THE MOTIVATION OF EDUCATORS FOR INTRODUCING INTERNET TECHNOLOGY INTO EDUCATION, WITH SPECIAL REFERENCE TO SECONDARY SCHOOL CLASSROOMS

by

NATASJA HAUPT

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submitted in accordance with the requirements for
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SUPERVISOR: DR. G. VAN DEN BERG

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DECLARATION

Student number: 0-879-641-6

I declare that "The motivation of educators for introducing internet technology into education, with special reference to secondary school classrooms" is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

_____ _____

SIGNATURE DATE

(Miss N. Haupt)

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SUPERVISOR	:	DR. G. VAN DEN BERG
DEPARTMENT	:	EDUCATIONAL STUDIES
DEGREE	:	MEd (Specialisation in Adult Education)

ABSTRACT

The purpose of the research was to determine how educators could be motivated to implement internet technology in education. The literature study highlighted the need for e-learning while suggesting that educator support would not be achieved easily. The empirical study, however, revealed that at the international school examined, educators accept internet learning and demonstrate a willingness to introduce it into their pedagogy, were a blended approach to be adopted. Technological and psychological barriers had already been breached, as e-learning was taking place in a non-threatening environment. Educators were being empowered to experiment with e-learning in their subject areas. The study revealed that, having already embraced e-learning methodology educators would continue to do so if they could clearly perceive the benefits to be achieved. The study also showed that given a technologically nurturing environment, it would not be difficult to motivate educators to introduce internet technology into their pedagogy.

Key terms:

Internet technology, Internet methodology, Socio-constructivism, Pedagogy, E-learning, Scaffolding, Blended learning, Symbiotic relationship, Motivation, Lifelong learning, Facilitators

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CHAPTER 1

INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

According to Cabez de Vaca (2008: 12) many predictions have been made about what the future will hold and much has been written and said about future trends in education. She states further that international organizations like UNESCO (United Nations Educational, Scientific and Cultural Organisation) and OECD (Organisation for Economic Co-operation and Development), with considerable experience in education issues in both developing and industrial countries, predict revolutionary changes to the socio-economic structure of this all-encompassing world we inhabit. This has huge implications for the way schools are structured, on educators' approach to teaching and on what is taught.

This investigation will focus on the challenges educators face, in a specific private international school, as they attempt to harness technological resources available to them, to maximise their efficacy. The challenges include the following: individual limitations in utilising recent technology, lack of technological infrastructure available, time wastage caused by the traditional system not having been fully adjusted by management to encompass internet teaching; in other words there being generally no additional time allocated for the integration of these skills with traditional teaching.

Further challenges of an internet system are that it is often slow and has intermittent feeds. Management may be inclined to regard an internet system as an additional and unnecessary expense. Participating staff would be required to desensitise themselves to the negative influences of non-participating staff. The experimental nature of the medium is not entirely matched to examination syllabi and curriculum requirements. Allied to these problems are the perceptions that the educator is dealing with technology which is changing so fast, that the time spent adapting it to the classroom may not be justified as further developments make some current time wasting activities superfluous. For example voice-recognition which is now replacing the hard-earned skill of mastering the keyboard.

It is of paramount importance that strong motivating factors be established in order to achieve full educator participation in internet teaching. A great deal of resistance could be encountered as the direct benefits of internet teaching to final outcomes have not yet been established. Thus this study

aims to propose ways in which educators should consider adapting traditional pedagogics to communicate efficiently in a globally networked society thus easing transition to new modes of pedagogy.

For the first time in decades, education needs to reconsider its traditional parameters and paradigms. It appears that internet instruction may be best suited to cope with or generate viable alternative(s) to traditional methods of instruction. According to French (1999: 19) students who are bound by conventional classroom teaching stand to lose many of the opportunities for gaining information and extending horizons available in recent times through extended e-learning. Such conventional pedagogy could limit students' growth and opportunities for professional development. This use of the full range of methodologies and technological opportunities that modern conditions make possible I will refer to as "holism". Holism implies a fuller and richer educational experience such as exposure to a variety of international resources, insights and learning drawn from international and national experience. It could include blogging and exposure to the teaching style of another educator through for example, YouTube. Not to expose students to the holistic educational experience could lead to limiting their opportunities: "Limiting one's options narrows one's opportunities" (French, 1999: 19).

Before proceeding further, it is necessary to explain the following terminology as it is used in this research. The study is based on a specific international school and, the following terminology will be used:

- Educator refers to both the teacher in the classroom and beyond. In the modern South African context the term is preferred to that of teacher. Some sources used however refer to teacher which can be equated with educator for the purposes of this study.
- Student refers to learners at the specific international school which is the focus of this study, and include those at primary, secondary and post-matriculation levels.

Within this context the role of e-learning will be considered as part of the 'scaffolding' element of socio-constructivism. "Scaffolding" is the systematic, structured, building of layers of learning through interaction with various learning resources (Holmes & Gardner, 2006: 83-84). Blended with the traditional norms and methods, e-learning could potentially extend the "reach" of education beyond the classroom. It implies an extension of contact hours with students because the classroom effectively becomes available beyond the classroom boundaries. Access to websites would also expand instructional material, making them current and more comprehensive. It should afford educators a means of access to communicate directly with individuals and solve problems. Scaffolding extends the responsibility of the student in the learning process. He or she is expected to

become an active and responsible participant in learning activities. The educator must adapt the learning process to enable management of and access to learning material.

The terms constructivism and socio-constructivism, will be used in this dissertation and they should be distinguished here. Constructivism is the individualised reflection of the student on previous and present experience (Driscoll & Carliner, 2005: 45) while socio-constructivism refers to interactive and experiential human reflection and progression (Holmes & Gardner, 2006: 83-84).

The interactive nature of socio-constructivism implies a holistic view of the learning experience providing a richer and more comprehensive cognitive experience than constructivism. Woo and Reeves (2007: 18-19) contend that social-constructivism implies a relationship between the individual and society and that the individual learns by means of collaboration with the community life and the formal learning environment (Stage, Muller, Kinzie & Simmons, 1998). The authors emphasize the existence of a "social product" interacting with expert or adult logic to create meaningful learning (Confrey, 1995; Ernest, 1995).

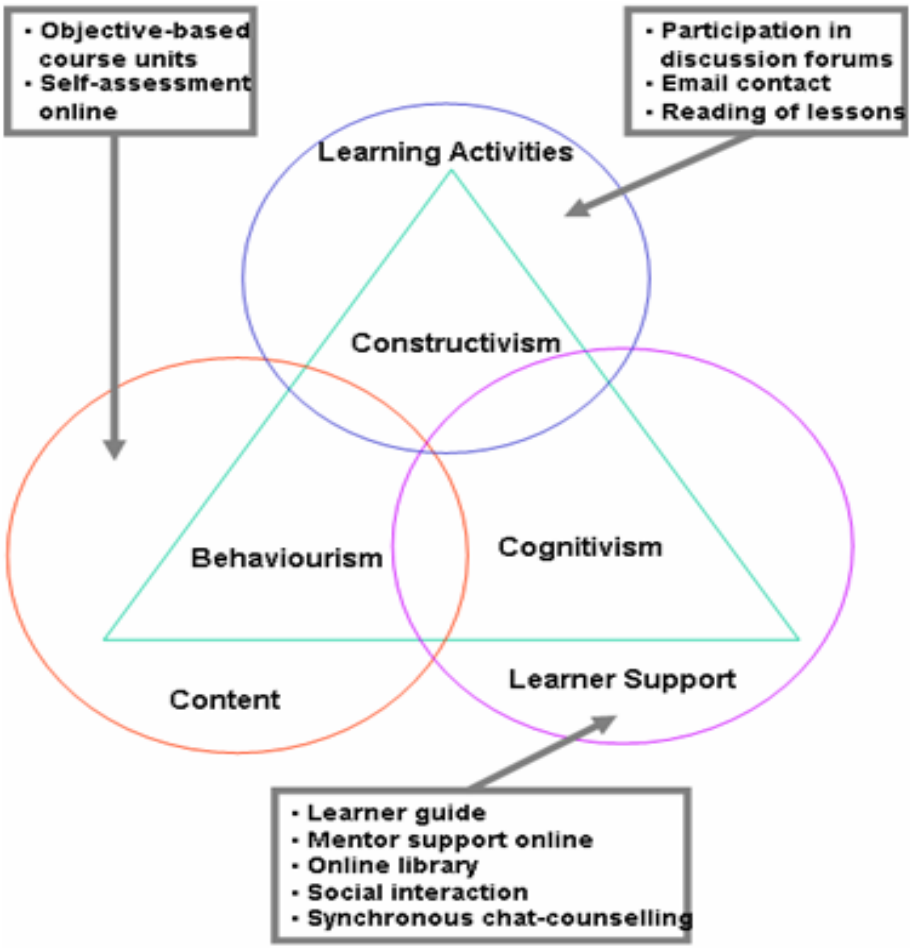
According to Holmes and Gardner (2006: 83-84) the following aspects are relevant to socio-constructivism:

- Interactivity permits student social interaction with the "e-world" through access to a wide range of information sources, websites, blogs and other communication instruments where information and ideas can readily be exchanged and shared between students as well as with the educator.
- Reflection stimulates and forces introspection and allows development of students' own opinions and conclusions.
- Authenticity is promoted when students are active participants in their own learning experience, having the freedom to interpret information and findings. Authenticity encourages originality and stimulates cognitive processes. Exposure to a wide variety of views provides conditions that often lead to critical assessment and interpretation of learning material.
- Scaffolding as a cumulative knowledge-building activity encourages students to add to their frame of reference, with continuous reflection and adaptation of information.
- Progression allows students to learn from hands-on experience and from mistakes they make in the process. The student is placed in charge of his/her progress and determines its pace.
- Experiential learning is brought about by the individual being not just an active but also an interactive participant in every aspect of the learning process.

Villalba and Romiszowski (2001: 325-342) argue that behaviourism, cognitivist psychology and constructivism (see figure 1) have been central to analysing effective learning, but that of the three theories constructivism is most appropriate for e-learning (Hung, 2001: 33-41; Hung & Nichani, 2001: 40-44). Lebow (1993: 4-16) suggest that constructivist learning should involve the following:

- Metacognition experience
- Multi-perspective experience and understanding
- Relevant and recognised didactics
- Student involvement and input in the learning process
- Socio-experiential input in the pedagogics
- Multi-faceted presentation
- Student knowledge of and participation in the way in which knowledge is created and delivered.

Figure 1: Design framework for online learning environments



Based on Villalba and Romiszowski (2001: 325-342)

Constructivist theory represents a shift in paradigm from the educator as knowledge generator to the educator as facilitator with an “emphasis on student-directed learning”. In French, Hale, Johnson and Farr (1999: 14) the following conditions are set:

- Student involvement in the goals set must be needs driven.
- Uniqueness of the individual student’s process of understanding based on his or her social environment must be considered.
- Learning solutions must be closely related to the personal experience of the student.
- The learning experience must be considered a process inclusive of the students’ individuality and collective involvement in society.
- Measurement of the level of learning can only be ascertained by direct discourse and surveillance of the individual.

The constructivist theory implies and leads to an eclectic instructional method where the student largely drives his/her learning experience by means of personal cognitive processes, hence the reference to an eclectic experience which includes direct dialogue and observation.

Learners age seven-to-seventeen, enrolled at international schools today were born in a age of new technology Cabez de Vaca (2008: 12). They would almost certainly be unable to grasp the notion of life without Automatic Teller Machines (ATM’s), computers or cellphones. They grew up with mobile phones, internet and Digital Video Discs (DVD’s), they socialize through Skype, are proficient at selecting the correct YouTube clips, communicate through Facebook, MySpace or Twitter and are familiar with Second Life. Most have travelled to a new country at least once. These factors will have a fundamental impact on the responsibility and involvement of educators in the international sector.

The implications of the above statement of Cabez de Vaca implies a progressive state of mismatch between the experiential environment of the student and the educator. It is as if two distinct worlds exist which have to be brought together successfully in the management of the education process. The international student of today is very likely to experience this mismatch between technological resources in the home and the resources available at the education institution.

In stark contrast, many educators grew up in a generation of monolingual cultures, television with local programmes, dial-up phones, and traditional schools with the only method of tuition being blackboards and chalk. Cultures and nationalities are today becoming more complex with bilingualism and multilingualism becoming the norm. Besides the growing understanding into how students learn and

the rapid pace of technological advancement educators cannot overlook these wider issues in their pursuit of education for future generations.

The pressure is growing on the educator to utilise the internet resources available to both educator and student as resources multiply even more rapidly. Ideally the educator should regard internet resources as an opportunity to rapidly close the gap that has very recently developed between the background of the student and the educator. Therefore internet technology should not be seen in any way as a threat to the educator but rather as a means by which his or her pedagogical position may be strengthened albeit in managing rather than imparting knowledge and logical reasoning skills (Lindeberg, 2005).

The advent of internet learning represents a means by which the student is able to tap into the knowledge, not only of the educator in the classroom but into that available in other classrooms throughout the world and in many other formats. The internet is best suited to maximise the contribution of the myriad of resources to the individual student despite the experiential and technological divide between educator and student which could threaten the success of traditional education. Note that it is possible through internet learning for students to avail themselves of the broadest possible instructional and knowledge resources and that the stark contrast between the lifestyle and technological experience of students and educators can be bridged.

The world is constantly changing and will continue to do so. Learning as a permanent discipline is the secret to adjusting to transformation. It has become necessary for schools to motivate educators to introduce internet technology to the learning environment. Instead of educators regarding internet learning as a timewaster or a threat to their existence as educators, it should be perceived as an ally which if utilised correctly is capable of saving time and enhancing educators' pedagogy. When used as a quick means of accessing information on condition that it is utilised effectively by the educator, the internet is able to shorten preparation time and speed up learning. Furthermore, the abundant supply of information and view-points could be invaluable in assisting the educator to achieve balance and depth of presentation (Lindeberg, 2005).

A threat which may be perceived by the educator is that the new technology may make him or her redundant. However I believe, that in this perceived threat lies the opportunity for the educator to have a new lease on life because internet learning creates an opportunity to not only revitalise the learning experience but to marry the worlds in which educator and student have grown up and to allow both

parties to contribute more meaningfully to learning through a mutually accepted medium. This should extend the effective lifespan of the educator deferring the possibility of redundancy and expanding the value of the pedagogic experience. This has further positive implications as the boundaries to learning set by formal education no longer exist and the student once exposed to learning through the internet is able to continue to study long after the formal process has been completed. Similarly, the educator is now also inducted into a process of lifelong learning and the possibility of stagnation is limited.

In modern society there is no limitation to the amount of knowledge that must be acquired and it is impossible for an educator to satisfy this requirement without input from other sources. The emphasis is no longer placed on the educator as the source of all knowledge but rather as facilitator to accessing knowledge.

According to Newby, Stepich, Lehman and Russel (2000: 21) facilitating learning calls for an active awareness of many instruments and techniques and an understanding of why, how and when they should be utilised. “Educators can no longer depend on constants – other than the fact that learners need access to the finest education schools can provide” (Cabez de Vaca, 2008: 12). For that reason, educators need to display pedagogic flexibility and adaptability.

Cabez de Vaca’s statement gives good grounds for focusing on a private, international school. A school of this nature caters for a diverse multicultural international student body where the expectation is that not only should there be leadership in the quality of education but also that the school be at the forefront of recent trends in communication and interconnectivity. The school in question is a private international school which has recently introduced wireless interactivity across the campus including the academic, hostel and staff premises. At present the headmaster and educators are exploring the introduction of e-learning blended with traditional classroom practice. A unique opportunity exists to investigate the barriers to successful implementation and utilisation of e-learning.

