

Chapter 3: Research methodology and design

1 Introduction

In chapter two I reviewed and discussed the literature that had been covered regarding the context of this study. In chapter three I will focus on the research methodology and design that I followed. I used evaluation research to evaluate whether the intervention was efficiently employed as a teaching method. Evaluation research in this study comprises the case study, sampling, data collection, data processing, data interpretation, validity and reliability as well as ethics.

2 Case study

According to Yin (2003, p. 15) “case studies have a distinctive place in evaluation research”. There exist different applications for case studies as research strategies. One of these applications is to “explore those situations in which the intervention being evaluated has no clear, single set of outcomes” (Yin, 2003, p. 15). The use of a case-study strategy to explore the outcomes of the ELISA project is an example of such an application.

This study was originally conceived as a design experiment but it turned out to be a case study because it completed only one iteration. Merriam (1998, p. 12) defines a case study as an “intensive, holistic description and analysis of a single unit or bounded system”. The ELISA intervention thus presented itself as a case study to me. I used the case study as a comprehensive research strategy to contribute to the growing body of scientific knowledge and theory.

Yin (2003) states that the utilization of case studies originated from the need to understand multifaceted social phenomena. The research strategy enables me to retain the significant characteristics of international relations and organisational processes between two HEIs in a North-South partnership. The main research question *What happens when two differing tertiary cultures meet around a common subject in a computer-mediated situation?* is an example of an exploratory question. According to Yin (2003, p. 6) “This type of question is a justifiable rationale for conducting an exploratory study, the goal being to develop pertinent hypotheses and propositions for further inquiry”. The ELISA programme is thus an example of an exploratory case study.

The study is based on qualitative evidence. Specific qualitative research characteristics are distinctive of the ELISA project. The study focuses on understanding the outreach process of the intervention and the meaning the role players have created. The “emic” voices (Merriam, 1998, p. 6) of the participants representing the insider’s perspective, is the main concern. The researcher fills the role of

the primary data-collection instrument. Data consist of documents, interviews and observation. She is also the primary instrument for data analysis. The collection of data involves fieldwork that requires the researcher to physically go to the participants and attend the activities to collect the data. The study follows an inductive research strategy that builds toward theory and hypothesis. The study is richly descriptive, emphasising the participants' own words and experiences to support the outcome of the study. Instead of employing an emerging, flexible design the design was specified ahead of time. The reason for this is that the design had to be specified before Stanford could acquire funding from the Whitehead Foundation. A non-probabilistic, purposeful sample is selected in order to obtain "rich and thick" information (Merriam, 1998, p. 211).

3 The intervention

This section will describe the intervention using the "ADDIE" model. The ADDIE model (Bichelmeyer, 2004; Hoogveld, Paas, Jochems, & Van Merrienboer, 2002; Kenny, Zhang, Schwier, & Campbell, 2005; Lohr, 1998; Molenda, 2003; Peterson, 2003; Shervey, 2007) comprises five stages namely Analysis, Design, Development, Implementation and Evaluation. I will employ this model to describe and evaluate the ELISA intervention.

3.1 Analysis

The analysis of the intervention is crucial and explores the goals of the learning experience, the learners, the media, the time frame and the cost of the exercise (Shervey, 2007). A needs assessment is an essential part of the analysis (Peterson, 2003) and determines the needs of the audience. Gagné, Briggs and Wager (1988); Peterson (2003); Dick and Carey (1996) define a needs analysis as the gap between the current state of affairs and the desired state of affairs. Gagné et al. state that "perceived or felt needs" (1988, p. 23) sometimes form the basis for curricular decisions. According to Reeves and Hedberg (2003, p. 129) the two most significant aspects of any needs assessment are "the list of objectives the product will address and a high-level description of the design".

3.1.1 Goal analysis

The goal of the project is to enhance the learning opportunities for previously socially and educationally disadvantaged learners; to develop critical thinking skills and dispositions; and to create a universal consciousness and understanding in tertiary learners from transitional societies. The purpose of this involvement is to foster an intellectually empowered generation of upcoming business leaders, community leaders, and leaders in the government.

3.1.2 Target population analysis

The participants were all higher education students. No special criteria in terms of race, sex, and age range were applied. No inducements were offered to the participants. The only motivation was to participate in an exceptional international distance-learning experience. The expertise of world-famous international and national environmental specialists was made available to them. This opportunity resulted in broadening the participant's perspectives on issues of global importance.

3.1.3 Media analysis

The programme consisted of the following components: WebCT6 Campus Edition, Compact discs (CD-ROMs), presentations, video conferences, telephone conferences, handbooks, face-to-face sessions and tutor classes. The intervention did not involve any physical lectures because the course was taught technologically.

3.1.3.1 WebCT6

The designers used WebCT6 as learning management system to provide the syllabus and support material. Options of WebCT6 included three main sections namely Build; Teach and Student View. The Teach option included the following: Course Tools, Course Content; Announcements, Assessments, Assignments, Calendar; Chat, Discussions, Learning Modules, Mail, Media, Search and Who's Online. The course tools gave directions to the appropriate web page where the course content could be accessed. Announcements indicated important messages regarding the ELISA project while assignments were given ahead of time. The lecturer or team member could view the students' assessments, use the calendar to plan activities, use the chat option and select discussions to communicate with students or colleagues. Learning modules showed the different curriculum units, while the mail option of WebCT6 enabled further communication. Who's Online enabled synchronous communication. The search option enabled the user to access the required information.

My Tools consisted of My Grades, My Files, My Progress and Notes. WebCT6 enabled synchronous and asynchronous communication. Students could use WebCT6 in order to keep track of their grades, progress of files and to make notes. Individual student performance is regarded as personal information and only available to the specific student. The following options of WebCT6 reflected on the Individual Student Performance Reports: Mail; Discussions; Calendar; Chat; Assessments; Assignments; Web Links; Folders; Files; Media Library. Assignments and Course Content were the most important elements of the learning management system.

3.1.3.2 Compact discs

WebCT6 was at the students' disposal on campus. However, inconsistent and slow internet connections resulted in inadequate access to WebCT6. This necessitated the reproduction of the lectures on CD-ROMs. Each student received seven CD-ROMs containing all fifteen lectures.

3.1.3.3 Handbook

The designers prescribed *Global Environmental Politics (2006)* by Chasek, Downie and Brown as supplementary reading material for the project. Due to copyright restrictions the content of the book could not be reproduced. The Stanford academic team therefore sent five copies to TUT. The students used these in rotation to access the reading material.

3.1.3.4 Face-to-face sessions

The TUT academic team organised six contact sessions with the students. Particulars of these sessions are illustrated in table 12:

Table 12: Contact sessions

Contact sessions	Dates	Presenters	Attendees
1	3 February 2006	Head of the Department of Journalism at TUT; Participant-observer	Head of the Department of Journalism at TUT; Participant-observer; Students
2	10 February 2006	TUT team leader; Head of the Department of Journalism at TUT; Stanford team leader; A consulting associate professor; 1 st Stanford Teaching assistant; 2 nd Stanford	TUT team leader; Head of the Department of Journalism at TUT; Participant-observer; Technical assistant from Telematic Education, TUT; TUT Technical team; Students



		Teaching assistant	
3	10 March 2006	TUT team leader; Head of the Department of Journalism at TUT; A consulting associate professor	TUT team leader; Head of the Department of Journalism at TUT; Participant-observer; Technical assistant from Telematic Education, TUT; TUT Technical team; Students
4	31 March 2006	Stanford and TUT academic teams; Students	TUT team leader; Head of the Department of Journalism at TUT; Stanford team leader; Associate Professor of Education (Teaching); Stanford team member; Participant-observer; Technical assistant from Telematic Education, TUT; Students
5	9 June 2006	Participant-observer; Facilitator from Telematic Education, TUT;	Participant-observer; Facilitator from Telematic Education, TUT; Technical support assistant from Telematic Education, TUT; Students
6	9 June 2006	TUT team leader; Head of the	TUT team leader; Head of the

		Department of Journalism at TUT; A consulting associate professor	Department of Journalism at TUT; Participant-observer; Technical assistant from Telematic Education, TUT; TUT Technical team; Students
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3.1.3.5 Video conferences

Three video conferences of one hour each were held. The first video conference served as an introduction of the South African team and the Stanford team to virtually meet each other and to communicate synchronously. The second video conference had a specific theme while the third consisted of a “theory” lecture in the video conference. This contact session concluded the pilot phase of the project.

3.1.3.6 Presentations

The incorporation of a variety of ICT technologies necessitated the presentation and the hands-on training sessions with these technologies. During the initial contact session an ITC expert from TUT gave an introduction on WebCT6. This consisted of a theoretical explanation of the functions of the platform as well as a hands-on training session during which the students could get acquainted with different aspects of WebCT6. The environmental expert presented two lectures, the first being a Microsoft Power Point slide show at the video conference. The technical assistant gave a presentation on the i-mate PDA 2k during a face-to-face contact session with the students. Together with the i-mate PDA 2k each student received a complete Windows Mobile Quick Start Guide and a Windows Mobile User Manual. The PDAs were charged before the presentation in order to accomplish a hands-on session. The assistant explained the different parts of the tool as illustrated in the Quick Start Guide (Windows, 2006a). He explained the position of the SIM card and battery, how to switch on the phone on and make a call, how to synchronise with ActiveSync, how to Surf the Internet, how to use the camera and capture a photo or video, how to send a SMS and MMS and the meaning of the different programme icons. He referred to the contents of the User Manual (Windows, 2006b) and advised the students to use the manual in order to proceed with this multi-functional tool. A hands-on session followed during which the students made use of the phones.

3.1.3.7 Personal Digital Assistants (PDAs)

Stanford expressed their interest in wireless and handheld technologies due to the fact that “these technologies are more ubiquitous in South Africa than in the United States or Russia” (Stanford team leader, personal communication, April 24, 2006). The purpose of the PDAs was to enhance mobile communication and to explore the possibilities of an augmented hands-on approach to the project. The goal of the mobile aspect was to enable the students to use their PDAs to perform a multitude of functions. This study, however, forms part of the pilot phase of the ELISA project and the academic teams decided that comprehensive research on the PDAs will *not* be part of the pilot phase but would fit better in later studies.

3.1.4 Time analysis

The ELISA project was envisioned as a two-year project running from September 2005 to August 2008. Two years became three years with the first year as a pilot phase and the second and third years as full project years. The pilot phase began with the design and implementation procedures in the fall of 2005. The course offering coincided with the beginning of the South African academic year in January 2006. The first face-to-face meeting between the South African academic team and the students took place on 3 February 2006 and the course ended on 9 June 2006. The qualifying students received their certificates on 28 August 2006 at a certificate ceremony held at TUT.

3.1.5 Cost analysis

The Whitehead Foundation in the United States was interested in *supporting work in South Africa* while focusing on international security issues. This resulted in the funding of the ELISA project in South Africa. The amount of Stanford’s request to the Foundation was originally scheduled at \$500,000 for the entire three year period. The full budget amount, however, had to be less than \$500,000 resulting in a request for \$485,862. A copy of the budget (Annexe J) is attached.

3.2 Design

The design of the project was specified in order to acquire funding from the sponsor. Because of this the exact specified design is described here as an example of a typical curriculum compiled by Northern hemisphere experts for use in a Southern hemisphere HEI.

The course author identified “five basic perspectives from which to understand why environmental problems arise and how we can solve them: What conditions produce agreements between countries to resolve problems? What types of rules prove most successful at inducing compliance? What sorts of trade-offs must be made between broad membership and stringent standards? How do we evaluate whether a treaty has been effective or successful? How do nations improve treaty effectiveness over time?” (Stanford team leader, personal communication, 2005). The idea was that objectives should be met by providing the syllabus, support materials for the project and formulate assignments as consistent question formats.

The Stanford team and the TUT team formulated the following assignments (WebCT6: IDL 102 International Environmental Policies Assignment Dropbox) for the course:

Assignment 1: Due Friday, 24 February 2006

“Identify one environmental problem that you think is internationally important and formulate its causes and possible solutions. Why is this problem important? What are the possible consequences of ignoring it?”

Mini-assignment: Due Friday, 17 February 2006

“Please submit 2 reflections or questions about this week’s readings and lecture. I encourage you to provide thoughts on the reflections and questions of others, as well”.

Sustainable Development Assignment: Due Thursday, 9 March 2006

“Use the website we have recommended to read different perspectives on sustainable development. Using arguments from 3 different sources and your own personal experiences with development, decide which side of the sustainable development debate you stand on: One side argues, in general, that in order to achieve sustainable development you need to prioritize reducing poverty and promoting economic development before you can prioritize protecting the environment. The other side of the debate argues that protecting the environment is necessary to reduce poverty and promote economic development. When citing an article or using a quote, explain where you found the information and why it is a credible source”.

Recommended resources and websites”

<http://nrm.massey.ac.nz/changelinks/Susdevenv.html>

<http://www.un.org/esa/Sustdev/>

Assignment 2: Due Friday, 24 March 2006

“Please respond to ONE of the following: Using the Internet (for example, Mail & Guardian online) identify a South African environmental issue getting significant attention in the media. Based on the different approaches/perspectives presented in the lectures and readings, (scientific, eco-philosophical, political, economic and legal) which approach/perspective is the media adopting to this issue? Do you agree with the selection of this approach/perspective? If you were the reporter, how would you address this issue similarly and/or differently?”

OR

“There are different points of view about sustainable development (SD). Some believe that sustainable development is desirable and feasible; others think that SD is desirable but not possible; still others think that SD is neither desirable nor feasible. Develop your argument about one of these views. Give an example”.

Assignment 3: Due Friday, 21 April 2006

“Identify one South African environmental NGO. By researching its website and/or interviewing someone at the NGO, describe its goal, resources and tactics”.

Assignment 4: Due Friday, 12 May 2006

“There are positive and negative consequences to free trade. Name several positive and several negative effects of free trade to environment. Choose your position in the debate about free trade effects on environment. Defend your point by developing an argument about one or two positive or negative consequences of free trade”.

OR

“Research the role of the World Bank in South Africa. You may find information from the World Bank website, in South African news resources or by contacting South Africans working for the Bank on its projects. The lecture describes both positive and negative perspectives on the role of the World Bank. Do you feel the effect of the World Bank in South Africa is positive, negative, or both? Why?”

Mini-Assignment: Due Monday 22 May 2006

“Look at the document Transnational Protection of Biodiversity – South African Peace Parks
1 Give short, but complete answers to the questions under 2. *Motivation*.
2 Describe the concepts of biodiversity as asked under 3.1 *International Law*”.

Assignment 5: Due Friday, 2 June 2006

“With reference to the most recent information that you can find as journalists, discuss the benefits that peace parks hold for Southern Africa. Concentrate on the improvement of sustainable development through increased environmental, development and economic opportunities, but also refer to the numerous obstacles that the peace parks currently encounter: For example unrealistic expectations, difficulty in attracting tourists, foreign land use and lack of involvement or ill-preparation of local communities, opposition from local communities for example the Nama, Makulele and San peoples (background on ONE of these cases), inequality between the different states, lack of resources, etc. Also keep in mind that a main supporter and financier of the concept, the industrialist and philanthropist, Dr Anton Rupert, died recently. Are these projects sustainable? In other words, will the governments of the different states concerned be able to meet their legal obligations of transnational biodiversity protection in the absence of assistance from the private sector and NGOs? Write as a feature (500 – 600 words)”.

