

Chapter 1
Introduction, background and research
problem

Chapter 2
Literature review

Chapter 3
Research design and methodology

Chapter 4
Analysing the case, evidence and
discussions

Chapter 5
Conclusions and recommendations



4. CHAPTER 4 ANALYZING THE CASE, EVIDENCE AND DISCUSSIONS

Introduction

This chapter reports on the results of the various data collection instruments that I used in this study. The instruments concerned were questionnaires, focus group interviews, telephone interviews, postings in the discussion forums, and webserver log files. Various kinds of analysis were made of data collected from these instruments after the data had been transposed into usable form.

Structure of Chapter 4

Chapter 4 presents the results obtained from an analysis of the data for the purpose of answering the main research question and the four subquestions. The questions requiring to be answered were:

1. To what extent do certain pedagogical theories and eLearning theories inform a high school eLearning resource?
2. Why do certain community elements in an eLearning resource contribute to creating and sustaining high school learning?
3. In what way and why do certain communication, collaboration and social elements influence a high school eLearning resource?
4. How do certain technological aspects and instructional design issues affect a high school e-learning resource?

All the data has been appended to this document in the form of annexures and



an attached data-DVD. Qualitative descriptions of the eLearning interface and the learners have also been provided. These have not been grammatically processed or corrected but have been preserved in their original, authentic form. In order to preserve the confidentiality and anonymity of the participant learners, the learners' names have been deliberately excised from the record.

During the crystallization process (Richardson, 1995), the same story is told by means of data gathered from different sources. I have therefore attempted to look at the data from the perspective supplied by the various data instruments in the study and have tried to find explanations for evident similarities and differences.

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Chapter 4 Analyzing the case, evidence and discussion

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4.1. Answering sub-question 1 : To what extent do certain pedagogical theories and eLearning theories inform a high school eLearning resource?

Organiser

The following section uses the results obtained from the data analysis to answer the first sub-question of the research – a question about pedagogics. In the first place, the overall academic results are presented. In the second place, the integrated data from the questionnaires and interviews is used to answer question 1.

This question relates to issues about pedagogics and how that impacts on the eLearning resource.

The analyzed results of the **questionnaires** are presented in **ANNEXURES 10,11 and 12**. The summarised results of the various **interviews** are presented separately in **ANNEXURE 13**. The **transcribed interviews** have been written onto the DVD. But in this chapter the results are presented as an integrated whole.

4.1.1. The overall academic results were favourable

Because academic results are relevant to judging the output of the eLearning resource, they are included at this point as evidence for the overall pedagogical

performance of the learners in the system. Since sub-question 1 deals with the pedagogical aspects of a high school eLearning resource, this data is necessary for answering this sub-question.

The Cambridge examinations written by the learners constitute a valid measuring instrument to judge the overall academic performance of the learners. These examinations are externally devised, moderated and controlled examinations under the aegis of Cambridge University International Examinations. The assessment standards of these examinations focus mainly on skills of analysis, synthesis and evaluation and are marked externally by markers authorised by Cambridge University International Examinations. The CIE website contains full details of the assessment standards used in marking (Cambridge International Examinations, 2006).

Research finding 1 : The overall academic performance was favourable

The performance of the learners in the Cambridge external examinations has been good and has continued to improve from year to year, even after the implementation of the eLearning resource in 2005. The annual learner performance from between 2000 and 2005 is indicated by the following figures:

| Year of Cambridge examination | Learner performance (pass rate) express as a percentage |
|--------------------------------------|--|
| 2000 | 76 |
| 2001 | 78 |
| 2002 | 80 |

| | |
|--|----|
| 2003 | 85 |
| 2004** eLearning resource was first implemented | 92 |
| 2005 | 92 |

Table 34 : Learner performance 2000 to 2005

The table shows the learner performance for the year 2000 to 2005, with year 2004 the first year of implementation of the eLearning resource.

I have included the academic results for the five years between 2000 and 2005 (Cronje, 2006b) below because they have a bearing on the research and shed light on the context in which the research takes place. They also put the technological build-up and the introduction of the eLearning interface into the context of academic performance. The table below details the academic results.

| Year | Enrolled subjects | Fall-out | Wrote exam | Failed (un-graded) | Passed | Distinctions | University pass |
|------|-------------------|----------|------------|--------------------|--------|--------------|-----------------|
| 2000 | 743 | 197 | 546 | 131 | 415 | 12 | 181 |
| | | 26% | 73% | 24% | 76% | 2% | 33% |
| 2001 | 995 | 429 | 566 | 122 | 444 | 20 | 230 |
| | | 43% | 57% | 21% | 78% | 4% | 41% |
| 2002 | 1298 | 858 | 440 | 87 | 353 | 25 | 199 |
| | | 66% | 34% | 20% | 80% | 5% | 45% |
| 2003 | 1351 | 1039 | 312 | 47 | 265 | 24 | 192 |
| | | 77% | 23% | 15% | 85% | 8% | 62% |
| 2004 | 514 | 142 | 357 | 29 | 328 | 39 | 186 |
| | | 28% | 30% | 8% | 92% | 11% | 52% |
| 2005 | 686 | 272 | 414 | 34 | 380 | 42 | 231 |
| | | 39% | 61% | 8% | 92% | 10% | 56% |

Table 35 : Data table of academic results of Cambridge students in this research 2000-2005

The chart shows the overall pass rate (as a percentage) of the learners who sat for the Cambridge external examinations between 2000 and 2005. A more detailed presentation of the data is presented in ANNEXURE (4.1.1 percentage pass rate.doc)

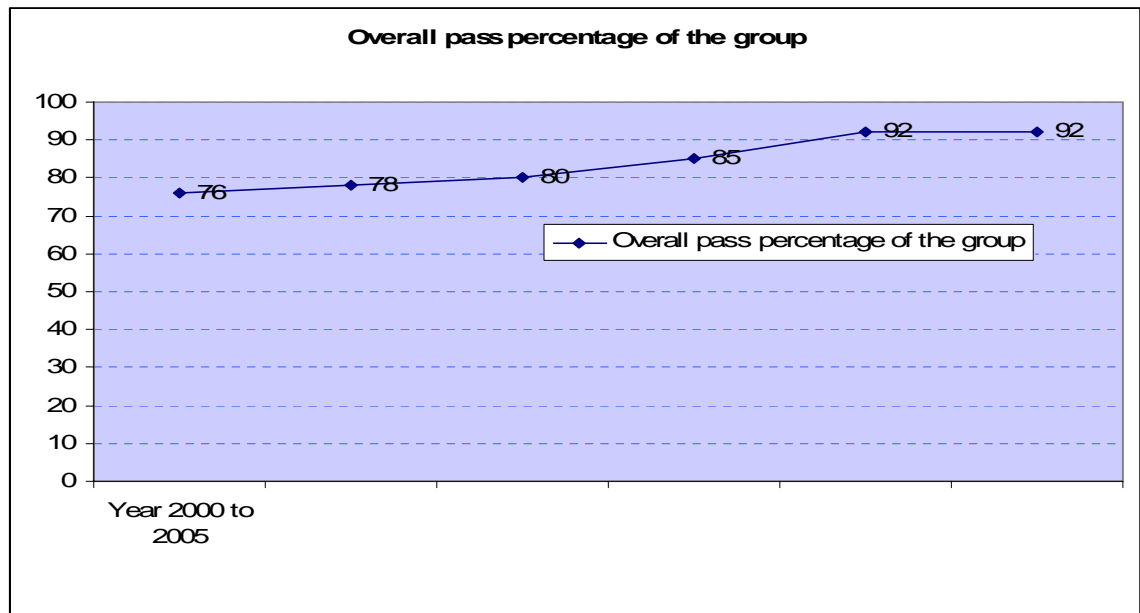


Table 36 : Overall pass percentage of the group 2000 to 2005

The chart shows the overall pass rate (as a percentage) of the learners who sat for the Cambridge external examinations between 2000 and 2005. A more detailed presentation of the data is presented in ANNEXURE " 4.1.1 percentage pass rate.doc" .

The most obvious deduction that can be made about academic performance during these five years is that the pass rate shows an overall steady increase from 76% in 2000 to 85% in 2003. The results then reached a plateau at 92% for the years 2004 and 2005, which were the first and second years of implementation of the eLearning resource

Other useful data that can be extracted from the academic results is as follows:

- **The Drop-out rate.** The percentage fall-out (i.e. those who enrolled but never presented themselves for the examinations) increased steadily from 26.5% in 2000 to 77% in 2003, but then dropped down to 28% in 2004 and rose again to 39% in 2005.
- **Learners who sat for all the final examinations.** The percentage of learners who sat for the final examinations steadily declined from around 73% in 2000 to a low of 23% in 2003. It then increased to 30% in 2004, the first year of eLearning implementation, and then rose again to 61% in 2005,

the second year of implementation of the eLearning resource.

- **Learners obtaining university exemption.** This figure indicates the number of learners who obtained at least a C aggregate in all their subjects. The percentage of learners who obtained university exemption steadily increased from 33% in 2000 to around 62% in 2003. It is interesting to note that this figure then dropped to 52% in 2004 (the first year of implementation of the eLearning resource), and then increased marginally to 56% in 2005.

4.1.2. Results from the questionnaires and interviews about pedagogics.

Organiser

While this section continues to deal with pedagogics, it will now focus on the data yielded by the various pedagogical theory elements that were used in the research questionnaires. These elements are cognitive science, constructivism, component display theory, customization, creativity, collaboration and companionship.

The findings regarding questionnaires for students are presented in detail in the Research-Question-to-Student-Questionnaire-question table in **ANNEXURE 14** and for subject advisors in **ANNEXURE 15**. It is summarised in the following sections.

4.1.2.1. The views of learners and subject advisers about cognitive science in the eLearning resource.

Research finding 2: Cognitive science theory elements are supported by the eLearning resource.

The online interface functioned as an aid. It supported critical thinking and behaviourist-type learning was important.

In general the students reacted positively to the questions concerned with cognitive science (88% 2004 - 80% 2005) (Students Educational Questionnaire 2 - Question 24, 40 and 41. Also see the detailed Research-question-to-Student-Questionnaire-question table in ANNEXURE 14 which was compiled to arrive at this finding.

Taken together, the subject advisers were very positive (79%) about the eLearning resource and cognitive science. A similarly favourable attitude was discernible in learner responses and is supported by the following facts:

The online interface functioned as an aid. While all the subject advisers agreed (100%) that the online interface was a help, fewer learners did (82%). (See the *Research-question-to-Questionnaire-question table* for the Subject Adviser Questionnaire in ANNEXURE 15.

- **Critical thinking was supported.** The subject advisers (80%) were more favourably disposed in their estimation of the extent to which the online interface made critical thinking possible than were the learners (of whom only 64% believed that critical thinking was enhanced by the interface).
- **Opinions about behaviourist-type learning.** Both the subject advisers and the learners were of the opinion that behaviouristic-type learning is important (99% and 89% respectively). There is a twist in the responses to question 40 in the subject advisers questionnaire. Only 57% of the subject

advisers were of the opinion that the eLearning system enabled behaviouristic learning (which, in my opinion, is the correct answer). Thus, even though the learners believed that behaviouristic elements were important, the subject advisers did not think that the resource particularly focused on that.