Gannon (2007) states that until now, e-learning has been technology- and not theory-led; by accepting that learning cannot be improved by technology alone, the perceived division between technology and pedagogy can be repaired. It is important to prevent technological goals taking precedence over pedagogical goals. E-learning needs to be based in educational theory to preclude disparities from forming between design of learning and its epistemological roots. Gannon (2007) claims that the aim of e-learning should be to concentrate on the deficiency of pedagogies by freeing the educational

promise of learning technologies. Instead of viewing them as rival entities, a symbiotic connection between pedagogy and technology has to be established and supported.

In this study conditions exists where the pedagogical environment requires technological focus thereby strengthening the symbiotic relationship mentioned in Gannon (2007) and ensuring that educational theory is not overridden by technology. For a holistic educational experience to be achieved at the school capable of matching the prior experiences of the majority of the student body, it is essential that technology be seen as a major educational driver. To motivate educators to adopt these innovations it is therefore important that they do not see e-learning as an imposition but as an integral and necessary requirement for a full learning experience for a student with a global outlook and experience.

McCombs (2000) promotes learner-centred principles which allow the technological e-learning process to focus on and take into account the "heredity, experiences, perspectives, backgrounds, talents, interests, capacities and needs" of the students. Allied to this McCombs proposes that educators put the following principles into practice: 1) including students in deciding "how and what they learn" and making it clear on which principles assessment will take place, 2) taking into account each student's view points, 3) respecting and acknowledging each student's uniqueness from cultural through to experiential background, 4) regarding students as "co-creators" in the pedagogical experience. This is supported by Darling-Hammond, (1996: 4-10); and Sparks and Hirsh (1997) who in addition mention the opportunities for critical reflection, collaboration in the planning process between student and educator to improve the process of learning, the degree of success and drive of the student. Sparks and Hirsh (1997) and others see this as a totally original and transformational change to education.

McCombs and Lauer (1997: 1-21); and McCombs and Whisler (1997) emphasise that "learner-centeredness" where education technology is involved should be closely aligned to the learner perception that their individual and collective needs are being addressed. McCombs (2000) suggests that one of the challenges of e-learning is whether it is possible to replicate the efficacy of the most effective educators through the e-learning process. According to this author, research has shown that learner-centred educators tend to have some general characteristics and dispositions in common. At the Association for Educational Communications and Technology (AECT) conference Fullan (2000) emphasised that the more influential technology becomes the more vital is a good educator. According to Fullan (2000), the ideal educators are "pedagogical design experts" and "facilitators of learning" (Brown, 2000: 14-15; Ellisworth, 2000: 28-30). Fullan (2000: In the 2000 Change Council

keynote address) emphasises the importance of educators finding “ways to build in meaning, purpose, connections, and relationships to the larger world and to the community outside the school building.”

According to Gannon (2007), a foundation for, developing a theoretical e-learning knowledge base from both points of view is required. Educators should therefore be encouraged and supported in continually upgrading knowledge and practice. Gannon (2007) further indicates that e-learning design should be reinforced through a reliable philosophical framework. Different theories recommend different approaches. She states that e-learning design can be strengthened with a fusion of principles from different learning schools. A blended methodology would serve a wide target audience and different learning approaches. Learning should be “suited to the objective”. The aim would therefore be to utilise the desired theory (or arrangement of theories) for the appropriate condition(s).

E-learning allows both the recipient of information and the corresponding new interpretations and options which it is hoped this study will reveal.

This investigation is aimed at motivating educators to introduce internet learning methodology which holds promise for the transformation of educational methodology.

1.2 PROBLEM STATEMENT AND RESEARCH QUESTIONS

For the pedagogic experience to achieve the highest degree of holism as it is emerging from the limitations of the traditional classroom, options need to be considered which will provide for a richer educational experience. Scaffolding provides new opportunities for the educator and student to interact jointly with a variety of learning resources since better access is currently available to educator and student.

Were new technologies and internet methodologies to be identified, acknowledged and incorporated by today’s educators, opportunities would be created for educators and students to overcome the experiential divide between educator and student which has developed in recent times.

The opportunity exists for the educator and the student to understand better how the learning experience can be maximised despite the disparity that has developed over time. The educator and indeed the student are given a new lease on life through the opportunity which internet methodologies should provide. The educator should ideally benefit from the prospect of revitalising the educational

experience while the student, bogged-down by the stagnation of the pedagogy of the past should benefit by being exposed to a more relevant educational experience.

When eventually properly utilised, it is envisaged that technology may become, a timesaving opportunity for the educator. In this study, ways will be suggested to motivate the educator to regard internet technology as an enhancement of the pedagogic framework, offering immediate access to a vast range of viewpoints. It is crucial that internet technology be marketed to the educator as an opportunity for lifelong learning which may counter pedagogic stagnation and indirectly leading to the extension of the lifespan of the educator in education.

It is acknowledged that change in education is inescapable. It appears that technology is the vehicle for change and that by promoting partnership between technology, the educator and the student a symbiotic phenomenon may evolve, rescuing the educator and student from the frustrations of traditional pedagogy. Emanating from this discussion the following research question emerges:

How can educators, at a private, international school, be motivated to introduce internet technology in the education?

These sub-questions follow:

What are the limitations of the traditional education system as experienced by educators?
How can internet technology address these limitations?
What concerns can be identified regarding e-learning?
How can educators be motivated to introduce internet technology in the learning environment?

This research will focus on providing motivation for educators to introduce internet technology in education. The focus is on secondary schools, although may be applicable to primary schools as well.

1.3 AIMS OF THE RESEARCH

The following are the aims of this research, which starts from the basis of investigations at a particular private school:

- To identify the limitations of the traditional education system as experienced by educators.
- To suggest viable solutions offered by internet technology to address the limitations.

- To identify concerns regarding e-learning.
- To provide motivation for educators to introduce internet technology in education.

1.4 RESEARCH ASSUMPTIONS

The following assumptions are expected to play a role in the extent to which the motivation of educators to implement e-learning will be successful or not:

- The spread of nationalities may not be truly internationally representative at the school.
- The level of computer literacy of educators and students will in the majority of cases not be a drawback to the effective implementation of e-learning.
- The majority of educators will display a willingness or ability to incorporate new teaching methods, will wish to improve their delivery by e-learning, and will thereby produce or improve results with this system.
- WI-FI linkages will be stable and not interrupted by system failure.
- By 2009, all students will be equipped with their own laptops or computers.
- Creativity/non-creativity of educators is not seen as a limitation.
- The curriculum will be adaptable and lend itself to e-learning and there will not just be a repetition of the traditional classroom.
- Management will play an active role and set an example in the motivation of educators and students, taking care not to use the new media to repeat formal education methods.
- Students will be fully briefed regarding the e-learning role of the facility and will not expect it to be an unlimited surfing and computer game opportunity.
- As e-learning in pedagogy is uncharted territory, unforeseen circumstances will arise.
- Management needs to control unreasonable expectations of educators and students and acknowledge small gains.
- Regarding structure and implementation of internet learning it is assumed that students will develop and evolve according to the vision of management.
- Management of controls will guard against haphazard implementation of the system.
- Educators will be able to adapt to a more exposed teaching environment where they are scrutinised by others. Educators will have been prepared by being trained in ICDL (International Computer Driver's Licence) having their own laptops and knowing how to navigate the Internet.
- Buy-in by all parties is one of the prerequisites for implementation and a benefit for educators and students.
- There will be access by educators, parents and students.

- A policy for blocking and/or securing websites is a prerequisite for implementing Internet learning.
- There will be regular reviews of progress, representative problems or proposals will be tested and redirection will take place as required.

1.5 DEFINITION OF CONCEPTS IN THE CONTEXT OF THIS STUDY

The terminology which follows is used in the literature study and in the chapters that follow. It represents important reference points that should be clearly defined at the outset.

Augmented teaching is based on the assumption that educators can enrich current teaching styles by augmenting classes with aspects of Internet-based learning using everything from e-mail to slide shows on the Internet to multiple, interconnected electronic formats (French et al., 1999: 2).

Behaviourism is an instructional philosophy which states that learning constitutes a change in behaviour and that the only behaviours that matter are those that can be observed and measured (Driscoll & Carliner, 2005: 21).

Blended learning refers to different courses in a curriculum being delivered by different media (thus blending the delivery method) (Driscoll & Carliner, 2005: 12).

Cognitivism views the goal of instruction as the communication and transfer of knowledge to students in the most effective way possible and describes how students process, store and retrieve information (Driscoll & Carliner, 2005: 43).

Constructivism is an instructional philosophy based on the premise that students can actively construct their own understanding of the world by reflecting on current and past experiences (Driscoll & Carliner, 2005: 45).

E-learning refers to (1) delivery of content via all electronic media (Aragon 2003: 20). (2) and provision of online access to learning resources, anywhere and anytime (Holmes & Gardner, 2006: 14).

"Guide on the side" describes an educator who uses methods other than formal lectures to impart basic knowledge and who serves in the role of cheerleader, librarian, facilitator and coach (French et al., 1999: 199).

"Just-in-time-learning" is the process of having educational access available at the time and location the student wishes (French et al., 1999: 200).

Learning refers to a change in or potential to change a person's level of skill or knowledge. It is of central concern for both students and educators (Newby et al., 2000: 21).

Problem-based learning (PBL) is a student-centred approach to learning intended to develop effective critical thinking and clinical reasoning skills. It fosters independent, self-directed learning skills and builds internal motivation to learn and question. Faculty members function as facilitators rather than content experts Barrows (2000) and Rounds and Rappaport (2008: 13).

"Sage on the stage" A wise educator standing in front of the class to impart knowledge through traditional lectures to passive receivers (French et al., 1999: 201).

Scaffolding (1) Support which enables a student to achieve a goal or action that would not be possible without such support and (2) Support which facilitates student learning to achieve the goal or action without such support in the future (French et al., 1999: 201).

Self-directed learning refers to an activity in which the student takes the initiative and responsibility for the learning process (French et al., 1999: 16).

Socio-constructivism refers to learning in a context that is social, reflective, authentic, scaffolded, progressive and experiential (Holmes & Gardner, 2006: 83-84).

1.6 RESEARCH DESIGN AND METHOD

1.6.1 Research design

Since the research aims to motivate educators at a private school to utilise internet technology, a qualitative and interpretive research approach was followed. A qualitative research method was chosen as it is concerned with understanding the participants' beliefs, attitudes, fears and knowledge toward the introduction of internet technology to their pedagogy. The qualitative method allowed natural interaction with the participants through open-ended questioning. This facilitated freedom of response and elaboration within the questioning context accommodating answers of a more expansive nature (Schulze, Myburgh & Poggenpoel, 2003: 41-42 and De Vos, Strydom, Fouche &

Delport, 2004: 270-276). The design consisted of purposeful sampling, data collection and data analysis which occurred on a simultaneous and interactive level.

Phenomenology (mostly interviews and observations) was the qualitative research strategy used in this study to determine and understand participants' perspectives, perceptions and understanding (De Vos, Strydom, Fouche & Delport, 2004: 273). It was felt that this strategy should allow the researcher the opportunity to step-inside the situated context of the pedagogical environment being studied (Moustakas, 1994).

1.6.2 Sample

A small group of participants was investigated to enable an in-depth understanding of the problem. The exact number of participants selected was determined as the investigation continued. Purposive sampling was used leading to the identification of participants typically representing the population to be studied (Singleton, Straits, Straits & McAllister, 1988: 153). Semi-structured one-to-one interviews with the principal and a group of volunteers from the educators including senior educators were arranged.

1.6.3 Data collection methods and data processing

Semi-structured one-to-one interviews were held with a set of predetermined questions used to guide the interview and allow participants a role in the proceedings. The individual interviews took place in the participants' homes and they were encouraged to elaborate where they felt it necessary.

The data was collected, analysed and processed according to specific themes relevant to the research question.

1.6.4 Ethical considerations and trustworthiness

Competence and knowledge about the research being conducted had to be ensured. Furthermore, informed consent from all participants, with the assurance of anonymity and confidentiality had to be assured. Consent was obtained before audiotape interviews took place and expectations were elucidated.

1.6.5 Limitations

Because of the qualitative nature of the research, the study is limited to one independent school in South Africa. The period of study is limited to the years 2008 and 2009 but has wider implications for the future. Involvement in the project will be limited to the educators at the specific private school.

1.7 DIVISION OF CHAPTERS

Chapter 1: Introduction and background

The focus of this chapter is to delineate the background against which internet technology is being introduced in teaching. The purpose is to identify the challenges that not only the educator but also the student face in an environment driven by technological advancement that requires innovation and change.

Phenomenology is the qualitative research strategy followed as it incorporates both observation and interviews. Purposive sampling was used to gather information from information rich participants at the school. Semi-structured interviews were held and the information gathered processed according to the research question. Ethical considerations and trustworthiness of the research were adhered to.

Chapter 2: Literature review

In order to establish a theoretical background, literature on the introduction of internet technology in the learning environment was researched. The review encompasses educators' motivations for involving themselves in e-learning. The literature study assesses the limitations of the traditional education system which still plays a major role in determining the approach of the educator in the pedagogic process. The limitations of e-learning are considered as are also the implications of e-learning for the educator and education in general. Theoretical motivation will be sought for educators to introduce internet technology to teaching.

Chapter 3: Research design, data analysis and interpretation

This chapter consists of an empirical study whereby the research design is addressed in semi-structured interviews in order to examine the ideas drawn from the literature study.

As the purpose of this investigation is to seek motivation for educators at a private international school to introduce internet methodology to the learning environment, it is necessary to assess the practical limitations of the traditional education system, to seek viable solutions to address these limitations by means of internet technology, and to establish how educators can be motivated to use and support internet learning in their subject teaching. In a study of this nature the extent of resistance to the introduction of this technology has to be established. Expectations of pedagogy have been raised, and identification of ways of successfully introducing internet technology to a pedagogy which is being forced to change in a globally interconnected community is critical to this chapter.

Chapter 4: Summary, conclusions, recommendations and suggestions for further research

The summary is divided into two distinct areas in which the main conclusions are identified, firstly in terms of the literature study and then in terms of the empirical study. This is followed by an identification of similarities between the findings of the literature and the empirical study and of areas that may be covered by one of the approaches but not the other. Furthermore, contradictions are noted and an attempt is made to explain them.

Following on the summary there is a section in which conclusions are drawn and in this regard it is necessary to answer the research questions in order to create a coherent structure to the study. Thereafter, recommendations are made from macro- to micro-level and finally suggestions are made for further research in this area.

1.8 CONCLUSION

This chapter dealt with the relationship that exists between pedagogy and technology as experienced at a private international school. It is of paramount importance that strong motivating factors be established in order to gain full educator participation in internet teaching. It has become necessary for schools to motivate educators to introduce internet technology to the learning environment as exposure to a variety of resources, insights and learning experiences will have a fundamental impact on the responsibility and involvement of educators in the international sector.

In the following chapter, the motivation of educators towards the implementation of e-learning in the classroom is the main focus and is aimed at a symbiotic final outcome in the sense that it is expected to be greater than either technology or pedagogy independently.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter seeks a theoretical background and context for the empirical research reported in Chapter 3. Limitations of the traditional educational system at an international school that has developed between technological (internet) advances and technological (internet) methodologies will be investigated.

In this literature review the challenge is to identify to what extent the theoretical framework being investigated addresses the divide that has developed between traditional pedagogy and internet pedagogy.

