution for secondary puzzle 2 (see 4.4.2.1.13). They posted the obligatory "My name is [name] and I am a Messenger" on the relevant forum thread (as The Messenger had done before them). However, despite being prompted, no player noticed that they had to post a video of themselves saying this phrase, even after Mia completed the task and got the allocated reward (the newly coloured avatar). A similar understanding was seen in the 'Men in Black Suits' puzzle (see 4.4.2.2.11) where the players understood that they needed to take a photo of an Observer to complete the puzzle, but chose to not complete the puzzle.

The players, however, slowed their pace after the release of the second primary puzzle. When asked about this in the focus groups, players reported that they found the book ciphers within primary puzzle 2 boring. Another player mentioned that the introduction of the beacons puzzle (see 6.2.7) split their focus. This made the players wonder which puzzles they should focus on, which frustrated them. Additionally, they initially struggled to understand both the book ciphers and the beacon puzzle, which they reported as demotivating. This period of the game progressed the slowest as a result, and was eventually abandoned in favour of progressing the game at a hopefully faster pace.

The next primary puzzle (primary puzzle 3 – see 4.4.2.1.24) progressed quickly with players figuring out the solution riddles and posting the answers to both the ‘We Are The Messengers’ and player forums within a few hours of the release of the puzzle. However, progression slowed again after this, with players initially confused regarding the referencing format for primary puzzle 4 (see 4.4.2.1.27). Once they understood the format it was noted by the power player that, like in primary puzzle 2, the players found the puzzle mechanic boring, leading to them not completing the puzzle.

When asked for their opinion of the game during focus groups, players noted that their play was motivated by wanting to discover the purpose behind both the story and the gameplay, that the story was well-structured and that they liked the “pop-culture” feel of the game itself. They noted that they enjoyed being able to feel in control of the game world, but as a result felt frustrated when they didn’t know what to do next or when puzzles broke, as they felt that this meant that they had failed.

6.3.4.2 *Engagement with the Game System*

As mentioned multiple times previously, the active player group seemed to be incredibly engaged with the game system. This can be seen when examining one of the first messages on the players’ IM group: one player encouraging the other members of the group to examining ‘Midnight Chapters’ in order to learn about Ana Kirlitz.

When examining access patterns for ‘Midnight Chapters’, it can be seen that a large portion (around 250) of its recorded 996 sessions lasted from one minute to thirty minutes, implying that the users who did engage with the website likely engaged with a large amount of its available content. Notably, however, Google Analytics only classified 182 of ‘Midnight Chapters’ 813 visiting users as returning visitors. This is likely because ‘Midnight Chapters’ served as an information hub game website: once players understood the narrative setup, there was little reason to return to the site, as they could simply follow Mia’s video blogs of the events on YouTube instead. The “investigation wall” on ‘Midnight Chapters’ (see 4.4.2.1.1) was similarly neglected, garnering only 77 page views. This was likely because, despite being a visual aid for the existing “evidence”, the multimedia posted on the investigation wall was also available in each separate blog post.

Google Analytics also revealed that the QR codes shown in the INL 110 ClickUP module banner and placed into an INL 110 assignment (see 4.4.2.1.5 and 4.4.2.1.6) were not as effective as initially hoped, with the orphan page only garnering a total of 46 views.

Lastly, examining ‘Midnight Chapters’, it could be seen that posts made by Mia were viewed more than those made by Ana. This may be because Mia’s videos linked her audience to ‘Midnight Chapters’, which meant that they may have been more inclined to read her blog posts over Ana’s. This is ironic as the purpose of ‘Midnight Chapters’ was to inform potential players of the narrative setup regarding Ana.

'We Are The Messengers', by comparison, was far more active, garnering 50 000 page views from 1015 users during the game, with an average session on the website lasting around four minutes. This suggests that most users likely engaged somewhat with the game, or at least registered on the website. This conclusion is corroborated by a 42% returning visitor ratio, almost double the 22% ratio received by 'Midnight Chapters'. These statistics make sense, as 'We Are The Messengers' was the game's main hub website. It is also noteworthy that 'We Are The Messengers' received increased numbers of page views on dates that correlate to the days of planned live events.

Despite these promising numbers, as noted in 6.3.2.2, new players often stopped playing fairly quickly due to a lack of use of the website's chat functionality and forum by the active player group. This led to new players often asking questions on the forum that were never replied to. This lack of answers may have confused new players and barred them from engaging further with the game. Additionally, two non-players mentioned that the two-week break in play that occurred due to a set of public and University holidays after live event 1 demotivated them from playing further, though these players mentioned following the story of the game through the power player. One moderately active player, however, reported that he/she barely followed the story after he/she began to play less actively.

The active players, however, remained engaged throughout the game. They reportedly self-organised meetings to catch up on game events and narrative if they hadn't played for a while, and kept a fairly active stream of communication throughout the game on their IM group. The experienced ARG player also constantly prompted the players to share clues and theories on one of the game forums. This meant that progression through the game was often based on the level of activity of the active player group.

Despite the breaks in play discussed briefly in 6.3.4.1, the active players were still engaged enough in the game to attempt to find the puppetmasters during live event 2. Additionally, it was reported during the focus groups that one player sprinted to the Information Technology building after hearing Ana's location in the final live event. This action typifies the deep level of engagement seen within the active player group.

6.3.4.3 *The "power players"*

During *Nomad*, there were two members of the active player group that could be considered "power players" due to their level of devotion to the game. These players are mentioned earlier as "the experienced ARG player" and "the power player". Within this section, the players will be called "Player A" and "Player B" respectively, rivalling "Player X", who was discussed in Chapter 5.

Player A, as noted in 6.2, had not participated in ARGs previously, despite having knowledge of the genre. It was seen through observation that he/she was not as active as other members of the

community during live events. However, Player A seemed to instead task him/herself with the documentation of the game and management of the player community. Player A was the most active member of both game forums. He/she created a new forum thread on the 'We Are The Messengers' forum whenever a new node, and subsequent new forum category, was unlocked on the forum. This forum thread pointed players to a similar forum thread on the private player forum. The player forum discussed in 6.3.2.4 was also created by Player A. This thorough documentation allowed the design team to have a comprehensive understanding of the players' perspective of the game during its play, and subsequently allowed the researcher to compare player perspectives with design team perspectives regarding the implementation of the game proper discussed in 6.2. It additionally allowed new players to quickly understand the game and begin playing at any point during the game's run.

Had Player A not been as dedicated in his/her self-assigned tasks as community manager and game documenter it is entirely possible that the active player group may have played far less actively, which may have resulted in the premature end of the game due to a lack of progression. This assumption was corroborated by some active players during the focus groups who praised Player A's ability to keep the group motivated.

Player B could be considered to be the game proper's Player X. However, unlike Player X in the pilot study, Player B's slight understanding of the ARG genre allowed him/her to understand the difference between the assets that were intentional or unintentional within the game world. As noted earlier, Player B intentionally brute-forced (forcibly solved) primary puzzle 1 by manually unscrambling the names within the list of books associated with the puzzle. This led to the design team obscuring the characters of the book names in primary puzzle 2 (so the puzzle could not be brute-forced).

Player B also viewed the HTML source code of 'We Are The Messengers' and discovered that he/she could access the content of locked nodes by directly inputting the name of the HTML page that was loaded into the node's dynamic frame (for example, Observer nodes were often named nodeX.html, with corresponding names for JavaScript or PHP files, where "X" was the number of the Observer node, from 1 to 13). To remedy this the design team initially disabled the ability for players to view the HTML source code of 'We Are The Messengers' altogether. They later re-enabled this (as certain puzzles required players to view the HTML source code of the site), instead disallowing browsers from directly accessing content that needed to be loaded into the node's dynamic frame. Despite this, Player B had now prematurely experienced narrative and puzzle content, and began to develop theories based on this advanced knowledge. These theories were often flawed (such as the "year-long ARG" theory noted in 6.3.3.1) but were shared with the community regardless. This meant that the community were sometimes acting on false information, which affected how they played the game. Members of the active player group reported getting annoyed with Player B for having this advanced knowledge, as it changed their experience of the game.

Just after live event 2, Player B discovered a page of a book in the Multimedia students' postgraduate lab. Unbeknownst to the player, this page was used by the design team during live event 2 to prompt the actor playing The Nomad, who was talking to the players in real time, and as such had phrases like "Run!", "Men in black suits" and "Save me!" scribbled on it. As noted in 6.3.3.1, Player B confronted the researcher about this, though the researcher denied all game-related involvement. During the focus groups, Player B divulged that this interaction made him/her sure that the researcher was the "mastermind" behind *Nomad*, though he did not divulge this fact to the player community.

This suspension of disbelief is what separates the intentions of Player B and that of the pilot study's Player X. While Player X's devotion to the game was often truly destructive to the joint experience of the community, Player B's exploitation of game systems did not truly disrupt the experience of the community, as his/her "inside knowledge" was shared less readily than Player X's.

Despite Player B's unwanted behaviour during play, he/she was necessary to the game proper. He/she was the central player within the active player group, and self-regulated his/her play at points during the game in an effort to allow other players to solve some of the game's puzzles. This often had an adverse effect, however, as when Player B played less, the rest of the community also tended to play less. Despite this, Player B had good intentions, and was a far less antagonistic presence to the design team than Player X had been before him/her.

6.3.4.4 *Emergence and Player Stories*

Observation during the game, along with player reports during the post-game focus groups, shows the amount of emergent behaviour that occurred during the play of *Nomad*. Emergence, as noted in Chapter 2 and Chapter 5, occurs as a result of player interaction with a system that results in meaning-making (Salen & Zimmerman 2003:62).

During the game, the players took actions not predicted by the design team, resulting in such emergence. This emergent behaviour resulted in multiple emergent narratives. Emergent narrative, as noted by Salen and Zimmerman (2003:383) are the narratives that result from play. These stories, thusly, can be described as the story of play, or stories that result from player experience. Both emergent behaviour and emergent narratives will be discussed in this section.

Examples of emergent behaviour have already been discussed throughout this chapter. The players' paranoia of men in suits, who they perceived to be Observers, the "Eye of Horus" theory and the "Oxford Street" theory are all examples of emergence that were previously discussed, as was the power player's discovery of the book page in the Multimedia postgraduate lab. Additionally, the players' utilisation of the library as a meeting location for their self-organised meetings can be considered emergent behaviour.

Another example of emergent behaviour occurred when the first timed event for the Observer event was taking place (see 4.4.2.2.5). The node with the timer inside it unlocked late at night, as this was when the players had completed the previous puzzle. At this point, the section of the library in which the dossier reward would have been placed was closed for the day. Despite this, the players met on campus (likely after driving to campus from their houses) to make sure they would not miss any part of the game. In keeping with the narrative, the design team placed the dossier in its correct location early the following morning. However, because the players had “failed” to retrieve the dossier in the allotted hour, parts of the files in the dossier appeared as redacted. This led to further emergence, with the players attempting to uncover the redacted information, similarly to how they had uncovered the unintentional “Colossus Innovations” tag on the dossier file. However, because the supposedly redacted information in the files was simply printed ink, the players could not uncover more information, despite spending hours trying to do so. To reward them for this effort, non-redacted versions of the files were made available to the players during the second timed event (see 4.4.2.2.9).

Another example of emergent behaviour occurred during live event 2. As noted in 6.3.4.2, the players attempted to find the design team and converged upon a location where they believed the design team was hiding. On one of the computers in this location, a Skype account with a contact profile was open. This coincidentally linked to the content of the live event itself, where the players had just received a phone call from The Nomad. Noticing this, the players recorded the username of this Skype contact and later phoned him/her, expecting to learn more about the game. They additionally waited at the location for a long period of time, expecting the design team to return. However, as noted earlier, the design team were in a different location during this event.

Similar emergence occurred later, while the players were awaiting a phone call related to an Observer node (see 4.4.2.2.8). Upon arrival at the payphone they discovered a warm cup of coffee someone had left nearby. This convinced the players that The Nomad or The Messenger had recently been at the location when, in actuality, it was merely some uninvolved person’s abandoned cup of coffee.

A last example of emergence occurred during secondary puzzle 4 (see 4.4.2.1.20), where players were searching for a QR code near the Law Library, as a riddle had pointed them to this location. Upon not finding the QR code outside the library the players became convinced that the QR code must be inside the library and began to ask students who had access to the library to allow them to enter the library to search for the QR code, when the QR code was simply more well-hidden outside than the players had originally thought.

During the focus groups, players relayed many emergent narratives they had experienced. These emergent narratives are briefly discussed below:

- After noticing the location in a video played in an Observer node (see 4.4.2.2.7), players went to the location to investigate. Whilst there, they found an illegal substance hidden similarly to how game information would be hidden. The players correctly dismissed this discovery as not part of *Nomad*.
- One player praised the scope of the narrative, noting that he/she had had a conversation with someone in one of his/her lectures about the game. This person then informed the player of their own, brief, experience with the pilot study. The player felt that this coincidental interaction made the game seem more realistic.
- As a result of the interaction discussed above, the same player began to scrutinise any misplaced piece of information, recalling that he/she “found so much meaning” in a passage of *The Hobbit* (Tolkien 1937) because he/she felt it described the players’ experience with *Nomad* perfectly.
- As noted earlier (see 6.3.2.3), the power player expressed a desire to be kidnapped by The Observers. This was a central joke amongst the player community for the remainder of the game.
- Non-players reportedly enjoyed watching the antics of the active player group throughout play.
- Players initially followed people who were dressed in suits, as the players believed that these people were Observers.
- During the final live event, one player physically tackled the researcher (who was now in-character as the leader of The Observer organisation) in order to retrieve Ana and rescue her.
- During primary puzzle 2, the players checked some of the relevant books out of the library in order to decipher the ciphers. One of the players, despite having been told the format of the ciphers multiple time by his fellow players, kept failing to correctly solve the ciphers, which the players would then tease him/her about. Additionally, during the solving process, the books, already worn from being used by other library patrons, began to lose pages and fall apart, which embarrassed the players greatly on their return of the books to the library.
- The partners of the active players played a significant role in the play of the game. In one instance, the partner of one player got incredibly angry at this player for his/her dedication to the game, likely because this meant the player was dedicating less time to his/her partner. Conversely, another player’s partner actively helped him/her during gameplay, and actively pointed out to this player that *Nomad’s* gameplay seemed to be teaching players how to use the library. Lastly, during the final live event, the power player was initially hesitant to participate, as his/her partner was ill. Upon hearing that the event was the potential final event of the game, the power player arrived at the event, having convinced his/her ill partner to join him/her.
- During live events in the library, the players would often be scurrying around to find books or solve puzzles. One player noted finding it strange that other patrons in the library would try to silence the players for making too much noise. This player noted that he/she would have joined in solving the puzzles had he/she seen a group of people doing a group activity in the library, but that no onlookers joined them.

These “player stories” are of particular interest to this study, as it attempts to discern the experience the players had whilst playing *Nomad* from both a learning perspective and an entertainment perspective. These detailed stories are pivotal to understanding how entertaining they found the game, as the emergent stories discussed above will likely be what is remembered by the players about the game when they later recall it. An examination of the successes of the game as an entertainment product is done further in 6.3.5.4.

6.3.5 Game Effectiveness

This section discusses *Nomad*’s overall effectiveness as both a teaching tool (as educational) and an entertainment product (as a game).

6.3.5.1 Linking game goals to learning outcomes

Both the questionnaire and the focus groups were examined considering how *Nomad*, as a game, taught its player community. As noted in Chapter 4, the design of *Nomad* was based on teaching various information literacy skills noted by Dunn (2002) and Bothma et al. (2014).

When asked about the educational components of *Nomad*, players noted that because of the separation from the Academic Information Management modules, unlike the mapping within the pilot study, they linked *Nomad* less consciously to the modules themselves. However, they collectively noticed that the game was educational when a game location (the library) and game puzzles (finding books) were repeated.

However, the players did not find that the educational components of *Nomad* made the game less engaging, noting through the questionnaire that they enjoyed the game regardless of the skills that needed to be exercised during play. One player noted that knowing the game was educational didn’t affect the play of the game because during play the players are focused on playing, not learning, despite the fact that they are learning during play regardless. Another player noted that the educational components and outcomes that were the basis of many game puzzles were “well hidden” by *Nomad*’s story.

When asked specifically about the game’s potential relation to the AIM modules during the focus group, players praised the ludic framing that *Nomad* gave to traditional information literacy tasks, noting that it made the tasks more engaging. One player additionally noted that *Nomad* was good at creating motivation to information literacy-related tasks, saying that these tasks often have to be self-motivated, which is more difficult.

Players also noted that the game helped them contextualise skills they had learnt in AIM and how to apply these skills in external contexts more effectively. They also felt that *Nomad* could be an effective practical component to complement the modules, and would be beneficial to students registered for the module.

As such, it would seem that *Nomad* was effective in linking its game goals to the learning outcomes of the AIM modules, whilst providing an engaging experience. Player comments included sentiments such as “thank you for the awesome experience” and that they would play similar games in the future if provided the opportunity. In addition, the story was universally acclaimed throughout the focus groups, with some players also mentioning that the gameplay, too, was memorable.

6.3.5.2 *Skill exercise and acquisition*

As in the pilot study, the questionnaire (attached in the appendix) presented players with a list of information literacy skills that they thought the game had taught them. As with the pilot study (seen in 5.3.5.1), the players collectively (through an aggregation of all questionnaire responses) felt that all the available skills noted within the questionnaire were taught during gameplay. These were the following:

- Searching for books in a library
- Understanding and decoding ciphers
- Academic referencing
- Internet search query construction
- Searching the internet
- Using academic journal databases to search for articles
- Using the University Library Portal
- Using different technological platforms (mobile, PC)
- Communication with a community through social media
- Using internet blogs, forums and social media
- Group problem solving
- Evaluating the relevance of information
- Rearranging information to provide context
- Exploratory or tangential learning

That *Nomad* seemed to effectively teach these skills as expected and, unlike the pilot study, the game proper was designed in such a way that all of these skills would be exercised. How these skills were implemented within the game proper was discussed at length in Chapter 4 (see 4.5).

Players also noted that *Nomad* taught them an array of other new skills and knowledge. These include the following:

- How to view HTML source code within a browser
- The different functionalities of Skype as an instant messaging and VoIP (Voice-Over-IP) client
- The history of the University's centennial structures
- More information regarding faculties available to postgraduate students at the University
- How to navigate the Hatfield campus more effectively
- How to use the library and its computers for finding resources and books
- How to widen one's scope when solving puzzles

The players also noted that *Nomad's* use of the campus as a physical space of possibility (Salen & Zimmerman 2003:66) could be useful for orientation purposes for new students, noting that they had a better grasp of the campus' "nooks and crannies" post-game. One player suggested that playing a similar ARG in the University's residences could be beneficial to new students, similar to how orientation-based ARGs have been developed and played in England (Piatt 2009; Whitton 2009a).

Additionally, and perhaps humorously, one player noted that *Nomad* taught him/her "how people [can] turn on each other at a moment's notice". As noted previously (see 6.3.2.3), the competitive elements that emerged in *Nomad* as a result of its community is a consideration for future ARG designers.

Despite being expected, the fact that *Nomad* was successful in the teaching or exercising of all these skills is a positive outcome for the study. It can be assumed, then, through the analysis displayed in both this and the previous subsection, that *Nomad* was a successful educational product.