- **Attitudes toward higher order thinking.** Learners agreed that they enrolled in this system because they were eager to engage in higher order thinking operations and because the learning materials were specifically designed to help them to develop such thinking skills. Learners therefore said that they preferred examples that they could work out and analyse for themselves. One of the outstanding features of the system in the opinion of the learners was the facilitation of learner learning by means of worked examples and by the necessity for them to move beyond theory by applying the knowledge they had gained in practice. The design of this system specifically therefore encouraged learners to put their thoughts into words and to embody their emotions in appropriate responses and statements. They agreed that the information that they were given was relevant to their lives, and that when they discovered new information for themselves by using the system, they tended to remember it because it was obtained as a result of their own initiative. The system also enabled them to learn how to learn. (Data accessed in interviews)
- **The system encourages activities apart from academic pursuits.** The learners felt that the system encouraged and enabled them to devote time to a variety of pursuits such as art and music. This was an advantage in the eyes of the learners because they felt that people performed well in different areas of life. (Data obtained from interviews).

4.1.2.2. The view of learners and subject advisers about constructivism in the

eLearning resource.

Research finding 3: Constructivist learning theory elements play a crucial role in the eLearning resource.

Attitudes toward constructivist learning with simulated real life situations and discovery learning were altogether favourable. The role that teachers played in propagating this method was highly rated by the learners.

Responses to questions about constructivist learning revealed the following:

- **The extent to which real world learning took place.** The learners experienced the real world through the eLearning resource significantly more favourably (75%) than the subject advisers thought they did (57%).
- **Discovery learning was possible.** Both the subject advisers and the learners were of the opinion that the system enabled discovery learning (71% and 66%).
- While the eLearning resource displayed all the best functions of a school, teachers were regarded as being more valuable than the resource itself. While most of the subject advisers thought that the eLearning system could function just like a school, only 50% thought that it was just as valuable as a teacher. The learners held different opinions about this because only 39% of them thought that the eLearning system was just as valuable as their teachers. This seems to indicate that the teachers were highly regarded and valued by the majority of the learners.
- Learners' opinions about the ability of the eLearning resource to facilitate constructivist learning varied between 2004 and 2005. While the number of learners who regarded the eLearning resource as an aid that encouraged constructivist learning was 61% in 2004, this percentage fell to 44% in 2005

(Learners Educational Questionnaire 2 -Question 24, 40 and 41. Also see the *Research-question-to-student-Questionnaire-question* table in ANNEXURE 14.

4.1.2.3. The views of learners and subject advisers about Component Display Theory in the eLearning resource.

Research finding 4: The learners expressed themselves as being quite certain that the eLearning system was workable and desirable in terms of Component Display Theory elements.

Learning was therefore made easier and adequate information was provided.

The learners were sure that the eLearning system was workable and desirable in terms of Component Display Theory elements. 73% of learners responded positively in 2004 and 78% responded favourably in 2005. The following elements were highlighted:

- **Learning was made easier.** Both the learners and their subject advisers were of the opinion that the system made it easier for them to learn (subject advisers 75% and learners 87%). The subject advisers believed that the system assisted learners to understand new material.
- **Adequate information was provided.** Both groups agreed that the information about what needed to be done during the year was adequate. They also agreed about the adequacy of deadlines and other needed information (an agreement rate of about 75% if taken together).
- **Material ready in advance is a benefit.** The fact that all required material was ready in advance and that learners did not have to wait for a teacher to

supply it was regarded as a benefit. Learners also appreciated the fact that the material was neatly organised into lessons in a structured environment. They felt that the high degree of interactivity built into the system was helpful.

- **Attitudes to the availability of material on CD rather than only on the Internet.** Learners regarded the fact that the core material was available on CD (offline) as helpful because it relieved them of the necessity to spend extra time on the Internet. They agreed that if the CD had not been there, they would have been in difficulties. They also valued the fact that they were able to get updates on their lessons from the Internet.
- **Efficiency in terms of time management.** Learners regarded conventional schooling as a system that utilises time wastefully and inefficiently. The examples they gave of inefficient time utilisation in conventional schools were occasions such as assemblies and the time spent moving between classes. In contrast to this, the eLearning system permitted learners to use their time more efficiently, and they felt that they were able to accomplish far more on their own than they had ever been able to accomplish in conventional schools. (Data from interviews).
- **The course content supported learning.** The learners felt that they received most of their subject content support from the system's course material. Then, in descending order of quantity, they also received subject content support kind from their parents, from other learning materials, and from their friends who were also engaged in collaborative learning. (Data assembled from interviews)
- **What features of the system did learners use?** Learners said that they used the system to locate administrative information, to find scheduled events on the calendar, to submit assignments, to view results, to examine feedback and to ask questions. They agreed that the Internet was also

important for their research. (Data assembled from interviews)

- **How learners use books and other resources.** Approximately 80% of learners said that they used text books. While 20% of them said they had a exclusive preference for online materials, the majority of them preferred so to use printed materials. The majority also preferred to use paper-based sources and textbooks rather than online sources, and most of them used sources supplied by the system most of the time. While some learners claimed to have no access to a library, most of them made extensive use of encyclopaedias and other books for research. And they agreed that the system encouraged them to use more than one source of reference to crosscheck facts. They said that they had also been taught never to rely on only one source. (Data assembled from interviews).

4.1.2.4. The views of learners and subject advisers about customization in the eLearning resource.

Research finding 5: While customization was regarded as important, the eLearning resource only permitted a limited amount of customization.

- **Customization did not feature.** In general, the learners were of the opinion that they could not customize their environment. 54% in 2004 and 61% in 2005 indicated that they were simply not able to customize their environment. A quarter of the subject advisers and a majority of learners were of the opinion view that the program did not allow them to customize their learning (25% of the subject advisers and 61% of the learners). 42% of subject advisers felt that the learners had not made use of customisation opportunities. Certain elements of customization were positively regarded by about 80% of respondents. Such elements included

when, where and how quickly learning could take place. 71% of the subject advisers were not enthusiastic about the customization of the interface.

- **The flexibility inherent in being allowed to work at one's own pace.** The learners appreciated the fact that the eLearning system allowed them to pace themselves and work according to their own self-devised schedules. One of the primary benefits of home schooling, in their opinion, was that they could utilise whole days to conduct research or to study if they wished to do so. They regarded the flexibility that allowed them to plan their own schedules and activities as a major benefit of the system. They also appreciated the freedom to choose their times for work and times for taking breaks from working. (Data assembled from interviews).

4.1.2.5. The views of learners and subject advisers about creativity and motivation.

Research finding 6: The eLearning resource made allowance for personal creativity and provided an environment that challenged learners to develop and nurture their own motivation. This effect of the resource suited those learners who were more independent and mature than the average.

Creativity was encouraged, a challenging working environment was created, and the standard of schooling was high. Learners came to realise that structured work was an important ingredient for success.

An overwhelming majority of the learners (90% in both 2004 and 2005) indicated that they experienced the eLearning interface as an interface that encouraged creativity, stimulated motivation and created a challenging environment. They

also offered the following opinions:

- **The standard of schooling was high.** The subject advisers and the learners indicated that the standard of schooling was higher than it had been in their previous school(s) (90% and 89% respectively), and that the work they were required to do presented a definite challenge (99% and 91%).
- **The environment was academically challenging.** For some of the learners for whom English was a second language, a great deal of adjustment was necessary before they felt it attuned to the system. All agreed that this system was academically far more challenging than the normal public schooling system and that it produced a much higher standard of work than did conventional schools. But even though they experienced the system as being academically more demanding, learners nevertheless still expected that they would perform well. While they received more support from their parents than they had done in conventional schools, they agreed that it seemed to take a long time for their parents to understand that the system was indeed very different in all kinds of ways from other forms of conventional schooling. The learners generally responded with gratitude to parental support as well as their acknowledgement and understanding of the unique academic environment of the college. (Data assembled from interviews)
- **Structured work is important.** While almost everyone agreed that the system offered opportunities for creativity and satisfying curiosity (99%), the consensus of opinion among subject advisers and learners was that structured work was important (87% and 89% respectively).
- **Some learners said they did not need support.** 53% of learners answered positively to the flat statement that they did not need support from anyone and that they were motivated and responsible.
- **Learners understood the need for self-discipline.** Learners understood

that they needed self-discipline to succeed in the system and they claimed that their powers of self-discipline had improved as a result of the kind of learning to which they were exposed by the system. (Data assembled from interviews)

- **Learners felt in control.** Learners felt that they were in control of their studies and they appreciated the fact that they were individually accountable.
- **The kind of learner in the system is set up for success.** While learners in this system felt that they were often regarded as coming from rich homes, they appreciated that this kind of schooling was cheaper in some ways than that provided by conventional schools. Learners felt that in the system of education such as that provided by the system, they had better opportunities of enjoying the benefits of cutting-edge technology in exchange for their parents' investment in the system than they would have had in the conventional schooling system. (Data assembled from interviews).

4.1.2.6. The views of learners and subject advisers about collaboration in the eLearning resource.

Research finding 7: While learners appreciated the value of collaboration, they preferred to work alone rather than together.

The following opinions emerged from the data:

- **Help was provided for collaboration.** While 63% of subject advisers thought that the system encouraged learners to learn together with other learners, far fewer learners (only 27%) were of the same opinion. This may be attributed to the fact that 66% of learners (see question 61) expressed a

personal preference to be left to get on with their work *alone*. This was corroborated by 100% of the subject advisers (question 68) who strongly supported the view that the kind of learner who enrolled for this kind of education definitely preferred to work alone.

- **Feedback was important.** While these majority of learners (78%) valued the feedback from subject advisers and fellow learners, only 46% of learners said they actually used the eLearning system to “talk” to other learners. 63% of subject advisers thought that a greater number of learners used the system to talk to one another.
- **Face-to-face workshops are valuable.** Most of the learners attended workshops, and the subject advisers also thought that they did so (78% and 71%). Both learners and subject advisers regarded the eLearning programme and the workshops as valuable (89% and 84%). In a question designed to force respondents to choose which they thought was the most valuable, two thirds of respondents chose the eLearning programme over the workshops. The subject advisers said that they felt both were essential (71%) and that they could not choose.
- **Face-to-face meetings should focus on specific issues.** Learners said they wanted the opportunity to be able to ask specific questions in the face-to-face learning situation instead of merely repetitively reviewing content material in workshops. There were complaints about having to pay for inadequate workshops conducted by some teachers who were thought to be unprepared. Learners preferred face-to-face interactions because they stated that it was difficult to explain the intricacies of certain queries through the medium of a computer or over the Internet. They were of the opinion that the recorded videos of the workshops were important for purposes of review and for those who had been unable to attend. (Data assembled from interviews)

- **Friends and peer group pressure did not influence learning.** The need for friends did not feature highly in this system. Most of the learners were strongly averse to peer pressure, and were of the opinion that they were not easily influenced. Because they felt that they could meet challenges on their own and that they did not need any help from “buddies”, they did not ask many questions. Because they preferred to help themselves and did not want their progress to be hampered by others who needed help and assistance, they preferred to work alone. When they did socialize, they did not talk about school matters. Peer pressure seemed to play an insignificant role in the lives of these learners. (Data assembled from interviews)
- **Learners in general made little use of the collaborative infrastructure.** It appeared to be generally true that online collaboration did not play any great role in the lives of these learners. Although they recognised the ability of the system to support a collaborative infrastructure and although they appreciated its presence, they made little use of it.