Final Mini-Assignment: Due Thursday, 8 June 2006

“Identify a future policy challenge for South Africa. Why is this a challenge? Discuss the range stakeholders involved in this issue (for example: government, citizens, NGOs, industry, international community) and the perspectives they are likely to adopt. Where do you stand on this issue? This should be an editorial piece, approximately 250 – 300 words. If you prefer, you can submit a video clip of comparable length – creativity is encouraged! There do not need to be academic references except identifying sources when necessary”.

3.3 Development

The course was called IDL 102: International Environmental Politics and was originally developed by the Stanford Institute for International Studies Initiative on Distance Learning. The developers compiled a tailor-made syllabus to ensure that the syllabus was suitable, sensitive and relevant. The course incorporated the expertise of the following guest lecturers to each develop a lecture for inclusion in the course:

Table 13: Suggested lectures

Themes	Presenters	Disks	Lectures
Course introduction: Environmental Politics for Journalists	Stanford course author	1	1
Evaluating policy impacts	Stanford course author	1	2
A scientific perspective	Guest lecturer, Stanford	1	3
Ecophilosophical and political perspectives	Stanford course author	2	4
Economic and legal perspectives	Stanford course author	2	5
Non-state actors	Stanford course author	2	6
How to conduct a good causal argument	Stanford course author	3	7
Problem identification theory; Negotiation theory; Compliance theory	Stanford course author	3	8
Negotiations theory	Stanford course author	3	9
Compliance theory	Stanford course author	4	10
Relative regime effectiveness: Whaling and ozone protection	Guest lecturer	4	11
Environment and security	Stanford course author	4	12
Transnational protection of biodiversity – South African peace parks	UP guest lecturer	5	13
Free trade and the environment	Stanford course author	5	14
The World Bank and the financing of	Stanford course author	6	15

environmental protection			
Eco-tourism	UP guest lecturer	6	16
Transnational atmospheric pollution and climate change	UP guest lecturer	7	17

3.4 Implementation

The implementation of the programme started with the delivery of the product. Various components of the project such as CD-ROMs, WebCT6, handbooks, face-to-face contact sessions, video conferences, presentations and PDAs were used to implement the project. Evaluation and revision took place throughout the implementation phase to ensure effectiveness. The first teaching assistant evaluated assignments throughout the course and gave her feedback promptly. The guest lecturer evaluated the assignments that were his responsibility. The leader of the TUT team moderated the assignments and marks, filled the role of mediator between the students, and the academic and research teams. The participant observer performed liaison services between the students and the abovementioned teams. The technical assistant solved WebCT6 and other technical problems.

3.5 Evaluation

The necessity of continuous evaluation is one of the key concepts in the determination of the effectiveness of the project. Peterson (2003) states that "The ADDIE framework is a cyclical process that evolves over time and continues throughout the instructional planning and implementation process". Stanford continuously evaluated and reconsidered the original model that they used in the former Soviet Union and Eastern Europe. They used the feedback from the local instructors and students to revise and adapt the pedagogy and content.

Evaluation in terms of curriculum is defined as "an ongoing process used to determine whether lesson objectives have been met, to identify the reasons for the observed performance, and to identify those portions of a lesson where modifications are required" (Hannafin & Peck, 1988, p. 299). Similar to curriculum evaluation, the pilot phase of the project was evaluated cautiously before effectiveness and a successful intervention could be accomplished. Formative evaluation of the ELISA project was a continuous process that aimed at improving the results of the evaluation. Because of Stanford's premature decision to discontinue the project, modifications to identify deficiencies in order to

determinate and isolate the reasons for those deficiencies were not considered. Summative evaluation involved a final decision regarding the effectiveness of the project.

4 The research

4.1 Sampling

The developers used a specific sampling strategy (Cohen et al. 2002). In the non-probability sample the TUT team selected fifteen third and fourth year Journalism students. The participants represented English, Afrikaans, isiZulu, Sesotho and Indian cultures. Mother-tongue speakers, multilingualism and command of language played an important role in the programme. Commitment to the programme was the main criterion in order to ensure cooperation and completion of the course.

The TUT team applied no special criteria in terms of race, sex and age in the selection of participants. The participants were all over the age of 21 as they were third and fourth year students. Stanford originally designed the intervention for socially and economically disadvantaged participants. The sample size was limited due to the grant that TUT and UP received.

4.2 Data collection

Data collection comprise online documents, project documents, minutes of meetings, minutes of telephone conferences, transcripts of interviews, a transcript of the focus-group interview, observation notes, face-to-face contacts and recordings of video conferences. Table 14 illustrates the outcomes that the data-collection instruments yielded.

Table 14: Data Collection Instruments

Data collection instruments	Online documents	Project documents	Minutes of meetings	Telephone conference	Interviews	Focus-group interview	Observation	Face-to-face	Video conference
Research questions									
What happens when two differing tertiary cultures meet around a common subject in a computer-mediated situation?	✓	✓		✓	✓	✓	✓	✓	✓
What happens when an international learning module, compiled by an American university is adapted for a South African HEI, and implemented in a computer-mediated context?	✓	✓	✓		✓	✓		✓	
What dialogue emerges and why does it emerge?	✓	✓	✓	✓	✓			✓	✓
How and why is shared meaning created?	✓	✓		✓	✓				✓
How do we deal with cultural differences?	✓	✓			✓	✓	✓	✓	✓
Which aspects of the process work well and why and how can it be improved to compensate for those that do not work well?	✓	✓			✓	✓	✓	✓	
Which aspects do not work well and why and how can they be improved?	✓	✓			✓	✓	✓	✓	

4.2.1 Documents

In this case study I used a variety of documents such as online documents, project documents, minutes of meetings, and minutes of telephone conferences as data-collection instruments. Online documents are the major source of information in this programme that was technologically taught. I used online documents compiled in the early stages of the programme to understand the concept of what happened when two differing tertiary cultures meet around a common subject in a computer-mediated situation (Table 14, question 1). I also used it to familiarise myself with what happens when an international learning module, compiled by an American university, is adapted for a South African HEI, and implemented in a computer-mediated context (Table 14, question 2). I did this because Guba and Lincoln, as cited in Cohen et al. (2002) emphasise the fact that if an event happened, there must be an official record of it. I used online documents to gather background information on the origin of the project and to reveal information thus far unknown to me. This background information pertains to the abovementioned two questions. Merriam (1998, p. 114) refers to the fact that documents can reveal information about the programme “that has taken place before the evaluation began”. The use of online documents in this regard is also motivated by the fact that Patton, as cited in Merriam (1998), states that documents disclose goals or decisions previously unknown to the researcher. Yin (2003) argues that documents have a broad coverage as they cover many events and many situations over a long time span. Another reason for using online documents to gather information regarding the abovementioned two research questions is that it is easily accessible and relatively inexpensive (Merriam, 1998). I used the minutes of meetings with role players to collect important information about the implementation and adaptation of an international learning module in a computer-mediated context (Table 14, question 2). The motivation for this is the statement by Patton, as cited in Merriam (1998) that official or unofficial documents provide important information about the project. The minutes of meetings, as well as the minutes of the telephone conferences contributed toward the understanding of what dialogue emerge and why it emerges (Table 14, question 3). The telephone conferences provided background information about the project (Table 14, question 1) as well as on the creation of shared meaning (Table 14, question 4).

Online documentation enabled me to understand what dialogue emerged and why it emerged (Table 14, question 3). I used email to obtain a clear understanding of the exchange of ideas between partners that emerged because Yin (2003) emphasises that the exact particulars regarding a project should be accessible. I employed online documentation to create shared meaning with the Stanford team (Table 14, question 4). Shared meaning is created through common incentives, common adversaries and common purposes. Common purposes resulted in cooperation and that was facilitated by email and the file-transfer protocol. I did this because Merriam (1998, p. 128) refers to “electronic paper” that are transferred online. Yin (2003) points out that due to the flexibility of the retrieval process the researcher can perform the research at her convenience. Yin (2003, p. 86) adds

that using documentation as a data-collection instrument is a stable way of conducting the research. Data can be reviewed repeatedly and unobtrusively. In other words, data are not created as a result of the case study". I also used email to determine how we deal with cultural differences (Table 14, question 5). According to Riley, as cited in Merriam (1998) documents may be the only source of information such as cultural differences.

I used researcher-generated documents to obtain information on questions that involve the positive and negative aspects of the programme. (Table 14, question 6 and question 7). This is because Merriam (1998) argues that these documents can provide data that would otherwise not be easily accessible. Another reason to use researcher-generated documents in this regard is to obtain knowledge about the dichotomous aspects of the programme. This is the result of Merriam's observation that the purpose of researcher-generated documentation is to enlighten the researcher about the circumstances, the people or the event being investigated. I also used researcher-generated documents that I obtained from the focus-group interview to understand how the students experienced the positive and negative aspects of the programme. I used project documents to obtain the best possible data to present information on the positive and negative aspects of the programme. According to Dexter, as cited in Merriam (1998, p. 125), documents "should be used when it appears they will yield better data or more data...than other tactics". I used documents in this regard to gather information about the positive and negative aspects of the programme.

4.2.2 Interviews

Interviews were used as a data-collection instrument in order to obtain information and get responses to all the research questions. The focus-group interview also contributed to this collecting of data when the facilitator asked the interviewees open-ended questions in order to get an idea of what happens when two differing cultures meet around a common subject in a computer-mediated situation. I also specifically wanted to know what happens when an international learning module compiled by an American university is adapted for a South African HEI, and implemented in a computer-mediated situation (Table, 14 question 1 and question 2). I did this is because Yin (2003) states that as a result of the open-ended nature of the questions the researcher can ask the interviewee about factual information regarding the events. Cohen et al. (2002) support this notion by saying that the interview may be used as "the principal means of gathering information having direct bearing on the research objectives".

I employed the open-ended questions to let dialogue emerge (Table 14, question 3). The line of questions that I asked yielded indispensable information in dialogue form because the interview "will appear to be guided conversations rather than structured queries" (Yin, 2003, p. 89). According to

Merriam (1998) an interview can be described as a purposeful conversation in order to obtain specific information. The information that I got from the interviews shed light on the creation of shared meaning (Table 14, question 4). Shared meaning is based on common denominators such as joint trust and joint purposes. In this regard Tuckman, as cited in Cohen et al. (2002, p. 268) points out “By providing access to what is inside a person’s head”, [it] makes it possible to measure what a person knows (knowledge or information), what a person likes or dislikes (values and preferences), and what a person thinks (attitudes and beliefs)”. I used the interviews to gather data about how we deal with cultural differences (Table 14, question 5). According to Kerlinger, as cited in Cohen et al. (2002) it might be employed to explore unexpected results.

I used the interviews and the focus-group interview to obtain the interviewees’ and the participants’ viewpoints on the positive and negative aspects of the programme (Table 14, question 6 and question 7). This afforded them the opportunity to reflect on their expectations of the programme and whether these expectations had been met. This correlates with Yin (2003) when he states that key respondents can give factual information as well as their opinions about specific aspects of the situation. Kitwood agrees when he refers to an untainted, information transfer, as well as a transaction that has bias (Cohen, et al. 2002).

4.2.3 Observation

I used unstructured observation to find out what happens when two differing tertiary cultures meet around a common subject in a computer-mediated situation (Table 14, question 1). This data-collection instrument yielded information on the context of different situations. Patton, as cited in Cohen et al. (2002) refers to this situation as the opportunity for a researcher to get an idea of what happens *in situ* rather than a second-hand review of it.

Observation afforded me the opportunity to get the participants’ perceptions of aspects that worked well and aspects that did not work well. This is propounded by Silverman, as cited in Cohen et al. (2002, p. 313) who distinguishes between the etic approach and the emic approach to data. The emic approach fits in with qualitative research “where the definitions of the situations are captured through the eyes of the observed”. I filled the role of participant observer and that enabled me to yield valuable information regarding aspects that worked well and aspects that did not work well. This afforded me the opportunity to gain access to the activities and the participants that would otherwise have been impossible (Yin, 2003).

Observation done during the face-to-face contact sessions yielded information regarding the question on cultural differences (Table 14, question 5). As participant observer I gained by the opportunity to identify some of the situations as *insider*, rather than an *outsider* to it (Yin, 2003).

4.2.4 Video conferences

I employed the video conferences to yield verbal and non-verbal data in order to understand *what happens when two differing tertiary cultures meet around a common interest in a computer-mediated situation* (Table 14, question 1). Cohen et al. (2002) emphasise the fact that non-verbal communication often provide more information than verbal communication. I used this to shed light on the contact between the role players as non-verbal communication revealed significant data about the participants' attitude and stance to the phenomenon under discussion.

The use of video data allowed for the interaction to be recorded in context. According to Mishler, as cited in Cohen et al. (2002), contextual facts are important. Because video data are potentially exciting material, I used it to gather information on *How do we deal with cultural differences* (Table 14, question 5).

5 Data processing

I used ATLAS.ti™ to capture the data that I obtained through data collection. I chose ATLAS.ti™ because I had an enormous amount of data and any amount of text could be coded as one unit. I entered all the appropriate primary data material into the hermeneutic unit through direct keyboard entry.

6 Data interpretation

I used ATLAS.ti™ to facilitate the analysis and interpretation of the data. Data analysis is a developing process which involves all the stages of the programme. I analysed the data that I obtained simultaneously during the data-collection process. While reading through the collected data I identified various different connotations. I selected and divided data systematically into manageable ideas, patterns, trends and correlations (Mouton, 2001). I then coded my notes and grouped them into categories. I then synthesised and interpreted it. Ongoing data analysis ensured that the data stay focused and repetition did not occur. I used crystallization as a technique to reflect on the research and ensure validity and reliability. McMillan and Schumacher (2001, p. 463) state that "Crystallization seeks to open the analyst to data analysis, maximum experiences within the analytic style" while Eloff et al. (2002) accentuate the deep and complex understanding of the topic provided by crystallization.

7 Validity and reliability

Validity involves the concept of whether a researcher really observes what should be observed. I incorporated a variety of strategies to ensure internal validity. I accomplished triangulation by using multiple methods and data sources to substantiate emerging results. I included member checks by taking tentative findings back to the informants whom I had consulted. I integrated long-term observation of the phenomena under investigation by repeating my observations and requested colleagues to comment on the results, ensuring peer examination.

Reliability can be seen as the degree between the natural situation of the intervention and data that the researcher records. Reliability in the ELISA intervention included “context- and situation-specificity, authenticity, comprehensiveness, detail, honesty, depth of response and meaningfulness to the respondents” (Cohen et al., 2002, p. 120). I tried to do justice to the abovementioned features during the intervention in order to ensure reliability of the research process.

8 Ethics

Validity and reliability imply that the research was conducted in an ethical manner. It is of vital importance to trust research results as an intervention (Merriam, 1998, p. 198) took place in the TUT students’ lives. The purpose of research is to produce “valid and reliable knowledge in an ethical manner” (Merriam, 1998, p. 198). Trustworthiness of research results means that there is an explanation for their validity and reliability.

8.1 Voluntary participation

The purpose of the research is to determine the aspects that influence common meaning across cultures and to identify the aspects that cause differences among cultures. One of the team leaders explained the participants’ role in the project and emphasised that they might withdraw from the project at any time. The motivation was to participate in an exceptional international distance-learning experience.

8.2 Informed consent

The participants’ verbal consent to participate was obtained as well as their written informed consent in which it was stated that participation was confidential and that their identities would not be established. The research did not involve the participation of minors (under 18). The participants were

all over the age of 21 being third and fourth students and they could all legally consent to participation in the project. No special criteria in terms of race, sex and age were applied as the research was conducted at a multicultural Higher Educational Institution. A copy of a letter of Informed consent is attached (Annexe I).