6.3.5.3 *Personal player accomplishments*

As with the emergent narratives discussed in 6.3.4.4, players in the study's focus groups were asked about their personal accomplishments. These accomplishments were often minor, such as feeling accomplished when a player downloaded a QR code scanning application to scan the game's first QR code or simply going to the library on campus to participate in the game.

The community collectively agreed that they felt accomplished when they progressed through the game, noting that rewards were very effective in making them feel accomplished. These rewards could be something as simple as a node unlocking on 'We Are The Messengers' to more physical progression markers, such as the discovery of Observer business cards, QR codes, or the notes from the pilot study that the players assumed were left for them by Subjects of the Observers. They also noted that solving riddles made them feel accomplished.

Some players noted that they felt accomplished when they correctly guessed part of the game's narrative based on the theories discussed earlier (see 6.3.2.2).

Lastly, the power player noted that he/she felt accomplished when he/she successfully exploited primary puzzle 1 and solved the anagrams of the book names. This may not be a feeling of accomplishment strictly for the exploitation of the game system, but rather for solving a difficult puzzle without being aware that the method itself was exploitative.

6.3.5.4 *Successes as an entertainment product*

It has been mentioned throughout this analysis, and noted specifically in 6.3.5.1 and 6.3.5.2 that *Nomad* was entertaining, as well as educational. This can be further supported by opinions noted in the study's focus groups.

In these focus groups, players thanked the researcher and the design team for creating a game that they noted was entertaining, addictive, made the Hatfield campus a more interesting place and that provided a welcome break from their studies. Overall, they noted, *Nomad* was a game that they were glad to be a part of.

Regarding specific praise the game received, one player described the game in the players' IM group as "a non-stop web of intrigue and mystery". A YouTube comment on one of Mia's videos, similarly, expressed the desire for the Ana Kirlitz's storyline to be published as a mystery novel. Players mentioned that there were always tasks to perform in-game, and that they never felt like they were waiting for more content to release. This rapid release of content was, in itself, exciting, as it made the players feel like they were constantly progressing.

The structure of 'We Are The Messengers' (as a website containing unlockable nodes) helped with this engagement. Players mentioned that the website itself was aesthetically pleasing and suitably game-like (with one player noting "it looked like a [legitimate] game"). One player noted enjoying the ability to click and drag nodes within the structure in order to watch them bounce back into place once released.

Regarding the narrative, players enjoyed the time travel aspect, additionally noting that the ending they received (though not the original ending) was satisfactory, and allowed the world to ultimately feel coherent.

Lastly, the statistics gathered from Google Analytics show one other notable success, though this success is one that is mostly relevant to the design team: 'We Are The Messengers' recorded 269 sessions (of its 1726 recorded sessions) from mobile devices throughout the course of the game, representing a 16% access ratio from mobile devices. This is notable due to an observation made within the pilot study that *Nomad* would need to be able to be played actively on a mobile device. This is because players spent large amounts of time during player meetups and live events accessing the website from their most convenient device, which was often their mobile phones. This 16% access ratio

suggests that *Nomad* was played significantly on mobile phones when considering the size of the active player group.

6.3.5.5 Shortcomings in the game implementation

As in the pilot study, the game proper of *Nomad* was not without its flaws. As in the pilot study, and indeed most ARGs, implementation flaws were integrated as best as possible into the game context where feasible. However, as in the pilot study, some of these flaws were only identified through post-game focus groups and questionnaires.

These implementation flaws are discussed below. Because there is currently no planned sequel or continuation to the *Nomad* narrative, potential solutions and considerations are rather discussed on a broader scale, in the hopes that these solutions and considerations may be applicable to potential future ARG designers.

Table 18: Shortcomings in *Nomad's* game proper implementation

Shortcoming	Discussion	Potential Solutions and Considerations
<p>Many of the game’s activities were repetitive.</p>	<p>Many of the game’s puzzles (discussed in detail throughout Chapter 4) required the players to complete the same or similar tasks multiple times. The focus on repetition attempted to condition the players using operant conditioning (Skinner 1938; Skinner & Ferster 1957), as is frequently used in modern games (Salen & Zimmerman 2003:345). Here, if the players completed a single rote task, they were rewarded similarly. This conditioning, as noted by Koster (2013:28–32), lies at the heart of all games, noting that fun occurs as a result of exercise. However, the players</p>	<p>One of the simplest solutions is to attempt to, during the run of an ARG, scale puzzles dynamically and appropriately to the size of the player community. This may, however, have a slight effect on the learning experience and large amounts of repetition will then likely not be present. Another solution may be to reward repeated activity slightly more with each repetition in order to keep players engaged. This solution, however, is dangerous as it may condition players to expect greater and greater rewards as the game progresses</p>

	<p>likely grew frustrated with this constant repetition due to the sheer number of repetitions needed to complete some of the puzzles. These large numbers, as noted in Chapter 4, were designed in support of a much larger projected community.</p>	<p>for a similar amount of participation.</p>
<p>The game’s community was somewhat, though unintentionally, ostracising to newer players.</p>	<p>As in the pilot, the game’s active player community remained fairly unchanged for the duration of <i>Nomad’s</i> run. Unlike during the pilot study, this ostracising of newer players was unintentional, but still occurred regardless.</p>	<p>Precise control of the community is difficult to achieve in ARGs, as much of the game’s direction is influenced by player action (McGonigal 2007b). As such, the best way to discourage this ostracising of new players by existing ones is to actively encourage and reward recruitment of players throughout the game. It is important to note, however, that this encouragement should form part of the game itself, either through dialogue between game characters and players or other similar in-game reward systems.</p>
<p>The ‘We Are The Messengers’ forum had long access times and was laid out in a confusing manner.</p>	<p>The forum component of ‘We Are The Messengers’ was integrated into the site’s WordPress structure by way of a WordPress plugin. This meant that the forum itself had few options for true customisation, leading to a confusing forum taxonomy that was hindered by</p>	<p>Communication methods should be a core concern during ARG design. While the players will likely, as observed in the game proper, create their own personal communication channels, the game should still provide suitably usable channels to the players, if it chooses to provide</p>

	<p>the aforementioned long access times.</p>	<p>communication channels at all. Requiring players to create their own communication channels is also a valid design decision, though this decision may be preferred by ARGs that already target an existing community of players who are either proficient ARG players or who already utilise their own communication channels as a private community.</p>
<p>'We Are The Messengers', as a game website, could be easily exploited.</p>	<p>As discussed in 6.3.4.3, the power player discovered a way to exploit the node structure on 'We Are The Messengers' to view content in advance of the nodes being unlocked by the players.</p>	<p>Security of game integrity is another concern for potential ARG designers. Design teams should allocate time during pre-game development to actively trying to exploit game resources as they are provided to the players. This matters slightly less for small-scale ARGs but, as evidenced by <i>Nomad's</i> game proper, this may still occur in small-scale applications. Design teams should thus be prepared for this eventuality.</p>
<p>The use of phone calls within the ARG had varying effect.</p>	<p>During the game's focus groups, players noted that the content of phone calls made to the players were often difficult to hear, and they felt that some information was lost. In other cases, players reported being able to hear the design team</p>	<p>The utilisation of phone calls in ARGs seem to be effective, as noted by the players of <i>Nomad</i>. However, care must be taken when using this medium. Preferably, actors should interact with players during these events without the interference of the design team, and should be adequately prepared to do so. Additionally,</p>

	<p>prompting the game’s actors regarding their scripts.</p>	<p>making sure that player expectations of these events (regarding information received and conveyed) are met is important when utilising this specific medium.</p>
<p>The additional “beacon puzzles” (see 6.2.7) split the attention of the players.</p>	<p>Because of the speed with which players completed the puzzles prior to live event 2, the design team decided to provide them with optional puzzles to complete whilst completing primary puzzle 2 and its associated secondary puzzles.</p>	<p>ARG players are likely to experience ARGs as a single coherent narrative, despite a potential multi-narrative design. As such, it should be made clearer to the players how these multiple narratives interact with other narratives within the game. Additionally, it should be made clear to the players which puzzles and events advance their respective narrative paths. This was done to an extent within <i>Nomad</i>, where Observer nodes were visually separated from the greater “main narrative” node structure. This visual signification should thus be unmistakable.</p>
<p>The power player understood a great deal of the story due to resources that were outside of the game’s structure.</p>	<p>During the game, the power player seemed to understand a great deal of the narrative. During the focus groups it was discovered that this was, in part, due to his/her registration in IMY 211, a second-year level Multimedia module, in 2014. During this module, the lecturer (the researcher) provided students with a sample hypertext fiction when</p>	<p>ARG narratives should be as original as possible, eschewing any previous or tangential work regarding the narrative that may be seen by potential players. Basing the narrative on previous work may spoil or skew the experience of the game for players familiar with the existing or similar material. However, an opposite scenario regarding narratives may also</p>

	<p>explaining the concept. This hypertext fiction was one that told a fictional story of an interaction between early versions of Ana Kirlitz and The Nomad. Specifically, the hypertext fiction reveals that The Nomad has become stuck whilst time travelling. This is a core reveal in the game itself.</p>	<p>be desirable. Basing an ARG narrative on a plethora of existing resources, stories and other phenomena, and having the ARG continue that existing narrative, can create a true “alternate reality” for the players to inhabit.</p>
<p>Towards the end of the game players began to feel dejected.</p>	<p>The design team took a rather harsh approach regarding the timeline of the game’s run due to its finite viability period. As such, this caused the players to be reprimanded multiple times when they did not complete game tasks in a timely manner. Because of this the players began to assume that they had failed The Nomad completely, resulting in sadness and demotivation to continue playing.</p>	<p>Designers should be aware of the finite timeframes of their ARGs during design. These timeframes should, ideally, be made clear to the players during the game in a manner consistent with the game itself. In the case of <i>Nomad</i>, for example, the design team suggested the appearance of a timer that provided players with deadlines for the solving of specific puzzles, participation in game events and an overall view of the length of the game itself. This would allow players to correctly gauge the meeting of game milestones. The aesthetic of the node structure on ‘We Are The Messengers’ attempted to visualise the players’ progression through the game, but did not provide players with hard deadlines for completion.</p>

<p>Some game puzzles were broken.</p>	<p>Some ciphers within primary puzzle 2 deciphered into unintelligible words due to errors in the cipher’s construction (though players could often ascertain the correct book name based on sections of the deciphered phrase). Additionally, the marked page puzzle within live event 3 (see 4.4.2.1.21) was completely broken, with players being unable to correctly line up their versions of the printed marked pages with any intelligible message using the provided book and page number. This is due to the discrepancy between the printed marked images and the marked pages the puzzle was actually based on. This demotivated players and caused some to not play as actively as a result.</p>	<p>Wherever possible, ARG designers must have people outside of the design team test their puzzles multiple times before the release of the puzzle to the player community. Though testing was done in <i>Nomad</i>, it was often done internally due to the short timeframe allocated to the game itself. Additionally, when ARG puzzles contain specific physical assets that are necessary for puzzle completion, it is best to simply provide the players with these assets on completion of the necessary puzzles so as to avoid puzzle breakages and confusion.</p>
<p>Primary puzzle 4’s necessity for referencing academic articles (see 4.4.2.1.27 for details) was not adequately ludic.</p>	<p>During primary puzzle 4, players must find and reference academic journal articles using the University’s Harvard method of referencing as taught in the AIM modules (Bothma et al. 2014:141). Players felt that being asked to adhere to a referencing format in this way was frustrating, boring and rote in comparison to other game</p>	<p>A suggestion to better this puzzle, or similar types of puzzles, would be to allow for multiple referencing methods to be used in the puzzle’s completion. Making such an activity more game-like, however, is more difficult, due to the formal nature of referencing in academic work. A consideration for making such an activity more game-like, however, may be to have it</p>

	puzzles, which affected their experiences of the game.	more directly link into the game's narrative, or simply to reward such strict game tasks with more coveted rewards.
--	--	---

6.3.6 Player Recommendations

The following sections discuss the recommendations made by the players with regards to *Nomad* and similar potential educational ARGs that could be implemented and run at the University of Pretoria. These recommendations often occurred during the study's focus groups.

As noted in 6.3.5.5, due to the lack of a planned continuation of *Nomad* it is irrelevant to discuss planned implementations. Instead, discussions of each suggestion, both narrative and ludic, will be had in the relevant sections.

6.3.6.1 Narrative Suggestions

The following narrative suggestions for *Nomad* or similar games were posited by the players:

Table 19: Player suggestions for *Nomad* and other ARG narratives

Narrative Suggestion	Discussion
Choose a more universally enjoyable narrative.	This suggestion was posited by a non-player who was concerned that not all potential players would be interested in a time travel narrative. In considering this, potential ARG designers should either conduct market research or target narrative-based ARGs to existing communities who enjoy similar narratives to those that the ARG would present. Finding a "universally enjoyable" narrative, however, would be difficult, if not impossible (Koster 2013:102–111).
Give the players narrative perspective throughout the game.	One player noted that he/she eventually became confused regarding who the players were meant to be saving in the grander narrative. As such, this player recommended that ARGs should constantly remind players of the game's overarching goals, as well

	as differentiate between disparate narrative goals (as discussed in 6.3.5.5).
Make The Nomad a more central character in the ARG.	Many players noted a feeling of apathy or even hatred towards The Nomad because of his perceived peripheral involvement as a character in <i>Nomad</i> . Theories even suggested that The Nomad had kidnapped Ana, and that the players were saving The Nomad in order to ensure his capture by The Observers. As such, it is recommended that central game characters are treated with importance, and that their motivations are well-known to the players so that the players can have the correct designed emotional response to these characters.
Create ARGs that are framed as authentic learning experiences for their respective subject fields.	Some disciplines attempt to test learning by placing students into situations that are framed to test their theoretical knowledge within pseudo-real-world contexts. These formats can be seen in the narratives of <i>World Without Oil</i> (Rusnak, Dobson & Boskic 2008) and <i>Urgent: Evoke</i> (Waddington 2013), both discussed in Chapter 2. A similar approach was followed by Brookes (2009) in order to teach his students Enterprise and how to deal with clients. It stands to reason, then, that a law-centric ARG, for example, could revolve around multiple court cases as an “authentic environment”.
Create an ARG by having scholars from multiple fields write narratives that display different perspectives on a central narrative from their field’s point of view.	This idea is alluring, though incredibly complex to execute. Because of the detailed input of subject field experts on a variety of topics, an ARG of this nature would undoubtedly need to utilise a “collective detective” community (McGonigal 2008). It would also be incredibly interlinked and complex, resulting in a potentially highly enjoyable, if often slightly confusing, game experience. Executing such an ARG, however, may be too large in scale to be done at an institutional level.
Be careful when crafting narratives involving time travel.	One non-player warned of the potential for inevitability in time-travel-related stories. Because of the nature of time, it is often difficult to explain the reasoning behind the events in time-travel-related narratives adequately. As such, common tropes appear,

	<p>including that of inevitability: no matter what happens in the narrative, the results of the narrative are fixed. This is not ideal within an ARG as it is important that players feel they have the ability to change such supposedly inevitable outcomes. This is, thus, as important consideration for potential ARG designers.</p>
--	---

6.3.6.2 Ludic Suggestions

The following suggestions regarding gameplay, as well as the use of ARGs for educational purposes, were posited by the players. As with the narrative suggestions in 6.3.6.1, these suggestions are followed by discussions, as opposed to planned implementations.

Table 20: Ludic suggestions made by the players regarding *Nomad* and similar campus-based or educational ARGs

Ludic Suggestion	Discussion
<p>Diversify from the library earlier in the game.</p>	<p>The potential use of the entire campus for teaching information-literacy-related skills was suggested multiple times throughout the focus groups. The players reasoned that the continual use of the library quickly became boring, and that similar information literacy tasks could be crafted using other locations on campus. The players were likely correct in this regard. Thus, it is advisable that potential ARG designers in similar contexts utilise the entirety of the physical space demarcated for gameplay in order to keep players engaged with the game context.</p>
<p>Create an ARG that runs for the entire University year.</p>	<p>As with the subject-expert narrative suggestion discussed in 6.3.6.1, this suggestion is enticing, as it would provide players with a truly immersive context. However, as with the previous suggestion, the creation of an ARG that contains enough content to keep its players busy for an entire year is massive in scope, and would thus</p>

	<p>need to be developed over a long period of time and involve an incredibly large team.</p>
<p>Correctly demarcate game events and real-world, non-game events.</p>	<p>The nature of ARGs as a genre suggests to the player that everything and anything can be part of the game. This was seen multiple times in <i>Nomad</i> when players assumed events that were part of the game actually weren't. One player reported that this became confusing at a point, because players were not aware if, for example, a broken puzzle within the game was supposed to be broken. As such, It is suggested that game events and assets are identifiable in such a way that it is obvious they are part of the game. Similarly, solutions to game puzzles should be clear and unambiguous.</p>
<p>The utilisation of book ciphers was boring and repetitive.</p>	<p>This specific player suggestion likely links to the repetition shortcoming discussed in 6.3.5.5. This, or similar problems, can be solved in ARGs by dynamically changing the content of the game during its run. In this way, puzzles that players clearly have no interest in completing can potentially be replaced.</p>
<p>Utilise an ARG for orientation week for University residences.</p>	<p>This suggestion is interesting as it links to the use of ARGs for orientation as noted by Whitton (2009) and Piatt (2009). It also links to the suggestion to diversify the game's locations to include the entire campus, as orientation ARGs will often utilise the entire campus in order to teach players the layout of the campus itself. If ARGs were to be used for orientation within this context they would likely need to be replayable. The effectiveness of replayable ARGs, and the degree to which <i>Nomad</i> was "replayable", in</p>

	<p>small-scale contexts is discussed further in Chapter 7.</p>
<p>Utilise timers to signify time limits on game activities to players.</p>	<p>The necessity for timers was already discussed in 6.3.5.5. Though in some ARG contexts this may be seen as breaking the “this is not a game” aesthetic, as timers are elements commonly found in games, it seems somewhat necessary, especially for ARGs that need to adhere to strict timeframes.</p>
<p>Find more ways to motivate the player community to play.</p>	<p>The solution to this suggestion differs from ARG to ARG. However, it is an important consideration for ARGs, as players need to remain motivated so that the ARG can progress. One player noted that interest drops within games are natural, and that ARGs should cater for interest drops within their planned timeframes as well.</p>
<p>Alert players with notifications when game events occur.</p>	<p>Within <i>Nomad</i>, this would have been an on-screen notification when new nodes had been unlocked, either via a text popup or a visual animation. However, a more effective manner may have been to directly target game-related content to player email addresses on a more regular basis. As seen in both the pilot and the game proper, these targeted messages can be seen by the players as unwanted spam, which may also discourage them from playing the game. This approach, thus, may be considered too risky and even ethically questionable.</p>
<p>Punish players who attempt to exploit the game system.</p>	<p>As noted in 6.3.5.5, security of online assets is particularly important in maintaining integrity within ARGs. As such, the notion that players attempting to exploit the game system should be punished is a reasonable suggestion. However, in</p>