Internet technology can be regarded as the new set of tools with which the pedagogue is required to work. Internet methodology is regarded as the techniques and methodological skills that educators are required to adopt and develop in order to make effective of the new technology.

2.2 MOTIVATION FOR EDUCATORS TO INTRODUCE INTERNET TECHNOLOGY IN EDUCATION

In this section a theoretical justification is sought for the introduction of internet-technology into the learning environment. Internet learning is seen as the vehicle towards expanding not only the learning environment beyond the classroom but also the scope of the learning experience. This study also presents the case for urgent action in implementing such a learning system as the literature indicates that a level of technological sophistication has been reached which is presently able to support such learning experiences. The argument in this section is that the time has come for urgent action to be taken in this step towards internet based learning. The preparedness of educators for the advent of internet learning and their awareness of its advantages and opportunities is a focus of this investigation. The study attempts to reveal that this process does not discard tried and tested techniques but is rather geared towards assimilation of the new with the old in a symbiotic relationship.

Motivating educators actively to pursue the introduction of internet technology in the learning environment is emphasised by the large number of investigations in the past decade by authors underscoring the need for education to employ emerging technology (Bishop, 2008: 21; Stefanics, 2008: 16; Rounds & Rappaport 2008: 12-16).

Bishop's (2008: 21) study on emerging technology in education mentions the enormous possibilities it offers and emphasises the practicality of educators placing their notes and/or prepared lessons on the web allowing students to work independently and collectively from any location. He emphasises the storage potential of the web for such material and it's availability to future students. He refers to a host of multi-media including images, wikis, pages and links, all valuable educational tools. This is supported by Harris (1999: 5) who reminds us that it is also used successfully in the business sector.

Bishop (2008: 21) also indicates opportunity for extended communication not only between the educator and student but also between students and the linked forums to which they may connect. There is increasing opportunity for students to interact in the educational process providing the opportunity for regular feedback, updates, information gathering and dissemination. This allows for viewpoints to be exchanged between educators thereby extending the resources available to them from a shared central web venue.

Bishop (2008: 21) further notes that the classroom has over the years become a very isolated domain and that sharing of ideas and material between classrooms at different schools and between colleagues who are no longer or have never been in geographic proximity to each other is now feasible. He highlights the advantages to be gained in particular from the sharing of videotaped lessons which can be streamed to colleagues elsewhere not only for use in teaching but for their comments and critique. French, Ransom and Bett (1999: 6) support the view of information dissemination and the retrieval capability of a central web venue as not being limited by location or time of day. Bishop (2008: 21) mentions the advantage for the individual educator of having his or her lessons recorded, thus being in a position to present them when applying for a vacant position. Finally, there are advantages to be gained by educators moving from the safety of their protected environment and exposing themselves to web options.

Stefanics (2008: 16) stresses the importance of staying ahead of developments in a swiftly evolving education environment. As a motivation for embracing IT in education, she quotes the former governor of Maine, Angus King: "You don't get ahead of competition by catching up." Allied to her plea

to stay in touch with electronic media and to provide the necessary hardware infrastructure is the opinion of John Couch, Vice President for Education for Apple Computer, who holds that if we buy into technology we will create networking communities which will be capable of operating twenty-four hours a day. Stephanics refers to the work of Marco Torres, educational consultant and social studies educator, who sees technology as “cool tools” which enable students and educators to extend their capacity for learning. Collis and Meeuwsen (1999: 4) sums this all up by emphasising that there are almost unlimited opportunities available to educators and students at the click of a button.

Jonassen, Howland, Marra and Crismond (2008: vi-viii) observe that there is consensus in the literature study that in the past decade there has been a major shift in the role of the educator from being a source of information from whom students glean what is necessary for them to be successful in their examinations to becoming a facilitator equipped to guide students to gather information from a multiplicity of sources. This is particularly supported by authors who refer to the responsibility shift which has taken place from the educator to the student in this regard. They perceive this shift as being a possible source of concern for educators schooled in the more traditional system. According to Vygotsky’s (1978) “zone of proximinal development” there is a gap that needs to be bridged between students’ independent achievement and facilitated achievement (Powell & Kusuma-Powell, 2007: 57-59).

Rounds and Rappaport (2008: 12-16) provide a practical example of an online problem-based learning (PBL) environment. PBL entails a process whereby the educator assumes the role of catalyst to the learning process, while the student is actively involved in the pedagogic process, in terms of spearheading the learning process; choosing the learning skills and questioning techniques to be applied and also playing the role of the driving force in the pedagogical environment. PBL converts the role of the educator from an active driving force to a supportive facilitator. The Rounds and Rappaport (2008) study proclaims the advantages of an online PBL approach as equipping students with the skills required for success in the world of work as the skills required to cope with the online course bring to the fore higher-order thought processes, research, blending of disciplines, self-direction and responsibility. This is corroborated by Falloon (1999: 19-23 & 2005: unpublished) who believes there is a shift towards thinking of the computer as holding the promise of raising the cognitive abilities of students to a level required by the world of work.

Rounds and Rappaport (2008: 15) report that interaction via bulletin boards and report-backs led to revealing the participation levels of each member of the study group. No-one was able to become a passive student.

French (1999: 18-22) stresses the advantage of hypertext links enabling students to move from one link to another with ease thus facilitating broadening of the knowledge base. French also sees the advantage of students seeing relationships between aspects of their work while being led through the hypertext links. The fact that members of the study groups who are not in the same geographical area have equal facilities to communicate and are treated equally in the sphere of testing is seen as a major advantage.

Weller (2000: 243-252) in his exposition of the advantages of the internet as an instructional tool highlights the relatively limited production time required for web-based programmes and the added advantage that it can be adapted swiftly and kept updated far more easily than any other materials produced in the learning process. Furthermore the quick-fire answer and response capability between student and educator is a boon to the education process. All learning materials of the past are still applicable to this process yet there is much more scope provided by internet technology as it is not limited in time, space, place and/or situation and has the capability for individual and collective instruction. This is supported by Oliver (1999: 5-18) who states that: “The new technologies appear to offer many advantages over conventional formats including economies in cost, greater levels of access to students, more flexible teaching and learning approaches and enhanced educational opportunities.”

Joyce and Calhoun (1995: 51-55) maintain that educational faculties realise that pedagogy is a continuous and unending process and must adapt as new technology appears on the market. The authors emphasise that “teaching and learning involves a never-ending process of trying to reach all students in the best ways currently known.”

2.3 LIMITATIONS OF THE TRADITIONAL EDUCATION SYSTEM AND PROPOSED SOLUTIONS

In order to fully understand the challenges and advantages posed by the “new technologies” supported by Oliver (1999: 5-18) it is necessary to focus on the traditional education system which has preceded the modern developments proposed in this study. For clarity I have classified these limitations under secondary headings. This provides the theoretical background to the practical exercise conducted, and is further researched in the interviews that will be conducted with the participants in the study. The literature study touches on a much broader range of limitations than were highlighted by the interviews and provides the necessary background against which the

outcomes of the interviews may be assessed. In the summary to this dissertation an assessment will be made of the degree to which the results of the interviews match theory supplied in this section.

2.3.1 The educator as "sage on the stage" (French et al., 1999: 201).

This is a limitation which presupposes the educator as the source of knowledge dispensing information in neatly packaged parcels to a passive student engaged in mere absorption. Powell and Kusuma-Powell (2007: 57-59) touch on a number of related issues which can be perceived as limitations of traditional education. They are proponents of differentiation from the standpoint of the constructivist approach and see differentiation as the key counter to the following perceived limitations which are that:

- Students are blank receivers of information which must be supplied in pre-packaged lessons.
- Disjointed rote learning takes place.

Proposed solutions: Powell and Kusuma-Powell (2007: 57-59) are proponents of effective differentiation in the classroom and counter educators' initial fears of differentiation which is seen as leading to the impossible task of accommodating the needs of all pupils of varying ability in the classroom. The authors concentrate on the constructivist approach in the classroom emphasising the role of the educator as that of a vital manager of learning. They propose that the educator develops a deep insight into students' previous interests, experiences and into the diverse factors influencing learning, the emphasis being on "knowing your students". Further, they emphasise redesigning the learning process around "primary concepts" with an emphasis on applying higher order question techniques: "knowing your curriculum". A key element is allowing every student to reach his or her potential by various, means suited to each candidate. A suggestion is made that there be a "repertoire of strategies" to allow for differentiated levels of entry in order for progress to be relevant to the students' needs and abilities. Finally, the authors suggest a back up support structure be set up for "keeping it social" which could allow for professional support to staff in achieving differentiated teaching.

2.3.2 The educator as the all-knowing interpreter of information

This formulation presupposes that pedagogical information delivered by the educator and interpreted from the educator's perspective can be matched to the perspective of the student as receiver. It is an intensification of the role of the educator as "sage on the stage", suggesting that the student is denied the opportunity to contribute on the level of cognitive interpretation beyond the educator's perspective.

This represents a serious limitation in my view as is indicated by the findings of Jonassen et al. (2008: vi-viii) who refer to:

- the educator being perceived as all knowing and authoritative in dealing with the world as it exists. In other words, the educator constructs meaning and interprets it on behalf of the student who is merely a receptacle of the educator's views.
- the students' interpretation of reality being at the mercy of the educators' comprehension.
- the assumptions of the role of the educator limiting the learning experience of the students.

They believe that a shift in these roles is required.

Proposed solutions: Jonassen et al. (2008: vi-viii) suggest a shift in intellectual authority in the classroom that will make the student a participant in the decisions regarding what it is important to study, how the study should take place and how students themselves can make a concerted and constructive contribution. The authors maintain that students play an active role in regulating the way in which their activities are chosen with the emphasis placed on what is important to learn and how they are to go about learning. The implication is that the educator steps aside and shares management of the teaching situation with the students. In order to achieve these goals and to facilitate shared management, the authors state that it is essential that the educator become better acquainted with e-learning techniques which support a learning process of this nature.

2.3.3 The passive student versus the active student: "learning to learn"

This statement will form part of the interview questions and will be dealt with more extensively in the practical aspect of the dissertation. Collis and Meeuwsen (1999: 27) state that it is obvious that students lack the specific "learning to learn" skills. By making use of guidelines gleaned from Dunlap (1997), Collis and Meeuwsen (1999: 27) identify five areas where there are shortcomings and which need to be developed in order to expand the "learning to learn" principle. These are: becoming an "epistemologist" by beginning to take responsibility for their own thought processes and how information is derived and conclusions drawn; improving management of the learning process; learning how to regulate the learning process; discovering how to keep the learning process on track; cultivating a wide range of study habits and skills in order to deal with identified information and to achieve best learning results; developing linkages between the subject matter being studied and related material from various other sources and, finally progressing to a stage of self-reflection whereby the student is able to identify areas of weakness or deficiencies in knowledge and seek ways to counter these outside the normal examination system.

Proposed solutions: Collis and Meeuwsen (1999: 32-33) refer to Young (1997: 41) suggesting a scaffolding process where students cross the divide between individualised-learning and assisted-learning. Four strategies are identified by Young. They are: opportunities for completing assigned tasks through joint networking with other students (to counter the negative effect of uninvolved students); opportunities for students not only to assess but to cogitate at more length than in the past on their assignments and study material (to counter inability to assess and express personal views on study material); increasing students' responsibility in planning and carrying out the didactic process and being expected to set out procedures and practice clearly (to counter student inability to exercise basic study skills); encouraging students to believe in themselves and to trust their ability in metacognition (to counter the culture of test-result driven student participation).

2.3.4 An imperfect learning environment

The traditional passive didactic learning experience is seen as only one of the parts of the holistic pedagogical package which is available. In my opinion it should be fully utilised. Reading between the lines of Harris (1999: 139-145) there is the suggestion that the traditional didactic system did not lack substance but was limited in terms of the complete learning experience.

Proposed solution: Harris (1999: 139-145) reports that the internet allows a holistic learning environment by adding an "interface" and an "infrastructure" which together create a sufficient learning environment. This is achieved by a system of synchronisation of the layers of infrastructure and interface which is essential for high levels of didactic achievement within an exiting and vibrant learning landscape. Harris explains that the subject matter must be adapted to suit the didactics but its intention does not change. Interface is the connection between the didactic material and the student or instructor and the infrastructure layer which embraces the interface and refers to the computer hardware, software and internet service at the disposal of the instructor. These layers form a scaffold for the complete learning environment unavailable in the traditional learning experience.

2.4 CONCERNS RAISED REGARDING E-LEARNING AND PROPOSED SOLUTIONS

The viability of an e-learning pedagogy may be limited by the possible drawbacks and impediments to its implementation. This section deals with the literature study which preceded the interviews that were conducted. For clarity the concerns are classified under subheadings as follows:

2.4.1 Lack of support for the implementation of e-learning

Stefanics (2008: 16) emphasises the possible problem of school management not supporting the implementation of e-learning and also not being willing to supply the necessary educator coaching.

Falloon (2006: 337-338) mentions that computers that are available to the educator are not always matched to the number of students in a class. I would argue that this situation could arise were management not to be fully supportive of the programme. The author is of the opinion that this problem must and will be addressed as internet access is expands in future.

I believe that this is an extremely critical aspect of the process which must be addressed in any institution before implementation can proceed. Failure to elicit the support of management could either cause the process to self-destruct or to make limited progress.

2.4.2 "Learning how to learn"

I believe that students do not receive enough credit for their ability to manage the learning experience productively. It is perhaps because of the passivity expected of the student in the past that the assumption has been made that the problem of the passive student also exists widely today.

Collis and Meeuwsen (1999: 25-33) remark that the great expansion of learning opportunities offered by e-learning is not always realised in practice as students differ from each other. Some are able to identify and assess information swiftly while others might appear non-plussed. The authors refer to the importance of "learning how to learn".

As noted under 2.3.3 above, Collis and Meeuwsen (1999: 25-33) identify five specific aspects of learning skills that add up to a picture of a self-motivated, active student. Furthermore, Jonassen et al. (2008: viii) contend that a shift in student roles is required once management of the learning process becomes a shared process with the educator. The new student role - voicing opinions, higher order thinking, self-assessment and communication - cannot just be presumed to fall within the student's sphere of ability. Many students have been observed to part with educational passivity reluctantly. The study of Jonassen et al. (2008: viii) however reveals that it is not normal for students to turn down the opportunity of extended participation in the education process and that they readily grasp the opportunity to build on their knowledge when offered more participative e-learning.

2.4.3 Loss of the formal classroom

The vanishing formal classroom referred to by Rounds and Rappaport (2008: 12-16) questions the role of the formal classroom system and its related rote learning methodology. I think that the receding role of the formal classroom is key to the future of all forms of education as it gives an intrinsic advantage to internet learning and provides the space for the new pedagogy" or modern education process. The inherent advantage of e-learning is that it has the capacity to break down the walls of the classroom and allow educational access to the masses of potential students. Rounds and Rappaport (2008: 12-16) mention that there is concern where PBL is implemented because there is a belief based on traditional teaching methods that students do not learn as efficiently when they are not part of a normal classroom situation. The normal system to which they had been accustomed, was based on the receipt of information and the student's ability to memorise. The PBL system removed this academic crutch and substituted the expectation of research and information gathering and of active interpretation of information. The idea of learning in isolation, which is a new dynamic, placed a previously undemanding system under strain. A new requirement surfaces, namely that the student be equipped with the desire and ability to take up the challenge of their own metacognition.

The study of Rounds and Rappaport (2008: 12-16) however reveals that students are too concerned with the correct answer. In PBL the process by which the answer is obtained is more important than the answer itself and the skills developed in the interaction between the student and the teaching staff, by means of facilitation and mentoring by guiding on the side, will bring a higher level of learning.