8.3 Safety in participation

The participants did not risk any harm. The research did not require any dangerous physical activities, psychological exploitations or interactions or legal undertakings. Social endeavours comprised six contact sessions, three video conferences and one focus-group interview. During all these social interactions it was expected of the participants to communicate verbally with the presenters and fellow students. Participation was, however, voluntarily and varied according to the eloquency of the participants. The certificate ceremony comprised a prestige social interaction and was attended by the participants and the South African role players. A video recording of this event was made and presented to Stanford. The participants did not risk any harm during these social interactions.

Chapter 4: Findings and results

1 Introduction

In chapter three I outlined the research methodology and design of the study. This focused on the case study as research approach. In chapter four I will discuss the results and findings of the central and critical questions. The central question comprise the following: *What happens when an international learning module, compiled by Stanford, is adapted for a South African HEI and implemented in a computer-mediated context?* The critical questions comprise the following: *What dialogue emerges and why does it emerge? How do we deal with cultural differences? How is shared meaning created and why is it created? Which aspects of the process work well and why and how can they be improved to compensate for those that do not work well? Which aspects do not work well and why and how can they be improved?*

2 What happens when an international learning module, compiled by an American University is adapted for a South African HEI, and implemented in a computer-mediated context?

This central question includes aspects pertaining to the international outreach programme that I explored. These aspects involved issues such as cooperative learning, cooperation at organisational level, the international Digital Divide, how to bridge the Digital Divide, HEIs, the role of technology, cultural diversity and cultural differences. The potential research collaboration originated from a discussion between a research expert from UP and a Co-director from the SUIOP, Stanford, at a conference in Cuba in 2004.

The project started when academic delegates from UP explored the possibilities of cooperation between Stanford, UP and TUT. The purpose of the collaboration was to introduce an existing Stanford international security course to a South African HEI. It was decided that UP would play an investigative role and that other South African universities would be invited to participate in the project as South African partners whose students should benefit from the course. TUT was identified as a possible research collaborator and meetings were conducted with various representatives from UP and TUT. The purpose of the meetings was to encourage participation and to establish a potential strategic partnership network, resulting in UP and TUT as research collaborators. The original outreach programme resulted in a decision to run a programme that lasted 19 weeks while the research focus was International Environmental Politics. This initiative involved the Department of Post-Graduate Studies in Education, the Department of Journalism as well as Telematic Education at TUT. Fourteen third and fourth year part-time journalism students participated in the study.

Stanford had already initiated existing outreach programmes to HEIs in the former Soviet Union and some Eastern European countries. These programmes were running for approximately six years. The model entailed that Stanford brought a number of PhD students from these countries to Stanford for training in Social Sciences such as Political Science, Sociology and Anthropology. This model however, resulted in every student costing Stanford about \$50 000 per year. This proved to be too expensive and therefore a more cost-effective model was considered. This model involved taking Stanford courses to students in their own countries, focusing on undergraduate students instead of graduate students. The Stanford team leader emphasised the fact that the rationale of the outreach initiatives to foreign institutions was not only to initiate collaborative research with foreign institutions but also to bring foreign courses to Stanford. The first teaching assistant mentioned that outreach programmes from HEIs such as Stanford to Sub-Saharan Africa entailed certain challenges to education. She was talking from personal experience as she had lived in Africa and had also visited numerous places in South Africa around 2000. According to her the ELISA programme certainly was a unique initiative, even at Stanford. The second teaching assistant also supported the idea of outreach programmes. For academic purposes she travelled to Tanzania in 2003 and showed a personal interest in rural areas. She compared the idea that education is taken for granted in the US to that of the rural East African region where that is not the case. In the latter instance she experienced that learners had less opportunities to be educated and to be exposed to new experiences than their counterparts in urban areas. This resulted in the East African students' desire to learn, being exposed to many things and thus to a greater appreciation for opportunities. While reading through the assignments that the ELISA participants submitted for grading and looking at the video conferences, she noticed a similar excitement among the students. According to her they revealed a bona fide interest in the programme and had a real desire to learn about the environmental issues at hand.

2.1 The international Digital Divide

2.1.1 The North–South phenomenon

The North-South phenomenon regarding the Digital Divide is clearly visible when the Stanford set-up is compared to the TUT set-up. The main difference is that while the majority of Stanford students are well-resourced the majority of TUT students are under-resourced. While visiting the Stanford campus I noticed that the possession and the use of computers and laptops amongst students is an indication of the affluence level at Stanford. I attended four contact sessions as a visiting guest at different Stanford schools. During these sessions it became clear that the use of laptops and supplementary technology was normal procedure for Stanford undergraduates and postgraduates.

The topic of the first lectures that I attended was *Ending civil wars: The implementation of peace agreements*. The auditorium was furnished with inter-active audio-equipment which enabled the

students to easily follow the lecture and even put questions and join in the discussion. More or less 200 students attended this lecture.

The second lecture that I attended was given by a Professor from the Stanford Center for Innovations in Learning (SCIL). The focus of the lecture was on the influence of innovations in communications technology on the learning process, thinking, and educational systems. The topic of the lecture was *Online learning communities* while the pedagogy was about *How to build a wiki*. The presentation outline covered aspects such as administration and questions about the students' online communities, overview of the prescribed readings, Web 2.0 collaboration-design challenge which lead to a discussion, application of Web 2.0 techniques to support learning activities, design solution, presentation and discussion, community participation and wrap-up. A full-time teaching assistant for the session was available while the lecture took place in the state-of-the-art Wallenberg Hall.

The third session that I attended was conducted by a Professor of Political Science. The topic of his lecture was the *Origin of the genocide in Rwanda*. Contrary to the previous two sessions the Professor did not use high-end technology but used board and chalk to explain to his undergraduate class what this conflict in Africa was about. He focused on power equality, the negative impact of colonialism and explained that conflict was almost always about control of the government. He expanded the discussion to European issues such as the autonomous provinces of Kosovo, Serbia and Montenegro, conditions before World War I, the basic background of World War II, up to the situation in Germany during the 1990s. Although this was a lecture conducted without state-of-the-art technology, most of the eleven students that attended had their own laptops with them.

The fourth session was conducted by a Professor of Education and (by courtesy) of Anthropology. The topic of the lecture that he conducted was *Housing patterns in West Oakland*, a suburb near Stanford. Students were divided into six groups and the assignment was to identify aspects that influenced housing patterns in a specific suburb. Students had the opportunity to map out the suburb, taking the following aspects into consideration: Negative environmental sites, property values, multi-family housing, police stations, public hospitals, free clinics, public transport, automatic teller machines (ATMs), minimum household income, commercial areas, shopping districts, bookstores, educational resources like community services, child care centres, libraries, high school districts and specialised schools. The emphasis of the lecture was on the purpose of education and each group had three minutes to collaborate and to present their feedback.

After attending these different lectures and contact sessions I realised that the use of educational technology played a significant role in teaching at Stanford. Applications of specialised techniques to support teaching and learning was standard procedure. State-of-the-art technical equipment was available to all lecturers. The Stanford team leader confirmed my finding by saying that "most of the

Stanford personnel and students are so tied to their computers and laptops” (Stanford team leader, personal communication, April 24, 2006).

Computers and Internet access can be regarded as an indication of the international Digital Divide. The Stanford team leader mentioned that it was standard procedure that Stanford students had twenty-four hours per day Internet access. The residences on campus were all equipped for this service. Large numbers of Stanford students were spending many hours in Cubberley Educational Library diligently applying themselves to their laptops and making use of the available research collections.

Contrary to these facilities at Stanford, there was no Internet access in the residences on the TUT campus. Students could book a one hour Internet session at the learning centre on campus. None of the ELISA participants, however, lived on campus since they were all working students. Internet access in the library was reserved for library staff. The ELISA participants had to do most of their research for the assignments on the Internet. During the focus-group contact session one of the students said that “most of the research is done on the Internet. You don’t even go to the libraries anymore to look for the books” (Focus-group interview, 2006).

2.1.2 Digital Divides within

Apart from the international Digital Divide I noticed that there exists a Digital Divide within nations and populations. Adding to this I observed a cognitive divide amongst certain levels of the ELISA students. Different socio-economic backgrounds, opportunities and technological skills contributed to this situation. During the focus-group interview on 9 June 2006, however, it became clear that the opposite point of view regarding Internet access and connectivity was also valid. The results indicated that one of the positive aspects was that three of the students at TUT reported that they had fast, wireless connectivity, even at home:

“Mine was fast”.

“Mine was quite fast”.

“Mine was fast as well”.

I once again realised that the *Digital Divide* could have been coined for South Africa.

When the students were asked about their perceptions of the programme the majority felt that the workload was too heavy. They replied as follows:

“The problem I had with the workload is that the assignments were posted about two days before it was due. That gave us too little research time”.

“I did not do all the assignments”.

One student, however, was unemployed and did not share the perceptions of the rest of the participants. He mentioned that:

“I don’t think the workload was that heavy” and

“I think doing a 600 words assignment is really not that tough – it’s very easy to do and it is very quick. The thing that takes the time is the research”.

Contributing to this phenomenon of a cognitive divide within and between the students is the issue of the use of technology. All the students could use their PDAs to get Internet access although the air-time vouchers were only to the value of R150.00 per month for the length of the programme. Additional advantages were that the PDAs enabled fast connectivity and that they were wireless. Some students were better prepared to employ technology than others and made better use of it. The Stanford team leader pointed out that although the United States was a northern hemisphere country some of the Scandinavian countries had the edge over the US. This was technologically speaking due to some of these countries who had first developed mobile technology. In this Digital Divide within and between citizens the North–South dichotomy is not relevant but rather attributable to uneven development globally.

2.1.3 Factors contributing to the Digital Divide

Several contributing factors are responsible for the Digital Divide. These factors comprise income differentials, insufficient telecommunication infrastructure, geographical barriers as well as differences in human capital. The second video conference on 10 March, 2006, took place between Stanford and TUT and provided an in-depth indication of some income differentials. A Consulting Associate Professor from the School of Education was responsible for this session. Her research interests include the following: “international environmental policy making and the promotion of sustainable development” (Consulting Associate Professor, personal communication, 2006). Her initiatives involved development programs to reduce poverty, empowerment through local participation and decent management of natural resources. She did much of her research in East Africa and Central America. The topic of the video conference was *Sustainable development and the environment*. She emphasised the role of citizens in the environmental conservation process. She also emphasised concepts such as development, economic and social goals versus environmental goals and sustainability. The drastically increasing population in Honduras was compared to the population in Kenya. This African country faced severe agricultural challenges as only 10% of the land is suitable for farming. The average size of a farm in Kenya is less than 2 hectares while 3.5 million people faced starvation. She highlighted the fact that 2.8 billion of the world’s population of 6.3 billion people in 2006 lived on less than 2US\$ per day. It was obvious that the observed East African families that the Consulting Associate Professor reported on did not fall in the income bracket of the prestigious, affluent Stanford culture. I noticed that the ELISA participants as a group were more affluent than the

East African citizens that the Professor spoke about. Before the programme started the students verbally indicated that they would be financially able to participate in the ELISA programme. I found that income differentials played a decisive role in the Digital Divide within nations as well as between the North-South divide.

2.1.3.1 Insufficient telecommunication infrastructure

Uneven distribution of fixed telephone lines was a feature of the South African telecommunication scenario, especially in underserviced rural and urban areas. Maintenance of the telecommunication infrastructure also proved to be complicated. Telecommunication costs regarding telephone and Internet connections were excessively high and proved to be unaffordable for the majority of South Africans. Despite the fact that South African mobile tariffs were significantly higher than in some neighbouring countries, mobile technology has become very popular in South Africa. Currently [2009] the main mobile subscriber base in South Africa is 42.2 million out of a population of 49,320,500 (Government of South Africa, 2009). Stanford showed an interest to explore the effect of mobile technology on teaching and learning in South Africa. The Stanford team leader said that this initiative was because South Africa's cellular technology was more advanced than that of the United States. According to her 98% of TUT students owned a cellular phone at the time that the ELISA programme was launched.

2.1.3.2 Geographic barriers

On a global scale geographic barriers may influence the phenomenon of the under-resourced and the well-resourced. The Stanford team leader said that according to her the US was also geographically isolated and this resulted in other countries getting the edge over the United States. On a local scale geographic barriers in South Africa did not prove to be insurmountable. It was made clear from the beginning of the course that attendance of the contact sessions were mandatory. One student however, lived in Nelspruit and reported that travelling between Pretoria and Nelspruit (a distance of 334 km) proved to be time-consuming and costly. Most of the other participants of the ELISA project resided in Tshwane in the Gauteng province and did not encounter geographic barriers per se.

2.1.3.3 Literacy

It was clear that the ELISA participants were all handpicked students who were committed to the programme. They were either third or fourth year journalism students who regarded the intervention as a meaningful learning opportunity. They were all literate students who enjoyed at least 12 years of schooling and at least two years of tertiary education. Another instrument that supported the

abovementioned findings are project documents. It includes the summaries and recommendation that the students wrote after the focus-group interview. The students were all adequately literate and expressed their ideas in no uncertain fashion.

2.1.3.4 Language

The ELISA participants were Afrikaans, English, Indian, isiZulu and Sesotho mother-tongue speakers. The results indicated that with the exception of one student, all had a good command of English. This level of language proficiency was indispensable since it is one of the official languages of TUT. English was also the official language in which the programme was conducted. The curriculum involved prescribed readings, video-taped lectures on CD-ROMs, research on the Internet, assignments, interaction with fellow students and members of the academic, research and technical teams, face-to-face contact sessions, video conferences as well as feedback. The Stanford team leader supported my findings regarding the importance of language proficiency. She referred to English as the lingua franca of the world. The participants in the Russian outreach programmes expressed their wish to learn about the United States and the American perspective. They concluded that they wanted to learn it in English because “that’s how we understand American culture” (Stanford team leader, 2006a).

2.1.3.5 Culture

I found that language is an important tool in the communication processes between students from different countries. It is even more so in Social Sciences than in Natural Sciences. Contextualisation and adaptation of the content was of vital importance in order to ensure success. The original design of the IEP programme that was previously presented to the Russian HEIs was adapted to include issues of importance for South African students. This resulted in the omission of two of the original seventeen lectures and the selection of fifteen lectures, representing some South African content in two of the lectures. The Head of the Department of Journalism at TUT commissioned a guest lecturer from UP to compile two lectures on local issues. This resulted in assignments on the *Transnational Protection of Biodiversity – South African Peace Parks* and *Benefits that Peace Parks holds for South Africa*. The second teaching assistant supported my findings on the importance of contextualization. She informed me that she included the South African Government's Green Policy Papers in the readings to expose the students to challenging environmental issues.

The Stanford team leader reiterated the findings related to the role of culture as a contributing factor to the Digital Divide. She contemplated the option of merely translating prescribed material to that of cultural adaptation of the curriculum. A Director of the FSIS supported the findings on the adaptation

of the curriculum. He said that Stanford was striving to present a curricular unit “that is as fully integrated into South African life and culture as it can be” (Director of the FSIS, personal communication, 2006).

2.1.3.6 Commonalities and differences

The focus of the study was on the commonalities as well as the differences between the well-resourced and the under-resourced that existed between the two sides. The UP team leader explained the international Digital Divide by saying that if something becomes more global, its local relevance decreases, and when something becomes more local, its global competitiveness will decrease. A Director of the FSIS also supported this finding when he mentioned that the local/global balance is of utmost importance. Local input was indispensable (Director of the FSIS, personal communication, 2006). Some of the students expressed similar ideas during the focus-group interview.