4.1.2.7. The view of learners and subject advisers about companionship.

Research finding 8: Companionship (i.e. other human beings) is the most important element in the eLearning resource.

- **Companionship was regarded as important.** Just over two thirds of learners (66% in 2004 and 71% in 2005) responded positively to questions about “companionship” as a factor in the eLearning system. 73% in 2004 and 83% in 2005 valued the feedback of the subject advisers.
- **Teachers are very important.** The help of teachers and the role of teachers play was regarded by learners as important. While 79% of learners felt that the role of the subject advisers was very important, 90% of the subjects

advisers were of the opinion that the learners regarded their role as important.

- **While learners valued support from teachers, they felt that it needed to be more quickly delivered.** While learners greatly appreciated the help provided by the subject advisers, there was a general feeling that it needed to be more quickly delivered. Some of the learners felt that they did not need support because they could work by themselves with the support of their parents. This group of learners seemed on the whole to be extremely independent. They did not much “bother” with the subject advisers because they felt they could help themselves and they only used the services of subject advisers when they needed difficult problems to be explained. In general they preferred to be “facilitated” and guided rather than taught. They were of the opinion that some of the subject advisers did not have an altogether clear idea of what was going on in the system or what was expected of them and of the learners. Some learners would have liked an opportunity to comment anonymously on the quality of various subject advisers. Some felt that subject advisers were like parents while others did not think so. The learners felt that the subject advisers were honest because they would say when they were unsure about something but would then come back later with the needed answer or information. Learners wanted more tutoring, not because of poor assistance from the system or because of time pressure. (Data assembled from interviews)
- **Human beings are more important than the resource itself.** Fewer than 50% (i.e. 39% and 37%) of learners, and approximately 50% of the subject advisers, regarded the eLearning resource as a kind of “father or mother” as far as their studies were concerned. But 79% of them felt that the human component of the eLearning resource (i.e. the subject advisers) were more important than the resource itself.

- **It is teachers and support that give the “heart” to the system.** While learners felt that the system made them feel special and that it provided stability and helped learners not to feel “messed up”, they valued the care and loving attitude that was apparent in the system.
- **Parental support is paramount.** While 90% of learners and 88% of subject advisers felt that parental support was a vital element in the total learning experience, only 30% of learners agreed that their parents actually worked with them. Subject advisers were of the opinion that only 12% of parents worked with learners.
- **Administrative support is important.** All the learners and subject advisers agreed that the work of the administrators was very important (100%).
- **Companionship creates confidence.** While learners generally had sufficient confidence to approach various older people in their parental network, they nevertheless trusted their parents’ opinions. The parents of the learners encouraged them to question and ask for the reasons why things happened. It became clear that while parents expected their children to perform well, they also gave them the necessary support to do so (except for the very few exceptions mentioned below). Learners asked their parents’ friends for information when they needed it and listened to adults while they conversed. They tended to listen and “pick up a lot” in this way. Since they lived in home schooling environments, this featured quite largely in their lives. A lack of parental support would change everything for the participating learners, and even though these learners were extremely independent workers, they valued support from their parents. There were a few cases in which learners coped even though they received no parental support. (Data assembled from interviews)
- **Parents were unaware of the content of courses.** 66% of the learners claimed that their parents were ignorant of the content of their courses.



87% of the subject advisers were of the opinion that the eLearning system made it possible for parents to assist learners, and 63% of them felt that parents would help learners to pass. 78% of learners thought that help from parents would assist them to pass. The bold statement that the learners needed no support received only a 50% agreement rate from the subject advisers. Although the parents were probably unaware of the work that was being done in school, their support was nevertheless very highly rated. While the learners thought very highly of companionship, subject advisers and parental support, only 30% of the learners said their parents knew what was work they were doing. This seems to indicate that when learners referred to “companionship”, they were talking less about any familiarity with subject content and more about the general encouragement, motivation and support they received from their parents.

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Chapter 1 Introduction, background and research problem
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Chapter 4 Analyzing the case, evidence and discussions

Chapter 5 Conclusion and recommendations

4.1. Answering sub-question 1 : To what extent do certain pedagogical theories and eLearning theories inform a high school eLearning resource?

- 4.1.1. The overall academic results were favourable
- 4.1.2. Results from the questionnaires and interviews about pedagogics.

4.2. Answering sub-question 2 : Why do certain community elements in an eLearning resource contribute to creating and sustaining high school learning?

- 4.2.1. Results of an analysis of the opinions of learners about various aspects of community in the eLearning resource.
- 4.2.2. The personality type of the learners
- 4.2.3. Patterns of online activity by the learners.
- 4.2.4. Patterns of online activity of the subject advisers.
- 4.2.5. Ratio of subject advisers to learners

4.3. Answering sub-question 3 : In what way and why do certain communication, collaboration and social elements influence a high school eLearning resource?

- 4.3.1. Did the learners adequately exploit the opportunities for communication inherent in the eLearning resource?
- 4.3.2. Reachability and preferences of learners in terms of communication?
- 4.3.3. How did the learners use the chat facility of the eLearning resource?
- 4.3.4. How did the learners use the discussion forums facility of the eLearning resource?
- 4.3.5. Learners that were active or were isolated?
- 4.3.6. Learners that “lurked” (i.e. were learners who never chatted or posted replies in forums)?

4.4. Answering sub-question 4 : How and why do certain technological aspects and instructional design issues affect a high school eLearning resource?

- 4.4.1. Computer skills and attitudes of learners and subject advisers
- 4.4.2. What was found in the implementation of the basic hardware and software systems.
- 4.4.3. Setting up the system - course materials
- 4.4.4. Setting up the system - Users and Facilitators

4.2. Answering sub-question 2 : Why do certain community elements in an eLearning resource contribute to creating and sustaining high school learning?

Organiser

The following section presents the results from the data analysis to answer the second sub-question of the research which is about aspects of community. These results are presented firstly from the point of view of the learners and secondly from the point of view of the subject advisers.

This question relates to various aspects of community and why they influence learning in the eLearning resource.

The analysed results of the **questionnaire 2** are presented in ANNEXURES 10,11,12. The summarised results of the various **interviews** are presented separately in ANNEXURE 13. The **transcribed interviews** are included in the DVD. But in this chapter the results are presented as an integrated whole.

4.2.1. Results of an analysis of the opinions of learners about various aspects of community in the eLearning resource.

Research finding 9: Learners experienced an increased sense of community between the first year and the second year.

Research finding 10: The learners have strong individualistic inclinations.

Research finding 11: Peer pressure does not play a role in the lives of these learners.

Research finding 12: Learners do not prefer group work.

Research finding 13: Learners do not like competition.

Research finding 14: The learning community creates a feeling of safety, care and openness.

Research finding 15: This type of community makes it possible for learners to have a wider range of friends.

Research finding 16: Face-to-face meetings enhance a sense of community and serve to bind the community together.

Summary of findings about community

- **There was an increasingly strong sense of community among the learners.** In 2004, 44% of the learners indicated they experienced a sense of community in the system. This increased to 73% in 2005.
- **The learners had very strong individualistic inclinations.** Their attitude was that they would ask for something if they needed it. Learners tended to be bold about their needs and opinions. They were never hesitant about asking parents and friends questions and were happy

to listen when they spoke. When they listened to other people speaking, the learners picked up a great deal of useful information. (Data assembled from interviews)

- **Peer pressure** did not play a role in their lives (29% in 2004, 37% in 2005). Some learners were viewed as being “too slow” to help or contribute. “Too slow” here meant that by the time they got an offer of help, the help was no longer needed. While some learners did not regard their peers as an important source of help, others valued them highly for that function.
- **The combined questions showed that learners had no great liking for group work.** Learners felt they could do what they had to do on their own and that they did not need the assistance of their “buddies”. While they and their advisers were aware that their friends had opinions, they did not rely on them for assistance because they realised that their friends might be wrong. But some learners preferred to gather a whole range of opinions. Some of the learners felt that friends might offer them “wrong logic” which they would then have to unlearn. If a friend of theirs was knowledgeable, they felt that it was acceptable to listen to that friend, but they required an assurance that the friend concerned possessed specific and correct knowledge. (Data assembled from interviews)
- **Learners did not like competition.** Learners felt that competition did not motivate, but that it was acceptable if it led to self-betterment. They also felt that their friends should *not* be regarded as benchmarks for comparison, and they had a strong aversion to being compared with their friends and exposed as academically incompetent. They felt that there were other forms of intelligence that were neglected in schools but which should be better acknowledged in a system such as that at the college. They were averse to comparisons that exploited “better than this, better than that” type comparisons. They felt that there should be a reward system but that

it should only function as a system to recognise achievement and that it should be “sensitive”. They felt that the present system placed no overt emphasis on competition. (Data assembled from interviews)

- **The nature of the learning community in operation.** Learners were in general agreement that the learning community was functioning well. Learners were comforting to one another, they felt safe, and they felt that their friends were important. While they were very comfortable with some of their friends, they felt more distant towards others. They agreed that they would react to emotional calls for help in the community if they were needed, and they observed how the community had responded to such calls during the year. They were sincere when they helped one another. They had seen how friends tended to gather naturally in groups. They appreciated the caring and helping attitude of teachers and administrators in the college. (Data assembled from interviews)
- **Openness in the community.** Because of the atmosphere of friendliness that prevailed in the community, they felt that everyone was able to laugh with everyone else and that it therefore did not matter if someone gave incorrect answers. Some learners nevertheless remain frightened of being laughed at. Since they didn't really know each other that well, they didn't really care and they just expressed their opinions regardless. (Data assembled from interviews)
- **A wider range of friends is possible.** Learners preferred to remain within the school system. They regarded the system as being superior to a “normal” school because of the variety of friends that could be made in the system (in contrast to ordinary public schools where one could make only a limited number of friends). They agreed that in a system such as this it was not possible for some learners to hold back other learners.
- **Face-to-face workshops helped to bind the community.** They felt that the

scheduled workshops made an enormous contribution to building a sense of social community and they felt that the workshops helped to create a sense of closeness in the community. Learners expressed a definite desire for *more* rather than fewer workshops. (Data assembled from interviews).

4.2.2. The personality type of the learners

Research finding 17: The personality types are more or less balanced, with no particular trait dominating. The “Thinking” (71%) and “Perceiving” (68%) traits are the only ones indicated by around two thirds of the learners.

The first questionnaire comprised a set of questions drawn up by the researcher to give the basic personality profile of each Learner.

The questionnaire compiled by the researcher was therefore similar to the MyersBriggs (Myers, 2004) profile. The full questionnaire is included in ANNEXURE 5. It is a self-administered questionnaire consisting entirely of closed-end questions and performed either on paper or online. The results of the questionnaire are attached in ANNEXURE 7, and they do include graphic representations.

Personality profile of learners

Questions 11 to 18 rendered a general personality profile of the learners in 2004. This section repeated ground covered in questionnaire 1 and was member-checked. The member-check showed a reliability factor of around 80% (see Table 4-8 earlier in this chapter).