2.4.4 Time consumption

Rounds and Rappaport (2008: 12-16) mention that the PBL process is very time consuming both for students and staff. One could agree with this as this process is much more indirect than the traditional learning process.

The authors however say that it appears that from the student perspective there has been creativity concerning collaboration in the sharing of tasks. For example students take responsibility for different tasks and preparation even to the extent of certain students being freed to deal with the work on certain days as mentioned in Rounds and Rappaport (2008: 12-16). Amongst students a greater level of structure has emerged by which progress can be monitored along a timeline. It appears according to the authors that the issue of time wastage is adequately countered by the benefits of creativity and a more productively structured pedagogy.

2.4.5 What is on the test?

Rounds and Rappaport (2008: 12-16) refer to student concerns regarding PBL directed at the fact that in this type of learning "what is on the test" is of secondary concern. This downplaying of testing is totally in opposition to traditional teaching pedagogy. The same authors (Rounds & Rappaport, 2008: 12-16) see this view as short sighted and stress that concentrating on "what is on the test" is a great limitation of the total learning experience preventing the student from exposure to the full implications of the pedagogy. I agree with this response as the focus of students on the correct answer as opposed to the method of achieving the answer has been a serious concern of educationalists. This concern was researched in the interviews with the educators to ascertain its validity.

I believe that emphasising the methods used in arriving at an answer could have far-reaching positive repercussions on students' willingness and ability to continue their studies and to enter into research at tertiary level. The confidence gained by managing the process rather than the answer would surely benefit the student at high levels of cognition and learning and assist them to gear themselves towards seeking possible solutions rather than a defined answer.

2.4.6 The changing role of content, interface and infrastructure

Harris (1999: 139-145) contends that the limitation of the e-learning based approach to education is that were any one of the three layers of content, interface and infrastructure to be absent or malfunction, learning would be incomplete. This means that each area should operate optimally for the complete learning experience.

Harris further suggests that e-learning should be so structured that the layers of interface and infrastructure remain an important part of the process but merge unobtrusively into the didactical process. For this to be achieved the author feels it would be necessary that both educator and student be made so familiar with the infrastructure and the interface that the point would be reached where these two aspects are secondary to the subject being studied without them being absent from the process.

My response to this concern is that the didactics of internet learning is a more comprehensive means of learning than that found in the traditional system. In this regard, I argue that for each learning experience content, interface and infrastructure would certainly be present but at varying strengths, the specific learning experience determining the emphasis to be placed on each of these aspects. With internet learning the emphasis is more on the process than on the final result.

2.4.7 The lack of one-on-one communication and variety

Harris (1999: 139-145) maintains that because of one-on-one communication being absent the lack of human expression could lead to subject material not being interpreted correctly. Another limitation is that this method is mainly founded on reading and writing and this could be regarded as a limitation to students who are not as well able to cope with this medium of instruction and who would possibly prefer a more visual method of instruction. Finally, the authors refer to the limitation of the material being of a limited variety and not subject to a great deal of change once it has been placed on the web.

Harris' concern about (1999: 139-145) the lack of one-on-one communication is interesting. I however, regard this as an inherent advantage of internet learning which offers the opportunity of interaction between more than one student and educator thus providing a broader point of view and wider experiential knowledge base. As to the limitation of the variety of information accessed, I belief there is a virtually limitless amount of information available and that it is only inability or unwillingness that stands in the way of accessing it. In reality there should be an endless variety of both interactions and learning material.

The author does not provide answers to these problems as such but considers that the youthfulness of this medium of instruction will of necessity bring teething problems. He is confident that as there is more exposure to this medium, solutions will be found.

The teething problems referred to by Harris lead to the question of whether the final outcome of the e-learning process matches-up with the expectations of an examination system towards which the final outcome of pedagogy is generally geared. I argue that the problems mentioned above would require that examinations be restructured, including testing methods, for maximum efficiency in implementing the system. It would be to no avail to attempt to match traditional examinations to a non-traditional pedagogical system.

2.4.8 Perceived personnel limitations

Johnson (1999: 184-187) contends that the introduction of hypertext links and setting up subject specific websites to support pedagogy are some of the few problem areas to be dealt with. He further indicates that the big challenge will be for the teaching staff to develop their skills in conducting classroom discussions and in fully utilising the technology at their disposal.

He however maintains that restrictions on progress are not of a technological nature but that we are restricted mainly by our perceptions of our ability to use e-learning effectively.

I would argue that human shortcomings will be countered through educational institutions assessing the technological limitations of educators and addressing shortcomings which may exist effectively and speedily by means of specific training to match the requirements of the institutions' specific internet-based programmes. I maintain that once educators have been exposed not only to the technology but also to the advantages of the technology for their subject areas they should become self-driven in their quest to introduce e-learning effectively. This should relieve the educational institution of the burden of driving the process.

2.4.9 The battle between technological and educational goals

Gannon (2007) writing on bridging the "technology-pedagogy divide", states that it cannot be accepted that technology on its own improves learning and warns against technological goals automatically superseding educational goals. She cautions that up to now technology and not educational theory has driven the e-learning process and that it should really be the other way around. She suggests that educational theory should form the basis of e-learning to align it with the accepted epistemological process. She furthermore expresses the need for learning which is "fit for purpose" and suggests a "blended approach" in order to include a wider range of student capabilities and their metacognition. Her proposal is that there should be no limitation to learning styles employed in education and that there should be a wide variety applied to meet the varied abilities and learning requirements of a student population.

Gannon (2007) proposes a clear movement towards learner-centred learning against the background of behaviourist, cognitivist and constructivist theories. The emphasis is on a wide variety of learning techniques guided by the experiential approach. Villalba and Romiszowski (2001: 325-342) proclaim the virtues of social-constructivist pedagogics, emphasising obtaining knowledge and using it in the solution of practical problems. They emphasise placing the learner in the centre in a closely linked relationship with the learning activity and landscape. Lave and Wegner (1991: 40) referred to "learning to be situated" indicating that the mere passing on of information in an abstract manner should not be the intention but that the social and physical environment within which the knowledge is placed should play a meaningful role in passing it on. Villalba and Romiszowski (2001: 325-342) define each of the learning theories as follows:

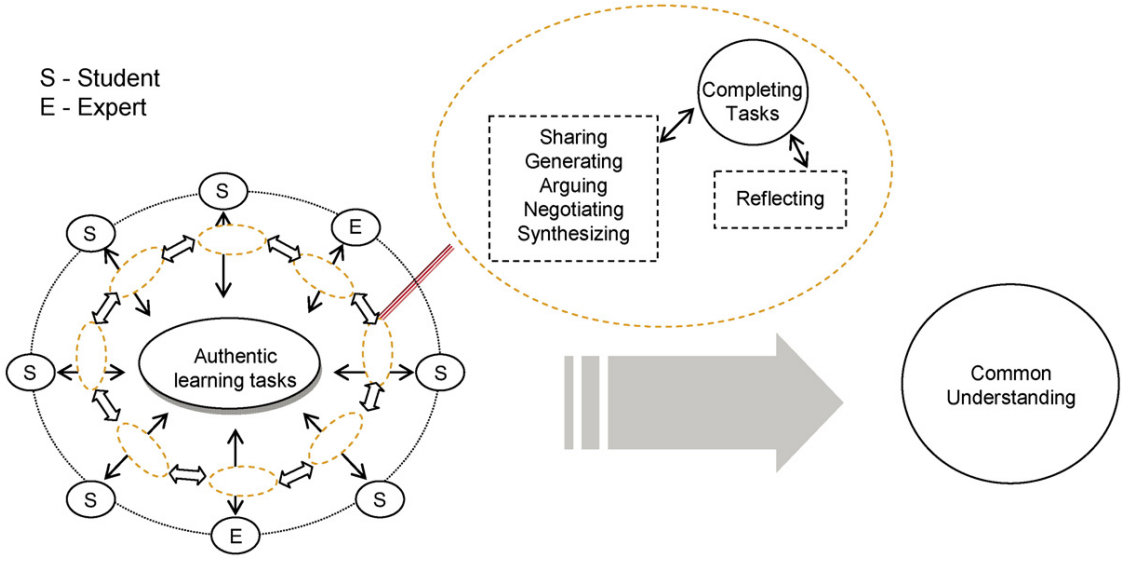
Behaviourism focuses on students being fully aware of the exact outcomes and expectations of the learning process. They must be assessed and comments and advice be provided on their performance.

Cognitivism focuses more on the aim and reason for the learning being communicated, and how the content is organised. Material is structured so that various learning styles are included. Metacognition is very much part of the process of learning to learn advocated.

Constructivism contextualises problems encountered in life. Activities should be geared toward developing higher order thinking skills with responsibility and open-ended learning situations being imperative.

Social constructivism is a "collaborative social negotiation" process. Cooperation between students in a collaborative environment is proposed in order to allow students to learn from their own "construction of knowledge meanings and values". Woo and Reeves (2007: 18-19) contend that social constructivism explains the foundational processes of learning using three concepts: 1) the 'Zone of Proximal Development (ZDP), 2) 'Intersubjectivity' and 3) 'Enculturation' (Fosnot & Perry, 2005: 8-38; Jonassen 1999: 215-239; Lave & Wegner, 1991; Vrasidas, 2000: 339-362). These three concepts respectively refer to the student's culturally inculcated notions meeting up with "adult reasoning"; communication generated interactive learning and cultural normative understanding. The same authors (Woo & Reeves, 2007: 19) supply a sketch (see figure 2) depicting student engagement in "authentic learning tasks" with peers and experts, interacting by sharing generating arguing, negotiating, synthesizing individual thoughts with those of others, completing the tasks, perfecting them and arriving at a common understanding after due reflection (Vrasidas, 2000: 339-362).

Figure 2: Meaningful interaction in social constructivism



Based on Woo and Reeves (2007: 19)

According to Gannon (2007), these theories of learning allow for “pedagogical, technical, social/cultural, ethical, organisational and institutional” issues to create the “guide on the side” instead of the “sage on the stage”. Instead of “chalk and talk” and creating “consumers of knowledge” socio-constructivist theory through e-learning raises learning delivery to a level of higher order thinking. She feels that technology and pedagogy should not be seen as two opposing forces but rather that through e-learning their relationship should be “dualistic symbiotic”.

2.5 IMPLICATIONS OF E-LEARNING FOR THE EDUCATOR

The introduction of e-learning places the onus on the educator to reassess his/her role in the pedagogic process. The literature study which follows suggests that in adapting to e-learning the educator will be required to develop new strategies and learn to adapt to a changing role in the classroom. This will require willingness to be exposed to a new technology and furthermore, the willingness to adapt tried and tested methods and blend them with the new pedagogical tools available. Perhaps the most challenging aspect for the educator will be acknowledging that he/she is not the only source of information and that the World Wide Web offers the student other options.

Stefanics (2008: 16) refers to Nigel May Barlow the author of *Rethink, how to think differently*. The author emphasises the need for educators to go back to educational basics, and approach it with “childlike curiosity” as they gear themselves to teach “screenagers”. The author identifies a wide range of tools: “podcasts with sound and video”; creating new learning environments using “wikis and blogs”; setting up up-to-date learning networks; using “mash-ups” of source material instead of textbooks; introducing the full variety of multi-media to the learning environment and individualised programmes to allow students to log-in to programmes anywhere and at any time.

Bett, French, Farr and Hooks (1999: 49) encourage educators to assess the usefulness of internet based technology in their classrooms and to regard this as a growth opportunity. They further encourage educators to employ whichever new processes they feel would be most effective in their classes.

French (1999: 63) identifies six skills areas for educators to become better equipped for internet based learning:

1. Developing e-personal networking relationships.
2. Searching and accessing widely on the internet for source material.

3. Testing and evaluating internet websites particularly with regard to their user-friendliness and effectiveness.
4. Setting up modules that can be independently utilised.
5. Setting up an online "course manager" in order to successfully link various models and course material.
6. Making use of high levels of networking and collaboration.

Lyman (1999: 97-118) refers to a model of situated learning, and indicates that the educator will have to take into account the following factors in setting up an e-learning experience: establishing the individual traits and background of each student; what it is the student wishes to achieve; what the learning method or approach must entail and a suitable plan of action to be followed. Lyman claims that internet based learning can remove restrictions to participation in the education process. Jonassen et al. (2008: 2-10) emphasise the role of the educator in leading students on a discovery path but allowing them to arrive at their own conclusions.

Jonassen et al. (2008: v-10) indicate that educators must increase and improve their technological capability, but must also ensure that their efforts are geared towards student discovery in the learning experience. They must be wary of not being seen as the "sage on the stage" (French et al., 1999: 201). Coaching of technology skills becomes a factor and often educators will be learning with the students. The authors warn that despite the educator no longer performing the key role as the wise one, at no stage may the educator withdraw from the teaching process and not take responsibility for equipping themselves with the relevant technology.

French (1999: 18-22) states that despite the time-consuming task of preparing e-learning modules, the advantages of revision of course material on a regular basis is a distinct advantage. The author refers to feedback from students being utilised to update course material at the end of a semester, thus regularly improving the quality of the material. The author furthermore states that the educator is now in a position to take up a greater role as facilitator because normal teaching time can now be utilised to assist in group work, peer discussions and the answering of questions posed by individual students.

Johnson (1999: 184-189) emphasises that in e-learning educators must prepare themselves to face online challenges from students regarding subject matter and must realise that they will not be seen as merely the "unquestioned authority".

2.6 IMPLICATIONS OF E-LEARNING FOR EDUCATION

Education in general has reached its rubicon, a point of no return with pressure to change to a technological based learning system so great that it can no longer be ignored. Even though the literature speaks of the potential of technology to alienate the student (Schank & Jona, (1999). I argue however that e-learning exposes the student as it does the educator to a broader peer audience with which communication can take place.

McCombs (2000) speaks of the transformation of education and the role that e-learning is expected to play in this process. She sees it as the driving force the world needs which has undergone a fundamental shift in recent times: new technologies have been placed at our disposal and they are available to serve the real needs of the world of work for the students of the future.

Schank and Jona (1999) see educational technology as the driving force in transforming the educator's role, and the contribution that the school of the future will make. It is through educational technology that the instructional packages of the future will be chosen and designed. The authors see educators as counteracting an extremely negative aspect which could arise were technology's potential to alienate and isolate the student not considered. The role of the educator in this case is to facilitate the harmonious interaction of the new technology with the socio-factors involved.

McCombs (2000) emphasises the social aspect referring to schools developing into "community centres" and students involved in their communities solving relevant problems. The e-learning facility would be seen as a centralising factor for the study which could then have an extended reach not only locally in the community but eventually globally. The authors foresee communication between educators extending across the world. Schank and Jona (1999) suggest a shift in focus needs to take place from "gold and standard setting" to the following:

- Utilising top quality technology specialists to design online subject material.
- Planning for a classroom free, school situation.
- Conducting experiments that will transform the learning process so that it could be conducted at any place at any time.

McCombs (2000) foresees "lifelong", "networked learning communities" and acknowledges the importance of security and a supporting environment if e-learning is to be conducted successfully on a global basis.

2.7 MOTIVATION FOR EDUCATORS TO INTRODUCE INTERNET METHODOLOGY

The emphasis in e-learning on the role of the educator as catalyst rather than problem solver in the learning process requires a potentially threatening mind-shift from the educator. This section stimulates the educator to achieve this transition to an internet-learning based pedagogy. In no way is the knowledge-base or the traditional role of the educator threatened or minimised. Internet-based learning is presented as an adjunct to what the educator has been equipped to do in the past. If anything the educator embracing e-learning should experience increased job satisfaction through the skills development that the technological exposure will bring.