2.2 Initiatives to bridge the Digital Divide

Differences between the two sides were inherent part of the team members. This necessitated an investigation into attempts to surmount the differences and reach middle ground in this very diverse cultural initiative. There exist several initiatives to bridge the Digital Divide. These initiatives included economic growth and development, human capital investment, Internet literacy, Internet access, technology diffusion and telecommunication infrastructure.

2.2.1 Economic development and growth

The ELISA programme, in particular, is an example of economic support in order to try and bridge the Digital Divide. The Whitehead Foundation in the US funded the ELISA programme in South Africa. Stanford originally requested \$500 000 for the entire three year period. This resulted in an amount of \$485 862 that was consented to due to the fact that the full budget amount had to be less than \$500 000. A Co-director of the FSIS supported my finding when he informed me that “my colleague and I talked with a US-based Foundation that expressed a very strong interest in providing us with a seed/planning grant to work with universities in South Africa” (Co-director of the FSIS, personal communication, 2006).

2.2.2 Human capital investment

One of the main rationales for the outreach programme was the development of human capital. The purpose of the SUIOP was to cooperate with international partners such as UP and TUT in creating, designing and evaluating a wide-ranging and suitable e-learning programme. The ELISA programme, an international project of the SIIS, complemented Stanford's renewed commitment "to raise its international profile by identifying issues of global importance and then providing resources, expertise and answers" (Delgado, 2004). This initiative resulted in the motivation of the TUT students by developing new interests and enthusiasm for environmental issues, thus developing human capital.

Several of the role players acceded to this initiative to foster human capital. A Director of the FSIS stated that one way to develop human capital was to teach the students to think critically. He accentuated that the development of an adequate skills set of how to filter through excessive information obtained from the Internet, needed attention. The students had to be empowered to distinguish between important and less important information (Director of the FSIS, personal communication, 2006). The Stanford team leader expressed similar ideas, emphasising that critical thinking skills had to develop into dispositions. This entails the ability and willingness to use critical thinking skills. She expressed her overall motivation of empowering the students with a worthwhile exercise. She would be more than satisfied to hear them say: "I am really glad I did that" (Stanford team leader, personal communication, 2006). The second teaching assistant supported the above findings. She stressed the development of critical thinking skills as well as dispositions. She mentioned that during the video conferences one or two students took the lead while the rest of the students observed the situation and took note of what was happening. She said that she would have preferred to engage every student in the discussions, thus improving educational prospects by using technology at its best (Second Stanford Teaching Assistant, personal communication, 2006).

The Co-director of the FSIS agreed with the above findings on the development of human capital. He explained that Stanford divided a large lecture class of 300 students into smaller seminar groups. These groups met with teaching assistants that revised the previous week's lectures. During these seminars students could clarify misconceptions and provide feedback to the teaching assistants who reported key challenges to the Professor. The purpose of these procedures was to improve communication and motivation between students and lecturing staff. Another initiative to produce human capital was to develop a web site on problems based on the previous week's lectures. They used multiple choice and open-rational questions. The latter offered academic staff the opportunity to "look into the thinking of the student" (Co-director of the FSIS, personal communication, 2006). Feedback was given on the students' progress, and the teaching assistants reported back via email. This provided the academic staff the opportunity to firstly give feedback, secondly, receive feedback and, thirdly, support communication. It resulted in motivation and inspiration amongst the students,

thus enhancing human capital. During the lectures that I attended I found that two of the lecturers focused on cooperative learning. The students worked collaboratively in small groups and could learn from fellow students. The main focus of these activities was to encourage participation and foster human capital.

The first teaching assistant also supported the findings on human capital investment. She expressed the hope that the programme would be a great learning experience for the students. She highlighted feedback and mentioned that she strove to be a resource for the students by being available to meet their needs (First Stanford Teaching Assistant, personal communication, 2006). Apart from her asynchronous online availability she initiated virtual office hours during which she would be synchronously available. This endeavour, however, did not materialise due to the fact that the students were working and did not enjoy the luxury of free time when it was appropriate.

I determined that the students found the programme to be very informative. All the students reported that they had benefitted from the learning exercise and that the value of the programme was crucial for journalism students. Regarding human capital development I found that the goal of the ELISA programme was fulfilled since the students were empowered in numerous ways and introduced to several new avenues of study possibilities.

2.2.3 Internet literacy

Internet literacy was a prerequisite to successful Internet use. A Director of the FSIS referred to the fact that the students often needed guidance in order to do significant research. He attributed this tendency to the fact that information on the Internet was mostly unfiltered. The students needed to learn the skills to do searches efficiently by critically distinguishing between important and unimportant information. According to him students in Russia, Stanford and South Africa needed to learn this.

2.2.4 Internet access

Some of the students reported that the availability of broadband Internet access would really add to the success of the programme. This would enable them to access the readings, do research on the prescribed topics, successfully logon to the management learning system WebCT6 and submit their assignments in time. The inability to logon to the Internet meant that the assignments of some students were submitted late. Contrary to these findings a few students reported that they had fast, reliable Internet connectivity (Focus-group interview, 2006).

“Mine was fast”.

“Mine was quite fast”.

“Mine was fast as well”.

Some of the students found the PDAs useful to obtain Internet access. The integration of the PDAs with WebCT6 could maximise the potential of the learning experience. One of the students remarked that the PDAs “could help us a lot more, sort of logistical issues about then getting the video clip action to be uploaded on WebCT6” (Focus-group interview, 2006). The permanent use of the PDAs could also contribute to Internet access as students would be more at ease with the new technology.

2.2.5 Telecommunication infrastructure

The development of the telecommunication infrastructure contributes towards the efforts to bridge the Digital Divide. However, this resulted in two students reporting that they could not access the Internet while they were in rural areas such as Hartebeespoort Dam in the Gauteng province. Nelspruit in the Mpumalanga province also proved to be problematic due to hampered telecommunication infrastructure. She said that “When I am here [Tshwane] it works perfectly, but if I am in Nelspruit, then I have problems” (Focus-group interview, 2006).

3 Higher Education Institutions

The escalating demand for higher education is a well-known global phenomenon. Stanford started outreach initiatives to transcend traditional academic boundaries. The purpose was to launch e-learning programmes for HEIs in specific regions on the globe. The ELISA programme was an example of such an intervention where working students could further their careers without leaving the work place. The Stanford team leader referred to the fact that round about 2001 significant debate on distance education commenced. Virtual education was supposed to be panacea. This resulted in the phenomenon that higher education was open to all kinds of people. The University of Phoenix in the United States is an example of a for-profit online school. This virtual online setting had a good business model and targeted specific audiences. The success that they had bred more success, resulting in training people for a specific labour market. This flexible learning style was effective for working adults who needed to obtain certificates or wished to continue their studies without leaving the work place. Contrary to this business model of a virtual university, the Stanford team leader referred to the traditional “bricks and mortar” on-campus university. She remarked that “many institutions such as Stanford and Harvard are not convinced that you are going to see ‘brick and mortar’ universities disappear” (Stanford team leader, personal communication, 2006). A successful initiative was Stanford’s School of Engineering that launched the Stanford Center for Professional Development (SCPD) round about 1991. For the first time they offered courses for Stanford students who only enrolled for courses through this system.

This method involved classes that were taught on campus, then filmed and produced and eventually streamed out on the web. This model proved to be highly successful for business companies, military personnel and United Nations employees. The School of Business at Duke University was another HEI that offered business degrees through distance education programmes. According to the Stanford team leader higher education was mainly about the needs of the end consumer.

A Director of the FSIS commented on the outreach initiatives in order to empower students both at undergraduate and graduate levels. These initiatives were launched in specific world regions. He emphasised the fact that learning environments whether they were virtual or physical were becoming very diverse. The challenge remained to create a learning environment that would enable students from different perspectives to participate in higher education. The Co-director stated that it is important that a HEI should create a learning environment that allowed students to experiment and grow. He said that “I am a firm believer that if you are able to connect learners to learners from other countries, bringing to the discussion and the learning process different perspectives, you have a tremendous opportunity to add richness to the learning process. Because all of a sudden your perspective is challenged and when your perspective is challenged, that’s where a lot of potential learning kicks in” (Co-director of the FSIS, personal communication, 2006). These findings resulted in the launch and completion of the ELISA programme at UP and TUT – a unique accomplishment that contributed to the students’ achievements.

The financial implications related to higher education remained one of the aspects of the feasibility of any outreach programme. A Director of the FSIS informed me on the cost of an outreach programme such as the Stanford initiative in Russia. He stated that Stanford was an expensive HEI and that every student cost them about \$50 000 per year. The financial specifications of the ELISA programme are discussed under *Economic development and growth* (Chapter 4, 2.2.1). The financial aid that Stanford offered via the ELISA programme resulted in the sponsorship of several students, especially journalists who could promote the necessity of global environmentalism. In my capacity of PhD student I had the privilege to visit Stanford and acquaint myself with multifaceted experiences on campus.

4 The role of technology

Technology was used as a tool to accomplish a variety of tasks. I found that technology redefined the boundaries of education. Stanford expressed an interest to explore the potential effect of mobile technology on teaching and learning. The Stanford team leader motivated this mobile initiative because South Africa’s cellular industry was more advanced than that of the United States. The first teaching assistant confirmed this premise: “I knew that they (the South African students) would know more than I did” (First Stanford Teaching Assistant, personal communication, 2006). According to the

Co-director of the FSIS, a former employee of Apple Classrooms of Tomorrow (ACOT), it appeared that since cellular technology was extremely popular in South Africa it could be used to support the interaction aspect of the outreach programme. He referred to a longitudinal study that ACOT did on the topic of how technology modifies teaching and learning. This included research on HEIs in Europe, Australia and the United States. He concluded that technology on its own was no guarantee for added value in teaching and learning instead he seriously suggested the combination of technology with other tools in order to act as a catalyst for change. The first teaching assistant supported this by adding that technology should be used to enhance learning and to create lifelong skills.

I found that technology can be described as the driving force to accomplish change and innovation. At the Wallenberg Hall where the Stanford Center for Innovations in Learning (SCIL) was housed the Academic Technology Specialist (Personal communication, April 27, 2006) introduced me to SCIL research and events. The purpose of this state-of-the-art centre was to provide “advisory and technical support to faculty teaching in the building”. SCIL research projects cover the study of high performance learning spaces and wireless interactive learning devices, the use of e-Portfolios in learning, and the CAT2 Lab and LIFE Center (Learning in Informal and Formal Environments).

The ELISA participants had a variety of technological tools at their disposal. These tools included laptops, computers and wireless handheld mobile devices such as PDAs and WebCT6 as a management learning system. The hardware enabled the students to logon to the Internet – an inexhaustible source of knowledge and information. Project documents revealed that the students used technology as a tool to search, collect and integrate information. The students did that in order to research their assignments, collect appropriate information and integrate it with existing knowledge. Their next option was to use technology as a communication tool resulting in interaction with colleagues, fellow students and/or lecturers and finally to use it to submit their assignments. I found that technological tools can be regarded as enabling tools in the ELISA programme.

The use of educational technology required training and support. This resulted in a contact session organised by the members of the academic, research and technical teams at TUT. The purpose of this lecture and workshop on WebCT6 was to introduce the students to this learning management system. Staff from Telematic Education at TUT presented a two-hour workshop on campus at the beginning of the course. The majority of students attended the hands-on session and got technical assistance whenever necessary. The expertise of the TUT instructional designer and technical assistant was available to the students for the duration of the programme. He also introduced the students to the PDAs at a follow-up session. He explained the following aspects to acquaint the students with the technology: Getting started, Knowing your phone, Using your phone, Synchronizing information, Personalising your phone, Getting connected, Using Microsoft Outlook, Messaging features, Applications, Using camera and album. The program entailed the following functions, see table 15:

Table 15: i-mate program functions

	ActiveSync	Synchronizes information between your device and PC
	Calendar	Keeps track of your appointments and creates meeting requests
	Contacts	Keeps track of your friends and colleagues
	Messaging	Sends and receives Email/SMS messages
	Pocket IE	Browses Web sites and downloads new programs and files
	Notes	Creates handwritten or typed notes, drawings, and recordings
	Phone	Makes and receives calls, and switches between calls
	Tasks	Keeps track of your tasks and remind you of important events
	Windows Media	Plays sound or video files
	Pocket Excel	Creates, views, and edits Excel workbooks
	Pocket Word	Creates, views, and edits MS-Word documents
	MSN Messenger	Sends and receives instant messages
	Camera	Snaps photos or shoots video clips
	Album	Collects, organizes and sorts .JPG/.BMP/.GIF files
	Photo Contacts	Inputs the image files according to your Contacts list and sets up the Caller ID
	Pictures	Collects, organizes, and sorts .jpg picture files
	Wireless Manager	Manages access to wireless connections
	WLAN Manager	Allows you to manage the WiFi connection
	Wireless Modem	Uses your pocket PC Phone as an external modem for a PC or Notebook by using a serial/USB port, Bluetooth or infrared connection
	SIM Manager	Collects, organizes and sorts the Contacts list stored on

		your SIM card
	xBackup	Backs up your Pocket PC Phone files to the ROM or SD card
	Calculator	Performs basic arithmetic
	Games	Jawbreaker and Solitaire are included

Source: (Windows, 2006a)

I found that Internet access was one of the main obstacles that students had to overcome. Internet access was available on the TUT campus, enabling the students to book one-hour sessions at a time. The students could not use this option since some of them did not reside in Tshwane and were full time working journalists. Some of the students reported that they had no Internet access at home, only at work. The exorbitant cost of telecommunication in South Africa could be one of the reasons for this state of affairs. The use of mobile technology to gain Internet access also proved to be expensive and dependent on a hampered telecommunication infrastructure. Since the students were working they could not research their assignments during working hours, resulting in the fact that they had to stay after work to get Internet access. One student pointed out that “my only Internet access is at work. I don’t have Internet at home. That was also a problem” (Focus-group interview, 2006). It became clear that Internet access was indispensable for research purposes. For students who did not have Internet access let alone fast Internet access, the research part of the programme thus proved to be a problem.

Some students experienced that the use of standard dial-up fixed lines was unreliable and slow. The majority of the students complained about slow Internet access. Two students expressed this concern by saying that: “It wasn’t up to standard” and “It is that the internet feed is a bit really too slow” (Focus-group interview, 2006). These obstacles with the Internet resulted in frustration and the inability to submit assignments in time. One student remarked that “you come here with dial-up and you just sit there for ages” (Focus-group interview, 2006). However, evidence to the contrary was delivered as three of the students reported that they had fast and reliable Internet access even at home.

The PDAs caused mixed reactions, ranging from clearly positive to downright negative, among the students. The use of the PDAs introduced the students to the mobile component of the programme. I realised that the novelty of these high-tech wireless devices turned out to be a privilege and unique learning experience. The concept of these handheld devices was one of the building blocks on which the ELISA project was built. A high-tech phone such as the i-mate filled the role as an enabler to achieve several tasks. The Stanford team leader, the Director of the FSIS and the first teaching assistant all agreed and supported these findings. Some of the students, however, did not efficiently

integrate the technology with their assignments. The main problem was that the PDAs could not be integrated with WebCT6. One student remarked that “There are lots of stuff that you can do with the i-mate...but I think it would have been much more easier if we can logon to WebCT6” (Focus-group interview, 2006).

One of the students reported that he struggled to take video footage of air pollution near a ferro-chrome mine due to the fact that the texture of the pixles did not capture the air pollution. The majority of the students confirmed that they would have appreciated the opportunity to explore the wireless technology over a longer period. The focus-group interview as well as the project documents indicated that the opposite was also the case as some of the students successfully integrated the new technology with their assignments. One student managed to attach a video clip to his assignment.