The broad outline of the personality profile is as follows:

| Personality profile results – questions 11 to 18 | | | | | |
|---|------|------|------------|------|------|
| Learners who corresponded to the following character types | | | | | |
| | 2004 | 2005 | | 2004 | 2005 |
| Introverts | 51% | 53% | Extroverts | 58% | 56% |
| Sensing | 61% | 58% | Intuitives | 51% | 54% |
| Thinking | 71% | 66% | Feeling | 46% | 46% |
| Judging | 53% | 37% | Perceiving | 59% | 68% |

Table 37 : Personality profile results of 4 personality types in this research 2004

The table shows the personality profiles of students who were part of the research

The personality types are more or less balanced, with no particular trait dominating. The “Thinking” (71%) and “Perceiving” (68%) traits are the only ones indicated by around two thirds of the learners.

A member-check form was designed for this personality profile and completed by the learners. The member-check form is included in ANNEXURE 6.

In the member-check form the learners were given the results of the personality analysis and were asked to indicate in general if it was a true reflection of themselves.

The percentage of learners who completed the member-check was 92% (37 learners). The complete member-check grid is included in ANNEXURE 6. The member-check rendered an overall reliability rate of 80.91%. A summary is presented here.

| Student | Student Reliability mark | Total possible | Percentage Reliability |
|---------|--------------------------|----------------|------------------------|
| 1 | 14 | 16 | 87.50 |
| Up to | | | |
| 37 | 15 | 16 | 93.75 |
| | | | ----- |
| | | Total | 2993.75 |
| | | Div 37= | 80.91 |
| | | | % reliability |

Table 38 : Member-check reliability of personality data indicator 80.91%

The table shows a summary of the results of the member-check done by learners on their personality indicators. It shows a reliability index of 80.91%

4.2.3. Patterns of online activity by the learners.

Research finding 18: The pattern of study activity among learners was similar to patterns found in a “normal” school in 2004 (the first year of implementation), but changed in 2005 to a pattern of more activity in the afternoons and evenings.

The eLearning resource data allowed me to analyse the times of day at which the learners used the system. The data thus obtained is presented in the table below.

| When did the learners use the eLearning resource? | | | | |
|---|--------|-------------|-------------|------------|
| | Total | Mornings | Afternoons | Evenings |
| 2004 Chat | 32 683 | 25662 (78%) | 6535 (20%) | 486 (2%) |
| 2004 Forums | 2 275 | 1086 (48%) | 836 (37%) | 353 (15%) |
| | | | | |
| 2005 Chat | 35 384 | 5072 (15%) | 22404 (63%) | 7900 (22%) |
| 2005 Forums | 2 741 | 944 (34%) | 1 382 (50%) | 415 (16%) |

Table 39 : Patterns of online activity : when the students used the eLearning interface to chat and make forum posts.

The table below shows the times of day when the participating learners in this

research used the eLearning programme. A diagrammatic presentation is given below.

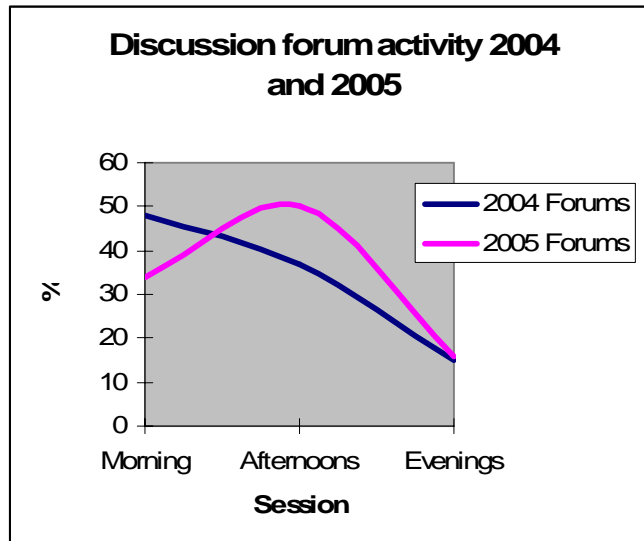
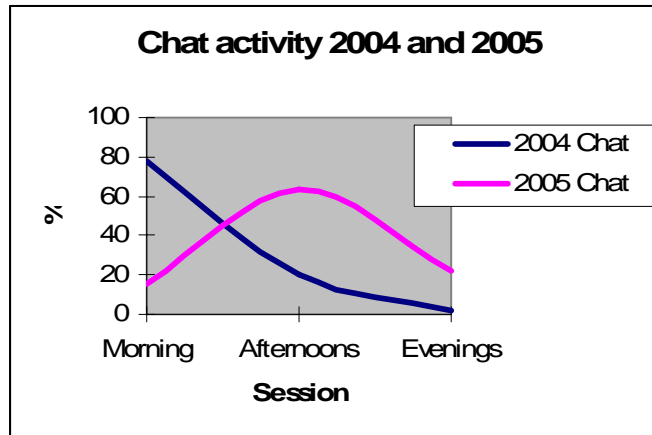


Table 40 : Chat and discussion forum activity 2004 and 2005

The pattern of study of the learners in 2004 seemed to follow the same patterns that one would find in a “normal” school. Most usage therefore occurred in the mornings (78% in 2004), with about 20% of the activity in afternoons, and much less activity in the evenings.

During 2005, however, a surprising change in the pattern occurred. There was a marked increase in activity in the afternoons in both chat and forum posts. In

2005, most of the chats (63%) and forum posts (50%) were occurring in the afternoon. A further surprise in 2005 was that the morning chat activity dropped to 15% in contrast to 2004 when it stood at 78% in the mornings.

Because this is a substantial shift in data, I rechecked the formulas and calculations and discussed the data with the technical staff as well as the subject advisers. We could not come to any definite conclusions about the reasons for online activity moving to the afternoons. There was no change in the type of learner who enrolled from between 2004 and 2005 since approximately 85% of the learners were home schoolers in both these years. The server time was correct as it is synched with international time servers. There were no special Internet discounts offered in the country that may have influenced the learners to log on in the afternoons, and evening usage was in fact cheaper (Telkom, 2006). A content analysis (see below) revealed that most of the chatting (99%) was of a purely social nature. The possible answer may be that more learners were studying in the mornings during 2005 and leaving their socializing for the afternoons. But then the chat and forum activities showed the same patterns (and forum activity is mostly academically orientated). We must simply conclude that we do not know the real reasons for this change in patterns.

4.2.4. Patterns of online activity of the subject advisers.

Research finding 19 : Subject advisers worked mostly in the mornings in the first year of implementation (2004) but then changed to working mostly in the evenings in the second year (2005).

| When did the subject advisers use the eLearning resource? | | | | |
|---|-------|----------|------------|----------|
| | Total | Mornings | Afternoons | Evenings |
| | | | | |

| | | | | |
|-------------|------|-----------|-----------|-----------|
| 2004 Forums | 595 | 248 (42%) | 180 (30%) | 167 (28%) |
| 2005 Forums | 2494 | 248 (42%) | 180 (30%) | 167 (28%) |

Table 41 : Patterns of online activity : subject advisers

The table shows the activity times of subject advisers in the mornings, afternoons and evenings.

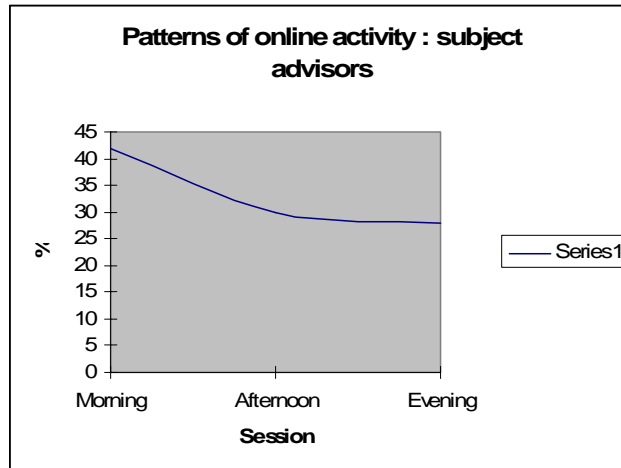


Table 42 : Patterns of online activity : subject advisers

The table shows the patterns of online activity of subject advisers

The pattern of usage of the subject advisers during 2004 was similar to the usage patterns of learners in 2004, with most of the activity occurring in the mornings (42%), followed by a more or less an equal distribution of activity between the afternoons (20%) and evenings (28%).

2005 saw a substantial increase in forum activity for the subject advisers as well: from 595 posts in 2004 to 2494 posts in 2005. The subject advisers were active in the mornings (35%), less so in the afternoons (14%), and most of all in the evenings (51%).

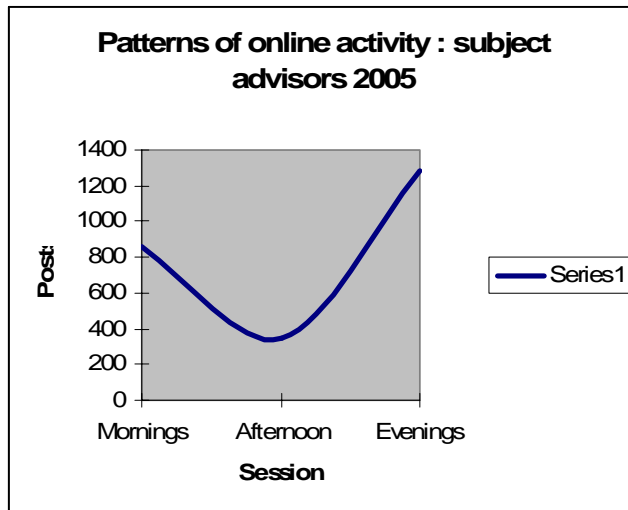


Table 43 : Patterns of online activity : subject advisors : forums 2005

This graph shows the pattern of online participation in forums on the part of the subject advisers during 2005.

The asynchronous communication tools were definitely used constructively by the subject advisers.

If the online activity times of learners and subject advisers for 2005 are compared to each other, one has to conclude that they are clearly asynchronous, that is to say, the learners are either active in the mornings or afternoons while the subject advisers are most active in the evenings. The following table and graph show the differences.

| Comparison of online activity times: learners and subject advisers | | | | |
|---|------------------|-----------------|------------------|-----------------|
| | | Mornings | Afternoon | Evenings |
| | | % | % | % |
| 2005 | Students | 34 | 50 | 16 |
| 2005 | Subject advisers | 35 | 14 | 51 |

Table 44 : Comparison of online activity times : students vs subject advisers 2005

The table below shows the comparative data for learner and subject adviser online activity in the discussion forums.

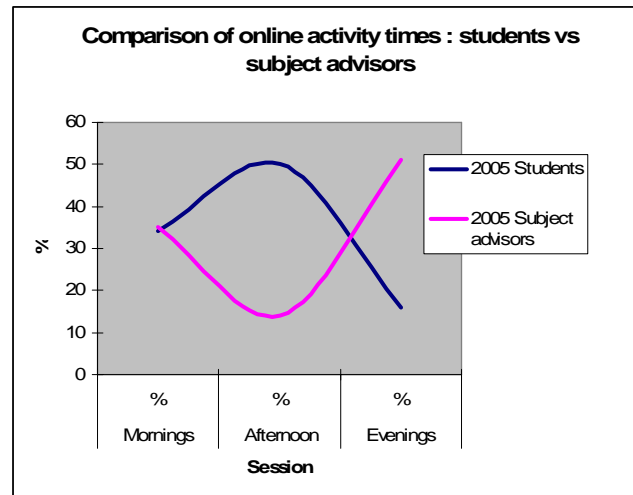


Table 45 : Comparison of online activity times : students vs subject advisors 2005

Research finding 20: The online activity of learners and subject advisers follows an asynchronous pattern, with the learners either being active in the mornings or afternoons, while subject advisers are most active in the evenings.