	<p>small-scale ARGs, especially within <i>Nomad's</i> game proper, the exploitative player (the power player) was also one of the game's most dedicated players. As such, ARG designers must consider if punishing these players may result in them no longer playing the game, as "power players" are often a necessary player group with the ARG community regarding game progression.</p>
<p>Provide players with multiple ways to solve puzzles.</p>	<p>Within <i>Nomad</i>, this player suggestion refers specifically to the amount of the specificity of the reference format in primary puzzle 4 (see 4.4.2.1.27), and that the game should have allowed for multiple reference formats. However, this player also suggested the use of "alternate pathways" to solutions, reasoning that players could be allowed to bypass puzzles that they found boring or frustrating in favour of completing other optional puzzles. This suggestion is interesting, as it allows for a great deal of player choice. However, developing multiple puzzles to support these "alternate pathways" would take significantly more development time, and would still need to meet educational outcomes within educational ARGs. This makes the suggestion difficult to implement, but still possible.</p>
<p>Directly target the community more.</p>	<p>As noted in 6.3.2.2, the active player group in <i>Nomad</i> often played the game inside a coffee shop on campus. Because this group was often at this location, there was the possibility to directly target this location for game-related events. This did not, however, occur in <i>Nomad</i>, as no puzzles were developed during the game for this kind of interaction. Regardless, the notion of directly targeting a community within an ARG at a specific</p>

	<p>location where they congregate is notable for potential ARG designers.</p>
<p>Make live event tasks available for longer periods of time.</p>	<p>A key aspect of live events in ARGs is that they are “live”: players meet at a designated date and time and complete a given puzzle in real time. However, during <i>Nomad</i>, because of scheduling problems, some non-players who wanted to play simply couldn’t. As such, these non-players suggested making live event tasks available earlier so that the community could congregate and complete the tasks at a time that was most convenient for the group. This, however, would be difficult for the design team as it would require them to be available to enact the end of the live event (often some kind of live reward) at any point during the day. A solution to this would be to allow for specific time periods through the day in which players could complete the event in order to alleviate some of the pressure on the design team.</p>
<p>Place the game’s rabbit hole in more obvious locations.</p>	<p>This was suggested by a non-player who disliked that the game’s rabbit holes were associated with specific modules noting that students do not pay attention to extraordinary events that occur during lectures. Instead, this player reasons, ARGs should potentially target large social student gatherings, potentially linking the ARG narrative to the targeted student community. This way, the ARG could potentially be seen and played by more people. This suggestion is promising, but neglects to consider that the same problem may be present in both a lecture and social environment: students may be too busy with the task at hand (learning or socialising) to notice extraordinary events. This view is supported by Whitton (2009a), who notes that orientation programmes are daunting for new</p>

	<p>students, and trying to engage them in playing an ARG in addition to this existing responsibility is difficult.</p>
<p>Recruit players at the height of their interest curves regarding new activity.</p>	<p>The same non-player mentioned that students are often most motivated to participate in activities at specific points in the academic year (often at the start of each semester). Recruiting players to play an ARG should ideally happen during these periods. It is possible that continued motivation to play an ARG may maintain this initial motivation in other activities that students engage in throughout the semester. As noted by Whitton (2009), however, ARG designers must take care not to overwhelm their potential community during time periods that are naturally busy for students.</p>
<p>Make gameplay feel escapist.</p>	<p>The same non-player further suggested that successful campus or educational ARGs should feel like they can be played somewhat asynchronously, and largely online. This asynchronous play, despite the real timeframes in which ARGs are played, can thus feel to the players like a momentary escape from other responsibilities such as studies. In this way, the player suggests that campus ARGs fulfil a similar purpose to the escapism presented by digital games. This suggestion is interesting, though implementation for this escapism will likely differ greatly from ARG to ARG. As noted in 6.3.2.1, an online-intensive ARG may help in crafting this sort of escapism.</p>
<p>Consider the relevance of educational ARGs.</p>	<p>One specific non-player focus group discussed the use of ARGs over other teaching methods for educational purposes. These non-players posited that ARGs may not necessarily be the most</p>

	<p>effective manner in which to teach specific content, as the creation of an ARG is a laborious process that does not always result in mass-participation by the player community. However, this suggestion is somewhat irrelevant for potential educational ARG designers, as evidenced by the conclusions made within this chapter. Though ARGs are indeed labour-intensive and often struggle to provide player estimates prior to their start, it has been made clear that these games are enriching to those who participate in them. This notion is examined further in Chapter 7.</p>
--	---

6.4 Conclusion

This chapter presents the implementation of this dissertation’s full empirical study: *Nomad’s* game proper. It then discusses the results of the study and analyses these results. This analysis presents reasons why the players experienced *Nomad* as they did. These reasons are based on the literature (see Chapter 2), the non-participant observation by the researcher (detailed in Chapter 3) and the outcomes, results and analysis of the pilot study (see Chapter 5).

The thorough accounts of both *Nomad’s* pilot study and its game proper present the cases used for the study’s single-case case study approach. The amalgamated case of the alternate reality game *Nomad* is used in Chapter 7 to examine how this study answered its research questions. Concepts central to educational alternate reality game design such as replayability, the importance of the “this is not a game” aesthetic in educational applications, and other conclusions made from the case study are also discussed in order to make conclusions regarding the genre of alternate reality games and their overall use as an educational tool within traditional educational contexts.

7. Chapter 7 – Conclusion and Suggestions for Future Work

7.1 Introduction

This study aimed to design, develop and implement an alternate reality game that endeavoured to teach information literacy skills. This chapter concludes the study by summarising the study itself and the findings of the empirical work. The findings presented by the study and the empirical work aims to answer the research question and sub-questions set in Chapter 1, and hopes to address salient issues with the educational ARG genre as noted by the theoretical framework discussed in Chapter 2.

This study initially posed the following research question:

How can an Alternate Reality Game be developed that, through its design and implementation, creates an “authentic learning” environment that teaches and exercises Information Literacy skills to the students who play it?

In order to answer this main question, an ARG had to initially be designed. The design of this ARG, the *Nomad* ARG, was discussed in Chapter 4. This chapter discussed the design of a single ARG that was implemented in two iterations. The first of these was the pilot study. After receiving feedback from this pilot study’s implementation and run, as well as from its players, the game proper – the full version of the *Nomad* ARG – was designed, heeding this feedback where appropriate.

The implementation of the *Nomad* ARG was discussed in two chapters. Chapter 5 details the implementation and run of the pilot study, before discussing its results. Chapter 6 is similar, though this chapter discusses the game proper’s implementation, run and results.

Thus it can be seen that the design, development and implementation of an ARG have already been discussed in this dissertation. However, one must still analyse whether this completed game succeeded in its goals of teaching and exercising information literacy skills in an “authentic learning environment”.

Before this is examined, however, this chapter continues by presenting a summary of the study itself. It then progresses to examine the results of the study with regards to the sub-questions of the above main research question, along with other salient issues that arose from the literature.

Once this has been completed one can revisit what remains of the study’s main research question – that is, whether or not the *Nomad* ARG was successful in teaching or exercising information literacy in an authentic, practical manner during its course of play. Once this has been answered this dissertation will conclude by examining the study’s contribution to the existing body of knowledge regarding educational ARGs, as well as discussing considerations for future research based on this study.

7.2 Summary of the Study

This study, as noted in 7.1, aimed to develop an educational alternate reality game for the purposes of teaching and exercising information literacy. In order to accomplish this successfully, the following was done:

- The study's educational approach was determined. Through the examination of various learning theories it was determined that games inherently utilise a myriad of these theories. Notably, games heavily utilise the behaviourist technique of operant conditioning (Skinner 1938; Salen & Zimmerman 2003:345) in their teaching process by rewarding or punishing the player for in-game choices during play. This process of reward and punishment is then coupled with the use of elaboration theory, a cognitive learning theory that orders task complexity from simplest to most-complex (Reigeluth & Carr-Chellman 2009). This facilitates both a difficulty curve and a learning curve. Because of this curve, players are encouraged to explore the game environment to facilitate progression. In doing so, they learn about the game world and how their interactions affect it. This is called situated cognition, which suggests that learning occurs contextually: knowledge is, at least initially, bound to the environment in which it was obtained (Brown, Collins & Duguid 1989). The learning theory that best describes the progression through an environment that promotes situated cognition was constructivism. Constructivist theories suggest that learners learn by continually integrating new knowledge with existing knowledge (Wadsworth 1996). This occurs in games naturally, as suggested by the literature (Gee 2003; Galarneau 2005; Dickey 2006). As such, a constructivist educational approach was taken in this study.
- Existing literature was examined in order to develop a theoretical framework through which an ARG could be designed. This framework was initially developed primarily through the examination of game studies literature. In particular, the work of Koster (2013), Salen and Zimmerman (2003), and Schell (2014). Using these primary sources, an examination of game design elements important to educational game design was completed.
- In order to integrate educational game design elements into the ARG genre, ARGs were examined next. This was initially done broadly, examining the genre and its conventions as a whole. After providing this context, various educational ARGs were examined in order to understand how these applications successfully married educational game design and the ARG genre. This examination provided the study with a set of characteristics that educational ARGs often adhere to; providing a framework upon which the *Nomad* ARG could be designed.
- The design of the *Nomad* ARG occurred next. A pilot study was designed that included the first two weeks of *Nomad's* gameplay. This was done in order to test the community reaction to the game's initial narrative and puzzle structure. This pilot study was implemented in the second semester of 2014 and ran for six weeks (instead of the planned two) because of a lack of player interaction. Because of this overlong running time, it was decided that the pilot should be prematurely terminated.

- Feedback regarding the pilot study was taken into consideration for the design of the game proper – a full-length ARG – that was designed in the first semester of 2015, and ran in April and May of that year.
- Feedback was received for the game proper after its conclusion. Following this, the results of both iterations of *Nomad* (the pilot study and game proper) were gathered and analysed.

The section that follows details the final task of the study. In this section the results of the study are summarised and analysed with regards to the study’s research questions. This is done in order to determine the measure of success of the study, as well as determine the study’s contribution to the larger body of academic work surrounding educational ARGs.

7.3 Results of the Study

When discussing the results of the study as noted in Chapter 5 and Chapter 6 it is important to position *Nomad* as an educational ARG with respect to other examined educational ARGs. To do this, one must examine the summative table of educational ARG characteristics (see 2.6.2):

Table 21: Qualities of Educational ARGs (repeated from Table 4)

<i>Legend: Skeleton Chase (1), Finding Identity (2), The Arcane Gallery of Gadgetry (3), The Tower of Babel (4), The Mighty Fizz Chilla (5), World Without Oil (6), Evoke (7), Conspiracy For Good (8), ViolaQuest (9), Who Is Herring Hale? (10), Black Cloud (11), Stop Toilworn Diamond (12)</i>												
Examined quality	1	2	3	4	5	6	7	8	9	10	11	12
Narrative linked to learning outcomes of target audience	X	X		X	X	X	X			X		X
Gameplay linked to learning outcomes	X	X	X	X	X	X	X	X	X	X	X	X
Adherence to TINAG aesthetic					X			X		X	X	X
Statement that learning outcome was achieved		X	X	X		X	X		X	X	X	X

Measure of success of overall game	X	X	X	X	X	X	X		X	X	X	X
Measure of success in terms of learning outcomes		X	X	X	X	X	X		X	X	X	X
Concerns regarding widespread suitability as an educational medium							X		X	X		X
ARGs as a novel form of education				X					X	X	X	X

The summary of results from the following section, as well as the discussion of the *Nomad* ARG throughout this dissertation, aims to position *Nomad* within the above table. It must be noted that while one quality in this table is an undesirable result (specifically “concerns regarding widespread suitability as an educational medium”), it can be seen that successful educational ARGs adhere to or acknowledge as many of these examined qualities as possible.

7.3.1 Summary of Empirical Study Results

The following sections present a summary of results from both empirical studies (the pilot study and the game proper). These sections thusly act as summaries of Chapter 5 and Chapter 6, respectively.

7.3.1.1 Pilot Study Results

- The game appeared, at least initially, to depict real events, adding to the narrative’s credibility. This aided in creating an authentic feel to the game world.
- The target audience’s understanding of *Nomad* as a game, and specifically an ARG, was lacking. Potentially as a result of this initial authenticity. Despite this, the group of players who played actively were aware that *Nomad* was a game and an ARG. However, these players had little knowledge of the ARG genre as few of them had participated in one before.
- The game failed to attract members of its target audience (students registered for the AIM 121 module) for a variety of reasons such as the fact that gameplay was often completed by a single player group who sometimes attempted to exclude members of the target audience, it was difficult to design puzzles and narrative in *Nomad* to cater to the disparate interests of such a large audience, and the fact that potential players may have simply chosen to not engage with the game system.

- Despite this failure to attract members of the target audience, those who did play (the active player group) understood and engaged with the game system, leading to various instances of emergent behaviour (Salen & Zimmerman 2003:62) during play.
- When considering the pilot's effectiveness, players noted that the pilot effectively linked the game's goals to its learning outcomes, and felt that they learnt and exercised a variety of skills (both information literacy skills and other, more general, skills). Further, they felt that the game was successful as a result, despite some shortcomings in the game's design and implementation. They also noted its success as an entertainment product.
- Players within the focus group additionally suggested a myriad of recommendations for subsequent game iterations. This suggests that through the play of *Nomad*, players came to enjoy both the game itself and the ARG genre.

7.3.1.2 *Game Proper Results*

- As with the pilot, the game's narrative initially appeared authentic and credible. In the game proper this authenticity was elevated by having an actor play a fictional version of herself for the purposes of the game.
- The active player group in the game proper was very aware of *Nomad's* game origins during its play. However, this group was less aware of the fact that *Nomad* was specifically an alternate reality game. Notably, this group advocated the understanding that a game was being played, noting that this distinction both increased the safety of play and the intrinsic motivational factor of curiosity to discover the game itself.
- As with the pilot study, the game struggled to gather players from its primary target audience (INL 110 students) or its secondary audience (the audience of the game's primary actor via her YouTube channel). However, it did manage to entice a player from its tertiary target audience (IMY 110 and IMY 300 students). This player became a central player in the game, as he/she took it upon him/herself to form most of the game's active player group (his/her friends who were not part of a target audience). Once again, the problem faced in the pilot study occurred: it is difficult to design a game that will cater to a large audience's disparate interests, and, even if it does, members of the audience may not choose to participate due to realistic constraints on aspects such as leisure time.
- As in the pilot study, the player group who did actively play the game had a good understanding of the game and remained engaged throughout its play. This player group was, in fact, so engaged that the game proper quickly became competitive, with players in the group not trusting one another as a result of a narrative reveal.
- The game proper also contained a large amount of emergent behaviour. This emergent behaviour, importantly to the study, resulted in a plethora of personal player stories – emergent narratives (Salen & Zimmerman 2003:383) – that made the game itself memorable to the players.

- It is these player stories that suggest the game proper's effectiveness as an entertainment product. The game was also unanimously praised by players in the focus groups for being incredibly entertaining for various reasons ranging from the narrative content to simple interactions with the game's hub website.
- Players also discussed its success as an educational product at length in the focus groups. Noting that the game effectively linked learning outcomes to game goals, provided a novel practical application for the educational content, and sufficiently exercised or taught information literacy skills. Notably, players of the game proper felt that a wider array of other skills were taught or exercised during play, such as orientation of the University of Pretoria's Hatfield campus and the history of centennial structures on the campus.
- As with the pilot study, players in the focus group cared enough about the game to continually recommend ideas for potential subsequent iterations of the game itself or for utilising ARGs for other educational or entertainment purposes within a local context.
- Some interviewees (non-players) from the focus groups expressed concern for the applicability of ARGs as a medium for teaching over more affordable, potentially wider-reaching applications; noting the niche market the ARG genre occupies.

7.3.2 Research Sub-questions

Based on the above results one can begin to answer the sub-questions of the main research question as posed in Chapter 1. This is done below by discussing each question individually.

7.3.2.1 Why is an Alternate Reality Game used as a case study instead of existing traditional gamification or game structures?

This question was primarily answered through the literature review completed in Chapter 2.

This dissertation chose to utilise an ARG, instead of a traditional game or a gamified system due to the desire to create an "authentic learning environment" (Galarneau 2005). The creation of this environment is discussed further in the study's last sub-question (see 7.3.2.5).

The results of the empirical study are examined when considering the success of specifically using an ARG in an educational context. Players of both the pilot study and the game proper agreed that the use of the ARG medium was effective in communicating the practicality of the skills being taught and exercised, because gameplay required them to physically complete information literacy based tasks.

As such, it can be said that ARGs are an effective vessel for teaching, and more specifically for teaching information literacy skills. How these skills are taught effectively are examined in the following discussions of the study's research sub-questions (see 7.3.2.2, 7.3.2.3, 7.3.2.4 and 7.3.2.5). As evidenced

by the study's results, an important consideration for utilising an ARG over existing structures is the use of its real-world possibility space to create a physical, practical game for its players.

7.3.2.2 *How does the specific issue of engaging players in an Alternate Reality Game context differ from a traditional game context with regards to education?*

Research on engagement within the ARG genre and how it potentially differed from traditional educational game applications was done in Chapter 2.

Initially, research focused on how engagement and motivation is fostered in traditional game contexts. The concepts of fun, as explained by Koster (2013:102) and the concept of the "play of pleasure" from Salen and Zimmerman's (2003:329–361) work were discussed, along with various additional frameworks that could aid in the creation of a fun experience for the player. These included LeBlanc's pleasure typologies (Salen & Zimmerman 2003:334; Hunicke, LeBlanc & Zubek 2004; Koster 2013:90; Schell 2014:128), Richard Bartle's player types (Bartle 1996; Salen & Zimmerman 2003:465; Schell 2014:129), Schell's (2014:130) pleasure types, Hallford and Hallford's (2001:158) explicit rewards, and Csikszentmihalyi's (1990) concept of "flow".

These concepts are all concepts relating to games themselves, and it became clear that engaging players in an ARG would not be entirely different to engaging them in a traditional game context. As such, these traditional approaches needed to be kept in mind when developing the *Nomad* ARG.

In the examination of the ARG genre, however, it became clear that aspects unique to the genre are also engaging elements for potential players. These elements had to be additionally considered during design. These include the importance of authenticity and immersion, as discussed later in 7.3.2.5, often through the use of the "this is not a game" aesthetic. Also utilised in ARGs is the discovery of a fragmented narrative through the use of multiple forms of media (discussed in 2.4.2.2). This creates a unique real-world experience analogous to solving a mystery, which is another likely draw of the genre to potential players. Finally, the importance of collaborative play (discussed in 2.4.2.3) is another engaging factor of the genre. The use of a "collective detective" (McGonigal 2003b) or "collective intelligence" (Lévy 1999; McGonigal 2008) in the solving of the above mystery analogy is another important characteristic of the genre, as it directly allows the players to affect the game during the course of play (McGonigal 2007a).

Finally, specific motivational factors within ARGs as a genre were examined. These included Whitton's (2009) six motivational elements during ARGs and Davies et al.'s (2006) guidelines for motivation in digital games as adapted for ARGs. These examinations (regarding core components of the ARG experience and motivational factors that support these components) allowed for a greater theoretical

understanding regarding how to engage ARG players through more than just techniques from game design theory.

Despite the understanding garnered from the theoretical framework, engaging potential players in both iterations of the *Nomad* ARG was a difficult task for the design team. This is discussed in 5.3.2.4 and 6.3.2.1 as the “problem with community”. A further discussion on this problem, one that potentially manifests as a result of Koster’s (2013:102–111) notion of “different fun for different folks” is provided later (see 7.4.2).

7.3.2.3 How is an Alternate Reality Game designed and implemented in order to promote skill-learning and skill-exercise?

A highly detailed account on how to design and implement an educational ARG is given in Chapter 4, Chapter 5 (specifically 5.2) and Chapter 6 (specifically 6.2) of this dissertation. A discussion specific to the implementation of information literacy skills can be seen in 4.5.