One of the main technological problems was that WebCT6 was [at that stage] not user-friendly. The students reported that they encountered numerous problems. One student described her problems to access the learning management system as follows: “I went to Cape Town – I couldn’t access WebCT6 at all – not in the Internet Cafés also” (Focus-group interview, 2006). Some of the students did not have the necessary skills to use WebCT6 correctly. The particular student complained that “I had my whole assignment typed and something happened, we logged off and everything was just gone” (Focus-group interview, 2006). They experienced problems posting their assignments “I never knew where to go...So to use a thing like WebCT6 is not easy...people just posted all over the show on different forums” (Focus-group interview, 2006).

This resulted in a complication namely that the assignments, which were individually posted appeared as being posted by the group. This was later rectified. The email function of WebCT6 caused a dilemma. Instead of using the correct protocol to access the email function of WebCT6, some students used their own personal email facilities to communicate with the teaching assistants. The students were informed not to use their personal email addresses to submit their assignments. The reason for this was that it would impede the record keeping of the assignments. Another problem was that some students could not access all the files that they were supposed to access. Some of the students, on the other hand, managed to use WebCT6 efficiently.

To conclude, it is clear that the majority of the students experienced some major difficulties in accessing and using technology. However, the abovementioned instruments such as the interviews and my observation notes proved that to a certain extent, the opposite was also true. Some of the students had fast, reliable Internet connectivity, some of them were more successful in integrating the PDAs with the other devices while some of the students had better skills to fit the technology to the learning process.

4.1 Cognitive divide

The Digital revolution changed all facets of our society resulting in clearly modified ways to gather, accept and retain significant information. The implementation of technology, as well as the way that it is employed, plays a decisive role in modern society. The Stanford team leader referred to the age of the students and said that, when designing the course, Stanford knew that they were not undergraduates who were only eighteen years old. What they didn't know was whether the mean age of the group was around thirty or closer to the fifty year bracket. The first teaching assistant said that United States citizens who were around thirty years old like herself were generally much more competent to use technology than their parents were. This finding was supported during the of face-to-face contact session at TUT when the PDAs were introduced. Because these devices are technologically challenging, some of the older lecturing staff had more resistance to the use of it than the students had. These findings resulted in my conclusion that currently [2009] there exists a cognitive divide between people from all walks of life and all age groups. This can be regarded as a global phenomenon that occurs with change and innovation and when exploiting new resources.

It is common knowledge that the younger generation is more at ease with the use of technology than the older generation. This can be ascribed to the fact that the latter did not grow up with technology while the youth are exposed to from an early age. According to the International Telecommunication Union (ITU) the age of a regular Internet user was from two years or older. In China children from the age of six are regarded as regular Internet users. This coincides with regulations in Switzerland where it is mandatory for children aged three years or older to attend pre-school.

Internet use has become a mainstream activity and part of everyday life. I am convinced that the older generation tends to regard technology as possessions rather than enablers. The ELISA programme indicated that the students who represented the Net-generation regard technology mainly as enablers. In order to counteract the cognitive divide it is essential for seniors to make a paradigm shift from *I cannot* to *I can*. Prerequisites for this endeavour would be to keep an open mind, the willingness and commitment to achieve the necessary skills as well as the employment thereof.

5 What dialogue emerges and why does it emerge?

Educational needs are increasing worldwide. Higher Education studies concerning Africa have become very popular. Developed countries are eager to form partnerships with developing countries because of various motives and incentives. The ELISA programme was an example of a cooperative research partnership that was supposed to adhere to basic principles regarding partnerships. These included mutual trust; shared decision making; national ownership; emphasis on applying research findings to policy and practice; development of national research capacity; shared responsibility;

monitoring and evaluation of the collaboration; dissemination of the results; equitable sharing of the profits; and building on the achievements. The dialogue that emerged focused only on certain of these basic principles. This is because the project was discontinued before research findings could be applied to policy and practice and the other research objectives could be achieved.

Initially mutual trust proved problematic since UP was sceptical about Stanford's motives and what they could offer. UP wondered if they could not achieve the same goals themselves. UP's doubt arose from the fact that Northern hemisphere universities were eagerly seeking partnerships with universities in the Southern hemisphere. Northern hemisphere partners had financial incentives to a certain extent and exploited their southern hemisphere partners for financial gain. The South African team was under the impression that Stanford had financial incentives because they kept the funds in the United States and only settled expenses already incurred.

Shared decision making was adhered to since both partners collaborated to get the programme going. This process of reaching shared meaning resulted in lengthy deliberations and communication. The emails alone amounted to 578, some of them involved lengthy discussions, suggestions and proposals on the curriculum. TUT put their proposal forward which dealt with the adaptation and contextualisation of the curriculum. This involved the suggestions of the two lectures by the UP guest lecturer to add some relevant South African content. The communication between the role players included two telephone conferences between UP and Stanford, numerous conversations and several meetings and discussions between the different departments.

The mutual will to participate gave rise to shared responsibilities. Yet shared responsibilities proved to be problematic. Stanford was responsible for financing the programme at TUT and UP from the direct grant that they received from the Whitehead Foundation. They were also responsible for their travelling costs and some hosting and entertainment costs during their visit to South Africa in March 2006. The TUT team leader was responsible for handling all the financial duties on the South African side. This entailed managing all the funds directed to the conduct and management of the research programme. More specifically it included the costs to reproduce the learning material in the form of CD-ROMs; the costs attached to the set-up of telephone and video conferences, travel costs to Stanford for one researcher; funds to purchase 20 state-of-the-art i-mate PDA 20k PDAs; contracts for 15 students with the service provider MTN; hosting and entertainment costs for the Stanford team during their visit to South Africa; and hosting costs for the students during the full-day contact session with the Stanford and TUT teams.

Shared responsibilities towards the curriculum were challenging. During the initial meeting in Stanford in November 2004 the South African team did not realise that Stanford had already delivered learning material that they wanted to impose on TUT and UP. This became clear from an email that the

Stanford team leader wrote to the Head of the Department of Journalism on June 1, 2005: "I am glad that you received the DVDs of our courses. I hope that you and your colleagues have had a chance to view the lectures, and visit our IDL website to review the syllabi. One of the outstanding questions we had after our round table at UP was whether only one of our courses, or a selection of lectures from all 4 courses, or all 4 courses in their entirety, would be of most use to you and your students. I look forward to learning your thoughts". However, after careful deliberation the South African team insisted on the inclusion of two lectures on South African content. This was done in order to contextualise and adapt the curriculum so that it would be relevant in the demanding South African environmental situation. Stanford also suggested that they would formulate the research proposal resulting in yet another problematic situation. TUT and UP however, demanded that this was their prerogative.

Stanford's academic and research teams had the responsibility to select and provide a suitable curriculum. Apart from the video-taped lectures that the students received on CD-ROMs a significant amount of reading material was placed on WebCT6. The students had to access these because the lectures were based on the readings and the Stanford course author often referred to the readings. The Stanford team leader and her team appointed two teaching assistants to assist with the selection of the reading material and to grade the assignments. The second teaching assistant had previous outreach experience and she was commissioned to select the reading material. She tried to incorporate some African-related writings but admitted that it was complicated to find suitable journal articles by African authors. The first teaching assistant was commissioned to grade the assignments and give feedback.

Responsibility towards the curriculum on the South African side entailed that the Head of the Journalism Department at TUT had to select the group of students to participate in the programme. The nature of the programme had to be suitable and fit into the curriculum of Advanced Reporting III and Specialist Reporting IV. The module IDL102 International Environmental Politics was the one that best fitted into the local context. Both the Head of the Journalism Department at TUT and I were responsible for moderation and assistance to the students. The UP guest lecturer was responsible for the grading of the two assignments that he included. TUT had more responsibilities since the implementation of the programme depended on them. The TUT team leader initiated the reproduction of the course material on CD-ROMs. The technical assistant at TUT was always available to support students who encountered technological problems. One of the students of the original group decided to leave the programme because of inadequate technological skills. The wireless component of the programme added more responsibility to TUT's effort to expose the students to a unique learning experience. This involved the TUT teams' decision to purchase 20 i-mate PDA2k models. From the beginning of the negotiations with the service provider MTN it seemed that TUT would have to bear the brunt concerning MTN's undertaking with service provision. Each student received a R150 air-time voucher from MTN that they could use for short message service (sms) facilities. This did not work out

as it was intended as some students received more and some less than R150. After the completion of the course the role players organised a certificate ceremony during which the students were entertained and received their certificates, issued jointly by Stanford and TUT.

Stanford and TUT mutually monitored and evaluated the collaboration and progress of the programme. According to a Director of the FSIS they were continually adapting the way that they teach courses at Stanford. They then evaluated how these techniques or methodologies transferred to the students. In the ELISA programme the teaching assistant's feedback enabled them to monitor the collaboration with the students. The TUT teams constantly monitored the collaboration to ensure a successful outcome.

6 How is shared meaning created and why is it created?

Shared meaning in the ELISA programme was created through common purposes, common adversaries and common incentives. The process of creating shared meaning started with shared ideas, resulting in various objectives set by different people in order to reach mutual and individual goals.

6.1 Goals, adversaries and incentives

Both Stanford and TUT, where the research was conducted, agreed to the comprehensive mutual goal that a course on International Environmental Politics was suitable for the programme. Stanford regarded South Africa as a leader in political and economic growth and development matters on the African continent. They quoted the mission of UP as an internationally recognised "teaching and research university and a member of the international community of scholarly institutions" (Stanford team leader, personal communication, 2006). Their purpose with the ELISA programme was as follows: To identify environmental challenges of global significance, to focus the attention on agreements that could help solve international environmental issues, to expose HEI students to international security courses developed by world leading authorities on Environmental Politics, to enrich students' perspectives on sustainable environmental development by means of making the expertise of world-famous national and international environmental experts available to them. The South African counterparts realised that the programme had the potential to provide an exceptional learning opportunity for graduate students as well as research on post-graduate level. Stanford realised that the curriculum that they presented in Russia was not entirely suitable for the South African situation. After the contextualisation and adaptation of the programme it became clear, *inter alia*, that Stanford's view coincided with the objectives set by the South African Department of Environmental Affairs and Tourism in the Green Paper for Public Discussion (October 1996). It states

that “there are many areas which the government needs to address in its environmental policy. These include, among others: Improved pollution and water control, focusing on people and their participation in environmental decision making, developing an improved system of governance, and ensuring that environmental decision making employs an integrated and macroeconomic perspective” (Republic of South Africa, 1996).

Stanford regarded the development of critical thinking skills and dispositions as one of the primary objectives of the programme. It was hoped that critical thinking skills would develop into dispositions: the ability and willingness to use critical thinking skills. Unless dispositions developed critical thinking skills were not to prevail. The development of these skills was one of the major outcomes that defined the success of the programme. It is also the mission of UP to stimulate critical and independent thinking. The Department of Journalism at TUT agreed that the development of critical thinking skills, as part of a journalism course, was a prerequisite for journalists. These skills were crucial in order to formulate an unambiguous argument and explain one’s position with supporting data, gain insight into lectures and readings, demonstrate one’s command of the material by choosing main points and organising learnt material into a reasoned written contribution, form an opinion on an issue after exploring information from the prescribed material, convince one’s readers of one’s views and present one’s ideas sensibly. An argument should be comprehensive, logical and based on solid evidence. Apart from the fundamental mutual goal on both sides there were individual goals that played a role in the implementation of the intervention. Stanford was committed to the programme because of the prospect of cooperation with TUT and UP in creating, designing and evaluating a wide-ranging and suitable e-learning programme in a specific world region. They hoped to implement international policy to alter national behaviour in South Africa with scholarships and to create new partnerships. They aimed to transcend conventional academic boundaries by making their research available to two South African HEIs. They attempted to advance Stanford’s international profile through the provision of resources, expertise and answers. Stanford’s commitment resulted in the grant of \$485 000 for the entire three year period. The Stanford team regarded the programme as an exceptional two-way learning process: the TUT students would be exposed to US perspectives in International Environmental Politics issues. Stanford would learn from their South African counterparts about mobile technologies in a distance setting.

An applied research component formed part of the outreach programme. Stanford envisaged a three year research project to study how an existing international environmental security programme could be contextualised and adapted for use in a new partnership in an international set-up. The purpose of both the research and academic teams at Stanford, UP and TUT was to advance research in interactive learning processes and wireless technology. TUT used the financial grant to sponsor the journalism students as well as myself. This study formed the pilot phase of the ELISA programme. Subsequent studies on mobile technology would be conducted during the second and third years

respectively. The pilot phase of the research made use of an intervention design consisting of a course on International Environmental Politics for journalism students at TUT. As a PhD graduate student enrolled at UP, I filled the role of participant researcher. The research component of the study took place at TUT, in collaboration with the Departments of Telematic Education and Journalism. My goal was to complete the study and to contribute towards the research proposal and existing body of knowledge on the transfer of learning in a computer-mediated situation. The mutual goal ceased to exist when Stanford decided to withdraw from the programme.

Initially common incentives contributed to the shared meaning. These common incentives entailed the cooperation between Stanford, UP and TUT. Cooperation would expectedly result in shared meaning. However, as time went by, it became clear that instead of common incentives, different institutional goals were being pursued. The idea was created that Stanford had a financial incentive because they received a grant from the Whitehead Foundation. The academic and research teams had professional incentives such as participating in an exceptional outreach programme, furthering their careers, supervising both under-graduate as well as post-graduate students and publishing academic articles. My incentive was to complete my studies and explore career opportunities. The students' incentives involved that they could complete their degrees whilst still working. They were exposed to international environmental perspectives that could lead to post-graduate studies. Hand-held wireless technologies offered the opportunities for hands-on experience with the PDAs. The Consulting Associate Professor sponsored each student to a one year subscription of the Society for Environmental Journalists (SEJ). All the students received certificates jointly issued by Stanford and TUT.

6.2 Motivation

Motivation is indispensable for successful learning, especially online learning. Interpersonal motivations are present in the presence of other people and depended on other people. These interpersonal motivations can be identified as cooperation, competition and recognition. Cooperation is often assumed as good, while competition is often assumed as bad. Both cooperation and competition can be used in beneficial or detrimental ways. The important question is how to exploit their motivational power. Cooperation and competition are in many ways parallel. Both fulfil psychological needs of the students.

Psychological needs can often be a driving force in order to excel. The students had various psychological reasons to ensure achievement. All the students experienced the need to complete the programme. This was because the International Environmental Politics module would count as accreditation towards the completion of their degrees. Some of the students expressed the awareness of the value of post-graduate qualifications. A few students had already applied at international HEIs by the time the programme reached completion. One student remarked that "It has opened the

possibility of great opportunities. I mean, I know a lot of us enquired as to do post-graduate studies with them – doing a fellowship and those kind of things. I don't think under normal circumstances any of us would have thought of Stanford and to study there. That really helps" (Focus-group interview, 2006).

Some of the students realised that they had the opportunity to participate in an exceptional outreach project. The ELISA programme was not offered as an open course for all students to register in. These third and fourth year students realised that they were selected because of their academic progress and commitment to the programme. They also realised that they were individually selected as a small group that would experience a unique learning opportunity.

Most of the students were interested in the completion of their degrees in order to work as professional journalists. Some of them were already employed as journalists by major South African newspapers, local newspapers or magazines. Their interest in environmental journalism increased after the introduction of the selected reading material for the programme. They reported that before the programme some of them really didn't care about the environmental conservation. This attitude changed drastically after they realised that environmental factors, could be hazardous and cause havoc. The social status and esteem of a well known journalist could, wrongly approached and applied, also be a motive to perform well.