4.2.5. Ratio of subject advisers to learners

Research finding 21: The average class size was 57 and 62 learners per class in 2004 and 2005 respectively.

Research finding 22: The ratio of learners per subject adviser was 223 to 1.

The system was supported with 11 subject advisers in 2004 and 2005. On average, each online facilitator took care of seven courses. The average class size is calculated by taking all 17 courses for which the first year group enrolled and dividing the total by 17. The table below shows the figures.

| Calculating average class size (2004 and 2005) | Nov 2004 enrolment | Nov 2005 enrolment |
|--|--------------------|--------------------|
| Accounting | 61 | 71 |
| Afrikaans First Language | 43 | 54 |
| Afrikaans Second Language | 85 | 88 |
| Art and Design | 24 | 35 |
| Biology | 75 | 104 |
| Business Studies | 79 | 61 |
| Computer Studies | 33 | 30 |
| Design and Technology | 18 | 12 |
| Development Studies | 24 | 15 |
| Economics | 71 | 70 |
| English First Language | 98 | 110 |
| English Second Language | 40 | 48 |
| Geography | 43 | 52 |
| History | 24 | 36 |
| Information Technology | 22 | 26 |
| Mathematics | 142 | 172 |
| Physical Science | 96 | 93 |
| Number of student enrolment in courses | 975 | 1062 |
| Divided by 17 courses | (17) | (17) |
| AVERAGE CLASS SIZE | 57 | 62 |

Table 46 : Calculating average class size

The table shows the calculation of average class sizes in the online system in this research in 2004 and 2005.

The average class size is calculated here as 57 learners in 2004 and 62 learners in 2005.

The subject advisers also supported learners taking courses in the South African syllabus system (these courses were not supported online). There are approximately 3000 learners in the South African system, with an additional seven subject advisers. The ratios are therefore calculated in the following way:



3000 learners divided by 18 subject advisers gives a total of 166 learners per subject adviser. The Cambridge online subject advisers had 166 South African learners plus an average of 57 Cambridge learners each, which gives each subject adviser a total of 223 learners to take care of.

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- 4.1.1. The overall academic results were favourable
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4.3. Answering sub-question 3 : In what way and why do certain communication, collaboration and social elements influence a high school eLearning resource?

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4.3. Answering sub-question 3 : In what way and why do certain communication, collaboration and social elements influence a high school eLearning resource?

Organiser

The following section presents the results from data analysis to answer the third sub-question of the research which is about *communication*. Firstly, results are presented with regard to the preferences and reachability of learners with different communication media. Secondly, chat data and forum data are analysed.

This question relates to aspects of communication and how they influence learning in the eLearning resource.

The analyzed results of **questionnaire 2** are presented in ANNEXURES 10,11,12.

The summarised results of the various **interviews** are presented separately in ANNEXURE 13. The **transcribed interviews** are included in the DVD. In this chapter, however, the results are presented as an integrated whole.

4.3.1. Did the learners adequately exploit the opportunities for communication inherent in the eLearning resource?

Research finding 23: Less than half the learners said that they adequately exploited the possibilities for communication inherent in the eLearning resource.

Only 24% in 2004 and 37% in 2005 of the learners responded that they adequately exploited the possibilities for communication inherent in the eLearning resource.

4.3.2. Reachability and preferences of learners in terms of communication?

4.3.2.1. How do learners prefer to be contacted?

Research finding 24: Learners mainly preferred to be contacted by means of email for purposes of learning. Fewer preferred to be contacted by means of a conventional (landline) telephone, and an increasing number preferred to be contacted on their mobile telephones.

| Contact methods preferred by learners | | |
|--|-------------|-------------|
| | 2004 | 2005 |
| Contact preferred via: Home telephone | 17% | 7% |
| Contact preferred via: Email | 56% | 56% |
| Contact preferred via: Cellphone | 27% | 37% |

Table 47 : Preferred contact methods of students 2004 2005

The figure above shows the preferred contact methods of learners (2004 and 2005).

There was a definite shift away from a preference to be contacted on a conventional (landline) telephone (preferences decreased from 17% to 7%) towards a preference to be contacted on a mobile phone (preferences increased from 27% to 37%). The preference to be contacted by means of e-mail remained the same (at 56%) in both years. This tendency to make increasing use of mobile

telephones is in line with the general world pattern towards increasing use of such telephones. There were no differences in the pattern of these preferences for preferred contact methods between older users (16 and older) and younger users (users younger than 16). This is depicted in the figure below.

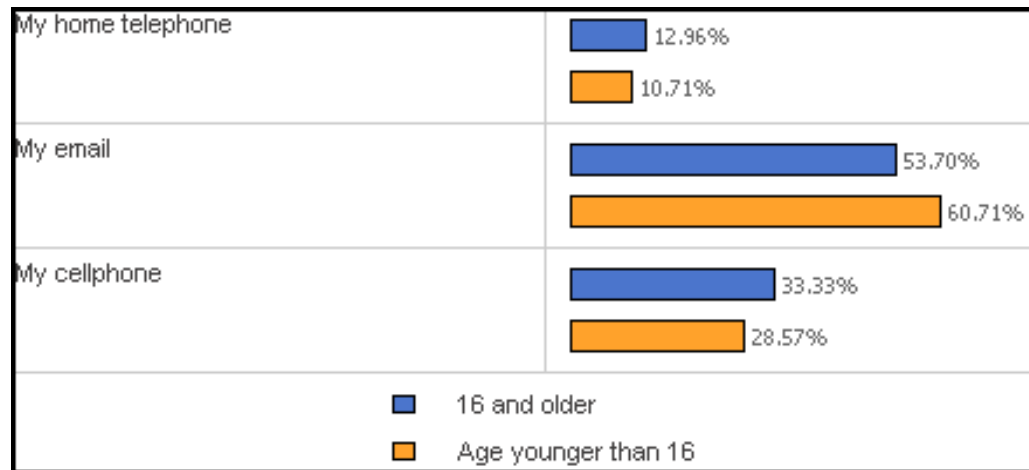


Table 48 : Contact preferences of older and younger students (2004 and 2005)

This figure shows the comparative differences in contact preferences between older and younger learners (older and younger than 16 years) for 2004 and 2005.

4.3.2.2. How reachable were the learners on their cell phones?

Research finding 25: While 83% of learners had a cell phone, only 56% could be reached by means of an SMS despite the fact that approximately 80% agreed that their numbers had not changed.

Contacting learners on their cell phones by sending SMS messages was investigated. At the most critical time of the year, when learners were waiting for their results, an SMS message was sent to all learners to tell them where their results might be found. The table below summarises the results of this communication initiative. It shows that 83% (172) out of 208 learners indicated that they did possess a cell phone where they could be contacted. 172 SMS

messages were therefore sent out by utilising an SMS service (SMSWhiz SMS Gateway, 2004). The SMS gateway used provided a report on the delivery rate of the SMS messages.

An example positive report was worded: Destination: -----cellnumber---,Date & Time: 2004-12-15 18:52:57 gmt. Reference: 8:50:58_pm, Status: 2, Description: Message Delivered to the Destination Handset. Tokens Used: 2

An example negative report was worded: Destination: ----cell-----, Date & Time: 2004-12-15 18:54:57 gmt, Reference: 8:50:58_pm, Status: 3, Description: Message Could not be Delivered to the Handset. Tokens Used: 2

The data shows that 97 messages were successfully delivered while delivery was unsuccessful in 73 cases. 97 out of 172 messages were therefore sent (a 56% success rate) and 44% of these messages were undelivered. This is probably indicative of the very volatile and transitory nature of the cell phone industry in South Africa. Because several cell phone user packages are available at a low cost, it is very easy for users to switch phones. These figures are probably a benchmark for other similar institutions in a similar market. If one wishes to communicate by means of SMSs, one might expect (in such circumstances) to reach about 50% of the target population. Unfortunately I could not find any other study that had included this kind of analysis for comparative reference..

| Success rate in sending SMS messages to the learner population (2004) | | | | |
|--|-------------------|------------------------|----------------------------|------------------------------|
| | Population | With cellphones | Successful delivery | Unsuccessful delivery |
| 2004 | 208 | 172(83%) | 97 (56%) | 73 (44%) |

Table 49 : Success rate in sending SMS messages to students 2004

The table shows the success rate (56%) of reaching learners through the medium of SMS on their mobile phones.

Only approximately half of the SMS messages (56%) were successfully delivered in spite of the fact that (1) 73% of the learners in 2004 indicated that their cell phone number had not changed in 2004, and (2) 80% indicated that their cell phone number had not changed in 2005.

| Cell phone number changes by learners in 2004 and 2005 | |
|---|--|
| | Percentage of learners claiming that their cell phone number had remained the same |
| 2004 | 73% |
| 2005 | 80% |

Table 50 : Cell phone number stability

The table shows the percentage of learners who indicated that their cell phone numbers had remained the same in the relevant year.

4.3.2.3. How reachable are learners by means of email?

Research finding 26: Almost all emails (92-94%) were successfully mailed. But this high delivery rate does not mean that they were read.

A prerequisite for enrolment in the course was to be in possession of full Internet access and email. As the chief administrator of the system, I made an analysis of returned emails and discussed the issues with the administrative personnel. A system enhancement implemented for the months September, October and November 2004 meant that all posts in discussion forums were immediately sent out to all participants in the discussion group. The system therefore functioned as a listserv. When an e-mail is addressed to a listserv mailing list, it is automatically broadcasted to everyone on the list. This effect is similar to that on

a newsgroup or forum, except that the messages are transmitted as e-mails and are therefore available only to bona fide (registered) members of the list (Listserv-email-lists-newsgroups, 2004). Lists of returned mails were gathered on the server for specific email accounts.

It was found that the e-mails were mostly valid and that the messages could therefore be delivered. An analysis of these emails revealed that between 9 and 12 emails out of a total of 150 learners in the social forum's emails were returned. This amounts to 6-8% of the total e-mail volume. On the positive side it does mean that 92-94% of emails are successfully mailed. But the fact that they were delivered does not mean they were read.

| Success rate of email delivery to learners in 2004 | |
|---|--|
| | Percentage of e-mails that were delivered |
| 2004 | 92-94% |

Table 51 : Email delivery success rate in 2004

The table shows the success rate (93%) of e-mail delivery during 2004

4.3.3. How did the learners use the chat facility of the eLearning resource?

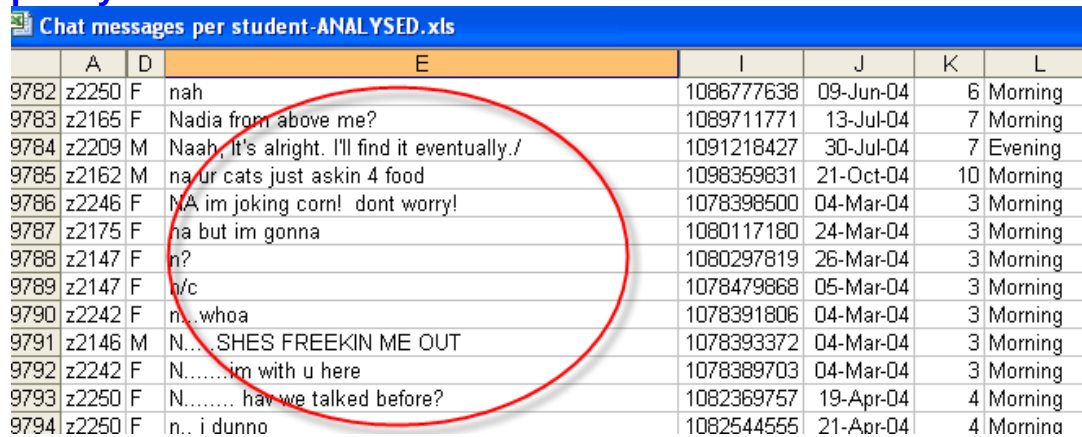
4.3.3.1. Chat data is mostly of social nature.