It can be seen through the empirical study’s results that this design and implementation was largely successful in terms of teaching or exercising specific information literacy skills through the course of play. Players of both iterations unanimously agreed that the game was a novel, practical way to teach or exercise information literacy skills, specifically those taught in the AIM modules (see 5.3.5.1, 5.3.5.2, 6.3.5.1, 6.3.5.2 for specific details).

7.3.2.4 How and why did the desired and intended effects, or the measure of “success”, of the game on the players, differ in terms of skill-learning, skill-exercise and engagement?

During design and implementation, it was hoped that *Nomad* would be considered “successful” by the end of its play, and every effort was made during design to make the game a successful educational and entertaining experience. This was done through the use of a detailed theoretical framework as posed in Chapter 2.

With this in mind, this sub-question can be simplified: “Was *Nomad* successful as both an educational and an entertainment product?”

Through the analysis of both games’ results, it can be seen that for the players that participated in iterations of *Nomad*, the game was both educational and entertaining. Responses from polling these players regarding the correlation between the game and the skill exercise and acquisition veiled within its tasks all suggest that the game fulfilled its purpose as an educational tool. Specific responses regarding this are discussed in 5.3.5.1, 5.3.5.2, 6.3.5.1 and 6.3.5.2.

Regarding the engagement of players and the measure of success regarding the game's entertainment value, responses from players were also overwhelmingly positive. Players noted that there were multiple occasions where they felt accomplished during the game (see 5.3.5.3 and 6.3.5.3), and that the game was entertaining overall, despite some shortcomings in the implementation (see 5.3.5.4, 5.3.5.5, 6.3.5.4 and 6.3.5.5). It can also be seen in the results that players were incredibly engaged with the game system through their propagation of theories (see 5.3.3 and 6.3.3), the ways in which they played the game (see 5.3.4 and 6.3.4), the emergent narratives the players left the game with (see 6.3.4.4), and the paranoia of the game proper's active player group (see 6.3.2.3).

However, one must also consider the way that both iterations of *Nomad* failed to engage large sections of their targeted communities. This is not necessarily a failure, however, as only a small ratio of players in targeted communities in ARGs end up playing the game itself. This problem also occurred in larger-scale ARGs such as *Urgent: Evoke* (McGonigal 2010b). *Urgent: Evoke* (McGonigal 2010b) only saw about 5% of its targeted players complete a large portion of the game. It is for this reason that the effectiveness of the entertainment and engagement provided by an ARG is likely better judged by discussing these factors with the players themselves. As noted in 7.3.2.2, a discussion regarding how to engage a larger audience is had later in 7.4.2.

7.3.2.5 *How do Alternate Reality Games create a more effective, "authentic learning" environment for teaching Information Literacy when compared to traditional teaching environments?*

The way in which an "authentic learning environment" is created through ARGs was discussed primarily in Chapter 2, and was noted as a determining factor for the use of an ARG over other methods in answering the study's first sub-question (see 7.3.2.1).

Specifically, authenticity is an important design consideration within ARGs for the creation of this "authentic learning environment" (see 2.4.2.1). This is due to the potential to adhere to the "this is not a game" aesthetic (or TINAG), whereby the game masquerades as "real" to its players (McGonigal 2003a; McGonigal 2003b). McGonigal (2003b) notes that this denial of ludic origins by the ARG allows players to immerse themselves in the experience more effectively. More importantly, she argues, this "performance of belief" (McGonigal 2003a) can result in transformative play (Salen & Zimmerman 2003:305), with players attempting to solve real-world problems using the skills they learnt during gameplay (McGonigal 2003b). This can be seen in games that McGonigal helped develop such as *Urgent: Evoke* (Waddington 2013) and *World Without Oil* (Rusnak, Dobson & Boskic 2008), both of which were studied in this dissertation.

Specific reasons for using ARGs over other possibilities within educational contexts were discussed in Chapter 2. These include the notion of the "protagonist-by-proxy", where the presence of a game protagonist helps effectively guide players through the learning process via the play of the game

(Bonsignore 2012; Bonsignore et al. 2013) and that the use of an ARG, because its play occurs within the player reality, can potentially be more engaging than other, more traditional structures (Whitton 2009a). Most importantly for this dissertation, however, is the fact that ARGs inherently teach and exercise various information literacy skills, regardless of the game content. This is done via the fulfilment of Bonsignore et al.'s (2012) Unified Metaliteracies Framework (UMF), which posits that ARGs teach 21st century literacies (and, by extension, information literacies) through their play alone.

This suggests that ARGs can be very effective in creating an “authentic learning environment”, and are thus an effective vessel for teaching, and specifically for the teaching of information literacy. This can be seen both inherently, as discussed by the UMF framework (see 2.5.4), and as evidenced by the results of the empirical study (and already noted in 7.3.2.1). Their unique characteristics for motivation (see 2.5.2) and teaching (see 2.5.3) as a result of their real-world possibility space makes them more effective than their traditional game or gamified system counterparts.

7.3.3 Main Research Question

Through the results discussed in 7.3.1 and the answering of the study's sub-questions in 7.3.2, one can now answer the study's main research question. This question is as follows:

How can an Alternate Reality Game be developed that, through its design and implementation, creates an “authentic learning” environment that teaches and exercises Information Literacy skills to the students who play it?

In 7.1 it was noted that the design, development and implementation had already been addressed through Chapter 4, Chapter 5 and Chapter 6 in this dissertation. These chapters describe, in detail, how an educational ARG can be developed. As such, the remainder of the main research question to be answered is whether this designed ARG succeeded in creating an authentic learning environment and in teaching and exercising information literacy skills.

This success can be seen when discussing the third, fourth and fifth sub-questions (detailed in 7.3.2.3, 7.3.2.4 and 7.3.2.5).

The third sub-question (see 7.3.2.3) discusses the importance of creating an effective skill-teaching and skill-exercise environment within the greater structure of an ARG. Answering this sub-question required an understanding of how an ARG creates an authentic context through its possibility space (the real world). Once this authentic context has been created one can begin to focus on the techniques that best enhance skill-teaching and exercise.

The fourth sub-question discusses whether or not the game, as an entire product – both educational and entertaining – was successful. The qualitative opinions of the players were paramount in answering this sub-question, as the qualitative measure of their experience, and the lessons they learnt throughout the course of play, help to determine whether or not the game could be considered successful.

The final, fifth, sub-question discusses why an ARG could be chosen over traditional methods as a teaching tool. The answer to this sub-question focuses on an ARG's unique characteristics, and how these characteristics (such as authenticity, the use of the "protagonist-by-proxy" and the implicit teaching that occurs through the play of the ARG genre) can be used for teaching purposes.

In answering these sub-questions one can discern that *Nomad* was successful in creating an authentic learning environment wherein skill teaching and skill exercise occurred.

7.4 Salient Issues within the ARG Genre

The following section discusses issues within the ARG genre that, while not important to the theoretical framework of the study established in Chapter 2, are important when considering future work in the field. How this study contributes to each of these salient issues is discussed.

7.4.1 Replayability

Replayability is an important consideration for educational ARGs (Hakulinen 2013; Hansen et al. 2013). Because ARGs are often finite (being played for a specific time, often only once), questions regarding suitability within traditional educational structures, even simply as complementary to existing syllabi, are often raised. It is unreasonable to expect the same design team to create a plethora of one-time experiences for different audiences each time learning must occur, as this would soon overwhelm them.

As such, the notion of replayability is one necessary to discuss when considering ARGs. Hansen et al. (2013) propose a framework to help guide designers regarding the extent of this replayability. This framework denotes three types of replayable ARGs: replayable ARGs, adaptable ARGs and extensible ARGs (Hansen et al. 2013).

Replayable ARGs are ARGs that are simply replayed from start to finish, similar to replaying a digital game. While small portions of the experience may differ from previous play experiences, the player experience is likely to remain similar (Hansen et al. 2013). Packaged ARGs, as discussed later in 7.5.2.4, are made as replayable ARGs. *World Without Oil* (Rusnak, Dobson & Boskic 2008) is an example of such an ARG.

Adaptable ARGs are ARGs that are replayed from start to finish, but often within a different context to the original game (such as with different players or in a different location). The ARG itself is then adapted for that new context, changing elements to make it more appropriate to the new context. In adaptable ARGs it is important that elements within the game are customisable for a variety of new contexts (Hansen et al. 2013).

Lastly, extensible ARGs are ARGs that expand upon an original ARG (Hansen et al. 2013). This is similar to sequels in other entertainment products or seasons of television programmes. ARGs such as *Urgent: Evoke* (McGonigal 2010b) even use this filmic jargon, referring to “Season 1” or “Season 2” of their game to imply continuation. Extensible ARGs are often alluring when considering the design of replayable ARGs because of their similarity to digital game franchises. It allows the design team to reuse assets from previous ARGs and expand upon their created game world (Hansen et al. 2013). The difficulty with developing such ARG franchises, however, is ensuring that the quality of subsequent games does not diminish, as each game progresses the state of an existing world (Hansen et al. 2013).

In Chapter 1, it was mentioned that *Nomad* was not originally designed to be a replayable ARG. However, the way in which the pilot study and the game proper were managed was done in such a way that the game proper could be considered an expansion of the pilot study, and thus an extensible ARG. Instead of simply redoing the same content (as would have happened in a replayable ARG), the game proper expands upon the pilot by introducing new narratives that continue from the timeline of the pilot study. The game proper was even named “*Nomad* Season 2”, internally, by the design team. This approach, as noted by multiple players from the game proper’s focus group, was successful as a world-building exercise as it added to the authenticity of the experience (see 6.3.4.4 for details). When considering *Nomad*’s ending as it was experienced by the players (whereby The Nomad is captured by The Observers), it is also hypothetically possible to further extend the game universe of *Nomad*. This is briefly discussed further in 7.5.2.5.

7.4.2 Engaging the Audience

As was noted multiple times throughout this dissertation, a core difficulty both the pilot study and the game proper had was engaging their desired target audiences. This is supported by the literature noting that ARGs are effective for those that enjoy the genre (Piatt 2009; Whitton 2009a). This suggests that it may always be difficult to engage players who are not already predisposed to participating in such experiences. Additionally, when considering conversion ratios of potential players to active players for large-scale ARGs such as *Urgent: Evoke* (McGonigal 2010b), it can be seen that this may be a difficulty faced by the genre as a whole.

Nomad failed to deal with this difficulty during its run effectively, instead focusing its efforts on providing an engaging experience for the player groups that were engaging with the game system. As

such, research regarding how to effectively engage target groups for ARGs may need to be done by potential future ARG designers, especially if their games necessitate large player communities. This is discussed further in 7.5.2.1.

7.4.3 The Importance of the TINAG Aesthetic in Educational Applications

The importance of the “this is not a game” aesthetic is a contentious issues within the literature. Initially, the aesthetic was a hallmark of the genre, especially when considering early ARGs such as *The Beast* (McGonigal 2003b). It was this aesthetic that made the ARG so immersive, and its influence allowed players to believe that approaching reality as they approached an ARG could affect real change (McGonigal 2003b). However, as the genre progressed, the aesthetic became less important, and often even unnecessary to the game experience (Stenros et al. 2011; McGonigal & Jerrett 2014).

This argument was supported by educational ARG designers who believed that adherence to the aesthetic was detrimental for educational applications, as the lack of transparency brings into question the safety of its players (players may not necessarily play an ARG if they do not know it is a game) (Piatt 2009; Whitton 2009a). The importance of safety was also noted in the results of the empirical study. An additional benefit of not adhering to the TINAG aesthetic in educational contexts is that it allows potential players the transparent opportunity to participate in an ARG, and may thus yield a larger player group than simply relying on the curiosity of potential players to discover the existence of an ARG before they can participate.

As such, *Nomad*'s adherence to the TINAG aesthetic ignored the existing literature's warnings. As noted in Chapter 4, the design team saw the adherence to the aesthetic as a challenge. As noted in the results of the empirical study, this adherence was successful. Even though the players of the game proper were aware that *Nomad* was a game, the adherence to the aesthetic allowed them to immerse themselves in Suits' (1978:34) lusory attitude more deeply. Additionally, aspects such as the expanded narrative from the pilot study enforced the TINAG aesthetic for the players, making them question at times whether the game truly was “just a game”.

Adherence to the TINAG aesthetic as the correct decision for all educational ARGs as a result of its favourable outcome for *Nomad* is difficult to advocate. The design team and the researcher believe that the TINAG aesthetic is beneficial to the ARG genre regardless of the context because of its ability to increase authenticity and immersion. However, the ARG genre has been recently evolving due to the emergence of other game-like interactive marketing experiences. These experiences, and how the ARG genre should adapt as a result of their existence, are discussed further in 7.5.2.2. This section notes that the idea of playing games for leisure has become more socially acceptable in recent years. Thus, potential players may happily participate in non-TINAG ARGs, should they know about them.

7.4.4 Effective Design and Maintenance Practices for Compelling, Small-Scale ARGs

Bonsignore et al. (2012) pose various questions in their suggestions for future research regarding how best to use educational ARGs. They note that educational ARGs are often small-scale (“classroom-sized”); or that educational ARGs are often developed with limited resources (Bonsignore, Hansen, et al. 2012). These factors often mean that educational ARGs need to effectively manage their scope whilst meeting learning outcomes and remaining enjoyable.

This is often difficult, as the progress of an ARG is dictated by its players. In some cases, players may quickly complete puzzles and progress through the game. However, oftentimes players will become busy with responsibilities external to the game, allowing them less time to engage with the game system. This was seen in the empirical study. As such, the scale of a particular educational ARG likely depends on correctly gauging its audience both during design and during the play of the game itself. The empirical study shows that being able to dynamically alter an ARG during its play is imperative to effectively manage scope.

The results of the empirical study show that *Nomad* was an effective application of the compelling, small-scale ARG that Bonsignore et al. (2012) requested. Additionally, the details of *Nomad* within this dissertation document design and maintenance practices for similar small-scale ARGs (see Chapter 4, 5.2 and 6.2) that future ARG designers may find helpful. A summary of these considerations are as follows:

- Know the audience: When targeting an ARG to a potential audience, attempt to align the ARG’s content with their own interests. Potentially make the audience aware that an ARG is being played.
- Be prepared to alter the game: Players are unpredictable, and their actions may facilitate various changes in an ARG’s design, even if their potential actions are anticipated during initial design. This may mean creating a plethora of new content during the game’s run.
- Consider the implications of having a plethora of content live before the game’s launch: Creating content and having it available for players to find long before they should find it (in terms of the narrative progression) is risky. Because this content is live, players may accidentally find the content out of sequence or attempt to find such content out of their own curiosity. However, the benefits of having content finalised and live prior to a game’s launch allows the design team to focus on the players’ play of the game, and responding to it, during the run of the game itself. This allows for a more dynamic, responsive player experience.
- Listen to the audience: Through the course of play, it is likely that a core group of players will be identified as the ARG’s “active player” group. Catering to these players by integrating theories they may have about the game into the game where possible is beneficial. This will excite them as they can see the tangible effect they have on the game’s world and its fiction. If this group of players stops playing, the game ceases to exist. As such, dynamic design should primarily be

geared towards this player group, whilst still maintaining alignment with the game’s goals and learning outcomes.

- Cater to the audience: Where possible, attempt to schedule crucial game events around the majority of the active audience’s schedules. This is not always possible, but trying to accommodate for these players, especially in an in-game manner (such as having an in-game character asking the players when it would be best for them to meet with him/her) will be noticed and appreciated by the audience.
- Diversify the game around learning outcomes: When developing educational ARGs, one may be tempted to align game goals with the intended learning outcomes too strictly. However, it is encouraged to create additional content that, while still aligning itself with learning outcomes, does so in a more tangential manner. In this way, the game remains entertaining instead of simply educational.

7.5 Future Work

The following section discusses potential future work within the field of ARGs and educational applications as a result of this dissertation.

7.5.1 Contribution of the Study

Now that the study’s main research question has been answered, and the results summarised, *Nomad* can be placed in the earlier table (see Table 21) showing qualities of educational ARGs. This is done in order to show how the *Nomad* ARG compares to similar educational applications. *Nomad’s* entry in this table is bolded to aid comparison with other applications:

Table 22: Qualities of Educational ARGs, revised to include *Nomad*

<i>Legend: Skeleton Chase (1), Finding Identity (2), The Arcane Gallery of Gadgetry (3), The Tower of Babel (4), The Mighty Fizz Chilla (5), World Without Oil (6), Evoke (7), Conspiracy For Good (8), ViolaQuest (9), Who Is Herring Hale? (10), Black Cloud (11), Stop Toilworn Diamond (12), Nomad (13)</i>													
Examined quality	1	2	3	4	5	6	7	8	9	10	11	12	13
Narrative linked to learning outcomes of target audience	X	X		X	X	X	X			X		X	
Gameplay linked to learning outcomes	X	X	X	X	X	X	X	X	X	X	X	X	X

Adherence to TINAG aesthetic					X			X		X	X	X	X
Statement that learning outcome was achieved		X	X	X		X	X		X	X	X	X	X
Measure of success of overall game	X	X	X	X	X	X	X		X	X	X	X	X
Measure of success in terms of learning outcomes		X	X	X	X	X	X		X	X	X	X	X
Concerns regarding widespread suitability as an educational medium							X		X	X		X	X
ARGs as a novel form of education				X					X	X	X	X	X

When examining *Nomad's* entry in this table, it can be seen that *Nomad* only fails to adhere to a single quality, that of narrative alignment to its learning outcomes. This was purposefully ignored during the design of *Nomad*, as it was felt by the design team that a story with a “spectacular nature” (Frontera 2012) would be more engaging than one grounded in reality when considering the subject matter.

However, the fact that *Nomad* adheres to the rest of these qualities is impressive, despite adhering to the unfavourable “concerns regarding widespread applicability as a medium” quality due to a discussion regarding its suitability in one of the game proper focus groups (as noted in 7.3.1.2). As noted previously in 7.3.1, ARGs that adhere to many qualities within the above table are often considered to be successful applications.

It is this “successful” application that this dissertation contributes to the greater body of work. More specifically, this dissertation contains an incredibly detailed case study of a successful application in the hopes that the amount of detail within this dissertation enables similar versions of the same ARG to be reproduced and replayed in other, similar contexts.

7.5.2 Suggestions for Future Research

This section discusses various subject areas and topics that warrant future investigation as a result of this dissertation.

7.5.2.1 *Increasing Engagement of Potential Players*

Encouraging an audience to participate in an ARG, as noted in 7.4.2, is difficult. As such, a potential domain for future research is understanding exactly why this is the case in a variety of contexts. Various sources, such as Whitton (2009a), Piatt (2009) and Bonsignore et al. (2012) suggest reasons relating to the agency of the audience in the decision to participate. However, there may be further, potentially cultural and socioeconomic, reasons for why ARGs are seemingly participated in less than traditional games.

Investigating this would require context-specific research, as noted by participants of the game proper's focus groups (see 6.3.6.2), so as to design a game that appeals more directly to the target audience. Arguably, this context-specific research should also be integrated into design schedules for potential ARGs in order to ensure that potential players will commit to playing a designed game.

Once enough context-specific research regarding engagement has been performed, one can begin to make inferences regarding how best to engage potential players in ARGs dependant on the context. As little research has been done explicitly on the topic of engagement in ARGs it may be a potentially important domain in future research on the genre.