Powell and Kusuma-Powell (2007: 57-59) admit that catering for differentiation in the education system could be extremely challenging for the educator and could drive them back to their traditionally safe methods of teaching. The authors have identified key areas that educators would have to address to become efficient in this form of delivery namely: a keen awareness of the self and the student; an in-depth knowledge of the learning material; preparing a wide range of approaches and emphasis on simplicity of delivery and group work, “keeping it social”.

Powell and Kusuma-Powel (2007: 57-59) refer to Vygotsky’s (1978) emphasis on the influence of past experience in all areas of life as a frame of reference to be considered if effective teaching is to take place. They question the “deep seated assumptions” of the curriculum by emphasising the necessity for benchmarks to be set based on “primary concepts” where after the pedagogical methods employed can be as differentiated as the student mix itself determines. For example emphasis on the visual aspects of pedagogy would be emphasised if a child is limited and struggles with reading and writing skills. By “keeping it social”, the authors are referring to “team teaching” and “professional coaching”.

In French, (1999: 9-24), the author looks to the future from the perspective of educators utilising internet based learning styles to augment present styles and foresees learning as an individualised process, self-directed in the sense that the student will be able to make decisions on the what, how and when of their involvement in the virtual class programme, particularly as it is foreseen that the internet will eventually replace the traditional classroom.

“Just–in-time learning” (French et al., 1999: 200) is a process utilised by both the educator and the student that allows learning to take place anywhere at any time required by the student, or the

educator. The authors encourage educators to match their internet abilities to the various opportunities for innovation that arise. It is not necessary to be highly qualified in the field initially, they say, as it is possible to begin "by wading in the shallows" (French et al., 1999: 2) with simple emails and develop their skill as experience allows.

Harris (1999: 139-145) emphasises the importance of setting up the learning environment successfully and ensuring that the infrastructure and various teaching instruments are in place. Add to this the third important aspect of good subject material and the three essential elements to success are in place. Good support structures should be present in each of these areas if success is to be attained.

Stefanics (2008: 16) refers to John Couch, Vice President for Education for Apple Computer, who identified three developing trends in education namely:

- "User-created content" - where students have created graphics and data for learning;
- "Mobility" - moveable equipment such as laptops; and finally
- "Learning communities" - communication chat groups and networking sites.

Couch downplays the word technology by indicating that it is new only to those who grew up in the pre-computer age.

Rounds and Rappaport's (2008: 12-16) perspective goes a long way not only towards supporting education but also towards encouraging educators to explore e-learning techniques as they provide answers to many of the questions posed by e-learning. PBL, according to the authors, provides an answer to problems posed by the sudden proliferation of knowledge and attendant requirements for "lifelong learning skills". They feel it has the potential to guide students towards higher order thinking skills and independence in the learning process. It provides an example of teaching staff who have committed themselves to a facilitation role. Emphasis is placed on solving problems rather than on the final answer and the strategy is closely aligned to the practical world of work nurturing problem solvers who can apply solutions they have arrived at to new problem situations. It combines interactive activities and individual "home study", the latter providing assessors with the opportunity to evaluate the individual's level of understanding. To move from the classroom to on-line based learning requires courage and self-confidence and shows belief by the members of the organisation in the merit of their pedagogy.

Rounds and Rappaport (2008: 12-16) argue that amongst the advantages gained from using PBL in an online format are bonding between students online and a high degree of electronic networking

between students and colleagues within the various faculties. The close relationship that has developed between staff and individuals through online courses has allowed staff to evaluate students much more effectively and they have become much closer to each other than they would have done in the normal classroom situation. Barrows (1988: iii) confirms that a learner-centred approach, once established, allows staff to reach a degree of closeness to the students. This approach assists them in assessment but also develops a high degree of respect between faculty members and students. He contends that students become "independent, problem-solving, self-motivated". This is an extremely encouraging report which holds out the probability of e-learning becoming an accepted learning process in future.

Assessing student achievement will, according to Johnson (1999: 184-189), always be difficult. The author, however, maintains that the advantage of online assessment is that there is usually an immediate result which is communicated immediately to the student, who has relevant feedback on the spot.

Falloon (2006: 337) mentions that, as computers become available to every student, it is increasingly possible for the educator to design student-centred, on-line study material, matching each student's needs, and that the curriculum will be structured in a way more appropriate to what each student requires (Blackmore, Hardcastle, Bamblett, & Owens, 2003; Capper, 2001: unpublished; Falloon, 1999; Iverson, 2001; Pittard, Bannister & Dunn, 2004).

The importance of the socio-constructivist theory in the learning process is emphasised by Shuell (1996: 726-764), who indicates that what the students "perceive, interpret and process", set against the subject content and "social processes", plays a critical role in establishing to what extent learning will take place.

Zemke (2002: 86-88) states that "there is not, and probably will never be, one great unified General Theory of Adult Learning that will solve all our problems." Gannon (2007) supports this scepticism about overarching theories, acknowledging that different learning methods are required to achieve different learning outcomes and that no specific school of thought or theory can claim to be the sole backbone of e-learning. The objective should always be to utilise an appropriate theory or combination of theories in addressing any specific learning situation. Gannon also says that teaching staff require assistance in designing programmes with "design toolkits and design patterns". At present, she says, at most institutions pedagogy is still more guided by the controlling than the facilitating principle. She concludes that the challenge now is to release the potential of learning technologies to address the poverty of current pedagogies.

2.8 CONCLUSION

It is evident from this chapter that the student presently graduating into the world of work will be required to be above all a problem-solver if they are to hold any position of responsibility which will reward them adequately in financial terms. The world urgently requires problem-solvers and this places the onus on today's education system to produce people capable of solving problems.

Modern technological advances have the potential to assist in producing problem-solvers. As emphasised in this chapter, the new technology if utilised correctly should help greatly to encourage a problem-solving mentality and downplay the significance of often misleadingly clear-cut solutions. The importance of self-study, self-management in learning, and lifelong learning should produce enquiring minds, and reflective thinkers who are able to research and draw conclusions rather than regurgitate knowledge.

This investigation points out the challenges existing for education in general and educators specifically in introducing e-learning to pedagogy and provides motivation for the implementation of internet methodology. In order to fully understand the challenges and advantages posed by the "new technologies" it is necessary to focus on the traditional education system which has preceded the most modern developments being proposed in this study. As will be seen, the literature study has touched on a much broader range of limitations than were highlighted in the interviews. It has provided the necessary background against which the outcomes of the interviews discussed in the next chapter can be assessed.

CHAPTER 3

RESEARCH DESIGN, RESULTS AND DISCUSSION

3.1 INTRODUCTION

The aim of the literature study in the previous chapter was to establish a theoretical foundation for the research described in this chapter.

The literature study highlighted the themes to be addressed in the empirical research in relation to the four general aims which emerged from the research question.

It pointed out the challenges for education in general and the educators particularly in introducing e-learning to pedagogy and provided motivation for the implementation of internet methodology.

In this chapter, the data collected in the interviews with educators is analysed, organised and systematised around eight key themes which emerged from the study question.

3.2 CONTEXT OF THE STUDY

The purpose of this investigation is aimed at seeking motivation for educators at a private international school, for the introduction of internet methodology (teaching methods used to implement internet technology) in education. Enhancement of the learning experience is its ultimate goal. The study first aimed to identify the limitations of the traditional education system, and secondly looked for viable solutions as to how internet technology could be utilized to address these limitations. Data was drawn upon to provide the necessary motivation for educators to use e-learning to support subject teaching. Possible resistance by educators to adopting internet-based approaches was investigated as were the limitations of integrating e-learning into the teaching environment. Furthermore, the study aimed to propose ways in which educators should consider adapting traditional pedagogies to communicate efficiently in a global network.

The investigation took place at a private international school which has recently introduced wireless connectivity across the campus. The headmaster and educators are exploring the introduction of e-

learning as a blended system with the traditional classroom practice. Developing e-learning to support subject teaching and learning has been identified as a priority at the school which follows the Cambridge curriculum. It has become necessary that motivating factors be determined to ensure full educator participation in internet teaching.

Because of the relatively innovative nature of this study, some responses obtained from educators do not clearly align with theoretical support which could substantiate them. Many of the responses therefore appear to warrant further research as internet technology increasingly impacts on educational methodology.

Socio-constructivism has been used as the theoretical framework for this investigation. This has as its basis the interaction between participants and sharing of resources and experiences, and it includes a strong element of self-reflection relating to active cognitive experiences and critical thought. These are seen as the building blocks, stepped in depth of levels of understanding, leading to learning. Active participation and self-pacing are the driving–forces present in socio-constructivism (Holmes & Gardner, 2006: 83-84; Gannon, 2007). According to Herrington and Oliver (2000: 23-48) internet technology can provide a higher order, social constructivist learning environment by enhancing the opportunities for student interaction on the Web. The authors refer to various internet tools which raise the level of communication, consultation and feedback but emphasise the importance of an instructional design model to generate meaningful interaction and learning. The authors point to the importance of realistic learning opportunities in an authentic real world context (Stage et al., 1998 and Woo & Reeves, 2007: 20).

3.3 RESEARCH DESIGN

Since the research aim was to seek motivation for educators at a private school to utilise internet technology, a qualitative and interpretive research approach was followed which relied on the emergent design. This strategy was used because the design of the research was developed as the study proceeded and qualitative research strategies are more flexible and adaptable in such instances.

The design process consisted of purposeful sampling, data collection and partial data analysis which occurred on a simultaneous and interactive level. A fair cross-section of the educator population at the school was obtained by combining purposeful sampling and volunteer sampling. Participation was of a

voluntary nature. Purposeful sampling ensured that, despite varying degrees of experience and knowledge in the field of internet learning, the participants shared an ability to supply information relevant to the study (De Vos et al, 2004: 207). A phenomenon common to all participants was the realisation that the school had embarked on a process of introducing internet technology to the classroom and that they were all integrally linked to this process.

Phenomenology (mostly interviews and observations) was the qualitative research strategy used in this study to determine and understand the participants' perspectives, perceptions and understanding (De Vos et al, 2004: 273). This approach entailed conducting in-depth interviews which focused on participants' experiences of internet learning. This allowed for entry into the experiential world of the educator focusing on their situated pedagogical context. The aim of the interpretive investigation was to elicit responses which would reflect the varied experiences and expectations of the participants (De Vos et al, 2004: 273).

3.4 SAMPLE

The sample population consisted of educators at a private international school in the North West Province of South Africa. The school was selected as it was in the process of integrating pedagogy and technology by means of the introduction of internet technology. Purposive sampling was used to select participants. Criteria for participation included: voluntary participation; informed consent to audio-tape interviews; various race groups; and genders. The study would have been limited if the following criteria for participation had been included: position held at school, years of experience, ITC skill, and implementation of e-learning in subject teaching. It was felt the responses would be more representative if restrictions were not placed on those participating in the study.

The Headmaster of the school was asked to assist in identifying individuals who complied with the previously-mentioned criteria for participation. He was requested to do this in a non-selective manner and to invite educators to volunteer for interviews. Educators who volunteered were given a clear explanation of the information being sought and the reasons for seeking it. They were asked to sign a consent form in which they were given the option to agree or object to the audio-taping of the interview which would last not more than 45minutes. It was indicated that audio-taping would save time and reduce the distractions of handwritten notes. A set of questions was provided that would be asked during the interview, arranged in the order in which they would be asked.

Time slots were allocated, with each volunteer being interviewed according to a schedule. Nine educators participated, including the Headmaster. Eight interviews were used for the research, the ninth was excluded as it was not rich in information, compared with the others: further reasons for this selection included years and levels of experience in education, representativeness of the educator population, seniority, willingness to participate and offer an opinion. All the interviews were conducted from 6 April until 14 April 2009.

The following participants in this study volunteered for interviews and were selected in order to achieve a balanced subject representation:

Participant A: Subject Head: Physics (Forms 3-6)
Participant B: Educator: History (Forms 3-6) and English (Form2)
Participant C: Deputy Head: Mathematics (Forms 1-6)
Participant D: Educator: Mathematics and Science (Forms 1-6)
Participant E: Educator: Mathematics (Forms 1-5)
Participant F: Subject Head: Chemistry (Forms 1-6) and General Science (Forms 1-2)
Participant G: Educator: Mathematics (Forms 1-6)
Participant H: Headmaster: Afrikaans and Commercial subjects (Previous experience)

The grade equivalents of forms 1-6 are grades 7-12.

Given the heavy demands on educators' time, not every member of the staff was able to participate. They were occupied with end of term arrangements such as reports, sporting tours and preparation for parent evenings. Therefore, interviews could only be conducted during the school holiday. Furthermore, as I work in a public school, it was difficult to schedule the interviews at times when the school holidays coincided with private schools' holidays. Educators had also made Easter holiday plans and those who were not going away, did not want to be interviewed during this time; and, some educators were involved in sport festivals.

3.5 DATA COLLECTION METHODS

In order to obtain data which would reflect the educators' understanding of an international school environment within which they operate with specific reference to an internet environment, it was decided to make use of the interview as data collection method. In this regard a few broad areas were identified and investigated.

When the school introduced interconnectivity at the beginning of 2008, difficulties were experienced in providing a reliable internet service and this prevented the study from taking place earlier. It was only toward the end of 2008 that systems were up and running and the study could take place. In the mean time research was done, background information gathered (refer to Addendum A for details of the WI-FI facility available at the school, Addendum B for the WI-FI installation plan and Addendum C for IT/ e-learning resources available at the school) and the literature study completed.

I carried out semi-structured one-on-one interviews, lasting 30 to 60 minutes and 1 hour and 38 minutes for the Headmaster. Semi-structured one-on-one interviews were chosen, as with this flexible method, although the questions are predetermined, the participants are able to play a role in how the interview proceeds and to enter into discussion beyond the formulated questions. This allows the interviewer to acquire more in-depth information, beyond the formulated questions.

Questioning (refer to Addendum D for the interview schedule) focused on participants' experience of internet-based methodology and how it could successfully support their teaching. This led to discussion of what would motivate educators to utilize e-learning, and suggestions about how fellow educators could be motivated to use e-learning in their teaching. Further prompts explored educators' ideas about the limitations of the traditional classroom, and about e-learning as well as future developments in this area. In the questioning, there was specific reference to blended learning.

The data analysis and management involved the following steps:

- The data was collected on site.
- The data gathered was transcribed from audio-tapes and relevant information was identified.
- The data was organised by colour coding of relevant themes, number coding of the participants and creating separate computer files for each interview.
- In order to link concepts and ideas propounded by various interviewees, the interviews were studied and notes made in the margin.
- Eight themes were identified.
- For each theme a new file was created.
- All the responses related to a specific theme were grouped together and placed in one file.
- Within these files, each participant's response was colour and number coded.

The audio-taped sessions were transcribed. An example of an information-rich transcribed interview is included in the research as Addendum E.

The eight themes identified were:

- The role of e-learning at the private school at present
- Previous exposure and experience with e-learning
- Limitations of the traditional classroom
- Limitations of e-learning
- Motivation for educators to engage in e-learning; advantages of e-learning
- Resistance to e-learning
- Blended learning 'old and new' Symbiotic Scaffolding (scaffolding refers to support which enables a student to achieve a goal or action that would not be possible without such support)
- Future of e-learning

Deductions were made in order to identify patterns, their validity was tested by corroborating statements, and interpretations evaluated for relevance. This followed the model proposed by Hammersley and Atkinson (1983).