Financial incentives were one of the important psychological reasons to excel. As mentioned earlier in chapter 2 some people believe that good qualifications can lead to employment and financial strength. This could result in financial independence and better living conditions. The majority of the students were interested in the financial incentives that could be obtained.

6.3 Cooperation and cooperative learning

Cooperation is regarded as a significant interpersonal motivation and it is mostly assumed to have positive outcomes. An important aspect of the learning process is how cooperation can be used to exploit its motivational power. I found that The ELISA programme was designed to involve students in cooperation, collaboration and cooperative learning activities. Cooperation took place throughout the programme. WebCT6 was used as learning management system that offered the opportunity to post messages on the Bulletin board. The students raised aspects concerning the assignments, the interpretation of reading material and communicated with fellow students. They also communicated with the assistant and members of the TUT academic, research and technical teams. The teaching assistant used WebCT6 to give feedback and thus cooperated with the students. The students often communicated with the TUT technical assistant, technical, in order to resolve technological problems. The first teaching assistant gave feedback instantly to ensure cooperation on the highest level.

Cooperative learning formed an important part of interpersonal motivation. The students were motivated to cooperate in order to let the ELISA programme succeed. The programme had six contact sessions for the students during which cooperative learning took place. During the first session the Head of the Journalism Department at TUT introduced the course to the students and distributed the CD-ROMs containing the lectures. Each student received five CD-ROMs with the seventeen lectures. Thereafter an ICT expert from the Department of Telematic Education presented a lecture on WebCT6 in order to introduce the learning management system to the students. A follow-up contact session took place on 10 February, 2006, during which the first video conference took place. It served as an introduction of the Stanford and South African teams to virtually meet each other and to communicate synchronously.

During the third contact session on 10 March, 2006, the academic, research and technical teams at TUT presented the students with the PDAs. The theme of the second video conference was sustainable development. Members of the TUT academic, research and technical teams and students attended while the Head of the Journalism Department at TUT acted as host. The Consulting Associate Professor from Stanford acted as presenter and focused on concepts such as development, economic goals versus social goals versus environmental goals and sustainability. Sustainability is concerned with economic prosperity and human welfare based on responsible resource management. She used a Power Point slide show to discuss the following aspects of sustainable development in depth: traditional development; intragenerational equity; global response; intergenerational sustainability and the sustainability dilemma.

The fourth contact session involved the full-day activity between Stanford, UP and TUT and took place on 31 March, 2006. The activities of this session are fully discussed in the section on Interdependence.

The focus-group interview was the fifth contact session and took place on 9 June, 2006. The theme was the students' perception of the programme. This interview was an example of cooperative learning because of the visibility of the process of learning (facilitator and students' discussions), the results (observation notes) and also the additional result of the learning process (video tape). The process of learning was made visible through the assistance of a facilitator from the Department of Telematic Education who facilitated the session. A technical support assistant from the Department of Telematic Education video-taped the proceedings. The facilitator asked the students their opinions on the following issues: Perceptions of the programme; the relevance of the course to their work; the distance-learning aspect of the course; PDA technology and its applications; the contribution of the Stanford team to the course; cross-cultural interchange; the role of WebCT6 as communication tool; technological access problems; closing comments. All the students participated and an informative discussion lasting for an hour followed. The students discussed their experiences during the

programme, gave their opinions on positive and negative aspects and reflected on the effectiveness of the programme. This resulted in shared meaning on the ELISA programme. An additional outcome of the learning process was the DVD that was produced.

On 9 June, 2006, the sixth contact session took place. This was the third video conference and Stanford and the TUT teams participated. This contact session concluded the programme and consisted of a “theory” lecture via a video conference. The theme of the lecture was environmental journalism. The presenter was a Consulting Associate Professor from Stanford. The students had to prepare a 200 word piece reflecting a journalism perspective on any pressing issue relevant to environmental journalism. The Professor facilitated a healthy discussion about the students’ contributions. The second teaching assistant researched academic, professional and conference opportunities for environmental journalists in this regard. The idea was that students could use these assignments to compile and revise a written example to use later to apply for development opportunities.

6.4 Competition

Competition and cooperation are parallel in many ways. Competition is a significant interpersonal motivation. It is, however, often assumed to be bad. Competition can be used in certain ways to accomplish beneficial outcomes if its motivational power is exploited well.

The cooperative learning exercises demonstrated that the motivational power of competition was exploited resourcefully. When the students had to read a particular section of the articles that the presenter distributed, they were allowed a limited time to do so. They thus had to compete against the members of their own group to complete their reading task in time. Then the members of each group had to identify the main elements of the issues, recognise connections between the environment and safety, contribute towards the group discussion, synthesise the article, present a summary and state whether the assertions made were true or false. The Professor allowed a limited time to complete the assignment. By doing so the groups competed against each other all to the benefit of all the groups. A next example of the motivational power of competition is the assignment that required students to search particular web sites on their PDAs. Then they had to put the web addresses and correct URLs on paper and present it. They had to complete this task in a limited time, thus competing against all the students in the group. This competitive activity lead to the benefit of all the students as it resulted in a one-page master list of all the relevant web sites. The students could use this for future assignments and articles.

A next example of the positive outcomes of competition can be found in the assignments that the students completed. The students had the opportunities to compare the scores of their assignments.

They could do so by using different technologies such as the PDAs or WebCT6. With independent tasks such as assignments it is quite straightforward to encourage competition. Competition concerning independent tasks is identified as exogenous competition. Psychological needs can be relevant in competition. Competition can fulfil various psychological needs.

6.5 Recognition

Recognition is a form of interpersonal motivation that plays an important part in the learning process. In the ELISA programme the visibility of results manifested in three ways. These entailed the process of execution of the activity, the result of the activity and the additional results of the activity. Several examples of learning activities that employed recognition originated in the ELISA programme. The most important example of recognition was the feedback from the first teaching assistant after the students submitted their assignments. The feedback was visible because the students could access their progress on WebCT6 and print it out. The results of the activities were the marks that the teaching assistant awarded for the assignments. The additional results were the certificates issued by both Stanford and TUT after the students completed the programme.

The learning activity where the students had to search for particular web sites was another example where recognition was used as an interpersonal motivation. The Professor's mild recognition of the correct URLs was visible. The outcome of this activity was also visible because it resulted in a master-list containing all the significant URLs. The additional results were the students' subscription to the Society for Environmental Journalists and the Society's activities such as daily emails.

Another example was the third video conference that the Professor facilitated. The visible process of the activity was the vigorous discussion that followed the students' preparation of a 200 word piece reflecting a journalism perspective on any severe issue relevant to environmental journalism. This resulted in the Professor's visible recognition of the students' efforts and consisted of a "theory" lecture on environmental journalism. The additional results were the educational, professional and conference opportunities for environmental journalists that the second teaching assistant researched. Another example of additional results was the possibility that the students could use these revised assignments to apply for development opportunities.

6.6 Interdependence

Mutual goals created interdependence among the members of the ELISA group. Two kinds of social interdependence were visible during the implementation of the programme. These two kinds were positive interdependence (cooperation) and negative interdependence (competition). No

interdependence resulted in the phenomenon that no interaction or interchange took place. Learning tasks were segmented into dependent and independent units.

An example of interdependence was visible in the cooperative learning activity, web-search activity and Bluetooth-video activity that the Consulting Associate Professor facilitated on 31 March, 2006, when a group of Stanford representatives visited TUT. She divided the students randomly into four groups. She formed these groups distinctively to organise the students in diverse groups, to get them out of their comfort zones where they only interacted with a few of their fellow students, and to promote communication and collaboration among all the students in the groups. Each student received a copy of TIME magazine dated April 3, 2006. This European edition of TIME featured a special report on global warming. The following articles were used in the assignment: Starving in a land of plenty; The tipping point; Vicious cycles; The impact of Asia's giants. Each group had to divide the articles in equal sections (dependent units) among the students, read through their specific section, identify the key elements of the issues, identify links between the environment and safety, participate in their group discussion, piece the article together, present a synopsis and state whether the allegations made were true or false. Each member of the group was thus interdependent on the other members of the group to complete the activity. The Professor summarised the issues and concluded the activity by facilitating a group discussion that resulted in shared meaning on the topics.

The next assignment involved a web-search activity. The students received cards containing the following cues: EPA.gov/; National Audubon Society; African Wildlife Foundation; United Nations Environment Programme (UNEP); World Resources Institute (WRI); World Watch Institute. Their assignment involved that they had to search those web sites on their PDAs and then put the web addresses and correct URLs on paper (independent units). The Professor commissioned one of the students to synthesise all the cards and to compile a one-page master document that would be distributed among the students for further use in assignments and articles. Another example of cooperative learning where independent units emerged was the Bluetooth activity. Each student had to use his or her PDA to make a video clip and forward it to one of the Associate Professors of Education at Stanford.

7 How do we deal with cultural differences?

Culture is an ever-changing social construct and many different cultures exist side by side, globally as well as locally. Students in the ELISA programme represented English, Afrikaans, Indian, isiZulu, and Sesotho mother-tongue speakers. An awareness and understanding of cultural differences facilitated the process of dealing with different cultures.

The legacy of colonialism resided in an awareness of the *other* versus *the own identity and traditions*. Globalisation in all aspects shrunk the world. This makes an understanding of other cultures a necessity. An example of this premise is the outreach initiative of Stanford to Russia. The students were interested to learn about America and the American perspectives. They wanted to learn that in English because they understood American culture by means of English. First they wanted to learn that, then to translate the material and then to compare it to their own perspectives.

Contact with fellow students contributes to an awareness and understanding of other cultures. According to the Stanford team leader it is vital that students come into contact with their peers. She regarded the private learning process where the students come together on campus and get the opportunity to socialise outside their family units, as extremely important. This results in personal development. In order to socialize people effectively it is necessary to bring them together in HEIs. Attending lectures at a HEI has numerous benefits such as mingling with peers from different backgrounds and being exposed to other cultural perceptions. The advisory board at Stanford became aware of the phenomenon that some of the post-graduate students did not have an understanding of other cultures. This could prove a problem for engineering students who might take up positions in other countries. This resulted in the inclusion of a two year mandatory foreign language course as part of an engineering degree. In the ELISA programme the students had the opportunity to socialise with other students during the face-to-face contact sessions. This enabled them to mingle with peers and become aware of some of their cultural habits and viewpoints.

Local cultures can be preserved without citizens having to leave their native region or environment. In higher education increased electronic delivery enables students to participate in distant learning. In doing so they have the opportunity to benefit from distance learning and further their careers. The Stanford team leader mentioned the for-profit online business school of the University of Phoenix. This school offers bachelors' and masters' degrees in certain fields of study. This takes place in a virtual setting and is exceptionally valuable for adults who don't have the luxury to quit their jobs to continue their studies. The ELISA programme is also an example of the globalising functions of the Internet. Students could access learning material on various topics – an asset to the enrichment of their knowledge and exposure to new perspectives. They could then incorporate the new information with their own knowledge, decide where they stand in the issue and adopt a certain perspective. In this process they could thus apply their critical thinking skills and come to a decision. An example of glocalization originated from the ELISA students as a result of their subscription to the Society of Environmental Journalism (SEJ). They mentioned the possibility of submitting some of their assignments to the SEJ for publication because “we [South Africans] have got quite a bit of writing that we are doing ourselves...they could learn from us” (Focus-group interview, 2006).

The cultural differences that were embedded in the ELISA programme were dealt with by mutual understanding, awareness and contextualisation of a part of the curriculum. A question such as *How can the environmental perspectives of Stanford be valuable to individuals and to South Africa as a whole?* involves several initiatives. The answer lies in contextualising and individualising the content to such an extent that it is useful and applicable to the local [South African] situation. Local needs and global objectives are combined to create a useful model.

8 Which aspects of the programme worked well and why and how can they be improved to compensate for those that did not work well?

Several positive aspects characterised the pilot phase. National ownership of the curriculum was one of the positive aspects. The students had the opportunity to make the learning material their own and this had a wide-ranging effect on them. Positive aspects included the following:

8.1 Blended learning method

Several aspects that were included in the design of the programme worked well to deliver a unique learning experience. One of the most important aspects involved the blended learning method that the ELISA programme employed, resulting in a significant and successful learning experience. This approach enabled independent study – an excellent method for part-time journalism students. Thirteen of the fourteen students were working students, mostly in the journalism sector. This learning method enabled them to further their careers without interruption at work while they could still be financially independent.

8.2 Content and workload

The students experienced the content of the programme as universal and of great importance. The selection of topics included in the curriculum focused the students' attention on the necessity and the urgency of environmentalism. This is vital in South Africa as the country is currently [2009] experiencing the pressures of political turmoil in neighbouring countries specifically Zimbabwe. This results in an influx of immigrants that puts pressure on resources such as water, food, jobs and shelter. However, some of the ELISA students were extremely motivated and expressed the aspiration to continue their studies abroad, possibly at Stanford. Should this happen it could give expression to the Stanford team leader's objective to mingle with other students from other countries and different backgrounds, resulting in a "wonderful learning experience" (Stanford team leader, personal communication, April 24, 2006). Some of the students experienced the workload as satisfactory, easy and very quick to complete while other students experienced it as heavy. Aspects such as language

skills, resource availability, background and knowledge of the topic and time available to complete their assignments were determining factors in this regard. Language proficiency refers to the students' different linguistic abilities and skills. The availability of resources in order to complete their assignments remains a vital aspect. Background information and knowledge is important to get an understanding of the topic in order to complete the assignments in time.

8.3 Critical thinking skills and dispositions

The International Environmental Politics course developed critical thinking skills, which was one of the main objectives of the course. The students admitted that since the beginning of the course, they did not take any readings at face value. "This course really got us thinking more" (Focus-group interview, 2006). The outcome was changed perspectives – the students saw things in a different light once they started writing.

Critical thinking skills resulted in dispositions, the concept that involves the use and application of critical thinking skills. This led to a sensitive awareness and apprehension of the environment. This is a newly acquainted attitude that developed since the beginning of the course. One student admitted that, previously, "most of us didn't care" (Focus-group interview, 2006). The outcome of critical thinking skills and dispositions were that students felt empowered by their ability to ask questions and give their opinions. Aspects such as the impact of the industry on the environment, regulatory policies and the protection of the environment, became key issues. The students became aware of the responsibility of the industry to consider and protect the environment. They started questioning the regulatory policies of big companies in promoting the protection of the environment.

8.4 Internet use

Some of the students experienced the use of the Internet as positive and indispensable for research purposes. They reported that they enjoyed fast access and connectivity at home and/or at work. Students could however, also use their PDAs to get fast wireless access. The positive impact of the Internet is discussed under 2.2.4.

8.5 Feedback and motivation

Students experienced positive feedback from the teaching assistants. They appreciated the punctual feedback and encouraging remarks during the entire course. The first teaching assistant also offered synchronous online office hours to assist students who needed support. Intrinsic motivation was in the

form of the completion of the IEP module that formed part of the students' qualification. Extrinsic motivation involved the use of the PDAs and the certificate that the students received after completion of the module. After the video conferences socialising took place while the one-day face-to-face contact session included breakfast and a traditional South African barbeque. During this contact session students had the opportunity to mingle with the Stanford visiting team – another highlight of the programme.

8.6 Components of CAI

The pilot phase received a high rate of satisfaction and positive feedback from the students. This reaction is related to several components of the CAI lectures on the CD-ROMs. These positive aspects include four basic adequacy categories such as instructional adequacy, cosmetic adequacy, program adequacy and curriculum adequacy (Hannafin & Peck, 1988, pp. 303-316). I analysed lecture 1 (CD copy included) as an example of the pilot phase since the lesson protocol and features of all the lectures correlate with lecture 1. Positive aspects of lecture 1 involve the following adequacies:

8.6.1 Instructional adequacy

Instructional adequacy reflects on the degree to which the lesson offers the required types of support and features to achieve the desired lesson objectives. Instructional adequacy deals with several main components, which are described below.