7.5.2.2 *The Evolution of the ARG Genre*

The ARG genre as it is understood today has existed since the turn of the century. *The Beast*, arguably the first large-scale ARG, was played in 2001 (McGonigal 2003b). However, these large-scale productions have become increasingly rare since 2010, when *Conspiracy For Good* was played (Stenros et al. 2011). Influential educational ARGs such as *Who Is Herring Hale?* (Piatt 2009) and *ViolaQuest* (Whitton 2009a) were first played in 2007 and 2008, with fewer educational ARGs being discussed in recent literature.

It could be suggested, then, that the ARG genre is becoming less relevant in its "purest" form. However, this is not the case. Various interactive marketing strategies, such as *Can't Kill Progress* (Square Enix 2015) borrow elements from the ARG genre.

Can't Kill Progress (Square Enix 2015) was an interactive marketing campaign for *Deus Ex: Mankind Divided* (Square Enix 2016), a digital game. In this campaign, participants could watch a stream of a man in a jail cell being interrogated over a period of three days (Kollar 2015). Participants could control the cameras in the cell and utilise a chatroom in order to interact with choice moments in the marketing campaign, as well as unlock additional content through the input of hidden commands (Square Enix 2015).

The marketing campaign for *Can't Kill Progress* (Square Enix 2015) allowed its audience agency similar to that provided in ARGs to determine the outcome of the scenes they were viewing in the video stream. However, unlike TINAG ARGs, Square Enix (the game's publishers), invited players to take part in the campaign before it launched (Kollar 2015).

The success of such campaigns may suggest a potential evolutionary path for ARGs. ARGs, or similar experiences like Investigate North's (2014b) game *Cloud Chamber*, may seek to be played out more primarily online, where potential players may choose to fully dedicate leisure time to their play. This agrees with the suggestion for a primarily online ARG seen in 6.3.6.2. Additionally, these ARGs may choose not to adhere to the "this is not a game" aesthetic to facilitate more engagement from potential players.

An examination of how interactive marketing campaigns and similar interactive products make use of elements common in ARGs by utilising the real world as an interactive possibility space may allow for a greater understanding regarding the evolution of the ARG genre. Understanding this evolution may also suggest how ARGs should be marketed, designed and implemented to capitalise on the success of these similar campaign types.

7.5.2.3 *Using ARGs for Practical Scenario-based Learning*

A discussion had in one of the game proper's focus groups (the "observer" focus group for non-players) suggested the necessity for the narrative in an educational ARG to be closely linked to its gameplay and learning outcomes. This approach is highly practical, and suggests that the ARG mimic some real-world scenario in which players would be taught the skills necessary to complete that scenario.

This can already be seen on a small-scale through the use of an ARG to teach Enterprise (Brookes 2009). In this example, players have to assist clients in saving a failing business. A similar scenario-based approach was seen in *World Without Oil* (Rusnak, Dobson & Boskic 2008), with players learning about the effects of an oil shortage through enacting the *World Without Oil* scenario.

Subject fields that could benefit from such scenario-based ARGs include law (in the presentation and defence of court cases), criminology (stopping a murder by tracking down a serial killer based on his/her previous victims), financial management (by advising clients on how to manage their finances effectively in pursuit of a goal), computer security (the construction of a near-unhackable computer system), and marketing (wherein players may have to pitch ideas for various products to companies in order to create a brand empire) to name a few. These scenario-based ARGs also have the benefit of being dynamic yet closed narratives, allowing them to exist as packaged ARGs.

7.5.2.4 *Packaged Educational ARGs*

Using an alternate reality game to teach information literacy

337

The notion of “packaged” educational ARGs, ARGs whose resources can be packaged and distributed, allowing for replayability, is not a new concept, having already been done for *World Without Oil* (Rusnak, Dobson & Boskic 2008) and *ViolaQuest* (as part of the Alternate Reality Games for Orientation, Socialisation and Induction project at Manchester Metropolitan University) (Whitton 2009a). However, the potential for scenario-based ARGs as discussed in 7.5.2.3 supports this packaged approach.

ARGs, as a genre, require a large amount of work to effectively design and maintain, as shown in this dissertation and as discussed in 7.4.4. As such, it may be compelling for educators to be able to implement already-designed small-scale ARGs for the teaching of specific outcomes. These ARGs can be much shorter in length than traditional, time-bound ARGs and still present a novel way for learners to interact with educational content. These packaged ARGs, because of their likely more-rigid structure, would be less work to maintain as well, due to less allowance for player agency to truly affect the narrative or gameplay.

Further research should be done in order to determine the need for these types of ARGs within an educational context, and how their design may have to differ from traditional ARG and game design to facilitate their packaged nature. A specific research topic in this field is an examination into how the lessened agency provided to players by these packaged experiences affect the appeal of the genre to those, and other, players.

7.5.2.5 *Extending the Nomad ARG*

As noted in 7.4.1, it is hypothetically possible to further expand the *Nomad* ARG and the *Nomad* universe based on the ending of the game proper. While there are no explicit plans for this currently, it is a possibility for future research. Potential sequels for *Nomad* may also experiment with teaching and exercising skill sets outside of information literacy, as the time-travel-based narrative can support other subject domains.

However, creating a sequel to the *Nomad* ARG would be no small task due to the sheer scale of the game proper that a sequel would have to expand upon. This expansion would also need to address shortcomings from the empirical study as noted within this dissertation in order to fully succeed.

These shortcomings, and specific topics for future research, include how to engage players in small-scale ARGs, the importance of the “this is not a game” aesthetic within a South African context, and how the *Nomad* narrative can remain original and enjoyable throughout multiple subsequent iterations.

7.6 Conclusion

This chapter concludes a dissertation wherein an ARG was designed, developed and implemented for the purpose of teaching and exercising information literacy skills in its players. Within this chapter the study has been summarised and the main research question answered through the answering of the study's sub-questions.

In beginning to discuss the study's contributions to the greater body of work, issues relating to the ARG genre are discussed with respect to the study. This continues in subsequent sections where potential future work based on the study is discussed after contextualising the study within the existing body of knowledge.

In summary, this study did the following:

- Developed a theoretical framework based on learning theories, game design theory, research on alternate reality games, and examples of educational applications of the genre in order to inform the design of an educational ARG for teaching and exercising information literacy.
- Designed two iterations of *Nomad*, the aforementioned educational ARG. Its design was informed by the developed theoretical framework. Both these iterations were developed and implemented over the course of a year at the University of Pretoria's Hatfield campus.
- Results from these implementations were gathered and analysed to inform on the effectiveness of using an ARG for teaching purposes, specifically in the field of information literacy. However, many recommendations were made by players regarding the usefulness of the genre as a teaching tool.
- Based on these results, some salient issues from the literature regarding the genre were discussed with respect to the study.
- Topics for future work, and the specific fields in which such work can be done, were suggested to potential future ARG designers. Such topics allow for the findings in this dissertation to be further examined and expanded upon.

As such, it is intended that this dissertation and its empirical study can adequately inform potential future ARG designers regarding how to design ARGs, specifically within educational contexts.

8. References

42 Entertainment 2010. I Love Bees – 42 Entertainment (Web Archive). [Online] Available at: <http://web.archive.org/web/20100220112600/http://www.42entertainment.com/bees.html> [Accessed 23 March 2015].

Abt, C.C. 1987. *Serious Games*. 2nd ed. New York: University Press of America.

Adu Poku, D. 2012. *Flow in games: Aural conditioning*. Thesis. [Online] Available at: <http://localhost:8080/xmlui/handle/123456789/57> [Accessed 4 June 2015].

Allender, S., Cowburn, G. & Foster, C. 2006. Understanding participation in sport and physical activity among children and adults: a review of qualitative studies. *Health Education Research* 21(6):826–835.

Alternate Reality Gaming Network 2002. What Is An ARG? [Online] Available at: <http://www.argn.com/what.html> [Accessed 11 June 2015].

American Library Association & Association for College and Research Libraries 2000. Information Literacy Competency Standards for Higher Education. [Online] Available at: <http://arizona.openrepository.com/arizona/handle/10150/105645> [Accessed 19 January 2016].

Andersen, M. 2008. An Interview with JC Hutchins: Personal Effects. *ARGNet: Alternate Reality Gaming Network*. [Online] Available at: http://www.argn.com/2008/11/an_interview_with_jc_hutchins_personal_effects/ [Accessed 24 February 2015].

Apter, M.J. 1991. A structural phenomenology of play. In M. J. Apter & J. Kerr, eds. *Adult Play*. Amsterdam: Swets and Zeitlinger:13–30.

Arias, E., Eden, H., Fischer, G., Gorman, A. & Scharff, E. 2000. Transcending the Individual Human Mind—Creating Shared Understanding Through Collaborative Design. *ACM Transactions in Human Computer Interaction* 7(1):84–113.

Badke, W.B. 2005. Can't Get No Respect: Helping Faculty to Understand the Educational Power of Information Literacy. *The Reference Librarian* 43(89–90):63–80.

Barlow, N. 2006. Types of ARGs. In B. Thompson & T. Chatfield, eds. *Alternate Reality Games White Paper*. International Game Developer's Association:15–20. [Online] Available at: <http://www.christydena.com/wp-content/uploads/2007/11/igda-alternaterealitygames-whitepaper-2006.pdf> [Accessed 3 March 2015].

Bartle, R. 1996. Hearts, clubs, diamonds, spades: Players who suit MUDs. *Journal of MUD research* 1(1):19.

Becker, K. 2005. How Are Games Educational? Learning Theories Embodied in Games. In *Proceedings of the 2005 DiGRA International Conference: Changing Views: Worlds in Play*. DiGRA 2005 – Changing Views: Worlds in Play. Vancouver: Digital Games Research Association. [Online] Available at:

http://denis.kraynov.2009.homepage.auditory.ru/2006/Ivan.Ignatyev/DiGRA/Learning/How%20Are%20Games%20Educational_Learning%20Theories%20Embodied%20in%20Games.pdf [Accessed 27 May 2015].

Beck, K., Greening, J., Martin, R.C., Beedle, M., Highsmith, J., Mellor, S., van Bennekum, A., Hunt, A., Schwaber, K., Cockburn, A., Jeffries, R., Sutherland, J., Cunningham, W., Kern, J., Thomas, D., Fowler, M. & Marick, B. 2001. *Manifesto for Agile Software Development*. Utah: Agile Alliance. [Online] Available at: <http://agilemanifesto.org/> [Accessed 23 October 2015].

Benford, S., Magerkurth, C. & Ljungstrand, P. 2005. Bridging the physical and digital in pervasive gaming. *Communications of the ACM* 48(3):54–57.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M. & Rumble, M. 2012. Defining twenty-first century skills. In *Assessment and teaching of 21st century skills*. Netherlands: Springer:17–66.

Boehm, B.W. 1995. A spiral model of software development and enhancement. *IEEE Engineering Management Review* 23(4):61–72.

Bogost, I. 2008. The Rhetoric of Video Games. In K. Salen, ed. *The ecology of games: Connecting youth, games, and learning*. Massachusetts: MIT Press:117–140. [Online] Available at: <http://mitpress2.mit.edu/books/chapters/0262195755chap9.pdf> [Accessed 19 February 2015].

Bono, J.J. & Breeze, M. 2008. What is an ARG? : ARGology. [Online] Available at: http://www.argology.org/_what-is-an-arg/ [Accessed 16 September 2014].

Bonsignore, E. 2012. The Birth of April G: Creating an ARG Protagonist-by-Proxy. In *Rough Cuts: Media and Design in Process*. United States of America: The New Everyday.

Bonsignore, E., Hansen, D., Kraus, K. & Ruppel, M. 2012. Alternate Reality Games as Platforms for Practicing 21st-Century Literacies. *International Journal of Learning and Media* 4(1):25–54.

Bonsignore, E., Hansen, D., Kraus, K., Visconti, A., Ahn, J. & Druin, A. 2013. Playing for Real: Designing Alternate Reality Games for Teenagers in Learning Contexts. In *Proceedings of the 12th International Conference on Interaction Design and Children*. IDC '13. New York: ACM:237–246. [Online] Available at: <http://doi.acm.org/10.1145/2485760.2485788> [Accessed 14 November 2014].

Bonsignore, E., Kraus, K., Ahn, J., Visconti, A., Fraistat, A. & Druin, A. 2012. Alternate Reality Games: Platforms for Collaborative Learning. In *Proceedings of the 10th International Conference of the Learning Sciences*. 10th International Conference of the Learning Sciences. Sydney: International Conference of the Learning Sciences:251–258.

Bothma, T., Cosijn, E., Fourie, I. & Penzhorn, C. 2014. *Navigating Information Literacy: Your information Society Survival Toolkit*. Second edition. Cape Town: Pearson South Africa.

Breuer, J.S. & Bente, G. 2010. Why so serious? On the relation of serious games and learning. *Eludamos: Journal for Computer Game Culture* 4(1):7–24.

Brookes, S. 2009. Using an Alternate Reality Game to Teach Enterprise. In *Posters from the 2009 International Entrepreneurship Educators Conference*. International Entrepreneurship Educators Conference. Edinburgh: International Entrepreneurship Educators Conference. [Online] Available at: <https://simonbrookes.wordpress.com/2009/11/03/using-an-alternate-reality-game-to-teach-enterprise/> [Accessed 3 March 2015].

Brown, E. & Cairns, P. 2004. A Grounded Investigation of Game Immersion. In *CHI '04 Extended Abstracts on Human Factors in Computing Systems*. CHI EA '04. New York: ACM:1297–1300. [Online] Available at: <http://doi.acm.org/10.1145/985921.986048> [Accessed 15 November 2013].

Brown, J.S., Collins, A. & Duguid, P. 1989. Situated Cognition and the Culture of Learning. *Educational Researcher* 18(1):32–42.

Badke, W.B. 2005. Can't Get No Respect: Helping Faculty to Understand the Educational Power of Information Literacy. *The Reference Librarian* 43(89–90):63–80.

Bungie 2004. *Halo 2*. United States of America: Microsoft Game Studios. [Online] Available at: <https://www.halowaypoint.com/en-us/games/halo-2> [Accessed 13 August 2015].

Fullerton, T. 2008. *Game Design Workshop: A Playcentric Approach to Creating Innovative Games*. Boca Raton: CRC Press.

Gagne, R.M. 1970. *Conditions of Learning*. 2nd ed. New York: Holt, Rinehart & Winston of Canada Ltd.

Koster, R. 2013. *Theory of Fun for Game Design*. 2nd ed. California: O'Reilly Media, Inc.

Maybee, C. 2006. Undergraduate Perceptions of Information Use: The Basis for Creating User-Centered Student Information Literacy Instruction. *The Journal of Academic Librarianship* 32(1):79–85.

Owusu-Ansah, E.K. 2004. Information literacy and higher education: placing the academic library in the center of a comprehensive solution. *Journal of Academic Librarianship* 30(1):3–16.

Reigeluth, C.M. & Carr-Chellman, A.A. eds. 2009. *Instructional-Design Theories and Models, Volume III: Building a Common Knowledge Base*. 1st ed. London: Routledge.

Salen, K. & Zimmerman, E. 2003. *Rules of play: game design fundamentals*. Cambridge: MIT Press.

Schell, J. 2014. *The Art of Game Design: A Book of Lenses*. 2nd ed. Boca Raton: A.K Peters/CRC Press.

Burgess, A. 1962. *A Clockwork Orange*. London: William Heinemann.

Burgess, T. 2001. Guide to the Design of Questionnaires. [Online] Available at: <http://ww.alicechristie.org/classes/593/survey.pdf> [Accessed 20 October 2015].

Burns, R.B. 2000. *Introduction to Research Methods*. Sage Publications.

Carroll, L. 1865. *Alice's adventures in wonderland*. 1st ed. Hoboken: BiblioBytes. [Online] Available at: <http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2008439> [Accessed 6 August 2015].

Case, D.O. 2012. *Looking for Information: A Survey of Research on Information Seeking, Needs and Behavior*. 3rd ed. Bradford: Emerald Group Publishing.

Cazden, C., Cope, B., Fairclough, N., Gee, J., Kalantzis, M., Kress, G., Luke, A., Luke, C., Michaels, S. & Nakata, M. 1996. A pedagogy of multiliteracies: Designing social futures. *Harvard educational review* 66(1):60–92.

Chen, J. 2007. Flow in Games (and everything else). *Communications of the ACM* 50(4):31–34.

Chess, S. & Booth, P. 2013. Lessons down a rabbit hole: Alternate reality gaming in the classroom. *New Media & Society*. [Online] Available at: <http://nms.sagepub.com/content/early/2013/07/11/1461444813497554.full.pdf+html> [Accessed 20 June 2014].

Collins, K. 2007. An introduction to the participatory and non-linear aspects of video games audio. [Online] Available at: http://www.lcis.com.tw/paper_store/paper_store/interactive-20141213212345468.pdf [Accessed 4 June 2015].

Colvert, A. 2009. Peer Puppeteers: Alternate Reality Gaming in Primary School Settings. In *Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London: Brunel University. [Online] Available at: <http://www.digra.org/wp-content/uploads/digital-library/09287.19018.pdf> [Accessed 19 February 2015].

Connolly, T.M., Stansfield, M. & Hailey, T. 2011. An alternate reality game for language learning: ARGuing for multilingual motivation. *Computers & Education* 57(1):1389–1415.

Conrad, J. 1900. *Lord Jim*. London: Blackwood's Magazine.

Creswell, J.W. & Tashakkori, A. 2007. Editorial: Differing Perspectives on Mixed Methods Research. *Journal of Mixed Methods Research* 1(4):303–308.

Csikszentmihalyi, M. 1990. *Flow: the psychology of optimal experience*. New York: Harper & Row.

Dahl, R. 1986. *Going Solo*. 1st ed. London: Jonathan Cape.

Davies, R., Krizova, R. & Weiss, D. 2006. EMaps.com: Games and Mobile Technology in Learning. In W. Nejdl & K. Tochtermann, eds. *Innovative Approaches for Learning and Knowledge Sharing*. Berlin: Springer:103–110.

de Beer, K. 2015a. *Seeing how deep the rabbit hole goes*. Pretoria. [Online] Available at: <https://www.youtube.com/watch?v=7I4VCsOEuPg> [Accessed 3 November 2015].

de Beer, K. 2015b. *So this is the hole?*. Pretoria. [Online] Available at: <https://www.youtube.com/watch?v=tJ4-yJMKhCk> [Accessed 3 November 2015].