3.6 ETHICAL MEASURES AND TRUSTWORTHINESS

Credibility, transferability, dependability and confirmability, the four constructs of Lincoln and Guba (1985: 290) cited in De Vos et al, (2004: 351-352), were important considerations in this study.

- Credibility refers to the accurate identification and description of phenomena in the research.
- Transferability refers to one set of findings being applicable to another context.
- Dependability refers to a strategy whereby the changing conditions regarding the phenomenon chosen to be researched and the changes in the research design as the research proceeds can be accounted for realistically.
- Confirmability refers to the strategy whereby the question is asked as to whether another researcher analysing the same data would reach a similar conclusion.

The following factors ensured ethical measures and guaranteed trustworthiness.

- I am not attached to the school. Written permission was obtained from the Headmaster to have the school participate in this study.
- Prior to the interviews, I prepared myself to be able to interview competently and ensured I had obtained enough knowledge for the research to be conducted.
- Consent from all participants was obtained after all relevant information had been communicated with assurances of anonymity and confidentiality.

- It was agreed that audio-taped interviews be allowed.
- Regarding the data collected, interviewees agreed to reply to any queries at a later stage.
- All participants were advised that they were free to withdraw from the study if they chose to do so. They were therefore in a position to make informed decisions on their participation.

3.7 DISCUSSION OF THE RESULTS

Analysis of the interviews conducted with the educators revealed that there were eight distinct themes (as listed in 3.5) relevant to answer the research question. Each one of the themes proved to be rich in phenomenological information, as the participants had constructed meaning from their experiences in the field of e-learning, whether their experience had been rich in technology or lacking therein, the information gathered proved valuable in answering the research question. The eight themes emerging are listed above under Data Collection Methods.

3.7.1 Role and involvement in e-learning at the school at present

All participants reported that they are able to access past exam papers, interact with discussion groups in their subject areas, inform the Cambridge subject advisors about problems experienced, answer questions and help others on the web. The Cambridge International Examination (CIE) discussion groups are utilised by some of the participants while others are starting to do so. The participants appreciated the value of access to the international community. Participant A commented on his communication with the Institute of Physics, “They give advice on how to conduct lessons or some demonstration ... teaching methods ... certain topics, so you can always stay abreast with what is happening with your subject”. He went on to comment that he had introduced a colleague who is new this year to the forum. Throughout the study, it was apparent that interaction and sharing of ideas between the educators were important in the induction of new staff into internet learning and acted as a catalyst to further involvement in this methodology.

Participant H acknowledged that the introduction of data projectors at the school was progressing but that at the time of the interviews only certain rooms were equipped with this facility. Access to websites was seen to be a valuable asset to educators and Participant A commented, “I think the direction we are going into is where the teachers will have their own sites and students can access that”.

A concern that was raised by Participants B, D and H was that in some cases the WI-FI service across the campus was intermittent and that some had lost their connectivity at certain venues. This

raises the question of the school ensuring that the internet service provider understands the importance of e-learning and its utilisation at the school, and realises its responsibility to provide a stable network at all times. In comparing his previous school to that of his present school, Participant B, remarked, “It just doesn’t arise in their heads (referring to a previous school) that we can raise such concerns that our WI-FI is not working and then it is not even an issue with them”.

All the participants apart from Participant B and F expressed the view that the internet was useful in developing communication with parents, students and educators not only of their own school, but also of other schools across the world. Participant G said, “Links that I have with schools throughout the world that are also Cambridge based. I’ll go to their websites and see how they work within their Mathematics departments and see how we can either interact with them or implement what they are doing in our own school to see if we can improve and learn from them as well”. The fact that student reports were being posted on the website was seen as a distinct advantage for the school in its communication at an international level.

There was consensus that the students were in many cases ahead of their teachers in terms of this new technology. “They are just very good at it”, Participant C indicated. Educators had been encouraged and assisted financially to obtain their Computer Driver’s License (ICDL) and to obtain laptops of their own. All educators were expected to use the internet-based Edu-Admin system to record marks and comments for student reports. Participant D reported using the Cambridge websites for teachers and “My Maths” among other programmes and a list of websites had been supplied at a CIE workshop in Johannesburg in October 2008.

There was general appreciation from educators that the school enabled them to access the internet and the campus intranet at night from their residences rather than having to wait for school to reopen the next day. It appears as if the downloading of teacher materials and examination type questions from various sources is broadening the scope of questioning and teaching at the school. It is felt that the extension of the internet access facilities across the campus has allowed the school to progress to another level in its pedagogy. Participant E remarked as follows, “I think as to e-learning we are far ahead. Because I have been to some private schools where students are not allowed to use the internet in the hostels. They just do it or even in the classrooms you know they just do it ... one computer block and once you are out of there you can’t use internet. But here students can sit anywhere. Even on the fields ... they can just sit there and start sending their e-mails to their parents ... it’s a modern world”.

Participant F remarked, “There is such a lot of information out there now. In terms of, like sourcing materials ... and stuff to use in the classroom. The internet is just one of the best ... tools there is for accessing information at the moment ... and I do use it a lot.”

There is consensus that the advantage of internet-based learning lies in providing material of varying difficulty to students of varying intellectual ability. The school was providing an opportunity for educators to observe how other educators are dealing with the teaching of certain topics in other parts of the world. The feeling was that in the past two years the school had made great strides in facilitating computer-based learning.

In the words of Participant G, “Although we haven’t gone very far, compared to where we were two years ago we have really made a head start”. Participant H spoke of a catalyst effect whereby the children’s expectations had forced staff to utilise the internet more, and that in response the educators were forging ahead.

3.7.2 Previous exposure to and experience of e-learning

It appears as if the training in interactive technology has been haphazard, with each educator’s experience being different. This is not ideal for the implementation of e-learning. Participant A had received training in interactive technology and said, “It was the CIE course which I completed in Kenya where we really talked about the value of ICT (Internet Computer Training) and then the guy who was also presenting gave us the software to use”.

Not all staff are aware that the school subsidised ICDL as being available to them since 2005. In any case, it is seen to be very limited in scope. Participant C, said, “We were introduced to not internet as such but to computers and working with it”. Disconcerting for the introduction of internet learning were the words of Participant B, “I’d rather have someone stand in front and say ... let me teach you how to do this, than someone giving me the programme and say, well, here it is, teach yourself what is going on”.

The training in interactive whiteboard technology has thus far only been offered to educators at the school by people involved in the sale of the technology. There appears to be a lack of hands-on training, as Participant E said, “It (interactive whiteboard) was bought only last year ... so far not many of us have managed ... although we have been trained. The guy came and showed us how to do it ... but it is not many teachers who have had the chance to use it“.

What did emerge from the study was that the interactive whiteboard was seen by educators to be a very useful interactive tool and there is a definite eagerness to incorporate this technology into their pedagogy. What is apparent is the ability of the technology to identify immediately, or at an early stage students, who have failed to understand what is being taught. In the few instances where staff had previous experience at other schools of utilising internet technology, it had taken place in an informal way and consisted mainly of learning from colleagues. Participant D was also involved in a pilot project but in each one of these scenarios there was not necessarily any training on how to use the internet. The word "self-taught" appears to encapsulate the training method in preparing educators for internet-learning. This is corroborated by Participants A, D and G, with the latter indicating, "What I know and what I use is mainly self-taught".

The introduction of the educational administration system Edu-Admin at the school has presented an opportunity for educators to learn about the use of and reach of the internet. All educators at the school are expected to enter results and comments into the system which is internet-based. In so doing the internet has become part of the daily lives of the educators. They have a better grasp of the benefit the internet holds in the sense that it allows the school to communicate with its parents unimpeded by geographical and time constraints.

Apart from the ICDL course the school offers to educators the financing scheme to purchase their own laptops and the provision of WI-FI across the campus has empowered the educators to make free and unlimited use of the internet and campus intranet. The school has embarked on mentorship programmes whereby educators who are more technologically inclined have offered their services to train and support educators who are more technologically challenged.

Because the school is moving forward quite rapidly with its IT and e-learning endeavours, the interview questioning of applicants who wish to teach at the school has had to include enquiries regarding the applicants' proficiency in ICT. New appointees who have not had exposure to school intranet and internet processes would initially be at a disadvantage and provision would have to be made for them to operate effectively from the outset on appointment at the school.

3.7.3 Limitations of the traditional classroom

There was general consensus that the traditional classroom did not present big barriers to learning. However, the following words of Participant C, are significant, "The only barrier that I see from my personal view has to do with motivating the kids".

Further investigation of this statement revealed a number of telling barriers to teaching that educators were experiencing. It is perhaps best expressed in the following words of Participant D, "... assumed knowledge, where you are assuming ... you assume that everyone is at this take ... whether they are exactly at that level ... some are and some are not ... at an International school where we are getting students from all over the world ... it then becomes difficult to try and find material for those students who are lagging behind ... but with e-learning I am sure you can quickly log on to the website where you can get the relevant information and bring up these guys to the level that you want to ..." and also the following statement: "... with the traditional method, once you erase it from the chalkboard it is gone for good".

The interviews revealed that the rigidity of the classroom could be the cause of disciplinary problems, laziness, students not doing their homework and poor results. Participant G said, "… would actually lead to behavioural problems especially with the fast learners. The fast learners will get the concept immediately … and then they are bored, and then they become a disciplinary problem because they start pulling each other's hair, they misbehave doing all sorts of things. And then on the other end you have the child that you are leaving behind because you've struck what you believe is the middle road … Over a continuous period of time that child becomes a disciplinary problem … it is so teacher-centred that you are the sole voice in the class. You could be a good teacher or you could be a not so good teacher but this is what we are stuck with …. You are sort of bound by those (exams) because at the end of the year you have to produce results and move them on to the next class and they are judged on their results." On the reasons for poor results, Participant E said, "… with things like the interactive board you can actually monitor as you teach, you can actually see that 50% of my students are not understanding as you teach. Unlike the traditional method where five people raise their hands, that's how you know that five people are able to answer this question … But if they don't know it (the answer to a question in the traditional system) they just leave it, they won't even try, because they have nowhere else, except the educator to give them the information".

The limitations of the traditional classroom in its inability to depict three dimensional mathematical structures and the monotony of the traditional classroom were seen to be a major drawback when compared to the ability of e-learning to captivate students and therefore assist their retention of the learning material. Participant D, identified the fact that the traditional methodology also made it difficult to cater for the different levels of students in the classroom, stating, "You assume that everyone is at this take whether they are exactly at that level … some are, some are not. An international school where we are getting students from all over the world … it then becomes difficult to try and find material for those

students who are lagging behind … catering for different levels of students in my class … With the internet you can generate the same test (at different types of difficulties for different students).” This statement is supported by Participants F and G who refer to the problem of mixed ability classes. Participant G said, “You have like kids who long understood already … and kids who haven’t got it, and yet there you are in the middle carrying on. I think it is one of the limitations of the traditional classroom”.

The problems presented by handwriting, and by some students being very slow when they write, was seen as a further disadvantage of the traditional classroom. The educator as the main source of information and the lack of sufficient activities to focus on problem solving was a major cause of concern. The need to extend the pedagogy beyond the classroom was referred to by Participant E, “I think it is not very sufficient, because you will find per topic of maybe 7 exercises maybe one of them will be problem solving ... so they need more practice ... and that practice should be during their free time. If we are to be able to complete the syllabus to prepare them for the examinations then they will have to do that extra work on problem solving ... if we need more practice we need more time which we do not have”.

It was generally felt that the traditional pedagogy would be something very difficult to discard but the study did reveal that the educators were aware of the behavioural and learning difficulties of students. As Participant G said, “Those are the normal continuous problems with chalk board teaching…that… would actually lead to behavioural problems, especially with fast learners ... and then on the other end you have the child that you are leaving behind because you struck what you believe is the middle road ... over a continuous period of time that child becomes a disciplinary problem because they don’t understand what you are carrying on about and there is nothing to keep them. And it is so teacher-centred that you are the sole voice in the class”.

Another point raised by Participant G was that, it was easier to follow up (to track learning progress) on boarders than with day scholars because the latter leave the campus and cannot be followed up as well. The participant felt that the school day was very limited in terms of time and it was difficult to fit in remedial work. It was reasonable to deduce that the traditional classroom’s reach was also an inhibiting factor in the pedagogic process. Participant H felt that a major communication gap was developing between educator and student and needed to be closed, this gap having been caused by the differing technological experiences and capabilities that existed and still presently exist between educators and their peers as well as educators and students.

Participant H also foresaw a shift in the pedagogy from knowledge gathering to knowledge interpretation and that this would ultimately be reflected in future examination systems. He foresaw a possible problem arising from a traditional system of paucity of knowledge to an overload of knowledge created on the internet and it was felt that students would need to be trained to manage this transition.

3.7.4 Limitations of e-learning

Participants identified a number of limitations presently being experienced or perceived for the future.

- *Plagiarism:* Participant A said, "I find that students may be copying and when they copy they don't understand ... I always encourage them that if they get ideas from other people that they should also try to understand it".
- *Computer intellect:* Participant B stated, "I don't think you will ever reach a point where any programme or computer would be able to respond with the same intellect I suppose as a human being".
- *Distractions*: Participant B noted, "... how they sit around a computer and suddenly look very busy".
- *Information overload:* In the words of Participant B, "... where it is too much and the person working with it whoever it is doesn't know where to start because it is such a lot".
- *Time wastage:* Participant B said, "... I know that if I'm looking for something I first go to a book rather than to the internet because the books are here and I know how to use them".
- *Ageing technology:* Participant B said, "My one concern is that my computer is ageing now and I don't know if the programmes I want to put on like Britannica or something like that would be able to operate".
- *Diversity/Superficiality:* Participant E stated, "... they are being spoon-fed now ... They still need to grasp concepts from a different perspective through the teacher because the internet is not going to provide all the solutions. What you'll find is that if they get solutions easily or they are readily available it becomes a problem. There is no learning ... just give the student an assignment. They can get everything now from the internet and without thinking, without digging deep from the actual sources which might be available. There is a problem of being superficial ..."
- *Distraction from examination focus:* Participant D said, "One would have to guard, you can get carried away. Always remember that your focus is on the exam requirements, the syllabus ... what is it that you need to cover with it ... just go that far ... and then during the student's spare time you can let them go on the full strength if they want to research more on certain topics ... but ultimately making sure that the syllabus requirements have been met."

- *Slow internet:* Participant D noted that at times the internet is slow, and said, “Then as a teacher you want to divert them from the slow opening and then you say: ‘”Oh well, let’s start doing this on the board” and then all of a sudden as you are in the middle of solving that, or making that discussion, it comes up on the internet and everyone changes their focus. So that is a kind of hindrance as well.”
- *Availability of facilities:* Participant D said, “If you need to use the internet you either have to go to one lecture place where there is a whiteboard or you have to liaise with the computer teachers when their labs are free ... we always have a surplus of computers in the lab. So basically your biggest problem would be availability of space ... to book space”.
- *Laptops versus interactive whiteboards:* Participant E indicated that there was a vast difference between controlling students when using the two facilities. She said, “... you know if I have 20 students and each one is having a laptop ... the laptops are not facing me ... they are facing them ... it means I would have to move around more than when I am using the interactive board. I can actually see that everyone is paying attention, or that one is not paying attention ... but if they are looking at their laptop I wouldn’t know what is there so I think that could also cause a problem”.

The following limitations were also revealed:

- Students working on websites they are not supposed to.
- Students who are not fully computer literate.
- Students just copy, paste and send information.
- Eskom power cuts.
- Lack of hands-on experience of staff with the whiteboard.
- Lack of stability of the WI-FI service.
- Connection costs prior to the cable being laid between Europe and Africa.
- The possibility that the personality of the teacher will take second place to the computer.
- The fear that the Board of Governors will allow cost factors to limit further development of the WI-FI system.