Research finding 27 : Learners used chat rooms mostly to socialize.

The eLearning system featured a function that kept a log of all chat session data as well as data in discussion forums. It was possible therefore to conduct a content analysis on both.

It soon transpired in the analysis that a detailed analysis was unnecessary because almost all of the chat was of a purely social nature and that the chat rooms were hardly ever used for academic purposes. This was crosschecked with the data from subject advisers. They also did not use chat rooms for academic purposes.

A sample chat room screen capture shows an example of the purely social nature of the content.



| | A | D | E | I | J | K | L |
|------|-------|---|---|------------|-----------|----|---------|
| 9782 | z2250 | F | nah | 1086777638 | 09-Jun-04 | 6 | Morning |
| 9783 | z2165 | F | Nadia from above me? | 1089711771 | 13-Jul-04 | 7 | Morning |
| 9784 | z2209 | M | Naah, it's alright. I'll find it eventually./ | 1091218427 | 30-Jul-04 | 7 | Evening |
| 9785 | z2162 | M | na ur cats just askin 4 food | 1098359831 | 21-Oct-04 | 10 | Morning |
| 9786 | z2246 | F | NA im joking corn! dont worry! | 1078398500 | 04-Mar-04 | 3 | Morning |
| 9787 | z2175 | F | na but im gonna | 1080117180 | 24-Mar-04 | 3 | Morning |
| 9788 | z2147 | F | n? | 1080297819 | 26-Mar-04 | 3 | Morning |
| 9789 | z2147 | F | n/c | 1078479868 | 05-Mar-04 | 3 | Morning |
| 9790 | z2242 | F | n.. whoa | 1078391806 | 04-Mar-04 | 3 | Morning |
| 9791 | z2146 | M | N... SHES FREEKIN ME OUT | 1078393372 | 04-Mar-04 | 3 | Morning |
| 9792 | z2242 | F | N.....im with u here | 1078389703 | 04-Mar-04 | 3 | Morning |
| 9793 | z2250 | F | N..... hav we talked before? | 1082369757 | 19-Apr-04 | 4 | Morning |
| 9794 | z2250 | F | n.. i dunno | 1082544555 | 21-Apr-04 | 4 | Morning |

Table 52 : Example of chat room data analysed

The figure above shows an example of data from a 2005 chat room (35 384 chats). It is clearly evident that most of this communication (which was also typical of the other communications) was of a purely social nature. The complete datasets are included in the DVD.

Learners were frustrated when they went online but there was no one there.

The online chatting was more social than educational in content and featured a number of regulars who frequented the chat rooms. It frustrated these individuals if they went online and found that there was no one there. They enjoyed going onto the Internet to chat with their friends, but also wanted to know when their friends would be online. They did not like going online when nobody else was there because, at such times, the facility seemed to them rather like a “haunted, empty house” (quote from learner). While nearly all these chats were more socially orientated than work orientated, some preferred not to

socialise on the Internet and preferred rather to communicate about work-related matters. (Data assembled from interviews)

The learners felt that the chatroom's social forums worked well for casual talking. The learners clearly had a need for interactions with all the learners –and not just with a few of their friends. They found that they could often make new friends online because their personal information was available and they used it. Because the Cambridge and South African matriculant learners were all members of this common forum, they were able to communicate, get to know one another, and make friends. This kind of socializing is therefore useful for creating friendships and ultimately also for furthering the goals of learning by cementing group solidarity, positive social relationships and user (learner) satisfaction. (Data assembled from interviews).

4.3.3.2. Analysis of CHAT data in terms of gender, totals and averages.

Research finding 28: Female learners chatted to a far greater extent than did their male counterparts (approximately 50% more). Averages: Female chat volume was 73% in 2004 and 63% in 2005 – as opposed to male chat volume which was 27% in 2004 and 37% in 2005.

| CHAT analysis summary : Female, male, totals and averages : 2004 & 2005 | | | | |
|--|--------|---------------------------|--------------|---------------|
| | | Number of students | Chats | Chat % |
| 2004 | Female | 94 | 23941 | 73% |
| | Male | 115 | 8742 | 27% |
| | Total | 209 | 32683 | |

| | | | | |
|-------------|---------|-----|-------|-----|
| | Average | | 156 | |
| 2005 | Female | 109 | 22398 | 63% |
| | Male | 94 | 12986 | 37% |
| | Total | 203 | 35384 | |
| | Average | | 174 | |

Table 53 : Gender differences in chat summary (2004 and 2005): females, males, total and averages. This table shows an analysis of data gathered from the eLearning system database for the number of chats conducted by females and males (with totals and averages) for the years 2004 and 2005.

During 2004, a total of 32 683 chat lines were typed. In 2005 a total number of 25 384 chat lines were typed (i.e. 8% more than in 2004). Female learners engaged in far more chats than their male counterparts. Thus, 73% (2004) and 63% (2005) of the chat volume was conducted by females while males contributed 27% (2004) and 37% (2005) of the volume.

4.3.4. How did the learners use the discussion forums facility of the eLearning resource?

Research finding 29: Analysis showed that only about one third of the discussions were about academic-related matters (1008 out of 2741 = 37% in 2005).

Because complete logs of all discussions are kept by the system, it was possible to analyse them in detail. A sample discussion forum analysis is presented below.

| Forum posts per student.xls | | | | |
|-----------------------------|-------|---|----------------------------------|-------------------------------------|
| | A | D | E | |
| 566 | z2188 | F | Attendance Register | <P>Hello Mrs Killer</P> □ <P>C |
| 567 | z2209 | M | Hypothetical Save-The-World met | <P>Well, I'm not entirely sure if |
| 568 | z2209 | M | Re: Not exactly a Science questi | Thats what I wanted to know!!! T |
| 569 | z2188 | F | Wow, was that fun! | <P>Hello Mam, I enjoyed Biolog |
| 570 | z2140 | F | Re: Not exactly a Science questi | anytime<IMG height=15 src="ht |
| 571 | z1158 | F | Re: Can't make up my mind | i did IT last year. microsoft is de |
| 572 | z2152 | M | Hey ppl wat is up.Wat time does | Hey ppl its 3 (8 |
| 573 | z2069 | M | Re: YES! | <P>Hey you guys,</P> □ <P>It! |
| 574 | z2069 | M | Re: Communicate with the subjec | <P>Hi there.</P> □ <P>Do you |
| 575 | z2168 | F | Re: Shorties is hear!!! | hi melndv hnw life hnw to see |

Table 54 : Example of discussions in a discussion forum

Analysis showed that only about one third of the discussions were about academically related matters (1008 of 2741 = 37% in 2005). This explains the correlation of the chat activity with the discussion forum activity in the question above, and the shift in chat activity to the afternoons (in section above) for 2005.

When academic-related posts have been specifically isolated and analysed, the data still shows a shift in 2005 to more activity in the afternoons (43%), more or less the same amount of activity as in the mornings (39%), and the least amount of activity in the evenings (18%). Discussions were very informal and were interwoven with social responses.

| DISCUSSION FORUM POSTS and forum replies summary : 2004 & 2005 | | | | | | |
|---|---------|--------------------|-------------|---------------|---------------|-----------------|
| | | Number of students | Forum posts | Forum posts % | Forum replies | Forum replies % |
| 2004 | Female | 94 | 1441 | 63% | 1089 | 66% |
| | Male | 115 | 834 | 37% | 555 | 34% |
| | Total | 209 | 2275 | | 1644 | |
| | Average | | 11 | | 8 | |
| 2005 | Female | 109 | 1161 | 42% | 755 | 41% |
| | Male | 94 | 1580 | 58% | 1104 | 59% |
| | Total | 203 | 2741 | | 1859 | |
| | Average | | 14 | | 9 | |

Table 55 : Chat, forum posts and forum replies: summaries for 2004 and 2005

This table shows an analysis of the data gathered from the eLearning system database for the number of chats, forum posts and forum post replies for the years 2004 and 2005.

| Posts of an academic nature by learners in discussion forums | |
|---|------------------|
| | 2005 |
| Morning | 391 (39%) |
| Afternoon | 435 (43%) |
| Evening | 182 (18%) |
| Total academic posts | 1008 out of 2741 |

Table 56 : Posts by learners in discussion forums of academic nature 2005

The table shows posts of an academic nature in the discussion forums in 2005. This once again confirmed the shift towards activity in the afternoons.

Research finding 30: The gender spread in terms of academic discussion participation is about equal (50%-50%) – dissimilar to chat activity where female learners contributed most of the traffic volume.

While female learners contributed 63% of the **forum posts** in 2004, the male learners contributed more forum posts in 2005 (58%). This same pattern was repeated in terms of replies on forum posts in 2005 (i.e. 66% were from female learners and 59% were from male learners).

Research finding 31: On average, learners contributed 174 chat posts per year, around 14 forum posts per year, and approximately 9 forum replies per year.

The average learner and therefore chatted 156 times in 2004 and a little more (174 times) in 2005. An average of 11 forum posts and 8 replies were made per learner in 2004, and an average of 14 forum posts and 9 replies in 2005.

The learners were able to help one another in the forums. The general

experience of learners was that if someone had a problem with some aspect of the work, others helped them as best they could. This kind of friendly response and service was greatly valued by learners. But others said they did not have “enough time or money” to answer the questions of other learners online. (Data assembled from interviews)

Some learners preferred not to use forums because they found it easier to talk face to face with someone. They found it easier to address their questions to a person in a face-to-face situation rather than online – especially if the question was complex and required a great deal of time to answer. (Data assembled from interviews)

Learners felt that the feedback from subject advisers and on forums should be faster.

Learners felt it teachers were taking too much time to respond to their queries and they wanted swifter feedback. They were also of the opinion that subject advisers were unfamiliar with the technology and that that was the reason why they were slow to respond. They thought that subject advisers should focus on the “big things” (such as compiling summaries) that would benefit all learners rather than deal with one small issue at a time. (Data assembled from interviews)

Private emails and discussions

Some learners used the personal information they found on the net and participated in private conversations outside the community. (Data assembled from interviews)

4.3.5. Learners that were active or were isolated?

Research finding 32: Approximately half of the learners were active contributors and half were isolated learners.