- de Beer, K. 2015c. *The “ring ring” observer node*. Pretoria. [Online] Available at: <https://www.youtube.com/watch?v=olGZrL9mA2I> [Accessed 3 November 2015].
- de Beer, K. & Holmner, M. 2013. The Design of an Alternate reality Game as a Capstone Course in the Multimedia Post-Graduate Degree. In *Proceedings of the IATUL Conference 2013*. Cape Town. [Online] Available at: <http://docs.lib.purdue.edu/iatul/2013/papers/30> [Accessed 19 February 2015].
- de Boer, A.L., Bothma, T. & du Toit, P. 2011. Enhancing information literacy through the application of Whole Brain strategies. *Libri* 61(1):67–75.
- Dena, C. 2007. Capturing polymorphic creations: towards ontological heterogeneity and transmodiology. In *Proceedings of the 4th Australasian conference on Interactive entertainment*. Melbourne: RMIT University:1–8. [Online] Available at: <http://portal.acm.org/citation.cfm?id=1367964&jmp=cit&coll=ACM&dl=ACM&CFID=27655947&CFTOKEN=58909698#CIT> [Accessed 20 February 2010].
- Dena, C. 2008. Emerging Participatory Culture Practices Player-Created Tiers in Alternate Reality Games. *Convergence: The International Journal of Research into New Media Technologies* 14(1):41–57.
- Denis, G. & Jouvelot, P. 2005. Motivation-driven Educational Game Design: Applying Best Practices to Music Education. In *Proceedings of the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology*. ACE '05. New York: ACM:462–465. [Online] Available at: <http://doi.acm.org/10.1145/1178477.1178581> [Accessed 4 December 2014].
- Denzin, N.K. 1970. *Sociological methods: A sourcebook*. London: Butterworths.
- Deterding, S., Sicart, M., Nacke, L., O’Hara, K. & Dixon, D. 2011. Gamification Using Game-design Elements in Non-gaming Contexts. In *CHI '11 Extended Abstracts on Human Factors in Computing Systems*. CHI EA '11. New York: ACM:2425–2428. [Online] Available at: <http://doi.acm.org/10.1145/1979742.1979575> [Accessed 23 July 2015].
- Dewey, J. 1916. *Democracy and Education: An Introduction to the Philosophy of Education*. Boston: Macmillan.
- Dickey, M.D. 2006. “Ninja Looting” for Instructional Design: The Design Challenges of Creating a Game-based Learning Environment. In *ACM SIGGRAPH 2006 Educators Program*. SIGGRAPH '06. New York: ACM. [Online] Available at: <http://doi.acm.org/10.1145/1179295.1179313> [Accessed 4 December 2014].
- Dijkstra, E.W. 1959. A note on two problems in connexion with graphs. *Numerische Mathematik* 1(1):269–271.
- Dondlinger, M.J. 2007. Educational video game design: A review of the literature. *Journal of Applied Education Technology* 4(1):21–31.
- Donohue, S.E., Woldorff, M.G. & Mitroff, S.R. 2010. Video game players show more precise multisensory temporal processing abilities. *Attention, Perception, & Psychophysics* 72(4):1120–1129.

Dunn, K. 2002. Assessing information literacy skills in the California state university: a progress report. *The Journal of Academic Librarianship* 28(1–2):26–35.

EA Digital Illusions CE 2008. *Mirror's Edge*. Sweden: EA Digital Illusions CE. [Online] Available at: <http://www.mirrorsedge.com/> [Accessed 13 August 2015].

Evoke 2010a. Mission List. *Mission List*. [Online] Available at: <http://www.urgentevoke.com/page/mission-list> [Accessed 23 March 2015].

Evoke 2010b. Social Innovation. [Online] Available at: <http://www.urgentevoke.com/page/social-innovation> [Accessed 23 March 2015].

Evoke 2010c. What Happens Next – ACT. *Urgent: Evoke*. [Online] Available at: <http://www.urgentevoke.com/page/what-happens-next-act> [Accessed 8 October 2015].

Farrell, D. & Moffat, D.C. 2014. Adapting Cognitive Walkthrough to Support Game Based Learning Design. *International Journal of Game-Based Learning* 4(3):23–34.

Fisch, S.M. 2005. Making educational computer games “educational.” In *Proceedings of the 2005 Conference on Interaction Design and Children*. IDC '05. New York: ACM:56–61. [Online] Available at: <http://doi.acm.org/10.1145/1109540.1109548> [Accessed 15 May 2014].

Foddy, W. 1994. *Constructing Questions for Interviews and Questionnaires: Theory and Practice in Social Research*. 1st ed. London: Cambridge University Press.

Frasca, G. 2003. Ludologists love stories, too: notes from a debate that never took place. In *DiGRA '03 – Proceedings of the 2003 DiGRA International Conference: Level-Up*. 2003 Digital Games Research Association International Conference: Level-Up. Utrecht: Digital Games Research Association. [Online] Available at: http://www.ludology.org/articles/frasca_levelUP2003.pdf [Accessed 8 January 2015].

Frontera, E.B. 2012. Teaching students to build historical buildings in virtual reality: A didactic strategy for learning history of art in secondary education. *Themes in Science and Technology Education* 2(1–2):165–184.

Fujimoto, R. 2012. Designing An Educational Alternate Reality Game. [Online] Available at: http://www.shoyu.com/education/Research_DesigningAnEducationalARG.pdf [Accessed 14 May 2014].

Fullerton, T. 2008. *Game Design Workshop: A Playcentric Approach to Creating Innovative Games*. Boca Raton: CRC Press.

Gagne, R.M. 1970. *Conditions of Learning*. 2nd ed. New York: Holt, Rinehart & Winston of Canada Ltd.

Galarneau, L. 2005. Authentic Learning Experiences Through Play: Games, Simulations and the Construction of Knowledge. [Online] Available at: <http://summit.sfu.ca/item/245> [Accessed 24 March 2014].

Gee, J.P. 2003. What video games have to teach us about learning and literacy. *Computers in Entertainment* 1(1):1–3.

Gentry, J.W. 1990. What is experiential learning. In *Guide to business gaming and experiential learning*. New Jersey: Nichols Publishing Company:9–20. [Online] Available at: <http://www.wmich.edu/casp/servicelearning/files/What%20is%20Experiential%20Learning.pdf> [Accessed 25 September 2015].

Gerring, J. 2004. What is a case study and what is it good for? *American Political Science Review* 98(2):341–354.

Gilster, P. 1997. *Digital Literacy*. 1st ed. New York: John Wiley & Sons.

Gladwell, M. 1996. The Tipping Point: Why Is the City Suddenly So Much Safer—Could It Be That Crime Really Is an Epidemic? *The New Yorker* 72(14):32–38.

Global Digital Citizen Foundation 2015. 21st Century Fluencies. *Global Digital Citizen Foundation*. [Online] Available at: <https://globaldigitalcitizen.org/21st-century-fluencies> [Accessed 6 October 2015].

Gorman, G.E., Clayton, P.R., Shep, S.J. & Clayton, A. 2005. *Qualitative Research for the Information Professional: A Practical Handbook*. 1st ed. London: Facet.

Gurzick, D., White, K.F., Lutters, W.G., Landry, B.M., Dombrowski, C. & Kim, J.Y. 2011. Designing the Future of Collaborative Workplace Systems: Lessons Learned from a Comparison with Alternate Reality Games. In *Proceedings of the 2011 iConference*. New York: ACM:174–180. [Online] Available at: <http://doi.acm.org/10.1145/1940761.1940785> [Accessed 17 September 2014].

Hakulinen, L. 2013. Alternate Reality Games for Computer Science Education. In *Proceedings of the 13th Koli Calling International Conference on Computing Education Research*. Koli Calling '13. New York: ACM:43–50. [Online] Available at: <http://0-doi.acm.org.innopac.up.ac.za/10.1145/2526968.2526973> [Accessed 17 September 2014].

Hallford, N. & Hallford, J. 2001. *Swords & circuitry a designer's guide to computer role playing games*. Roseville: Prima Tech.

Halverson, R., Shaffer, D., Squire, K. & Steinkuehler, C. 2006. Theorizing Games in/and Education. In *Proceedings of the 7th International Conference on Learning Sciences*. ICLS '06. Bloomington: International Society of the Learning Sciences:1048–1052.

Hansen, D., Bonsignore, E., Ruppel, M., Visconti, A. & Kraus, K. 2013. Designing Reusable Alternate Reality Games. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. CHI '13. New York: ACM:1529–1538.

Hardy, T. 1874. *Far from the Madding Crowd*. 1st ed. New York: Henry Holt & Company.

Henning, E., Van Rensburg, W. & Smit, B. 2004. Methods and Methodologies. In *Finding your way in qualitative research*. Pretoria: Van Schaik:32, 41.

Hinske, S., Lampe, M., Magerkurth, C. & Röcker, C. 2007. Classifying pervasive games: on pervasive computing and mixed reality. *Pervasive games* 1. [Online] Available at: <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.66.6807> [Accessed 19 August 2009].

Hofstee, E. 2006. *Constructing a good dissertation: a practical guide to finishing a Master's, MBA or PhD on schedule*. South Africa: EPE Publishers.

Hopson, J. 2001. Behavioral Game Design. *Gamasutra*. [Online] Available at: http://www.gamasutra.com/view/feature/131494/behavioral_game_design.php [Accessed 7 October 2015].

Hunicke, R., LeBlanc, M. & Zubek, R. 2004. A Formal Approach to Game Design and Game Research. In *Proceedings of the AAAI Workshop on Challenges in Game AI*. AAAI Workshop: Challenges in Game AI. California: Association for the Advancement of Artificial Intelligence. [Online] Available at: <http://algorithmancy.8kindsoffun.com/MDA.pdf> [Accessed 8 June 2015].

International Civil Aviation Organisation 2001. Aeronautical Communications. In *Annex 10 to the Convention on International Civil Aviation*. Montreal: International Civil Aviation Organisation:58.

International Game Developers Association 2011. Alternate Reality Games SIG/Whitepaper. [Online] Available at: http://wiki.igda.org/Alternate_Reality_Games_SIG/Whitepaper [Accessed 24 March 2014].

Investigate North 2014a. *Cloud Chamber*. Sweden: Investigate North. [Online] Available at: <http://cloudchambermystery.com/> [Accessed 7 January 2015].

Investigate North 2014b. Cloud Chamber | Massively Multiplayer Story Game. [Online] Available at: <http://cloudchambermystery.com/> [Accessed 7 January 2015].

Jean, L. 2013. Dungeons and dragons taught me how to write: analyzing the parallels between guides for new teachers and tabletop roleplaying game manuals. [Online] Available at: <http://hdl.handle.net/2148/1655> [Accessed 24 March 2014].

Jenkins, H. 2008. *Convergence Culture: Where Old and New Media Collide*. Revised. NYU Press.

Jerrett, A. 2014. Thenewspaceman. *YouTube*. [Online] Available at: <https://www.youtube.com/channel/UChJ7l84NEDMwffIVT1-X90w> [Accessed 10 September 2015].

Johnston, J.D., Massey, A.P. & Marker-Hoffman, R.L. 2012. Using an Alternate Reality Game to Increase Physical Activity and Decrease Obesity Risk of College Students. *Journal of Diabetes Science and Technology* 6(4):828–838.

Jørgensen, K. 2008a. Audio and Gameplay: An analysis of PvP battlegrounds in World of Warcraft. *Game Studies* 8(2). [Online] Available at: <http://gamestudies.org/0802/articles/jorgensen> [Accessed 4 June 2015].

Jørgensen, K. 2008b. Left in the dark: playing computer games with the sound turned off. In K. Collins, ed. *From Pac-Man to Pop Music. Interactive Audio in Games and New Media*. Farnham: Ashgate:163–178. [Online] Available at: <https://bora.uib.no/handle/1956/7855> [Accessed 4 June 2015].

Juul, J. 2010. In Search of Lost Time: On Game Goals and Failure Costs. In *Proceedings of the Fifth International Conference on the Foundations of Digital Games*. FDG '10. New York: ACM:86–91. [Online] Available at: <http://doi.acm.org/10.1145/1822348.1822360> [Accessed 5 December 2014].

- Kim, J., Lee, E., Thomas, T. & Dombrowski, C. 2009. Storytelling in new media: The case of alternate reality games, 2001–2009. *First Monday* 14(6). [Online] Available at: <http://journals.uic.edu/ojs/index.php/fm/article/view/2484> [Accessed 20 June 2014].
- Kim, J.Y., Allen, J.P. & Lee, E. 2008. Alternate reality gaming. *Communications of the ACM* 51(2):36–42.
- King, I. 2008. *How to Make Good Decisions and Be Right All the Time: Solving the Riddle of Right and Wrong*. 1st edition. London: Bloomsbury Academic.
- Kipling, R. 1894. *The Jungle Book*. 1st ed. United Kingdom: Macmillan.
- Klopper, E. 2008. *Augmented Learning: Research and Design of Mobile Educational Games*. Massachusetts: MIT Press.
- Kolb, D.A. 1984. *Experiential learning: experience as the source of learning and development*. New Jersey: Prentice Hall.
- Kollar, P. 2015. What the hell is Square Enix doing on Twitch? *Polygon*. [Online] Available at: <http://www.polygon.com/2015/4/7/8363521/square-enix-twitch-cant-kill-progress-reveal> [Accessed 11 January 2016].
- Koster, R. 2013. *Theory of Fun for Game Design*. 2nd ed. California: O'Reilly Media, Inc.
- Kring, T. 2010a. *Conspiracy For Good – 2010*. London. [Online] Available at: https://www.youtube.com/watch?v=wN590e-fopc&feature=youtube_gdata_player [Accessed 24 March 2015].
- Kring, T. 2010b. *I Am Not a Member*. London. [Online] Available at: <https://www.youtube.com/watch?v=NYQhjPIN98w> [Accessed 9 October 2015].
- Kruchten, P. 2011. Agile's Teenage Crisis? *InfoQ*. [Online] Available at: <http://www.infoq.com/articles/agile-teenage-crisis> [Accessed 23 October 2015].
- Kruh, L. 1982. A Basic Probe of the Beale Cipher as a Bamboozlement. *Cryptologia* 6(4):378–382.
- Kuhlthau, C.C. 2004. *Seeking meaning: A process approach to library and information services*. 2nd ed. Connecticut: Libraries Unlimited.
- Langton, C.G. 1997. *Artificial Life: An Overview*. 2nd ed. Cambridge: MIT Press.
- Laurel, B. 2001. *Utopian entrepreneur*. Cambridge: MIT Press. [Online] Available at: <http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=138674> [Accessed 24 March 2014].
- Lee, T. 2006. This Is Not A Game: Alternate Reality Gaming and its potential for learning. *Futurelab*. [Online] Available at: <http://archive.futurelab.org.uk/resources/publications-reports-articles/web-articles/Web-Article477>.

- le Roux, A. 2014. *AIM PRESENTATION FREAKOUT*. Pretoria. [Online] Available at: https://www.youtube.com/watch?v=KJ_ouweEbFs [Accessed 10 September 2015].
- Levitsky, D.A., Garay, J., Nausbaum, M., Neighbors, L. & DellaValle, D.M. 2006. Monitoring weight daily blocks the freshman weight gain: a model for combating the epidemic of obesity. *International Journal of Obesity* 30(6):1003–1010.
- Lévy, P. 1999. *Collective Intelligence: Mankind's Emerging World in Cyberspace*. Cambridge: Basic Books.
- Lewallen, R. 2005. Software Development Life Cycle Models. *Code Better*. [Online] Available at: <http://codebetter.com/raymondlewallen/2005/07/13/software-development-life-cycle-models/> [Accessed 19 January 2016].
- Lichtman, M. 2012. *Qualitative Research in Education: A User's Guide*. 3rd ed. London: Sage.
- Lincoln, Y.S. & Guba, E.G. 1985. *Naturalistic Inquiry*. 1st edition. California: Sage Publications.
- Lindley, C.A. 2004. Trans-reality gaming. In *Proceedings of the 2nd Annual International Workshop in Computer Game Design and Technology*. International Workshop in Computer Game Design and Technology. Liverpool: Integrated Project of Pervasive Games. [Online] Available at: http://skynet.ie/~ogami/notes/year%204/writing/Lindley_Trans-reality_Gaming.pdf.
- Littlejohn, S.W. 1992. *Theories of human communication*. Belmont: Wadsworth Publishing Company.
- Magnuson, L. 2011. Promoting privacy Online and reputation management as an information literacy skill. *College & Research Libraries News* 72(3):137–140.
- Martin, A. & Chatfield, T. 2006. What Is An ARG? In B. Thompson, ed. *Alternate Reality Games White Paper*. International Game Developer's Association:6–7. [Online] Available at: <http://www.christydena.com/wp-content/uploads/2007/11/igda-alternaterealitygames-whitepaper-2006.pdf> [Accessed 3 March 2015].
- Martin, R.C. 2003. *Agile software development: Principles, patterns, and practices*. New Jersey: Prentice Hall.
- Maslow, A.H. 1943. A theory of human motivation. *Psychological Review* 50(4):370–396.
- Matheny, J. 2013. This is Not A Game: Rise of the ARG. *GamesTM* 1(135):88–93.
- Maybee, C. 2006. Undergraduate Perceptions of Information Use: The Basis for Creating User-Centered Student Information Literacy Instruction. *The Journal of Academic Librarianship* 32(1):79–85.
- McGonigal, J. 2003a. A Real Little Game: The Performance of Belief in Pervasive Play. In *DiGRA '03 – Proceedings of the 2003 DiGRA International Conference: Level-Up*. 2003 Digital Games Research Association International Conference: Level-Up. Utrecht: Digital Games Research Association. [Online] Available at: <http://www.avantgame.com/MCGONIGAL%20A%20Real%20Little%20Game%20DiGRA%202003.pdf> [Accessed 24 March 2015].

McGonigal, J. 2003b. This Is Not a Game: Immersive Aesthetics and Collective Play. In *Melbourne DAC 2003 Streamingworlds Conference Proceedings*. RMIT University.

McGonigal, J. 2007a. The puppet master problem: design for real-world, mission based gaming. In P. Harrigan & N. Wardrip-Fruin, eds. *Second Person: Role-Playing and Story in Games and Playable Media*. The MIT Press. [Online] Available at: http://www.avantgame.com/McGonigal_THE-PUPPET-MASTER-PROBLEM_MITpress.pdf.

McGonigal, J. 2007b. The Puppet Master Problem: Design for Real-World, Mission Based Gaming. *Second Person*. [Online] Available at: <http://www.waffler.org/wp-content/uploads/2009/05/the-puppet-master-problem-design-for-real-world-mission-based-gaming1.pdf> [Accessed 16 March 2015].

McGonigal, J. 2008. Why I love bees: A case study in collective intelligence gaming. In K. Salen, ed. *The ecology of games: Connecting youth, games, and learning*. Massachusetts: MIT Press:199–227. [Online] Available at: <http://mitpress2.mit.edu/books/chapters/0262195755chap9.pdf> [Accessed 19 February 2015].

McGonigal, J. 2010a. *Gaming Can Make A Better World*. California: TED2010. [Online] Available at: http://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world?language=en [Accessed 23 March 2015].

McGonigal, J. 2010b. Urgent Evoke: What Went Right, What Went Wrong: Lessons from Season 1 of EVOKE. [Online] Available at: <http://blog.urgentevoke.net/2010/07/26/what-went-right-what-went-wrong-lessons-from-season-1-evoke1/> [Accessed 23 March 2015].

McGonigal, J. 2011. *Reality is broken: why games make us better and how they can change the world*. New York: Penguin Press.

McGonigal, J. & Jerrett, A. 2014. Discussion Regarding TINAG and Authenticity in ARGs. [Online] Available at: <https://twitter.com/twoleftsright/status/512303300692439040> [Accessed 10 March 2015].

McSweeney, F.K. & Murphy, E.S. 2014. *The Wiley Blackwell Handbook of Operant and Classical Conditioning*. 1st ed. Wiley-Blackwell.

Michael, D.R. & Chen, S.L. 2005. *Serious Games: Games That Educate, Train, and Inform*. 1st ed. Ohio: Muska & Lipman.

Midnight Reads 2015. Midnight Readers. *Midnight Readers*. [Online] Available at: <http://themidnightreaders.blogspot.co.za/> [Accessed 21 September 2015].

Miles, M.B., Huberman, A.M. & Saldana, J. 2013. *Qualitative Data Analysis: A Methods Sourcebook: A Methods Sourcebook*. 3rd ed. London: Sage Publications.

Moffat, S. & Davies, R.T. 2005. *Doctor Who*.