“Are the directions for lesson control clearly stated?” (Hannafin & Peck, 1988, p. 303).

The directions for lesson-control options are indicated by navigation keys. The navigation keys consist of one blue arrow and seven white user-control buttons on a blue-fragmented background. The students have the options to revisit the navigation keys from any section in the lesson. These lesson-control options appear at the bottom of every screen that forms part of the lesson. The most important aspect of the lesson is clear directions to the students. The lesson-control options include the following navigation keys:

Table 16: Navigation keys

Icon	Description
	Back
	Back to the beginning of Lecture 1
	Back to the previous section of the lecture
	Pause
	Activate
	Stop
	Go to the next section of the lecture
	Last section of Lecture 1

The lesson provides guidance of the ongoing directions by means of the abovementioned options. Help or assistance options are not provided. The directions are effective and prevent the students from floundering aimlessly during a lesson.

“Is the lesson consistent with the outcomes specified in the objective?” (Hannafin & Peck, 1988, p. 303).

The stated course objectives are systematic guides that steer the lesson activities. Two of the course objectives are to identify environmental issues and challenges of global importance and to identify international treaties to solve environmental problems. These correlate with the lesson activities namely to identify contemporary environmental problems, their causes, possible solutions and treaties. The lesson activities correlate with the instructions in Assignment 1 namely to identify one internationally important environmental problem and formulate its causes and possible solutions. The correlation of the lesson objectives, lesson activities and assignment questions ensures the validity of lesson instructions.

“Is the instructional sequence easy to follow and empirically based?” (Hannafin & Peck, 1988, p. 303).

Lesson flow is vital to accomplish learning. One frame flows smooth and logically to the following which ensures effective learning attention. The progression in the lesson is well coordinated and enables effective learning. It is easy to follow the lesson, make sense of it and comprehend the lesson content.

“Is the lesson readily understood and free from vague and ambiguous text?” (Hannafin & Peck, 1988, p. 304).

The lesson uses readily understood techniques to convey the information. The Stanford lecturer asks questions, the students have the opportunity to reply and the lecturer summarises the answers in writing on the whiteboard. This summary appears on the screen. The lesson is free from excessive jargon, ambiguous text or confusing terms that detract learner attention.

“Is the basic design logic of the lesson sensible, including the components and features of well-designed lessons?” (Hannafin & Peck, 1988, p. 305).

The design logic of the lesson is sensible. Key vocabulary, the hierarchical relationships among ideas and the choice of the desired lesson activities influence the comprehensibility favourably. The relationship among aspects such as the problems, causes and solutions to environmental dilemmas is clear, unambiguous and well illustrated.

“Are lesson procedures and activities efficient?” (Hannafin & Peck, 1988, p. 306).

Lesson procedures and activities are efficient. Lesson objectives are the main focus. The identification of problems causes and possible solutions are explored. No unnecessary information is presented. The lesson teaches the skill of exploring the problems and forming an opinion on it by discussing it.

“Have important terms, concepts and information been amplified effectively?” (Hannafin & Peck, 1988, p. 306).

The lesson employs several attention-directing techniques to focus the students' attention on significant terms, concepts and information. Amplification techniques involve cosmetic amplification and information-based amplification (Hannafin & Peck, 1988, pp. 185-191).

Cosmetic amplification features include type size, font, text animation, computer graphics, colour and sound. The lesson uses different type sizes to present the content. This allows information to be enlarged (Hannafin & Peck, 1988, p. 186). The type size of the topics is 26, that of the text is 16 while the type size of the menu topics is 8. The lesson employs uppercase to present the headings of each topic, which makes it more difficult to read than sentence case or lowercase. The lesson uses sentence case to present the informational content. The use of italics to present the headings of the topics and the text impedes the readability. The topic on Future problems and examples uses a regular font to distinguish between main points and supporting information.

The font of the headings and text differs from the font of the menu topics. Menu topics are presented in Sans Serif MS. The use of italics to present the headings of the topics and the text impedes the readability.

Text animation and computer graphics are partly cosmetic but also substantive to illustrate important information. The lesson employs text animation to present the discussed content. The lecturer uses the image of a graph on the whiteboard to present illustrative support for content presented verbally. The graph is not illustrated on the screen.

The lesson employs colour effectively to amplify important information. The use of colour is discussed in detail under Cosmetic adequacy (Chapter 4, 8.6.2)

The lesson incorporates sound as an important aural cue to accentuate significant terms, concepts and information. The presenter draws attention to the relevant aspects by presenting information verbally where upon the students respond verbally.

The lesson employs information-based amplification techniques such as orienting strategies, repetition and recollection. These amplification techniques depend on deliberate "...manifestations of the lesson content itself and not on the capabilities of the computer used to deliver the CAI" (Hannafin & Peck, 1988).

The lecturer uses orientation to emphasise the lesson objectives. This approach aids the students to grasp the relationship among the terms, concepts and information mentioned in the lesson. This strategy helps the students to understand the integration process of existing information with current information.

Repetition of the essential aspects occurs as the lecturer presents important terms verbally, discusses them and writes them down on the white board. This information is also presented on the screen. The lesson features five examples of the identification of environmental problems, causes and solutions.

Recollection involves that the students recall information from previous or current lectures. This happens due to the students' previous preparation of the learning material and already known information.

“Does the lesson distribute emphasis according to the importance of the different parts and sections?” (Hannafin & Peck, 1988, p. 307).

The lesson emphasises important aspects adequately, causing learners to sort through the lesson. The lecturer repeatedly explores different environmental problems such as population, deforestation, fisheries, climate change, toxic substances and water resources. The lesson eases the learning task by cueing learners to important information, such as the discussion on the causes and solutions to the problems. Assigning emphasis is one of the most challenging tasks of CAI lesson design.

“Does the lesson provide opportunities for meaningful interaction between the student and the lesson content?” (Hannafin & Peck, 1988, p. 307).

The interactive lesson encourages the Stanford students to respond to the instructional content. The interactivity is accomplished through the lecturer applying the technique of questions and answers. This guides the students to participate in the discussion, help them to demonstrate comprehension of the lesson content, aid them to reflect on their own learning and assist them to grasp the lesson content. The lesson does not involve the TUT students in interaction.

“Does the lesson personalise instruction appropriately?” (Hannafin & Peck, 1988, p. 308).

Relevancy and meaningfulness are two aspects that are employed in order to ensure personalisation and to make the activities seem relevant for each student. The lecturer personalises the instructions by using the Stanford's students' names in the lesson. He incorporates significant examples into the discussion appropriately. Some students may regard the computer-learner interaction as informal or conversational. The lesson is perceived as personal while the techniques to make the activities appear significant for each student result in greater acceptance of the lesson. The lesson does not personalise instructions for the TUT students.

“Is the step size appropriate for the kind of learners and learning task?” (Hannafin & Peck, 1988, p. 309).

The limitation of the step size to the appropriate size ensures the learning of new individual concepts. The lesson limits the step sizes to the information needed in order to master new concepts. The lesson does not contain unnecessary concepts in the same step and results in effective initial

instruction. Text divided into chunks prevents the display of too much information in one lesson, thus increasing the quality of the lesson. The lesson bridges acquired steps into subsequent steps, such as the discussion of causes and solutions to different environmental problems.

“Are the pacing procedures and display rate appropriate for the learners and learning task?” (Hannafin & Peck, 1988, p. 310).

The lesson uses computer-controlled pacing of frames. The text appears on the screen and is removed by means of program control. All students do not read at the same rate which causes that some of them may not have completed reading all the information before it is removed. This may result in frustration which inhibits learning (Merrill, 1994). Pause and stop options are, however, incorporated to enable the students to take charge of the pace of frames that display new information. Students' reading and study methods involve a key factor such as variability which should be accommodated. Computer-controlled pacing of frames requires evaluation of lessons to determine realistic time per frame. If the pacing rate is too fast the students can repeat the lesson.

“Are lesson activities, content, and procedures likely to motivate students to perform?” (Hannafin & Peck, 1988, p. 311).

Lesson activities, content and procedures are well-designed and organised to motivate the students. Relevant motivational factors such as challenge, curiosity and control (Malone & Lepper, 1987) are incorporated. The lecturer challenges the students to identify environmental problems. He then arouses curiosity by presenting new information that attract attention and encourage the students to explore additional information. The TUT students have the option of lesson control which enables them to make a choice pertaining to the lesson menu. It is possible to access any part of the menu at any time. Motivational aspects also include attention, relevance, confidence and satisfaction (Keller & Suzuki, 1988). The lecturer attracts attention by presenting information. This correlates with the abovementioned curiosity (Malone & Lepper, 1987). Relevance involves that the lesson content (environmental problems, solutions and treaties) will be useful. Confidence involves the opportunity to complete the lesson successfully. Satisfaction involves activities which allow the students to apply the information that they have mastered.

“Are required or desired record-keeping capabilities available in the lesson?” (Hannafin & Peck, 1988, p. 311).

Record-keeping capabilities are not available in the lesson. (Progress reports and achievement records are provided in WebCT6).

“Are appropriate lesson-control options available?” (Hannafin & Peck, 1988, p. 311).

Lesson-control options such as “Help” and “Review” are not provided. The lesson can be repeated by returning to the Beginning Exercise or it can be terminated at any time by activating the last topic of the menu. The lesson completely avoids the idea of trapping the students within the lesson.

8.6.2 Cosmetic adequacy

In the past, cosmetic features of CAI received more attention than other more important concerns. Colour, sound and motion played a remarkable role. Visual appeal is important in lesson design but it is not the principal concern.

“Is screen space used effectively?” (Hannafin & Peck, 1988, p. 311).

The informational content is neatly organised and arranged on the screen. The screen space is used effectively. It is possible to identify, locate and read all the information on the screen.

The use of screen space differs for every screen according to the amount of informational content presented under the topic. The amount of lines used differs from a few lines to half of the screen to three quarters of the screen to almost all of the available space. The last topic on the menu features only the heading namely Discussion of syllabus, which appears in the middle of the screen. This topic does not present any informational content on the screen due to the fact that the presenter discusses the relevant information.

Some screens allow a white space between the lines which contribute to the readability of the text. Some screens use indentation, bullets, letters and numbers to distinguish between the main points and supporting information.

“Is there a consistent and effective protocol for the various frames in the lesson?” (Hannafin & Peck, 1988, p. 311).

Consistent and effective protocol exists for the various frames in the lesson. The designers designated the different zones of the frames for particular uses. Lesson information such as the topic always appears at the top of the frame. The informational content appears towards the middle of the frame while the proceeding navigation keys are always located at the bottom of the frame. The designers used the locations, frame space and text layout consistently throughout all the frames. An exception to the rule is the last topic on the menu namely Discussion of syllabus which appears in the

middle of the screen. This is functional because the lecturer discusses the appropriate information and does not summarise the content on the frame. According to Hannafin & Peck (1988, p. 178) “The key to effective frame protocol is consistency”.

“Is the information presented free of crowding and cramming?” (Hannafin & Peck, 1988, p. 311).

The informational content differs from frame to frame. Some screens contain more informational content than others. Screens that are free of crowding and cramming are the following: Beginning exercise; Core themes for course and Discussion of syllabus. The first two screens have a white space left open between the different lines which contribute towards the readability of the text. On the Discussion-of-syllabus screen, the second last topic on the menu topic, the text is centered and consists only of the topic.

Some frames are crammed with information. Examples of these are the following: General listing of contemporary environmental problems; Identified problems; Future problems; Central themes; Tragedy of the commons; Example of tragedy of the commons – first; Example of tragedy of the commons – second; Example of tragedy of the commons – third; Different problems require different solutions; Perverse outcomes and Sequence of course. Information is presented without a blank space between the different lines which create the idea of being crowded. Some letter types are printed in italics while the lesson uses a grid as background. These features seriously impede and complicate the students’ task to sort the lesson out and to make sense of it. Repeated crammed frames result in a boring learning experience. This compromises the computer’s capability to direct learning; ending in instruction being similar to those in print media rather than being characteristic of well-designed CAI.

The topic menu is presented in uppercase which creates the impression of cramming and crowding. Each frame should present the necessary content to keep the students interested and to ensure progress through the lesson.

“Do color and sound, if used, support student learning?” (Hannafin & Peck, 1988, p. 312).

Both colour and sound are used effectively to support learning. The use of colour can enhance the performance of the students (Schwier & Misanchuk, 1995). Graphics in the form of real-life colour video clips of the three lecturers on the title page attract the students’ attention. The use of colour video clips of both lecturers and students during the lesson enliven the presentation and responses.

Colour is also used effectively to attract attention to important information. The halo in pink and blue around the name of the course International Environmental Politics emphasises it. The light blue colour that is used as background for the three topics of Lectures 1, 2 and 3 on the title page, focuses the students' attention on the specific topics of the lectures. The green colour that is applied to the image of a tree on the right hand side of the title page accentuates the environmental aspect of the lesson.

The lesson employs colour sparingly to support student learning. Examples are the graphics in the form of a seal and a line graph in grey on the title page. The use of green when the icons Play; Previous Clip; Next Clip are activated, can be regarded as "consistent with common usages in society" (Alessi & Trollip, 1991, p. 42) where green is associated with "go". The mute icon turns yellow when activated while the volume is indicated by green.

Excessive colour is avoided in the text of the lesson. Black text on white with a pale grey grid background impedes the readability. The choice of blue for the topics is effective and distinguishes it from the rest of the information. A deeper bright blue quadrangle appears in the right upper corner of the screen when the title and introduction to the course is presented. It features as a background that disappears when the video clip of the Stanford course author appears.

The use of colour to amplify information is functional. The light blue that is applied to the lessons' menu alternates with a lighter shade when the specific topic is presented. The names of the presenters appear swiftly in deep cerise and focus the students' attention on their biographical details. The image of flags of various countries contributes to the international feel of the programme and echoes the outreach aspect.

The lesson uses audio effectively as a presentation mode (Alessi & Trollip, 1991) as well as to attracting attention and supporting text (Stemler, 1997). The systematic use of sound improves the instructional value of the lesson. The students may use the option to pause the audio if necessary.

"Does animation, if used, support student learning?" (Hannafin & Peck, 1988, p. 312).

The lesson uses text animation to support student learning. Since it is applied systematically and support lesson objectives it can improve the cosmetic appeal of the lesson.

"Are lesson frames free from scrolling effects?" (Hannafin & Peck, 1988, p. 312).

The lesson frames are free from scrolling effects. The menu in Lecture 1 consists of sixteen programme topics. Thirteen of these sections are accessible on the title page while the remaining

three require scrolling down. Designers should avoid and eliminate scrolling due to the fact that it may be annoying, may distract learners' attention and reduces lesson appeal.

“Do lesson activities appeal to students?” (Hannafin & Peck, 1988, p. 312).

In this lesson the Stanford students listened attentively to the lecturer, responded spontaneously and participated in the debate. The TUT students regarded the lesson activities appealing because they were exposed to an interactive lesson by an international environmental specialist and Stanford class. According to Hannafin & Peck (1988) CAI designers often base their ideas of what would be appealing to the students on personal experience, trial and error and recommended preferences. In some cases, learners do not regard these features as interesting. The formative evaluation process requires that designers verify what learners regard as appealing, and not assume it.

“Is the lesson free from typographical errors?” (Hannafin & Peck, 1988, p. 312).

The lesson is free from typographical mistakes that can reduce the cosmetic appeal of a successful lesson.