I categorised the learners on the basis of the content of their contributions in accordance with a descriptive typology drawn up by Leionen (Leinonen, 2003) which scrutinises contributions and then identifies learners either as “active contributors” or as “isolated learners”. The table below outlines the results of my analysis.

| | | Total | Active Contributors | Isolated students |
|-------------|----------|-------|--|--|
| | | | % | % |
| 2004 | Students | 203 | Posts 56% Replies 49% Average 53% | No posts 44% No replies 51% Average 48% |
| 2005 | Students | 209 | Posts 64% Replies 39% Average 52% | No posts 36% No replies 61% Average 49% |

Table 57 : The categorisation of learners in this research as active contributors or isolated learners according to Leionen's categories

The table shows the percentage of learners who were “active contributors” and those who were “isolated” according to Leionen’s (2003) typology

The following learners were active contributors: 117 out of 209 learners (i.e. 56%) in 2004, and 129 out of 203 learners (64%) in 2005. The number of learners who replied to posts were 100 out of 203 (49%) in 2004, and 82 out of 209 (39%) in 2005. More learners posted to the forum in 2005 than in 2004 but fewer replied to posts in 2005 than in 2004. About half of the learners on average were active contributors (53% and 52%) while about half were isolated learners (48% and 49%). Fewer than half the learners posted replies in the course of discussions, and about half of these were “isolated learners” in terms of Leionen’s typology.

4.3.6. Learners that “lurked” (i.e. were learners who never chatted or posted replies in forums)?

Research finding 33: The percentage of learners who “lurked” was about 40% initially, but this percentage decreased in the two-year period (42% in 2004 became 32% in 2005)

| Incidence of learners who “lurked” (i.e. learners never chatted or posted replies in forums) | | | | |
|---|---------------|-----------------|---|---|
| | | Learners | Number of learners who did nothing | Percentage of learners who did nothing |
| 2004 | Female | 94 | 35 | 40% |
| | Male | 115 | 52 | 60% |
| | Total | 209 | 87 | 42% |
| | | | | |
| 2005 | Female | 109 | 41 | 63% |
| | Male | 94 | 24 | 37% |
| | Total | 203 | 65 | 32% |

Table 58 : Learners who were “lurkers” (i.e. those who never chatted or posted replies in forums)
This table shows the number and percentage of learners who participated in chats and who never posted replies in the eLearning system in 2004 and 2005.

In 2004 42% of learners neither chatted nor posted any reply. In 2005 this figure decreased to 24% (lower than 32%). Whereas it was male learners who mostly lurked in 2004 (60%), 63% of the female learners in 2005 neither chatted nor used forums. These figures give some indication of the lurking factor in the eLearning system.

A large percentage of learners lurked. These were mainly learners who read discussions but never participated. Because some learners do not like to be exposed to challenge or discussion and possibly laughed at, they remain silent and never participate. Although there is an anonymous function in the system, it



was seldom used. One may hypothesise that those learners who participated more frequently were probably more extrovert and outgoing personalities and were consequently more comfortable with taking risks. (Data assembled from interviews).

You are now here:

Chapter 1 Introduction, background and research problem
Chapter 2 Literature review
Chapter 3 Research design and methodology

Chapter 4 Analyzing the case, evidence and discussion

Chapter 5 Conclusion and recommendations

4.1. Answering sub-question 1 : To what extent do certain pedagogical theories and eLearning theories inform a high school eLearning resource?

- 4.1.1. The overall academic results were favourable
- 4.1.2. Results from the questionnaires and interviews about pedagogics.

4.2. Answering sub-question 2 : Why do certain community elements in an eLearning resource contribute to creating and sustaining high school learning?

- 4.2.1. Results of an analysis of the opinions of learners about various aspects of community in the eLearning resource.
- 4.2.2. The personality type of the learners
- 4.2.3. Patterns of online activity by the learners.
- 4.2.4. Patterns of online activity of the subject advisers.
- 4.2.5. Ratio of subject advisers to learners

4.3. Answering sub-question 3 : In what way and why do certain communication, collaboration and social elements influence a high school eLearning resource?

- 4.3.1. Did the learners adequately exploit the opportunities for communication inherent in the eLearning resource?
- 4.3.2. Reachability and preferences of learners in terms of communication?
- 4.3.3. How did the learners use the chat facility of the eLearning resource?
- 4.3.4. How did the learners use the discussion forums facility of the eLearning resource?
- 4.3.5. Learners that were active or were isolated?
- 4.3.6. Learners that “lurked” (i.e. were learners who never chatted or posted replies in forums)?

4.4. Answering sub-question 4 : How and why do certain technological aspects and instructional design issues affect a high school eLearning resource?

- 4.4.1. Computer skills and attitudes of learners and subject advisers
- 4.4.2. What was found in the implementation of the basic hardware and software systems.
- 4.4.3. Setting up the system - course materials
- 4.4.4. Setting up the system - Users and Facilitators

4.4. Answering sub-question 4 : How and why do certain technological aspects and instructional design issues affect a high school eLearning resource?

Organiser

The following section shows how the results of a data analysis answers the fourth sub-question of the research (which is about technological elements).

The analyzed results of questionnaire 2 are presented in ANNEXURES 10,11,12. The summarised results of the various interviews are presented separately in ANNEXURE 13. The transcribed interviews are included in the DVD. In this chapter, however, the results are presented as an integrated whole.

4.4.1. Computer skills and attitudes of learners and subject advisers

Research finding 34: Both learners and subject advisers were highly computer-literate and displayed positive attitudes towards both the medium itself and the eLearning resource.

Both subject advisers and learners reported very high levels of computer skills (90% and 98%).

The subject advisers were confident that the learners also rated their (i.e. the subject advisers') computer skills very highly (80%).

The responses of the learners (73% in 2004 and 95% in 2005) indicated the strong

positive and favourable attitudes that learners had towards the medium and the resource and towards their own mastery of the technological elements of the eLearning system.

The subject advisers reported that they were getting what they expected from the eLearning resource (60%). Only 55% of the subject advisers thought that the learners were getting what they expected from the resource.

Although all the subject advisers agreed that the eLearning system was easy to master (100%), 90% reported that they had been nervous when they first encountered it (they had wondered at the time whether they would be able to master it). 80% of the subject advisers rated the system's overall usability as good. While 70% of the learners initially found the system easy to use, this number increased over time (84% of them reported, after a longer period of acquaintance, that they found working with the system easy). Only 60% of the subject advisers thought the learners would find the system easy to work with. The larger picture is therefore that, while the subject advisers seemed to have found the system easy to get to know right from the beginning, the learners found it initially more difficult to master, but easier later on. Both these groups therefore found the system easy to work with once they had become acquainted with it.

Almost all the subject advisers (99%) thought that not having access to such a system would have hampered learner's studies, while only 75% of learners were of the same opinion.

The technological elements of the system were therefore viewed positively by both the subject advisers and the learners. But in the opinion of both these

groups, the system could never replace the human beings involved, i.e. teachers and parents. They do not see the eLearning resource as a companion, but rather that the parents and teachers are the companions, and to a lesser extent the fellow learners.

Connectivity, cost and speed

The Internet connection was not exactly a problem, and the speed was deemed to be reasonable. Although the cost of the Internet connection was not a direct personal factor for most learners, parental restrictions on the use of the Internet inhibited most learners. Quite a number of the learners were uncertain about the actual cost of an Internet connection, and most of them did not really bother much about it. It was simply not a factor in their personal lives because their parents paid. Because some of the learners had problems with Internet speed, they utilised special times to access the Internet and their parents got special discounts for connectivity at these times. Most of this group, for example, accessed the Internet after 7 p.m. in evenings. Even though the Internet was a vital resource for learners' research, some of them obtained most of their sources and references (research materials) from the system – and said that they did not rely in any way on libraries or other resource centres.

- **Interface issues.** The learners expressed a desire to have place where they would be able to see whatever new things were added to the resource (and there is, in fact, a place exactly for seeing that). Some said that they felt that there was too much information on the screens and that the screens were too “busy” (i.e. crowded with information).
- Learners would have preferred ONE page on which they would be able to see (1) everything that was important, and (2) everything that had changed since their last log-in.

- Learners reported that they sometimes could not find things that they were expected to find. While some learners encountered problems in finding updates and reported that they did not know where to look, others reported that they experienced no problems in this regard. And while some learners encountered difficulties in submitting assignments and brought their assignments to workshops with them, the majority of learners experienced no problems in submitting their assignments.
- While some learners felt that they would have liked to have been able to customise their screens, others felt that the screens were “okay” and “balanced”. Some learners thought that the interface should have been made easier for the sake of the teachers because they (the teachers) seemed to have more problems in this regard than the learners themselves! They were of the opinion that the subject advisers were unskilled and inept in using technology and that that was the reason why they were “slow”.

The learners felt that it was important for course material to be provided on CD and not just on the Internet.

The learners felt that the CD containing vital information was “essential” and that without it they would have had problems. They appreciated the fact that updates on their lessons were posted to the Internet. They also appreciated the fact that the core material of their courses was available on CD because this relieved them of the necessity to spend even more time than they were doing on the Internet. They felt that if the CD was inadequate in any way, they could obtain the necessary information from Internet, and vice versa.

Video clips and videos of face-to-face workshops were important to the learners.

The learners felt that the video clips were very useful. While they felt that the video recording of workshops was very important, they said that they did not have time for “playing with techno-toys like webcam”. Skype might therefore be

considered in this regard

4.4.2. What was found in the implementation of the basic hardware and software systems.

The technical "story" of what happened on the resource throughout these two years is told from a technical point of view in the following sections. It is important to include this information because it may be of considerable assistance to other people throughout the world who might wish to implement eLearning systems of this kind for high school learners.

Webserver hardware and software.

Research finding 35: Because constant updating is necessary, it is necessary to have the kind of reliable technical expertise that will enable one to upgrade continuously.

Even within the space of two years, upgrades on basic hardware were needed in terms of RAM memory, processor speed, hard drive and backup capacity. The computer motherboard was also upgraded to accommodate the backup system and a faster processor (2 Ghz was upgraded to 4 Ghz).

| Hardware upgrade path for the computer equipment used on the webserver of the eLearning resource | | |
|---|--------------------------|--------------------|
| | Beginning of 2004 | End of 2005 |
| RAM | 512KB | 2Gig |
| Hard drive | 80Gig | 2 x 80 Gig |
| Processor speed | 2Ghz | 4Ghz |

Table 59 : Hardware upgrade path for the computer equipment of the eLearning resource server
This table shows the hardware upgrades that were performed on the eLearning

resource's server between the beginning of 2004 and the end of 2005.

All the operational software on the webserver went through a series of updates in 2004 and 2005. The table below shows the progress between the software versions of the various kinds of software used in the two years of the research period.

| Software upgrade path for the software used on the webserver of the eLearning resource | | |
|--|----------------------------------|----------------------------|
| | Version at the beginning of 2004 | Version at the end of 2005 |
| RedHat Linux | Version 9 | Upgraded the kernel |
| PHP | 4.1 | 4.4.1 |
| MySql | 3.2.3 | 4 |
| Apache | 1.3.1 | 1.3.36 |
| Moodle | 1.3 | 1.5 |

Table 60 : The table shows the various updates performed on the software that drove the eLearning resource in this study

This table shows the various updates that were performed on the software that drove the eLearning resource in this study in the period between the beginning of 2004 and the end of 2005.