Montola, M. 2005. Exploring the edge of the magic circle: Defining pervasive games. In *Proceedings of DAC*. :103–107. [Online] Available at: <http://remotedevice.net/main/cmap/exploringtheedge.pdf> [Accessed 17 September 2014].

- Montola, M. 2010. A ludological view on the pervasive mixed-reality game research paradigm. *Personal and Ubiquitous Computing* 15(1):3–12.
- Moseley, A., Whitton, N., Culver, J. & Piatt, K. 2009. Motivation in alternate reality gaming environments and implications for learning. In Leicester: Academic Conferences Limited. [Online] Available at: <https://ira.le.ac.uk/handle/2381/9104> [Accessed 23 June 2015].
- Mouton, J. 2001. *How to succeed in your master's and doctoral studies: a South African guide and resource book*. Pretoria: Van Schaik.
- Munassar, N.M.A. & Govardhan, A. 2010. A comparison between five models of software engineering. *International Journal of Computer Science Issues* 7(5):95–101.
- Muntean, C. 2011. Raising engagement in e-learning through gamification. In *Proceedings of the 6th International Conference on Virtual Learning*. 6th International Conference on Virtual Learning. :323–329.
- Nacke, L.E., Grimshaw, M.N. & Lindley, C.A. 2010. More than a feeling: Measurement of sonic user experience and psychophysiology in a first-person shooter game. *Interacting with Computers* 22(5):336–343.
- Niantic Labs 2013. Official Ingress Website. *Ingress*. [Online] Available at: <https://www.ingress.com/> [Accessed 20 January 2016].
- Niemeyer, G., Garcia, A. & Naima, R. 2009. Black Cloud: Patterns Towards Da Future. In *Proceedings of the 17th ACM International Conference on Multimedia*. MM '09. New York: ACM:1073–1082. [Online] Available at: <http://0-doi.acm.org.innopac.up.ac.za/10.1145/1631272.1631514> [Accessed 14 November 2014].
- Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. *Organization Science* 5(1):14–37.
- Oblinger, D.G. 2004. The Next Generation of Educational Engagement T. Anderson & D. Whitelock, eds. *Journal of Interactive Media in Education* 2004(8):10.
- Ornebring, H. 2007. Alternate reality gaming and convergence culture: The case of Alias. *International Journal of Cultural Studies* 10(4):445–462.
- Örnebring, H. 2007. Alternate reality gaming and convergence culture The case of Alias. *International Journal of Cultural Studies* 10(4):445–462.
- Owusu-Ansah, E.K. 2004. Information literacy and higher education: placing the academic library in the center of a comprehensive solution. *Journal of Academic Librarianship* 30(1):3–16.
- Palys, T. 2008. Purposive sampling. In L. Given, ed. *The SAGE encyclopedia of qualitative research methods*. New York: Sage Publications:697–698. [Online] Available at: <http://eprints.hud.ac.uk/id/eprint/2049> [Accessed 19 October 2015].

- Papert, S. 1986. *Constructionism: A new opportunity for elementary science education*. Massachusetts: Massachusetts Institute of Technology, Media Laboratory, Epistemology and Learning Group.
- Patton, M.Q. 1987. *How to Use Qualitative Methods in Evaluation*. Sage Publications.
- Phillips, A. 2001. Deep Water. *Cloudmakers.org*. [Online] Available at: <http://www.cloudmakers.org/editorials/aphillips726.shtml>.
- Phillips, A. 2006. Methods and Mechanics. In B. Thompson & T. Chatfield, eds. *Alternate Reality Games White Paper*. International Game Developer's Association:31–42. [Online] Available at: <http://www.christydena.com/wp-content/uploads/2007/11/igda-alternaterealitygames-whitepaper-2006.pdf> [Accessed 3 March 2015].
- Piatt, K. 2009. Using alternate reality games to support first year induction with ELGG. *Campus-Wide Information Systems* 26(4):313–322.
- Pickard, A.J. 2013. *Research methods in information*. Chicago: Neal-Schuman.
- Poremba, C. 1998. *Player as Author: Digital Games and Agency*. . Canada: University of Waterloo.
- Portnow, J. 2008. The Power of Tangential Learning. *Edge Online*. [Online] Available at: <http://www.edge-online.com/features/power-tangential-learning/> [Accessed 12 June 2014].
- Powell, R.A., Single, H.M. & Lloyd, K.R. 1996. Focus Groups in Mental Health Research: Enhancing the Validity of User and Provider Questionnaires. *International Journal of Social Psychiatry* 42(3):193–206.
- Preece, J., Sharp, H. & Rogers, Y. 2015. *Interaction Design: Beyond Human-Computer Interaction*. West Sussex: John Wiley & Sons.
- Prensky, M. 2003. Digital Game-based Learning. *Computers in Entertainment* 1(1):21–21.
- Purchase, H. 1998. Defining multimedia. *IEEE MultiMedia* 5(1):8–15.
- Racette, S.B., Deusinger, S.S., Strube, M.J., Highstein, G.R. & Deusinger, R.H. 2005. Weight Changes, Exercise, and Dietary Patterns during Freshman and Sophomore Years of College. *Journal of American College Health* 53(6):245.
- Reigeluth, C.M. & Carr-Chellman, A.A. eds. 2009. *Instructional-Design Theories and Models, Volume III: Building a Common Knowledge Base*. 1st ed. London: Routledge.
- Richardson, G.P. 1986. Problems with causal-loop diagrams. *System Dynamics Review* 2(2):158–170.
- Ridley, P. 2002. *Mighty Fizz Chilla*. London: Puffin.
- Royce, W.W. 1970. Managing the development of large software systems. In *Technical Papers of Western Electronic Show and Convention*. Western Electronic Show and Convention. Los Angeles: WesCon. [Online] Available at: http://leadinganswers.typepad.com/leading_answers/files/original_waterfall_paper_winston_royce.pdf [Accessed 24 October 2015].

Rusnak, P., Dobson, T. & Boskic, N. 2008. Articulation of ecological values in alternate reality gaming: A case study of World Without Oil. In *Proceedings of the 2nd European Conference on Games Based Learning*. Spain: Academic Conferences Limited:383. [Online] Available at: http://books.google.co.za/books?hl=en&lr=&id=hqUHBAAAQBAJ&oi=fnd&pg=PA383&dq=world+without+oil+alternate+reality+game&ots=eWUtr53RMS&sig=ktA8_bxFJjTKhn4smpBTNT1qdA8 [Accessed 19 November 2014].

Ryan, M.-L. 2001. *Narrative As Virtual Reality: Immersion and Interactivity in Literature and Electronic Media*. Baltimore: Johns Hopkins University Press.

Salen, K. & Zimmerman, E. 2003. *Rules of play: game design fundamentals*. Cambridge: MIT Press.

Salzman, M.C., Dede, C. & Loftin, R.B. 1999. VR's Frames of Reference: A Visualization Technique for Mastering Abstract Multidimensional Information. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. CHI '99. New York, NY, USA: ACM:489–495. [Online] Available at: <http://doi.acm.org/10.1145/302979.303141> [Accessed 8 December 2014].

Sankar, A. 2006. Surely, you must be joking! *The Hindu*. [Online] Available at: <http://www.thehindu.com/todays-paper/tp-features/tp-metroplus/article3202521.ece> [Accessed 8 October 2015].

Savery, J. & Duffy, T. 2001. Problem-Based Learning: An instructional model and its constructivist framework. In B. G. Wilson, ed. *Constructivist Learning Environments: Case Studies in Instructional Design*. Educational Technology:135–148.

Savitch, W. 1994. *Pascal: An Introduction to the Art and Science of Programming*. 4th ed. California: Addison Wesley.

Schell, J. 2014. *The Art of Game Design: A Book of Lenses*. 2nd ed. Boca Raton: A.K Peters/CRC Press.

Schoemaker, E.M. 2015a. *I am a Messenger | Ana*. Port Elizabeth. [Online] Available at: <https://www.youtube.com/watch?v=LKkFM6JnrpM> [Accessed 5 October 2015].

Schoemaker, E.M. 2015b. *I need your help | Ana*. Port Elizabeth. [Online] Available at: https://www.youtube.com/watch?v=ZRMxmL_7zuk [Accessed 3 November 2015].

Schoemaker, E.M. 2015c. *Miaisnotmyname*. *YouTube*. [Online] Available at: <http://www.youtube.com/c/miaisnotmyname> [Accessed 26 August 2015].

Schoemaker, E.M. 2015d. *The Library | Ana*. Port Elizabeth. [Online] Available at: <https://www.youtube.com/watch?v=cWsvWZcAhD4> [Accessed 3 November 2015].

Schoemaker, E.M. 2015e. *We have a Lead! | Ana*. Port Elizabeth. [Online] Available at: <https://www.youtube.com/watch?v=ieoxdw5ICqg> [Accessed 3 November 2015].

Schunk, D.H. 2011. *Learning Theories: An Educational Perspective*. 6th ed. Boston: Pearson.

Siemens, G. 2005. Connectivism: A Learning Theory for the Digital Age. *International Journal of Instruction Technology and Distance Learning* 2(1):7–10.

Simpson, J.A., Weiner, E.S.C. & Oxford University Press 1989. *The Oxford English Dictionary*. Oxford: Oxford University Press.

Six to Start 2012. *Zombies, Run! Zombies, Run! Game*. [Online] Available at: <http://zombiesrungame.com/>.

Six to Start 2014. *Superhero Workout by Six to Start. Superhero Workout*. [Online] Available at: <http://superheroworkoutgame.com/>.

Skinner, B.F. 1938. *The behavior of organisms: an experimental analysis*. 1st ed. New York: Appleton-Century.

Skinner, B.F. & Ferster, C.B. 1957. *Schedules of Reinforcement*. 1st ed. Connecticut: Appleton-Century-Crofts.

South African Government 2015. National Book Week. *South African Government*. [Online] Available at: <http://www.gov.za/national-book-week-2015-0> [Accessed 21 September 2015].

Square Enix 2015. *Can't Kill Progress. Can't Kill Progress*. [Online] Available at: <http://na.square-enix.com/us/node/6377> [Accessed 11 January 2016].

Square Enix 2016. *Deus Ex: Mankind Divided*. Montreal: Eidos Montreal. [Online] Available at: <https://www.deusex.com> [Accessed 11 January 2016].

Squire, K. 2005. Changing the game: What happens when video games enter the classroom. *Innovate: Journal of online education* 1(6). [Online] Available at: <http://website.education.wisc.edu/~kdsquire/tenure-files/26-innovate.pdf> [Accessed 15 May 2014].

Stake, R.E. 2005. Qualitative case studies. In N. K. Denzin & Y. S. Lincoln, eds. *The SAGE handbook of qualitative research*. Thousand Oaks: Sage Publications:236–247.

Steiner, B., Kaplan, N. & Moulthrop, S. 2006. When Play Works: Turning Game-playing into Learning. In *Proceedings of the 2006 Conference on Interaction Design and Children*. IDC '06. New York: ACM:137–140. [Online] Available at: <http://doi.acm.org/10.1145/1139073.1139107> [Accessed 9 December 2014].

Stenros, J., Holopainen, J., Waern, A., Montola, M. & Ollila, E. 2011. Narrative friction in alternate reality games: Design insights from conspiracy for good. In *Proceedings of the 5th Digital Games Research Association Conference*. DiGRA 2011: Think Design Play. Hilversum: Digital Games Research Association:1–17. [Online] Available at: <http://researchbank.rmit.edu.au/view/rmit:25393> [Accessed 11 March 2015].

Stewart, D.W. & Shamdasani, P.N. 1990. *Focus groups: theory and practice*. 1st ed. London: Sage Publications.

- Stewart, S. 2006. Undefined ARG. *Unfiction: Alternate Reality Gaming*. [Online] Available at: <http://www.unfiction.com/compendium/2006/11/10/undefining-arg/> [Accessed 11 June 2015].
- Stewart, S. 2008. Alternate reality games. *Sean Stewart*. [Online] Available at: <http://www.seanstewart.org/interactive/args/> [Accessed 27 February 2015].
- Stokstad, M. 2007. Chapter 3: Art of Ancient Egypt. In *Art History*. Upper Saddle River: Prentice Hall.
- Strauss, A. & Corbin, J.M. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 2nd ed. London: Sage Publications.
- Suits, B. 1978. *The grasshopper: games, life, and Utopia*. Buffalo: University of Toronto Press.
- Susi, T., Johannesson, M. & Backlund, P. 2007. *Serious Games : An Overview*. Institutionen för kommunikation och information. [Online] Available at: <http://his.diva-portal.org/smash/record.jsf?pid=diva2:2416> [Accessed 13 November 2013].
- Swartout, W. & van Lent, M. 2003. Making a Game of System Design. *Communications of the ACM* 46(7):32–39.
- Szulborski, D. 2005. *This is not a game*. United States of America: New Fiction Publishing.
- Tamura, H., Yamamoto, H. & Katayama, A. 2001. Mixed reality: future dreams seen at the border between real and virtual worlds. *IEEE Computer Graphics and Applications* 21(6):64–70.
- The Hallway Museum 2015. Eye of Ra. *The Hallway Museum*. [Online] Available at: <http://thehallwaymuseum.com/symbols/eye-of-ra/> [Accessed 8 December 2015].
- Thompson, B. 2006. Understanding Your Audience. In B. Thompson & T. Chatfield, eds. *Alternate Reality Games White Paper*. International Game Developer's Association:43–48. [Online] Available at: <http://www.christydena.com/wp-content/uploads/2007/11/igda-alternaterealitygames-whitepaper-2006.pdf> [Accessed 3 March 2015].
- Thompson, S.K. 1991. Stratified Adaptive Cluster Sampling. *Biometrika* 78(2):389–397.
- Thorndike, E.L. 1913. *Educational psychology, Vol 1: The original nature of man*. New York: Teachers College.
- Tolkien, J.R.R. 1937. *The Hobbit*. 1st ed. United Kingdom: George Allen & Unwin.
- Toprac, P. & Abdel-Meguid, A. 2010. Causing fear, suspense, and anxiety using sound design in computer games. In G. Mark, ed. *Game Sound Technology and Player Interaction: Concepts and Developments*. New York: IGI Global.
- Twitter 2014. Why am I missing from search? *Twitter*. [Online] Available at: <https://support.twitter.com/articles/66018> [Accessed 10 September 2015].
- Twitter 2015. Thoughtsdream – Twitter Search. *Twitter*. [Online] Available at: <https://twitter.com/search?q=thoughtsdream> [Accessed 10 September 2015].

Unfiction 2002. The Unfiction Glossary. [Online] Available at: <http://www.unfiction.com/glossary/> [Accessed 28 February 2013].

University of Pretoria 2014a. Code of Ethics for Research. [Online] Available at: http://www.ais.up.ac.za/research/docs/code_ethics.pdf [Accessed 3 December 2014].

University of Pretoria 2014b. Faculty Committee for Research Ethics and Integrity. [Online] Available at: <http://www.up.ac.za/en/faculty-of-engineering-built-environment-it/article/15815/faculty-committee-for-research-ethics-integrity> [Accessed 3 December 2014].

University of Pretoria 2015. University of Pretoria Information Science Postgraduate Information. [Online] Available at: <http://www.up.ac.za/en/information-science/article/48020/postgraduate> [Accessed 6 August 2015].

Vygotsky, L.S. 1980. *Mind in Society: The Development of Higher Psychological Processes*. 1st ed. Boston: Harvard University Press.

Waddington, D.I. 2013. A parallel world for the World Bank: A case study of Urgent: Evoke, an educational alternate reality game. *Revue internationale des technologies en pédagogie universitaire* 10(3):42–56.

Wadsworth, B.J. 1996. *Piaget's theory of cognitive and affective development: Foundations of constructivism*. 5th ed. White Plains: Longman Publishing. [Online] Available at: <http://doi.apa.org/psycinfo/1996-97227-000> [Accessed 13 November 2014].

Walther, B.K. 2005. Atomic actions – molecular experience: theory of pervasive gaming. *Computers in Entertainment* 3(2). [Online] Available at: <http://portal.acm.org/citation.cfm?id=1077258> [Accessed 19 August 2009].

Watson, J.B. & Rayner, R. 1920. Conditioned emotional reactions. *Journal of Experimental Psychology* 3(1):1–14.

Webb, R.M. 2001. Recreational Geocaching: The Southeast Queensland Experience. In *Faculty of Built Environment and Engineering. 2001 – A Spatial Odyssey – Australian Surveying Congress*. Australia: Institution of Surveyors:1–12. [Online] Available at: <http://eprints.qut.edu.au/4160/> [Accessed 21 September 2015].

Wempen, F. 2014. *Computing Fundamentals: Digital Literacy Edition*. 1st ed. London: John Wiley & Sons.

Wengreen, H.J. & Moncur, C. 2009. Change in diet, physical activity, and body weight among young-adults during the transition from high school to college. *Nutrition Journal* 8(1):1–7.

Wertsch, J.V. 1985. *Vygotsky and the Social Formation of the Mind*. Boston: Harvard University Press.

Whitton, N. 2008. Alternate reality games for developing student autonomy and peer learning. [Online] Available at: <http://e-space.mmu.ac.uk/e-space/handle/2173/144830> [Accessed 26 March 2015].

Whitton, N. 2009a. *Alternate reality games for orientation, socialisation & induction*. Manchester Metropolitan University. [Online] Available at:
<http://www.jisc.ac.uk/publications/reports/2009/argosifinalreport.aspx> [Accessed 14 May 2014].

Whitton, N. 2009b. Narrative Design. [Online] Available at:
http://argosi.playthinklearn.net/narrative_design.doc [Accessed 25 March 2015].

Whitton, N. 2011. Game Engagement Theory and Adult Learning. *Simulation & Gaming* 42(5):596–609.

Whitton, N. & Moseley, A. 2012. *Using Games to Enhance Learning and Teaching: A Beginner's Guide*. Routledge.

Wilson, T.D. 1999. Models in information behaviour research. *Journal of Documentation* 55(3):249–270.

Yang, T.A. 2001. Computer Security and Impact on Computer Science Education. In *Proceedings of the Sixth Annual CCSC Northeastern Conference on The Journal of Computing in Small Colleges*. CCSC '01. Middlebury: Consortium for Computing Sciences in Colleges:233–246. [Online] Available at:
<http://dl.acm.org/citation.cfm?id=378593.378722> [Accessed 6 October 2015].

Yin, R.K. 2013. *Case study research: Design and methods*. 5th ed. Thousand Oaks: Sage Publications, Inc.

Zhang, D. & Nunamaker, J.F. 2003. Powering e-learning in the new millennium: An overview of e-learning and enabling technology. *Information Systems Frontiers* 5(2):207–218.

Zyda, M. 2005. From visual simulation to virtual reality to games. *Computer* 38(9):25–32.

9. Appendices

9.1 Research Consent

9.1.1 *Appendix A – Ethics Approval for the Study*



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Reference number: EBIT/86/2014

03 December 2014

Mr AML Jerrett
P O Box 11797
Queenswood
Pretoria
0121

Dear Mr Jerrett,

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Ethics Committee refers.

- 1 I hereby wish to inform you that the research project titled "Using an Alternate reality Game to teach Information Literacy" has been approved by the Committee.

This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Codes of Research Ethics of the University of Pretoria, if action is taken beyond the approved proposal.

- 2 According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of any member of the Faculty Committee who will deal with the matter.
- 3 The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.