8.6.3 Program adequacy

It is important that a lesson executes as planned. Designers use a process called debugging to evaluate program adequacy. This process is defined as follows: “Debugging is a process where lessons are executed, with the resulting input, output, and control decisions examined for accuracy. Program commands are then altered as needed until the program executes as planned” (Hannafin & Peck, 1988, p. 312). Debugging solves most of the apparent program errors in the lesson.

Sometimes, bugs occur merely in certain circumstances. It may be problematic to predict these problems during debugging. In some cases, collapses in program logic do not cease the lesson execution. Programming errors do not let the lesson crash, but unintentionally direct learners to possible but inappropriate parts of the lesson. The following aspects are important when evaluating program adequacy.

“Does the lesson run as intended?” (Hannafin & Peck, 1988, p. 313).

The computer determinedly presents the required actions in all prescribed situations. The different topics can be accessed subsequently. The lesson-control buttons function effectively. Therefore, the lesson runs as intended. The programming logic is the most important feature of program adequacy.

Program logic concerns “the manner in which the program execution is consistent with the kinds of lesson input, output and control prescribed in the lesson flow chart” (Hannafin & Peck, 1988, p. 313).

“Is the lesson free of conceptual and programming loops?” (Hannafin & Peck, 1988, p. 313).

No programming loops occurred thanks to good planning and programming. Systematic evaluation can identify loops and cautious planning and programming can eliminate problems. The lesson employs a linear design as all the students continue through the same instruction in the same sequence. Conceptual loops may occur due to the conceptual difficulty of the learning material or as a result of the students’ limitations.

“Does the lesson minimize the disk-management requirements for the learner?” (Hannafin & Peck, 1988, p. 313).

The students are able to access the lesson by switching the computer on and accessing the disk. The lesson is self-starting and does not require manipulation of the computer. Conceptual comprehension of the computer is not necessary to employ the lesson.

“Does the lesson run efficiently?” (Hannafin & Peck, 1988, p. 313).

The lesson runs effectively. The lesson designers finished the preferred activities as efficient as possible. Well-defined methods, subroutines and variables streamlined programming needs and provide extra flexibility in the lesson.

“Does the lesson include sufficient security for both the students and the disk itself?” (Hannafin & Peck, 1988, p. 313).

The designers provided sufficient security for the students and the disk. The TUT students used individual passwords to access the lesson on WebCT6. Increasing sophistication among learners require safeguards in lessons to ensure that aspects such as individual learner performance summaries are kept safe and that accidental or intentional sabotage of lessons do not occur. Security concerns are becoming progressively more important for CAI designers.

“Has the domain of appropriate responses been carefully anticipated?” (Hannafin & Peck, 1988, p. 314).

The domain of appropriate responses is not applicable in the lesson. The lesson does not employ any opportunities for multiple-choice responses, true-false responses or student input. Therefore,

significant, sustained interaction does not take place. Instead, the teaching assistant responds to constructed questions such as the formulated assignments and mini-assignments. Response management involves the way in which the computer accepts and assesses the students' input during a lesson. Responses can be classified as legal or illegal and authorised or unauthorised.

“Have appropriate procedures for evaluating student input been provided?” (Hannafin & Peck, 1988, p. 314).

Appropriate procedures for evaluating student input involved the evaluation of assignments and mini-assignments. The programme did not involve multiple-choice or true-false choice of replies in the lesson. Assignments were formulated in the form of 600 word opinion pieces or mini-assignments comprising 200 words. The assignment questions did not have straightforward correct or incorrect answers. The students had to analyse the information in the prescribed lectures and readings and then take a position on the matter. Since the students were enrolled as journalism students they had to convince their readers of their opinions, support their arguments with evidence and present their ideas logically (First Teaching Assistant, personal communication, 2006). The teaching assistant used the following grading rubric based on five categories to grade the major assignments. The categories are structure, content, evidence, writing and references. Structure refers to the organisation of ideas, arguments and conclusion. Content involves the correct use of facts, the use of theoretical concepts and the use of concise, unambiguous arguments and counter-arguments. Reliable, persuasive use of evidence is indispensable while writing has to reflect effective language and grammar usage. Appropriate reference citing is essential.

The following scale was used:

Table 17: Scales

Full mark 25	Full mark 15	Full mark 10
21 – 25 marks – excellent	13 – 15 marks – excellent	9 – 10 marks – excellent
16 – 20 marks – good	10 – 12 marks – good	7 – 8 marks – good
11 – 15 marks – adequate	7 – 9 marks – adequate	5 – 6 marks – adequate
6 – 10 marks – poor	4 – 6 marks – poor	3 – 4 marks – poor
0 – 5 marks – unacceptable	0 – 3 marks – unacceptable	0 – 2 marks – unacceptable

Scoring is shown in table 18:

Table 18: Scores

	Possible marks	Marks earned
Structure	25	
Content	25	
Evidence	25	
Writing	15	
References	10	
TOTAL	100	

The following grading rubric applied to mini-assignments:

21 – 25 marks – excellent

16 – 20 marks – good

11 – 15 marks – adequate

6 – 10 marks – poor

0 – 5 marks - unacceptable

Students received their grades and comments after completion of their assignments via WebCT6.

“Does the lesson display information accurately?” (Hannafin & Peck, 1988, p. 314).

Accuracy of display is a feature of the lesson. The verbal presentation and response of the Stanford students are displayed correctly on the screen. The location of the presented information “is consistent with the frame design parameters” (Hannafin & Peck, 1988, p. 314). The consistent designation of different zones on a frame for particular uses results in simplifying the learning task (Hannafin & Peck, 1988, p. 175). No split-end words occur at the end of a line. Adequate text centering, lack of word truncation and appropriate screen dimensions contribute to the phenomenon that the lesson displays information accurately. The content of the lesson is output to the correct position and presented as planned.

“Have lesson components been logically and systematically located?” (Hannafin & Peck, 1988, p. 314).

Lesson components have been systematically located and are easily identified uniformly across subsequent frames. Components such as the lesson content or topic menu appear on the specified location on the frame across successive frames. Lesson content appears logically towards the centre

of the frame with the topic menu designated towards the right bottom corner of the frame. Successive identification of lesson components eases the learning task.

“Is lesson execution consistent with the conditions specified in the flowchart?” (Hannafin & Peck, 1988, p. 314).

The lesson execution is consistent with the lesson flowchart. The lesson proceeds through a fixed sequence and executes as planned.

8.6.4 Curriculum adequacy

The extent to which the “lesson procedures, activities, and formats are consistent with accepted standards” (Hannafin & Peck, 1988, p. 314) is one of the essential factors concerning the long-term acceptability of the lesson. According to Wholeben (Hannafin & Peck, 1988) the lesson should be compatible with the approaches and methods of both teachers and students, easily integrated into current curriculum activities and compatible with types of lesson procedures already taking place.

“Is the lesson consistent with other related lessons?” (Hannafin & Peck, 1988, p. 315).

Other lessons exist in the International Security course and represent the standard of available instructional software. The newly designed and programmed lessons form part of the International Environmental Politics IDL 102 module and logically account for the anticipations that preceding lessons created. This does not imply that the new lessons should reflect preceding lessons. It is essential to scrutinise successful and popular aspects of existing lessons as they are important and form part of the anticipations of the users.

“Are lesson procedures consistent with the expectations of users?” (Hannafin & Peck, 1988, p. 315).

Contact with the procedures of a variety of lessons shaped user anticipations over time. The lesson offers fairly reliable methods for lesson execution. The methods used in the lesson are useful and compatible with regard to other lessons.

“To the extent feasible and advisable, have teacher and user preference been included?” (Hannafin & Peck, 1988, p. 315).

Teacher preferences have been included in the curriculum as the module forms part of a specially designed programme. The Stanford academic and research teams designed the module IEP as part

of a whole range of security issues. Teacher preferences regarding instructions that match the students' learning styles, have been considered. The designers tried to accommodate the students' preferences regarding instructions in order to enhance the learning process.

“Could the lesson be used as a basis for additional, related lesson development?” (Hannafin & Peck, 1988, p. 315).

The lesson consists of Lecture 1 which forms part of the ELISA project. The content consists of 15 lectures that were all created utilising the same protocol and response formats. The lesson protocol allows for the development of supplementary lessons. The lesson could be used as an example for additional related lesson development. The ELISA project was employed as a pilot phase that could be used to create additional related lessons.

“Does the lesson contain information likely to become quickly obsolete?” (Hannafin & Peck, 1988, p. 315).

The lesson contains information that will not become quickly obsolete. Due to several challenging factors to the planet such as population growth, climate change, limited water resources, species loss, toxic substances and deforestation, environmental issues will remain universal problems. Solutions to the mentioned problems will probably remain current and future environmental issues. South Africa as part of Africa currently experiences harsh climate conditions such as exceptional rainfall in some parts of the country and devastating veld fires in other regions. Food shortages, limited water resources and population growth in neighbouring countries such as Zimbabwe, Mozambique and Lesotho cause devastation and cause crippling demands on the sustainability of the environment.

“Can the lesson be completed within the allotted time?” (Hannafin & Peck, 1988, p. 315).

The lesson was completed within the allotted time. The time required for the completion of the lesson was 90 minutes. The designers were aware of the time limits agreed upon for lesson completion. It is inadequate to teach desired proficiencies if the required time is prohibitive. Due to the flexibility in the timeline, the students were afforded the opportunity to complete the lesson in their own time.

“Does the lesson offer flexibility in how it can be used?” (Hannafin & Peck, 1988, p. 316).

The lesson offers flexibility with regard to the navigation keys, the menu and the timeline. Navigation keys can be used to go to the next section of the lesson, to go back to the previous section of the lesson, to go back to the introduction of the course, to go back to the beginning of Lecture 1, to pause, to activate the lesson or go to the last topic of the menu. The menu offers flexibility regarding user

control without compromising the fundamental design. The students can access different menu topics if preferred. Flexibility regarding the timeline refers to the possibility to pause the lesson and continue at a later stage from there. The lesson does not contain options such as a hidden menu, varying lesson parameters, specification of the number of attempts per item or storage of students' scores to printer or disc. The documentation of the students' scores is managed through WebCT6.

9 Which aspects did not work well and why and how can they be improved?

The South African team as well as the students were of the opinion that, although generally speaking, the programme worked well. It became clear, however, that various aspects could be improved. These include the following:

9.1 Combination of course material

The combination of course material involved among others the introduction of PDA technology. One of the aspects that could be improved concerns the loan versus ownership of the PDAs. Should students be able to use the wireless handheld mobiles on a permanent basis it could enhance the hands-on approach of the programme and result in augmented journalism. However, the cost of the devices played a decisive role in the financial planning and it was decided that comprehensive research on the PDAs would be performed and included in subsequent studies. Skills to use PDA technology were insufficient. Since the students were introduced to PDA technology they had to adapt to this innovation in the minimum period of nineteen weeks. One of the assignments required them to record a video clip, attach it to the assignment and forward it via Bluetooth. Only one student succeeded in accomplishing this task. The negotiations with the cell-phone supplier MTN turned out to be cumbersome, time-consuming and caused unnecessary and avoidable irritation.

9.2 Workload

Some of the students felt that the workload was too demanding. The Stanford team selected a vast amount of reading as background for the topics. Some of the students indicated that they had limited time to research the prescribed topics to complete the assignments. This resulted in the unfortunate situation that not all the students completed their assignments. Despite this barrier all the students completed the course and received their certificates.

9.3 WebCT6

Some of the students did not have the necessary skills to use WebCT6 correctly. They experienced problems when they tried to submit their assignments “I never knew where to go...So to use a thing like WebCT6 is not easy...people just posted all over the show on different forums” (Focus-group interview, 2006). This resulted in a complication, namely that the assignments that were individually posted reflected as being posted by a group. This was later rectified. The email function of WebCT6 caused a dilemma. Instead of using the correct protocol to access the email function of WebCT6, some students used their own personal email facilities to communicate with the teaching assistants. The students were informed not to use their addresses to submit their assignments. Another problem was that some students could not access all the files that they were supposed to.

Geographical barriers formed part of the problems that can be improved. Not all the students resided in Tshwane. It was made clear from the beginning of the module that face-to-face contact sessions formed part of the programme and that attendance was mandatory. However, face-to-face contact sessions proved to be an obstacle for some students who had to take leave in order to attend the sessions.

9.4 Schedule

Some of the students objected to the date that the assignments were posted on WebCT6. They felt that not enough time was allowed between the posting date and the submission date. The submission dates used to be on a Friday at 24:00. This was unpractical and they suggested that it should be changed to a Sunday, Monday or Tuesday. This could afford the students the opportunity to work on their assignments during the weekends. They felt that a schedule containing all the information should be available at the beginning of the course.

9.5 Internet use

Contradictory to the positive aspects of Internet use, some students reported that they only had Internet access at work. They were, however, not permitted to use the Internet for study purposes during working hours and had to stay after work to research and complete assignments. Internet connectivity proved to be problematic for those students who did not have access to broadband.

9.6 Components of CAI

In order to access the lectures specific hardware as well as software had to be installed. The reason for this is that the lesson contains an audio-option that required a CD-ROM drive in order to run the compact discs. Software such as Realtime One had to be installed to access the lesson individually.

10 Reasons for the discontinuation of the project

In September 2006 Stanford unexpectedly informed the South African partners that the project would be discontinued due to several reasons. Their objections related to the lack of progress regarding content scheduling, media production, course logistics, and research practicalities. This news came as a surprise because from a South African perspective the pilot phase was successful.

With regard to content scheduling I wish to point out that in September 2006, before Stanford informed TUT that the project would be cancelled, the Stanford team leader reported that she was researching the specifications for the second year module. This module was due to commence at the start of the 2007 TUT academic year.

With regard to content planning, I was surprised to learn that the mutually agreed to curriculum specifications were apparently in doubt, whereas prior to the implementation of the ELISA phase, both the Stanford and South African participants agreed on adaptation and contextualization of the existing module to fit in with TUT's Department of Journalism curricular specifications. During the interview with a Director of the FSIS he mentioned that "The kind of local/global balance is extremely tricky. People have to feel contextually comfortable, so if it is completely disconnected from life as they know it, it's not going to register, it's not going to penetrate. On the other hand, if it is exclusively local without the global link-up then the relevance or what one is doing, is lost" (Director of the FSIS, personal communication, 2006).

In the interview with the Stanford team leader (Personal communication, April 24, 2006) she too emphasised the importance of contextualization: "...when you want to work closer with another organization and you want to meet the needs of the students which would be learning about it, in this case, International Environmental Politics, you need very much to take into consideration what their needs are and their expectations are. So in this case the choice of the environmental course was very appropriate. What was fascinating was being able to work with the South African environmental specialist to find out what are the areas of interest to you all. I think that it is really crucial having a local person on the ground to contextualise it further. In this type of situation you have one perspective that we are giving and then to have someone who can say: 'Ok, what you have heard at this level, how do you apply it to South Africa or to you as an individual?', and then further individualise it that

way. I think it is extremely helpful. I don't think a course could be successful if you were just going to do it for the for-profit model, say: 'Here is the course, take it' because people might not necessarily understand some of the case studies or some of the expressions because everything would be couched in American terms, and those are not necessarily applicable to other countries. So that is extremely important. I have learned the value of really having someone on the ground to help tie in whatever the content is, into that local and individual perspective and then meet those needs".

Despite the mutual agreement to contextualize and adapt the curriculum Stanford afterwards referred to this contextualization as "never a good fit" (Blignaut & Conradie, 2006). With regard to media production, course logistics, and research practicalities this study does not investigate the "why?" of it as I believe that there are enough data for a whole new study into why this happened.