Implication: Because one will inevitably need constantly to update software, one will need to have access to reliable technical expertise in order to perform such upgrades in a continuous fashion.

Web speed comparison between international and local internet service providers.

Research finding 36: Web servers inside the local country usually provide better speeds.

Working with the system revealed a significant difference in the speed of the Internet between hosting services which place web content on servers outside South Africa and those that operate locally. A comparison was made by using

the command “ping” from the Microsoft Windows (Microsoft Corporation, 2006) environment and the results were as follows.

| Comparisons of Internet speeds (by using “ping”) between internationally based web hosting and locally based web hosting | | |
|---|--|----------------------------------|
| | Internationally based web hosting | Locally based web hosting |
| Speed in milliseconds (Tested for one week once every day during May 2005 and repeated in July 2006) | 700-900 ms | 30-50 ms |

Table 61 : Internet speed comparison - international vs local web hosting

The table shows a comparison of the relative Internet speeds of international and local web hosting made by using the command “ping”. Local web hosting is seen to be around ten times faster.

4.4.3. Setting up the system - course materials

The data about setting up the system with course materials is important for others who would like to implement similar systems.

Available materials ported to the eLearning interface.

Research finding 37: The average size of a file of course material was 72 kilobytes. It took 5,5 hours to upload 1.1 gigabytes of data in 16 000 lessons in South Africa in 2005.

Around 16 000 lessons were ported from the CD content to Internet format.

Uploading to the eLearning resource – useful information extracted

Once it had been worked out where and how to store the courseware, it was uploaded to the eLearning system. The total file size upload was around 1.1 gigabytes $\times 1024 = 1126$ megabytes $\times 1024 = 1153433$ kilobytes (i.e. around three

and a half normal CDs). The average of a file size is then calculated as follows: 1153433 kilobytes divided by 16000 files = 72 kilobytes. It took approximately five and a half hours to upload the data files. This was calculated in the following way: 1153433 kilobytes divided by 60 kilobytes per second (the ADSL broadband maximum speed) = 19223 seconds = 5.3 hours. This partly explains the peak in bandwidth usage and files uploaded in the web statistics for the system (Webalizer.com, 2004).

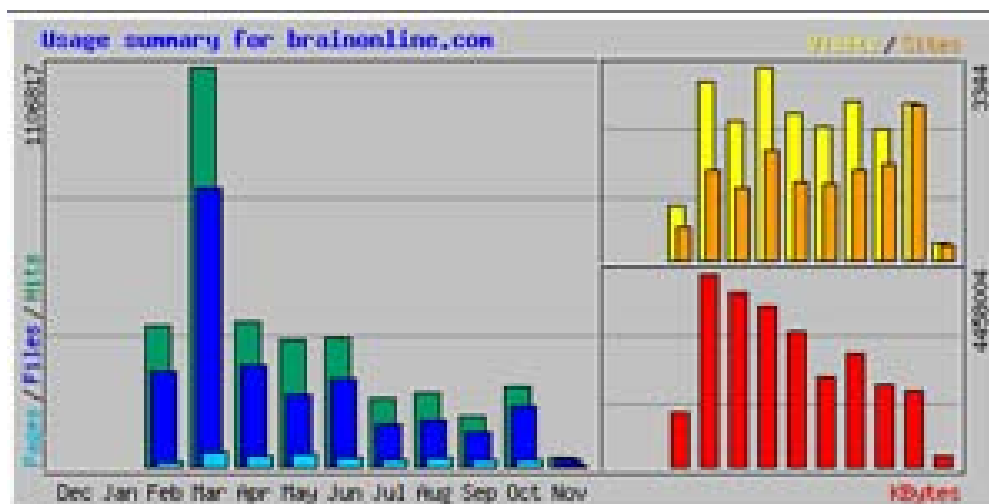


Table 62 : Usage summary for brainonline.com for the year 2004 (Webalizer.com, 2004)

The figures for March 2004 showed the peak caused by the uploading of course material in that month. Crosschecking with other usage data showing bandwidth on all ports shows the wastage caused by a denial-of-service (virus) attack (Symantec.com, 2004) released world-wide and also reflected here. I include information about this attack here because protecting the system against viruses (a.k.a. malware and badware) and malignant attacks constitutes a vital part of the daily maintenance of such a system.

How the denial of service (DoS) attack created abnormal bandwidth usage and disruption

Research finding 38: Hack attacks and viruses can waste large amounts of bandwidth and increase running costs.

This data is included here because it might be of practical importance for system engineers when they set up such systems.

A denial-of-service attack is not a virus but a concerted method that hackers use to prevent or deny legitimate users access to a computer. Denial of service attacks are typically executed by using denial of service tools that send a vast number of request packets to a targeted Internet server (usually a Web, FTP or mail server). These request packets then overextend the server's resources and temporarily make the system unusable. Any system that is connected to the Internet and is equipped with TCP-based network services is open to such an attack, and in past years such attacks have been successfully mounted against major corporations such as large banks and even United States government departments.

One may imagine, for example, a hacker who creates a program that automatically telephones a local pizza store. The pizza store would then answer the telephone, but upon learning that it is meaningless call, would hang up. But if the program causes the pizza store's telephoned to be rung continuously and repeatedly, legitimate customers would be prevented from ordering pizzas because the telephone line would be constantly engaged. This is analogous to a denial of service attack, and similar to what a denial of service attack achieves. In a denial of service attack, a very large amount of Internet traffic is created by millions of minute requests and these cause a server to become overextended and so be placed beyond the reach of legitimate clients.

Creating the user interface in the courses

After files have been uploaded, the courses have to be set up. There were 74

different courses offered in 2004, and 65 in 2005. A customised program was developed to set up the courses in a structured and coherent manner. This is probably what every provider will have to do in cases where existing material needs to be ported. The amount of time saved by setting up courses with a customised program is substantial.

Customized course creation

Research finding 39: Automated course creation of 74 courses saved approximately 1300 hours of human labour and around US\$11 000 in South Africa in 2005. The automation used US\$500 versus manual creation of US\$11 000.

I measured the time that it took me to create the infrastructure for one single lesson (I am, of course, not referring here to the actual creation and design of the lesson content). During my first attempt, the Internet line went down and it took me six extra minutes to get it up again. If I average this out, I estimate that it will take approximately five minutes to set up one lesson. If this figure is multiplied by the number of lessons, the calculation would look like this: 16 000 lessons x 5 minutes = 80 000 minutes, which, if worked back to human-labour hours, equals 1 333 human-labour hours or 16 people working full time for about one month. If one costs this at a low rate of R60 (or \$9.2 using an exchange rate of R6.5 to the American dollar) per hour, it works out to approximately R80 000 (US\$12 000). One may calculate the real time it took a specialist programmer to write the code and create the courses as follows: 16 hours at a rate of R200 (US\$30) per hour = R3 200 (US\$500).

See Table: Customized course creation below.

| | Time for one lesson (mins) | Number of lessons | Total minutes | Human-labour hours | Costing at R60/\$9.2 per hour | Cost in R | Cost in US\$ |
|--------------------------------|----------------------------|-------------------|---------------|--------------------|-------------------------------|-----------|--------------|
| Manual course creation process | 5 | 16000 | 80 000 | 1333 | 9.2 | 80 000 | 12 000 |
| Programmatic course creation | | | | 16 | 30 | 3 200 | 500 |

Table 63 : Customized course creation: manual course setup versus programmatic course setup time and costs

This table shows how much time would have been required and how much it would have cost to set up courses manually as opposed to setting them up programmatically in 2004

Development costs of the course material.

Research finding 40: Course development costs in the researched institution were significantly cheaper than international costs – US\$3 000 in South Africa as opposed to US\$88 000 in the United States.

The costs mentioned above do not include the cost of developing the actual course material. There are various models for doing this. A search for costing parameters produced about 200 000 entries from Google in 2004, with the Commonwealth of Learning providing a vivid example of an accounting course (Learning, 2004) which cost US\$88 500 (or R575 250 @ \$6.5 to the Rand at that exchange rate). This, multiplied by 74 courses, would yield development costs of R42 568 500 (US\$6 549 000). South African professionals are accustomed to work at much lower rates than these.

My estimate is that, in real terms, the minimum development cost in South Africa would be around R20 000 or (US\$3 000) per course.

This would result in direct costs of approximately R1 480 000 (US\$230 000). This would exclude the fixed costs of the business (which I would estimate at approximately R1 200 000 (US\$180 000) per year). At the top end of the scale, one might expect to pay around R30 000 (US\$4 500) per month for 12 months to get **one** very good course developed. That would equate to R360 000 (US\$54 000) per course. The totals would then be $R360\ 000 \times 74 = R26\ 640\ 000$ (US\$4m)

| | Cost per course in USD | Number of courses 2004 | Total in USD |
|---|-------------------------------|-------------------------------|---------------------|
| Example Accounting Course USA | 88 500 | 74 | 6 549 000 |
| Lowest Estimate : Researched organisation - Brainline | 3000 | 74 | 222 000 |
| Highest Estimate : Researched organisation - Brainline | 54 000 | 74 | 3 996 000 |

Table 64 : Calculation course development costs

The table shows the estimated cost of developing a course.

4.4.4. Setting up the system - Users and Facilitators

Enrolment prerequisite for learners: the necessity to have both Internet access and email.

Research finding 41: It is necessary to set certain minimum hardware requirements for those who enrol.

One of the prerequisites for enrolment in the course was to have full Internet access and email. It was assumed in the administration of the system that the Internet data supplied by the learners on their enrolment forms was accurate.

Number of users on the system

208 learners were enrolled for the Cambridge courses at the time of this study in 2004, and 188 learners were enrolled in 2005.

The personal data captured in learners' personal profiles are made up of a number of entries. These included name, surname, telephone numbers and town of residence. They also included a place for a photograph, a personal website and an ICQ number. The number of personal photographs and ICQ is used here. Learners were allowed to edit and modify their own profiles (and specifically the photographs of themselves on the system).

The number of learners who added a picture of themselves (customisation).

Research finding 42: Only about one third of the learners added a photograph or a symbolic image (icon) of themselves to their profiles.

An analysis of user profiles revealed that the number of learners who added a photograph of themselves in 2004 was 9%. The percentage of learners who added symbolic pictures (icons) to represent themselves was 31%. The percentage of learners who added no photograph or symbolic picture (icon) of themselves was 60%. For 2005 the data looked almost the same, with 12% of learners adding photographs of themselves, 23% adding a symbolic picture (icon), and 65% adding no photograph or icon at all. This information may give some additional insight into the kind of learner under scrutiny in this research. The data is tabulated in the table below.

| Analysis of learners who supplied representations of themselves (and those who supplied none) | | | |
|--|---|--|---|
| Year | Percentage of learners providing real photographs of themselves | Percentage of learners providing symbolic images (icons) of themselves | Percentage of learners providing no image of themselves |
| 2004 | 9% | 31% | 60% |
| 2005 | 12% | 23% | 65% |



Table 65 : Analysis of learners supplying representations of themselves

The table shows the percentage of learners who supplied photographs, symbolic images (icons) or no representation at all of themselves for their profiles.

Even though a special campaign was mounted in the language courses to get learners who had not already done so to upload photographs of themselves (with extra marks being promised as an incentive for those who did), learner response to this appeal was zero.