Prof JJ Hanekom
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION
TECHNOLOGY

Figure 79: Ethics clearance for the study

9.1.2 Appendix B – Sample of Focus Group Consent Form

Declaration of Consent

This form declares the consent of the undersigned for use of their responses from interviews, questionnaires and in-game channels for the purposes of the analysis of “Nomad”, an alternate reality game used to exercise information literacy skills, developed as the empirical study of Adam Jerrett’s MIS (Multimedia) degree at the University of Pretoria.

I, the undersigned, hereby voluntarily grant my permission for participation in the project as explained to me by Adam Jerrett. The nature of the data gathered and its analysis for the purposes of the study has been explained to me and is suitably understood.

The anonymity of my responses has been guaranteed within the purpose of the study through the omission of personal detail, with aliases used when my responses are sampled in order to draw conclusions for the study.

I understand that I participated in this project voluntarily, despite being unaware of its academic nature during its run. I am aware that my responses, as well as the results of the empirical study may be used to support a Masters dissertation, as well as a research article, that may be published. I also provide consent for my responses to be adequately documented either through audio recording of interviews or through digitisation of questionnaire responses.

Upon signature of this form, I will be provided with a copy, as well as access to the finished dissertation should I ask for it.

Signed:	_____	Date:	_____
Witness:	_____	Date:	_____
Researcher:	_____	Date:	_____

Figure 80: Consent form distributed within the focus groups during data gathering

9.1.3 Appendix C – Sample of Name and Likeness Use Consent Form

Declaration of Consent

This form declares the consent of the undersigned for use of their full name and picture within the full text of Adam Jerrett's MIS (Multimedia) dissertation entitled "Using an alternate reality game to teach information literacy". This dissertation is compiled according to the requirements of Adam Jerrett's MIS (Multimedia) degree at the University of Pretoria.

I, Ané Steenkamp, the undersigned, hereby voluntarily grant my permission for my full name to be used within this dissertation as compiled by Adam Jerrett. I understand that only the name printed here ("Ané Steenkamp") will be used.

Additionally, I grant Adam Jerrett permission to use the below photograph of myself. In the event that I do not find this photograph suitable, another suitable photo shall be provided to him. I understand that only this photo, or another that I have provided, will be used within the dissertation.



Upon signature of this form, I will be provided with a copy, as well as access to the finished dissertation on completion should I ask for it.

Signed: _____	Date: _____
Witness: _____	Date: _____
Researcher: _____	Date: _____

Figure 81: A sample of the consent form completed by actors to include their names and photographs in this dissertation

9.2 Research Instruments

9.2.1 Appendix D – Electronic Questionnaire Used for Data Gathering

The following appendix shows a sample of the electronic questionnaire used for data gathering. A sample of the physical questionnaire is not included as its content is identical.

The screenshot displays the 'Nomad ARG Questionnaire' interface. At the top, the title 'NOMAD' is prominently displayed in a stylized, white, distressed font against a dark blue background with a starry space theme. Below the title, the subtitle 'Nomad ARG Questionnaire' is shown in a teal color. The introductory text explains that the questionnaire is for a focus group discussion about 'Nomad', an educational alternate reality game. A red asterisk indicates that the following questions are required. The section is titled 'Starting to Play' and discusses the user's entry into the game. The first question asks if the user has ever played an ARG before, with radio button options for 'Yes' and 'No'. The second question asks for a list of previous ARGs, followed by a large white text input box. The third question asks for a brief explanation of the entry point, also followed by a large white text input box. The fourth question asks for the user's awareness level, with four radio button options: 'a. Unaware', 'b. Vaguely aware', 'c. Moderately aware', and 'd. Very aware'. At the bottom, there is a 'Continue »' button and a progress indicator showing '33% completed'.

Figure 82: The first section of the digital questionnaire

Playing The Game
This section notes your experiences whilst actually playing the game.

5. Briefly explain why you played the game. *

6. Did you feel part of the player community while playing? Mark the response that is most accurate to your experience. *

- No. I was not aware there was an active player community.
- No. I knew about a player community but still felt as if I was playing alone.
- Sometimes. The player community and my interaction with them was sporadic.
- Yes. I felt part of a shared community and experience throughout the game.

7. Did you prefer the game's story or its gameplay? *

- Story
- Gameplay
- Both

8. Do you feel the game's story was memorable? *

- Yes
- Somewhat
- No

9. Please motivate your answer to the above question. *

10. Would you play a game with similar narrative themes again? *

- Yes
- No

11. Please motivate your answer to the above question. *

12. Do you feel the game's gameplay was memorable? *

- Yes
- Somewhat
- No

13. Please motivate your answer to the above question. *

14. Would you play a game with similar gameplay again? *

- Yes
- No

15. Please motivate your answer to the above question. *

« Back Continue »

66% completed

Figure 83: The second section of the electronic questionnaire

After The Game
This section notes your reflections on your experiences with Nomad.

16. Did you enjoy the game overall? *

Yes
 Somewhat
 No

17. Please motivate your answer to the above question. *

18. Describe a moment in the game, if any, where you felt a personal sense of accomplishment.

19. Select skills you feel that playing the game taught you, if any.

Searching for books in a library
 Understanding and decoding ciphers
 Academic referencing
 Internet search query construction
 Searching the internet
 Using academic journal databases to search for articles
 Using the University Library Portal
 Using different technological platforms (mobile, PC)
 Communication with a community through social media
 Using internet blogs, forums and social media
 Group problem solving
 Evaluating the relevance of information
 Rearranging information to provide context
 Exploratory or tangential learning
 Other:

20. Do you feel that the gameplay helped contextualise the skills taught and exercised during the University's Academic Information Management (AIM) modules? Mark each response that applies. *

I found the gameplay boring because I had to learn or exercise these skills.
 I played the game, but did not consciously link it to AIM.
 The game taught me new skills.
 I enjoyed the gameplay regardless of the skill exercises required to participate.
 Playing the game helped me understand the purpose of AIM.
 Playing the game helped me better understand how to apply those skills in other contexts.
 Other:

Never submit passwords through Google Forms. 100%: You made it.

Figure 84: The final section of the electronic questionnaire

9.2.2 Appendix E – Active Player Focus Group Interview Schedule

Interview Schedule – Active Player Focus Group

Layout Note

Closed bullets contain either direct questions to the group or discussion points, for which sample prompt questions are provided with open bullets. Any other text denotes samples of interviewer conduct.

Introduction

Hello, my name is Adam Jerrett (adam.jerrett@up.ac.za), and I'll be talking to you about "Nomad", the alternate reality game you participated in this semester. This interview will be used to gather subjective data about your feelings on the game as a whole which will then be used as data for my Masters dissertation, as supervised by Professor Theo Bothma (theo.bothma@up.ac.za).

Before we start, I want to let you know that this group interview's audio is being recorded for later transcription and analysis. This is mentioned on the consent form you received earlier. If you feel at any time you wish to state something off the record, please let me know.

If you're ready, we can now get started.

Context Establishment

- What were your usernames on Midnight Chapters, the game's main website? (Note: this question is posed to establish that each participant was an active player on the site, as well as to be an introduction to the rest of the group. Individual responses linking players to their aliases are not used for data analysis in the study.)

Alternate Reality Games

- Have any of you ever played an alternate reality game (ARG) or similar game before? For affirmative answers, discuss which ones and their reasons for playing.
- At what moment did you realise you were playing a game?
- Was there a difference in approach to how you participated prior to and after that moment?
- When you were aware it was a game, did you approach playing it differently ("I'm going to play this game now" before doing tasks, or were the tasks simply part of your daily life)?

Figure 85: First section of the "active player" focus group interview schedule

Entertainment Value

- Discuss the enjoyment the players felt and possible hurdles to that.
 - Did they enjoy the game?
 - Did things get boring?
 - Did they get too busy with other aspects of life?
 - Were there ever too many “live” puzzles or game elements that made the act of playing the game seem daunting?
 - Was there ever too much waiting around?
- Was there a particular moment where you felt a personal sense of accomplishment during play (a particular puzzle, piece of narrative, live event)?
- Discuss the use of multimedia within the game.
 - Were the various gameplay platforms intuitive (the blog, how they interacted with the characters etc.)?
 - Did the various platforms of rewards enrich the game experience?
 - Did these platforms integrate well and inform player context (audio giving context to images, video informing gameplay and narrative)?
- Do you feel the game was cohesive and complete?

Academic Skill Integration

- Discuss what the players feel the game taught them. Leave this open to player interpretation.
- Discuss the links between gameplay and skill exercise.
 - Were the players consciously aware that the gameplay linked to information literacy skills?
 - If they were, at what point did they make that connection?
 - Did that context dilute the experience due to feeling too “academic” or “work-like”?
- Discuss how valuable the game was in terms of exercising information literacy.
 - Do the players feel that their experiences during gameplay aided or contextualised skills taught and exercising during the University’s Academic Information Management (AIM) modules?
 - Do they feel that a “game framing” of Information Literacy skill exercises made them more engaging?

Figure 86: Second section of the “active player” focus group interview schedule

Specifics Regarding Motivation and Engagement

- What motivated you to play and keep playing?
- Discuss the notion of ludology vs narratology: some play games for the gameplay, and others see it as a vehicle for narrative.
 - Regarding Nomad, did the players find the narrative or the gameplay more engaging or motivating and why?
- Were there any specific points where the players became demotivated to play, thus diluting the memorability or pervasiveness of the experience?
- Is there anything they could suggest to lessen this demotivation for future iterations of similar studies?

General Feelings

- Is there any story of your experience with the game you'd like to share, or anything regarding the game you would like to openly discuss?
- Is there anything else you'd like to say regarding the game whilst on the record?

Conclusion

Thank you for your time today. It was very enlightening to hear your take on Nomad as a whole and that you experienced it differently to how we perceived players might during the design phase of the game.

Rest assured that all your opinions from this interview will be kept confidential and anonymous, and that you may request to see my Masters dissertation in which this information will be published upon its completion.

Once again, my team and I thank you both for your opinions provided today as well as your participation in the game. We hope you enjoyed it as much as we did.

Figure 87: Final section of the "active player" focus group interview schedule

9.2.3 Appendix F – Player-Observer Focus Group Interview Schedule

Interview Schedule – Player-Observer Focus Group

Layout Note

Closed bullets contain either direct questions to the group or discussion points, for which sample prompt questions are provided with open bullets. Any other text denotes samples of interviewer conduct.

Introduction

Hello, my name is Adam Jerrett (adam.jerrett@up.ac.za), and I'll be talking to you about "Nomad", the alternate reality game you participated in this semester. This interview will be used to gather subjective data about your feelings on the game as a whole which will then be used as data for my Masters dissertation, as supervised by Professor Theo Bothma (theo.bothma@up.ac.za).

Before we start, I want to let you know that this group interview's audio is being recorded for later transcription and analysis. This is mentioned on the consent form you received earlier. If you feel at any time you wish to state something off the record, please let me know.

If you're ready, we can now get started.

Context Establishment

- If you were active on Midnight Chapters, the game's main website, what were your usernames? (Note: this question is posed to establish which participants were members of the site, as well as to be an introduction to the rest of the group. Individual responses linking players to their aliases are not used for data analysis in the study.)

Alternate Reality Games

- Have any of you ever played an alternate reality game (ARG) or similar game before? For affirmative answers, discuss which ones and their reasons for playing.
- At what moment did you realise you were playing a game?
- Was there a difference in approach to how you participated prior to and after that moment?
- When you were aware it was a game, did you approach playing it differently ("I'm going to play this game now" before doing tasks, or were the tasks simply part of your daily life)?
- Discuss the community and how the players experienced it.
 - Did they feel they were part of the community?
 - Did their feelings towards the community contribute to them playing less than active players?

Figure 88: First section of the "player-observer" focus group interview schedule

Entertainment Value

- Discuss the enjoyment the players felt and possible hurdles to that.
 - Did they enjoy the game?
 - What made them not play as actively?
 - Did things get boring?
 - Did they get too busy with other aspects of life?
 - Was there ever too much to do in-game that things seemed daunting?
 - Was there ever too much waiting around?
- Was there a particular moment where you felt a personal sense of accomplishment during play (a particular puzzle, piece of narrative, live event)?
- Discuss the use of multimedia within the game.
 - Were the various gameplay platforms intuitive (the blog, how they interacted with the characters etc.)?
 - Did the various platforms of rewards enrich the game experience?
 - Did these platforms integrate well and inform player context (audio giving context to images, video informing gameplay and narrative)?
- Do you feel the game was cohesive and complete?

Academic Skill Integration

- Discuss what the players feel the game taught them. Leave this open to player interpretation.
- Discuss the links between gameplay and skill exercise.
 - Were the players consciously aware that the gameplay linked to information literacy skills?
 - If they were, at what point did they make that connection?
 - Did that context dilute the experience due to feeling too “academic” or “work-like”?
- Discuss how valuable the game was in terms of exercising information literacy.
 - Do the players feel that their experiences during gameplay aided or contextualised skills taught and exercising during the University’s AIM modules?
 - Do they feel that a “game framing” of Information Literacy skill exercises made them more engaging?

Figure 89: Second section of the "player-observer" focus group interview schedule

Specifics Regarding Motivation and Engagement

- Discuss the notion of ludology vs narratology: some play games for the gameplay, and others see it as a vehicle for narrative.
 - Regarding Nomad, did the players find the narrative or the gameplay more engaging or motivating and why?
- Were there any specific points where the players became demotivated to play, thus diluting the memorability or pervasiveness of the experience?
- Is there anything they could suggest to lessen this demotivation for future iterations of similar studies?

General Feelings

- Is there any story of your experience with the game you'd like to share, or anything regarding the game you would like to openly discuss?
- Is there anything else you'd like to say regarding the game whilst on the record?

Conclusion

Thank you for your time today. It was very enlightening to hear your take on Nomad as a whole and that you experienced it differently to how we perceived players might during the design phase of the game.

Rest assured that all your opinions from this interview will be kept confidential and anonymous, and that you may request to see my Masters dissertation in which this information will be published upon its completion.

Once again, my team and I thank you both for your opinions provided today as well as your participation in the game. We hope you enjoyed it as much as we did.

Figure 90: Final section of the "player-observer" focus group interview schedule

9.2.4 Appendix G – Observer Focus Group Interview Schedule

Interview Schedule – Observer Focus Group

Layout Note

Closed bullets contain either direct questions to the group or discussion points, for which sample prompt questions are provided with open bullets. Any other text denotes samples of interviewer conduct.

Introduction

Hello, my name is Adam Jerrett (adam.jerrett@up.ac.za), and I'll be talking to you about "Nomad", the alternate reality game you participated in this semester. This interview will be used to gather subjective data about your feelings on the game as a whole which will then be used as data for my Masters dissertation, as supervised by Professor Theo Bothma (theo.bothma@up.ac.za).

Before we start, I want to let you know that this group interview's audio is being recorded for later transcription and analysis. This is mentioned on the consent form you received earlier. If you feel at any time you wish to state something off the record, please let me know.

If you're ready, we can now get started.

Context Establishment

- If you were active on Midnight Chapters, the game's main website, what were your usernames? (Note: this question is posed to establish whether each participant was a member on the site, as well as to be an introduction to the rest of the group. Individual responses linking players to their aliases are not used for data analysis in the study.)

Alternate Reality Games

- Have any of you ever played an alternate reality game (ARG) or similar game before? For affirmative answers, discuss which ones and their reasons for playing.
- Did you realise you were playing a game?
- If you did realise it was a game, did that affect your active participation ("I don't have time to actively play a game")?
- Discuss the community and how the players experienced it.
 - Did they feel they were part of the community?
 - Did their feelings towards the community contribute to them playing less than active players?
- Had you been made aware that it was a game, would you have played it?

Figure 91: First section of the "observer" focus group interview schedule

Entertainment Value

- Discuss the enjoyment the players felt and possible hurdles to that.
 - If they were aware of the game, did they enjoy their observation thereof?
- Discuss the use of multimedia within the game.
 - Did the various platforms of rewards enrich the game experience?
 - Did these platforms integrate well and inform player context (audio giving context to images, video informing gameplay and narrative)?
- Do you feel the game was cohesive and complete?

Academic Skill Integration

- Discuss the links between gameplay and skill exercise.
 - Were the players consciously aware that the gameplay linked to information literacy skills?
 - Was this a reason they decided to not play the game, but rather observe it or forget about it? Did it feel too much like “work”?

Figure 92: Second section of the "observer" focus group interview schedule

Specifics Regarding Motivation and Engagement

- Discuss the players' experiences of the narrative and the gameplay, and how that affected participation.
 - Was the narrative memorable? Why?
 - Was the gameplay memorable? Why?
 - How did their perception of the game in these regards affect their choice to observe the game or forget about it?
- Were there any specific points where the players became demotivated to play, thus making them become observers or forget about the game entirely?
- Is there anything they could suggest to lessen this demotivation for future iterations of similar studies?

General Feelings

- Is there any story of your experience with the game you'd like to share, or anything regarding the game you would like to openly discuss?
- Is there anything else you'd like to say regarding the game whilst on the record?

Conclusion

Thank you for your time today. It was very enlightening to hear your take on Nomad as a whole and that you experienced it differently to how we perceived players might during the design phase of the game.

Rest assured that all your opinions from this interview will be kept confidential and anonymous, and that you may request to see my Masters dissertation in which this information will be published upon its completion.

Once again, my team and I thank you both for your opinions provided today as well as your participation in the game. We hope you enjoyed it as much as we did.

Figure 93: Final section of the "observer" focus group interview schedule

9.3 Game Assets

9.3.1 Appendix H – Ana Kirlitz’s Electronic AIM 121 Questionnaire



[show all posts](#)

MIS Information Science: *Analysing the effectiveness of dedicated Information Literacy Courses in teaching Information Literacy* questionnaire

To participate in the above-mentioned study, please complete the questionnaire below.

1. Please rate each statement below as it applies to you BEFORE you started the AIM module.

1. Disagree strongly
 2. Disagree
 3. Neutral
 4. Agree
 5. Agree strongly

	1	2	3	4	5
I know what 'Information Literacy' means.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe it is important to be information literate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know the proper referencing techniques for various types of sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to find the information I need on the internet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to find the information I need in the library.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to use information sources ethically.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to search for information on the library website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to evaluate an information source to determine whether to use it or not.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Please rate each statement below as it applies to you DURING the AIM module.

1. Disagree strongly
 2. Disagree
 3. Neutral
 4. Agree
 5. Agree strongly

	1	2	3	4	5
I already know a lot of what we are being taught in the AIM module.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can see how this module will benefit me as a student in years to come.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am enjoying the module.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am realising that there a lot of things I didn't know about information literacy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 94: The first section of Ana Kirlitz's in-game questionnaire

Please rate each statement below as you believe it will apply to you AFTER taking the AIM module.

- 1. Disagree strongly
- 2. Disagree
- 3. Neutral
- 4. Agree
- 5. Agree strongly

	1	2	3	4	5
I know what "Information Literacy" means.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe it is important to be information literate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know the proper referencing techniques for various types of sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to find the information I need on the internet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to find the information I need in the library.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to use information sources ethically.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to search for information on the library website.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to evaluate an information source to determine whether to use it or not.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. What has been your most positive experience with the module so far? This can be anything - from the learning material, logistics or even lecturers.

5. What has been your most negative experience with the module so far? This can be anything - from the learning material, logistics or even lecturers.

6. What has been the most valuable thing that you have learnt in the module so far? Please explain why.

Submit questionnaire

[top](#)

©2014 by Ana

Figure 95: The second section of Ana Kirlitz's in-game questionnaire