3.7.5 Motivation for educators to engage in e-learning/advantages of e-learning

It has been difficult to separate the two concepts of motivation to use, and advantages of e-learning because they show clear linkages as soon as one engages with participants. In this study, this bond will be maintained as it appeared that most participants were aware of advantages that would benefit

and motivate colleagues. It was clear that an important motivation for educators to use internet learning is that it has advantages, not only for them but also for their students.

There was strong support for the interest factor and the advantage of students being able to access the internet after hours. As Participant A, stated, “Now e-learning is interactive, students ... find it very interesting and not boring they all want us to go there, because they can see things which are difficult to explain ... on the board. So when you explain how particles move within matter they can actually visualise particles moving, whereas when you talk about it, it is very much abstract”.

Participant A continued, “... we can expect more when you have the internet. We have also given them the power to access it ... websites, so when they are in their hostels now they can get to that on their own laptops ... they were actually commenting to me (the students) and saying that you are doing the modern thing and that it is not boring ... it clears up many things for students ... The key thing is visual learning rather than rote learning. E-learning has helped quite a lot of them to understand underlying ideas”.

Participant E, corroborated this view, “... the motivation is just that I may be using something that the students like ... you don’t have to push them to learn because they are going to be involved ... you hear when you are talking to them that they would probably want to say ... Hi, Mam! ... if we are connected that anytime I can get help from you ... They must like what is happening”.

According to Participant A, there has been a significant change in attitude of students since he has been utilising internet learning technology, “With research you actually ask them to look for information after you have posed a question and really it is exciting for them to know that they can actually get information. They are like young scientists and they like the feeling that they have discovered it. It is quite motivating really.” This same participant felt that a further motivating factor for educators would be to give workshops whereby the benefits or even simple concepts can be explained by and discussed amongst staff. “Maybe have some small groups of students be taught with one method and others with another method and then compare the benefits of it”.

Participant A indicated that there are a number of “add-ons” to the hardware and the software, such as data-loggers and software, which are free on-line and which could be very beneficial and could create interest among the more traditional style of educator. It was felt that very strong motivators would be the assistance that internet learning could provide to an educator in providing work at the

right pace in classes of varying ability. Participant B noted that, access to a variety of opinions and arguments, and access to resources such as “recordings of speeches in the voice of the person who actually said it”, would be advantageous. These were all seen to be major stimuli in achieving positive educator and student reaction towards e-learning.

Educators were excited by the prospect that the school envisages subject websites to allow interaction beyond the classroom between educator and student. The advantage of this is that it would enable quick answers to student enquiries and this was viewed as a positive factor in the learning process as also the posting of homework, FAQ’s, lesson notes and film clips of lessons, the latter being made available through YouTube.

The educators felt that the full introduction of interactive whiteboards linked to the internet would be a positive stimulus to the educational process and would motivate the students. The availability of after hours, beyond the classroom assistance was seen as a key motivator by Participant C, “... interactive boards, laptops in terms of the students ... for e-learning any minute, anytime you can freely correspond and get a response ... Now there is that opportunity where you could just send your questions to a number of friends and the chances of getting a response are high. So I see it as one way of actually making sure the students are learning every minute or most of the time”.

Greater contact with students inside and outside the class cannot be separated from the positive attitudes generated by e-learning on all participants in the learning process. It is clear that a key advantage is that for the student and the educator is the, “anytime, anywhere and anyplace” availability as mentioned by Participant D. Participants also felt that this interaction has a compounding effect as it brings into play the aspect of interaction between different classes at different schools in different countries. As stated by one respondent, “So we find that intra teaching is also taking place student-to-student as well as teacher-to-teacher ... every student even the one who is most docile in class are all wide awake and seem to be paying attention ... those who are hyper-active in class suddenly become hyperactive (positive towards the learning experience) when exposed to the internet”.

Regarding pacing of students in mixed-ability classes, Participant G said, “I use it for extending students like the students who are very good, and who are very fast and work quickly. There are sites where you can find lots of questions and related material that they can further read and work with. So I will attempt to actually save it and maybe transcribe it into worksheets and stuff like that, which I

would then pass on to the students ... So if you can find interesting material to occupy them in the meantime while you are working with the slower kids, that kind of thing, ... all the information you need is there, even in terms of wanting to expand what knowledge you have. All you have to do is press the help button ... there is a lot of scope for learning oneself and improving all the time ... You can cater for the very fast learners, expose them to other things maybe as in Maths as a sort of follow through of later work ... to desensitise that work ... And similarly with a group I think I am failing, if I'm working with one kid, put the other kids on some other work that would help them as well catch up or that would make the work easier to understand, or just give them back their confidence, because when kids fail they lose their confidence as well. Reduce the work to their level and allow them to work at maybe their own pace as well".

Participant D, saw a distinct advantage of the whiteboard over the chalk-and-talk method in the students being able to download the lesson on their flash drive, and stated, "Each one of them has his own hard copy rather than having it there on the chalkboard, it is not the same thing".

An aspect with interesting repercussions for the educators is that students themselves can download examination papers from the internet, and in some cases, even those which are password-protected for educators. This has meant that it has become impossible for educators merely to recycle old question papers for their internal examinations. For the students, this has advantages in the sense that educators are forced to search widely for examination resource material and, boundaries are stretched.

Participant F, noted that after exposure to an e-learning class, a student who was not noted for academic excellence in the class performed extremely well in the follow-up test. The educator described this as possibly being the result of "... most skills are actually excited (stimulated) ... I just think maybe that way students might have self-motivation to learn by using websites, or just doing things by themselves, or learning by themselves ..."

Communicating via the computer or the internet was seen to minimise student behavioural problems and even homework could be done better. Participant F felt that creating new teaching aids, need not be such a burden on the teacher, suggesting that the students could play a large role in the design of their own learning paths because of their high level of interest in the method of learning, "... it gives challenges to the students to design their own path of learning. Instead of the teacher trying to make teaching aids which are very creative and interesting, they have their own teaching aid which will be

interesting to them, so you'll find the creativity in teaching aids will be eliminated and there will be one universal teaching aid which anyone or every student will be so keen and interested to use".

Participant F said, "… with the traditional teaching method students expected to be tested in exactly the same way that they have been taught whereas with the involvement of the internet, students' minds are opened and they are made aware of many examples, applications, uses and therefore also questioning".

Cross-curricular options arose in discussion with participants and were seen as an area which could open up new vistas in pedagogy. Participant G said, "... we tend to teach subjects in little compartmentalised pieces, like this is Maths, this is History, this is ... I mean that also opens up that whole scope of interacting, the whole curriculum and seeing how things merge into each other".

It appears that educators have access to software and some additional tools such as graphing calculators which are linked to their lap tops. Participant G commented, "It works, I like it. It's taken me a while to manipulate a lot of the functions. I am still learning. Every holiday I try to learn at least two or more functions on how to link it all up, I have done quite a bit of work ... Most of the kids in my hostel have laptops ... You have programmes installed there, everyone links in and you work. I'd love that. I'd love to eventually arrive there where you are not using so many of the traditional tools like graph paper. If we have these programmes we just input our data and hey presto up comes the graph and we do it a few times and we get a generalisation, swop graphs, print and see, generalise, put the things up on the wall and move on. I would really love that".

Participant G also pointed to the following as exciting prospects, "... you could save lessons for when a person is absent, they (students) don't have to miss out on the lesson. They can actually access that lesson, ... do today's lesson, put in the homework bit, everyone accesses it and perhaps who knows, send it back to me where I can check it before tomorrow morning. Maybe for the school, then you can do inter subject as well. Maybe initially just for your subject. Initially just for your subject and with the link with the kids some kind of internet within the school where kids could log-in and see what today's lesson was and what tomorrow's lesson will be if they are not coming to school tomorrow, what their homework will be, when is it due ... where to get help ... Kids could work in groups even, it opens up scope for group work and helping each other and stuff like that ..."

Regarding assignments, Participant G saw the following advantage of the internet, “You don’t have to physically write your assignment and go and put it under your lecturer’s door. You can just send it in (over the internet) and get it back”.

Concerning the somewhat different communication offered by the internet, Participant H said, “... allows me as a Headmaster to communicate with my parents ... with my staff on a daily basis after hours ... all over the world.” Participant H felt that communication between the school and its target groups was much more controllable and no longer dependent on children relaying messages to parents. The activation of subject websites containing notice boards, notes, FAQ’s and homework would be advantageous.

The internet presently allows educators to feed information into the administration system at any time and from any place in the world. He foresaw a staff member, or himself, communicating with a class via the website and Skype from anywhere in the world. He saw the advantages of important lessons on difficult topics being posted on YouTube by the school’s internet service provider which would preserve specific lessons for students, allowing them to repeat them until they understood the content.

Participant H also foresaw that he and his management team could, by prior agreed arrangement with educators, film specific lessons attended and make these available to staff at the school via the intranet. The advantages of this would be that educators could observe each other and learn new techniques from each other and eventually becoming more effective in the classroom. This could help to answer the question, “Are we preparing our students better for the ultimate outcome we are looking for?” (Stefanics, 2008: 16).

Participant H saw the motivation of educators who are less inclined to technological advancement coming from those who were more technologically gifted. He felt that educators would realise that preparation of lessons would no longer go to waste as they would all become recordable and have an extended lifespan.

Finally, it was in his view important to build a back-up system for students and educators to extract the maximum benefit from e-learning in order to improve the pedagogical offering as success in this regard would drive the process faster and further.

3.7.6 Resistance to internet learning

An interesting juxtaposition has developed between resistance to e-learning and its necessity for the future. It appears that the latter aspect namely, the necessity for educators to become involved in the process, will eventually counter the resistance to the process.

On this, Participant A said, “I think it is just a question of attitude and a lack of exposure ... I don’t think they are resistant. I think there is a need for exposure among the teachers regarding what they can do with e-learning ... because I think people are not very clear about the internet and need experimenting ... in Science it has really become compulsory ... for example with Biology we are dealing with bodily processes where they can actually see what is happening and actually see when blood is flowing, they can see it moving and understand it ... I don’t think there is anyone who thinks computers are not good. I think everyone has a computer and knows it’s through the assistance of the school. I think it’s only a matter of getting them to use it more effectively”.

Participant B felt that the longer educators had been in education the more they would be uncomfortable with new ideas and would possibly put up some resistance. He felt that younger educators would be more apt to utilise e-learning because of the environment that they have been brought up in. Points raised were, individuals’ natural response to change and the resistance which could result from attitudes such as that mentioned by Participant B, “... of simply I don’t want to ... I don’t see the point ... I have never had to do it in the past, why should I now?”

It is however my opinion that resistance could rather be linked to an individual’s character than to age.

The word “compulsory” arose on a number of occasions and the consensus was that this was dangerous territory. It was felt that good educators who could simply not face the computer should be accommodated in the system and that they should rather be encouraged step-by-step in certain intranet and internet activities as they were not necessarily holding the school back from better performance. It was felt that peer instruction in the utilisation of internet in the pedagogy would alleviate the problem. Participant B said, “I suppose if someone (peer) were to come forward and was able to have a stint with the educators and show them what they could do. I think very often resistance can be removed when you discover just what you can do with something, once you know how, so I think that (training) would help. Participant A added, “Yes, I do believe some of them (educators) are behind and they need to catch up, but I share with them my knowledge, especially, with those in my department”.

This is particularly relevant to educators who have seen advantages in their traditional methods, have achieved results and still believe that they can achieve results with the same methods. Participant B felt that educators showing resistance would not be agreeable to upgrade their computer skills merely to implement e-learning in their classes. Participants A, B, C and D felt that the methods utilised in the classroom should remain optional as far as practicable, as the results obtained in internet learning may have to be the catalyst for non-conforming educators to come on board. However, Participant F felt that there was merit in making it (implementation of e-learning) compulsory "as those who resist will enjoy it". Participant G agreed with Participant F, but referred rather to educators being "gently persuaded".

The proposed extension of the communication process between student and educator after hours and beyond the classroom was seen in a very positive light in general, and Participant E suggested that, specific times should be set aside for correspondence and communication. Participant E stated the following in answer to the question, "So you would place restrictions on your time?" "Ja, maybe, I would say up to 9 o'clock – 10 o'clock but not midnight".

On the issue of resistance, Participant F said, "The biggest challenge itself is just being friendly to the computer ... taking the computer just as a cell phone ... play around with it ... yes, I know resistance will always be there but at the end of the day even those who resist will enjoy it". On the issue of exposure, Participant F said, "I think the first step is trying to say … 'We are now sending memo's or newsletters through your e-mail address' ... just as simple as that ... say: 'any communication that we do we are going to send it though your e-mail address'."

Participant G equated resistance with the fear of being replaced as has often been implied in the media, and remarked, "I think a lot of people would still see the computer as replacing them rather than complementing them, because you know how we feel like we are in control, when we have everyone's attention, now you have this machine. I don't have a problem with it, but I can foresee that this would maybe become one of the problems".

Participant G also brought up the following question, "There is still that fear, you know, with people my age group. We grew up being told not to press that and not to press this. So you have to get to terms that pressing a button won't change anything. If it's not working, it's not working. It's always like your hands are poised above the keyboard and thinking, 'must I or mustn't I?', 'What if?' I am learning to overcome that. My son is really good, he'll say, 'Let's try it this way', and then he'll do it and then it won't work and, he'll say, 'Okay, let's abort this and do it the other way', and I'm sort of learning to be

there. I used to hold his hand and say, 'No, no, no, what if it crashes?', and he used to say, 'no, Mum, nothing is going to crash' ... Confidence. I think it comes with confidence, more use, more and more regular use of the computer."

Participant G felt that the greatest resistance was born of the fear of being made to look stupid and stated that people who felt this should gently be persuaded that the computer is not their enemy but their friend.

Participant H felt that progress and success in implementation would be achieved in small steps and would then snowball. He further felt that his role was to ensure that at no stage would the process regress because, of resistance and that it was important that at every point of resistance, relevant and convincing motivations should be found to proceed with the process. The momentum gained by doing so would drag dissenters along for fear of being left behind.

3.7.7 Blended learning, "old and new", symbiotic scaffolding

Although there are varying views on the importance of the old and the new pedagogy, a strong feeling emerges in the interviews that traditional pedagogy will remain dominant for some time yet and that it should form the foundation of the symbiotic scaffolding the latter term suggesting a layered learning process with the outcome being greater than the some of the components. The assumption that most educators are making is that the examination process will remain as it is for the foreseeable future. This is probably the crux of the matter as all learning at present is geared towards an outcome based on the traditional system of teaching. This therefore implies that, for increased use of internet learning it may be a requirement that the examination processes being followed at present be adapted.

On the issue of blended learning, Participant A said, "I actually prefer the constructivist method of teaching which is where you have to challenge their opinions and they react. Because everyone coming into a learning environment brings something you need to reconstruct, what they are getting wrong and also reinforce what they already know ... I think they (the educators) are still mostly traditional".

This view is corroborated by Participant B who said, "But really it would just be an alternative means of communication than a whole new change. Blended learning, problem-based learning; thinking and reasoning…but if it (internet resources) became more accessible, to get the information without having to hunt around for the books, that would be a big benefit. I think it is slowly going to be incorporated more and more".

Participant C argued, “You just have to have certain basic ... skills ... that are obtained through memorisation. At the same time there is that knowledge of electronic devices that they need to know at the same time. So it is very important that at this stage we move with both”. This respondent also differentiates between students’ background and indicates that some originate from underprivileged communities and have not been able to develop electronic skills as fully as their more privileged counterparts. The school offers scholarships to underprivileged and also attracts students from across Africa where in some cases, despite the affluence of individual students, the countries from which they come do not have widespread electronic communications systems.

Participant C felt that learning has to do with contradictions, and that content would remain the same, subject to change only in how it is delivered. He said, “To see the traditional or part of the traditional going… There is an element we do still need, yet we have to adapt to the modern ways ... There is no way that you can focus on the internet only and forget about the traditional methods. Because for you to actually get through those exams you would have to blend methods. Sometimes it works using the traditional methods to get to the exams, but at the same time we have talked about motivating the kids ... they’d have to find a way to motivate the kids to memorise concepts so that they would have no problem sitting for the exams. They would get to remember what we did on the internet”.

Participant D said, “In fact, e-learning should never replace the traditional way of teaching, it should only complement it ... Because if you replace the traditional method with e-learning it is like you are replacing the teacher with the computer which is not workable. It should only complement it. Even though you have prepared a lesson to use e-learning you should always have some components of the traditional way of teaching which should then carry on in a particular way. I can’t adapt the lessons to suite the internet that is one thing I cannot do because I have a syllabus to complete. I’ll have to find the suitable material from e-learning sites to suit my lesson ...”

Participant D continued, “When it comes to academic work there isn’t much catching up for the teachers ... because you know the teacher is always ahead of the student, from experience as well. Other things like Facebook ... yes, there is (some catching up for teachers). I think we should have a blend because there are some illustrations I have to make. In fact there should always be another option. If they can’t understand this one, let me try that one. Instead of me just having that one ... then it means that if they don’t get it ... that’s it”.

In general, it appears as if educators would tend to return to their roots in the traditional system, if there is any doubt about how to present a topic. What is encouraging is that they are not averse to applying e-learning if it would be advantageous for the student. The following comment by Participant F, supports this assumption, “I think blending the two methods because there are certain things the students ask you ... which they would have experienced from the internet and you as a teacher are not in the know-how of what he is talking about ... so ... eventually you brush him aside and by so doing you are losing him, his interest is actually ... hindering his interest in the subject ... so actually mixing the two would actually be the starting point for a great thing and eventually we could take the e-learning route when everyone is comfortable with the system”.

This participant raised the interesting point that there is a movement particularly in South Africa towards home-schooling and decentralisation of the place of learning, and that in future the centralised place might only be represented by the examination venue. This touches on a new approach to learning based on, its being offered anywhere, anytime. This could only be possible through the extension of internet learning, and centralising examinations under such a system would presuppose that they be conducted via the internet. Participant G, who has had more experience than most in dealing with all sections of the school populations, said, “I think we can marry the two quite happily, the e-learning experience and the traditional classroom experience. They can work hand in hand. It just opens up the world for our kids. Imagine sitting there and accessing what other people are doing in another country at the same time, in the same sort of context ...”

Participant H, placed great emphasis on the practical and success aspect of blended learning, “We’ve got to prove to the teacher that the results will be there if they are to follow the blended system. We’ve got to prove to the parent who wants the results and only the results and only looks at the mark at the end of the day, that the methods we are using are the best and that their children are being afforded the best opportunity to produce that result at the end of the day”.

3.7.8 The future of e-learning

Despite their somewhat subdued tone and reserved comments on blended learning, the majority of the educator participants felt that internet learning is here to stay. Participant B said, “I’m sure it is going to stay. I just think it is slowly going to be incorporated more and more, but then again as I have said I doubt that it is going to reach the proportions that people are claiming, it is going to be the computer screen teaching people, I think that you will still have the teacher using that”.

Participant C said, “I don’t think there would be a change in concepts. The actual content would remain the same, I feel. It is only a question of how you are delivering the content that will probably change ... It is necessary for every teacher to go through it because, let’s face reality … It is all technology out there. So it is very important that every teacher and I would say no, that all those who are going through the colleges now, those who are being trained to be teachers...it should be a requirement for them to go out there and teach”. As a way to encourage staff to embrace internet pedagogy, the same participant suggested, “... getting to know the level of all the teachers in terms of their knowledge of the internet. If you give them the opportunity to be part and parcel of formulating that way of learning ... you’ll find a way forward rather than just saying everyone has just got to go for it...there is no way we can actually say we can push it aside even though we still have those traditional methods ... but we have to adapt to technology”.

Although there is not a great deal of certainty as to whether it will continue in a similar format or if the internet will be replaced by some other more powerful system in the future with specific reference to internet learning, Participant H said,

- the school’s computer centres have been fully refurbished and updated in the past year and a capital plan exists for continuous renewal
- most of the staff already have invested through the school in laptops
- there is an ongoing facility for the continuous upgrading of staff laptops for the future
- the stability of the WI-FI system has improved and is continuing to improve
- access to websites is assured in every classroom at the school or on the property and right through to the hostels over an area of 54 hectares
- the recent introduction of ceiling mounted data projectors of which there are now 18 and which it is envisaged will be in every classroom by December 2009
- there are three new interactive whiteboards, with more being acquired in 2010 there is ample opportunity for the educators at the school to cut their teeth on internet-based learning
- allied to this is the encouragement from CIE for e-learning

Participant H, commented that, a key factor in the introduction of internet learning is that all the students should have access to the internet throughout the day and not only during the school day. In order to accomplish this, the three computer centres are also available after school hours and are upgraded annually. Older computers are moved to the boarding hostels and the day scholar hostel in order to supply the necessary after-hours access. A large proportion of the students have purchased their own laptops and this takes pressure off the school system.

Acknowledging that although the training of the educators in ICDL has slowed down it is envisaged that the rate of training will pick up in the near future as the ICDL course is offered and examined at the school by members of the teaching staff. The school is able to offer a cost reduction to the educators for this training. From January 2009, all students in forms 1-4 are expected to be enrolled for the ICDL course. This forms part of their ICT syllabus on which they are examined annually, and all students are expected to have been successful in all the modules of the ICDL course by the end of form 4.

Regarding the internet and the Cambridge curriculum, Participant D said, “Computer-based learning is going to be the future of learning especially with Cambridge ... they want to do all their marking on line. At IGCSE [International General Certificate of Secondary Education], they want to do all the marking on line now which is quite good in that it should be faster to do, collect marks and then publish results. This will make life easy for administrators to collect the question and answer scripts and send them in ... it will get there with the click of a button ... rather than having to ship or fly them out there [to the U.K. for marking]”.

On the question of whether the Cambridge curriculum would have to change in order for e-learning to be applied, Participant G said, “I think it has already started, there are teachers’ sites that you can go to with Cambridge. There are a lot of interactive things going on there. So it is already happening ... at first they used to send us CD’s where they would have all the papers for that particular year ... and they say they are weaning us off that now so you can go straight on to the site and also interact with other Cambridge schools across the world on what they are doing and how best to do this and that”.

Since the introduction of wi-fi at the school and the subsequent introduction of digital projectors, the internet teaching process has evolved so that each student no longer needs her or his own laptop in the classroom. As indicated by Participant E, “For teaching purposes ... laptops might not be necessary. I can actually use the interactive board and those are things they can use ... then they can use laptops for assignments, homework and other things ... (after hours and in other venues).”

Participant F said, “... there should be programmes or workshops to put teachers in the right frame of mind because the kids are miles ahead of us. Their exposure is on their fingertip but for teachers it is very traditional ... I think the first step the school has done is to encourage educators to buy laptops. I think that in that way we have become so friendly with the laptop now the next step would maybe be to encourage as many teachers as possible to do ICDL and at the same time invite resourceful

lecturers in e-learning who could stimulate and change the mindset to move towards e-learning ... The first step has been done but I think that training should be next. I think the first part is to generalise it, because from that general information, I'm sure you can easily link to your specific subjects ... The first part is for general knowledge for every educator. The later stage if you could specify with subjects ... to stimulate that interest in educators … would find them finding ways in their own subjects ... so it's best to use some members of staff who can reach out to them and make it".

Participant H highlighted the following as being necessary to ensure the smooth introduction of internet learning at the school:

- Refresher ICDL training for all educators
- Training for both educators and students on where to search and how to better utilise the internet
- Ensuring that the educator does not allow e-learning to dominate his or her role in the classroom, by training educators how to manage the e-learning situation effectively geared towards managing the transfer of knowledge rather than transferring own knowledge
- Introducing tutor and mentor systems for new students and educators, who have not had, significant prior exposure to computer utilisation at their previous institutions, training for students on how to access subject websites, protocols and how to utilise these websites most effectively, training for educators in managing subject websites effectively to achieve maximum learning benefits for the students
- Bridging the divide that has developed between students and staff, created by, both the traditional learning situation and the educator as the bearer of all knowledge
- Adjusting to new formats in computer technology which may in the near future make computers redundant and replace them with iPods and cell phones.
- Addressing the way in which the school is run and managed in terms of time, space and positioning and adapting organisational arrangements accordingly: adapting buildings to future learning modes and the possibility that, students may in future be based at home
- Investigating a new role for the school as a resource access centre; addressing the changes that may arise in boarding capability as a result of the development of internet learning
- Investigating the need for satellite schools and distance learning
- Blending e-learning and the educator to maximise symbiotic relations, interaction and achievement

- Investigating ways of accommodating the needs of parents who find themselves in a rushed environment and require an educational institution to manage learning throughout the day on their behalf
- Attempting to predict to what extent the present school system will be perpetuated, adapted or replaced by developments in technology and also in which form it may continue

3.8 CONCLUSION

The focus of this study has been to investigate the motivation for educators to introduce internet technology in the learning environment, identify the limitations that educators at a specific private school experience in education, note concerns regarding e-learning and make recommendations as to how internet technology can be utilised to address such limitations. It emerged from the Literature study that of major importance is the development of a matching pedagogy for technological advancement. Throughout the empirical investigation, an underlying recurring theme was how to match the new envisioned pedagogy with the traditional pedagogy in a symbiotic relationship in order to not only match the outcomes of the old pedagogy but to advance outcomes to meet the requirements of the new world of work.

The eight themes which emerged from the empirical study showed that educators were aware of the shift that has been taking place because through technological change, and that there was a general willingness to grapple with the emerging methodology.

The conclusions to be drawn from the study are that e-learning has become part of the lives of educators at the school despite their previous exposure to e-learning not having been very structured. As the interviews proceeded, it became clear that they perceived opportunities which e-learning may provide to counter the disadvantages of the traditional pedagogy. They were not afraid to state that traditional pedagogy, well-implemented, can be a valuable ally in developing a new, technological pedagogy. The management of the classroom environment where the educator can rely on unlimited technological resources and where teaching time could be extended beyond normal teaching times was seen as a major motivating factor for the introduction of e-learning. “Cool tools” mentioned in Chapter 2 such as the interactive whiteboard and data loggers were identified as aids which educators wished to be exposed to.

Chapter 4 will summarise the findings of the literature review and the empirical study in order to draw conclusions and make recommendations and suggestions for further research.

CHAPTER 4

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

In order to summarise and compare the literature study and empirical study, it is necessary to repeat the aim of the research and its general aims.

The aim of the research was to investigate the motivation of educators to introduce internet technology in the learning environment, identify the limitations educators at a specific private school experience in education, note concerns regarding e-learning, and make recommendations as to how internet technology can be utilized to address such limitations.

Four themes emerged from this aim

- To identify the limitations of the traditional education system as experienced by educators
- To suggest viable solutions offered by internet technology to address the limitations
- To identify concerns regarding e-learning
- To provide motivation for educators to introduce internet technology in the learning environment

4.2 SUMMARY OF LITERATURE REVIEW

The literature review in Chapter 2 was divided into seven subsections:

1. Motivation for educators to introduce internet technology in the learning environment
2. Limitations of the traditional education system and proposed solutions
3. Concerns raised regarding e-learning and proposed solutions
4. Implications of e-learning for the educator
5. Implications of e-learning for education in general
6. Motivation for educators for the introduction of internet methodology
7. Conclusion

Each one of these subsections was discussed in relation to the research question in order to provide motivation for educators to introduce internet technology in the learning environment.

4.2.1 Motivation for educators to introduce internet technology in education

In this section, the internet is seen as a vehicle to provide a holistic education with the capability of extending beyond the classroom and the constraints of time. The literature refers to the role of the educator in assimilating new and old technologies in a symbiotic relationship.

The enormous possibilities offered by internet technology enable educators to publish their notes on the web and students to work independently and collectively using a host of multi-media. The literature suggests that there is an opportunity to extend the communication methods of both educator and student via various linkages allowing for feedback, updates, information gathering, dissemination and exchange of viewpoints.

Reference is made to the advantage of educators moving from a previously protected environment and exposing themselves to critique and comments and sharing resources, unfettered by geographic boundaries. The importance of keeping ahead of technological advances is highlighted against the background of the advantages of networking communities being in the position to operate twenty-four hours a day. Mention is made of “cool tools” (Stefanics, 2008: 16) which are able to extend the capacity of the learning experience for both educator and student.

The literature refers to a gap that needs to be bridged between students’ independent achievement and facilitated achievement which in the past decade has required a shift in the role of the educators from being a source of information to a facilitator equipped to guide students to gather information from many sources. This is supported by the view that PBL promotes higher-order thought processes, research and blending of disciplines and self-direction and responsibility and best prepares students for the real world. A passive student does not form part of this process.

The literature also indicates that web-based programmes are adapted swiftly and can be regularly updated and most importantly allow for rapid response between student and educator. Internet technology is seen as not being limited to time, space, place/situation and having the added capacity to instruct collectively or individually.

This section ends with the literature suggesting that pedagogy must be in a constant state of evolving in line with the best ways known.

4.2.2 Limitations of the traditional education system and proposed solutions

A number of limitations were identified and briefly discussed, with proposed solutions being provided from the literature. The educator as the "sage on the stage" (French et al.,1999: 201) which presupposes the educator as the dispenser of packaged information is seen as a limitation which promotes rote learning. The literature dealing with this issue, touches on the fear that educators have of not catering for classes of varying ability. The authors emphasize the constructivist approach in dealing with this programme, and emphasize the role of the educator as that of a vital manager in the process of learning. The solution seems to be that educators should know their students, redesign the learning process around key concepts, emphasize knowledge of the curriculum through questioning of a higher order and allow every student to reach their potential by means suited to each candidate.

The limitation represented by the educator being seen as the constructor of meaning on behalf of a receptive student is seen as a serious defect. The literature proposes countering this by making the student a participator in decision-making regarding what and how studies should take place and to what extent student contribution is required in the process. There is a shift in emphasis from learning what is important to learn, to how students go about the learning process, with the educator's role becoming that of facilitator. The problem of the passive student lacking the skills of learning to learn is identified, and traditional pedagogy can be certainly seen as limiting the students' role in the epistemological process. In countering this, a scaffolding process is suggested to cross the divide between individualized and assisted learning. Four suggested solutions are: creating opportunities for completing assigned tasks through networking with other students; creating opportunities for students not only to assess but to think, increasing student's responsibilities for didactic processes; and encouraging students to believe in themselves and to trust their ability in metacognition.

Finally, reference is made to the traditional didactic system being high on substance but low on complete learning experience. The literature suggests that the internet counters this by adding an interface and an infrastructure, these layers forming scaffolding unavailable to the traditional learning experience.

4.2.3 Concerns raised regarding e-learning and proposed solutions

A number of concerns were mentioned in the literature and in the study, and solutions were sought either in the literature itself or by means of personal comment by the author of this study. A fear was

raised that school management might not be supportive of e-learning, would not train educators sufficiently and would not supply a matching number of computers for each student in the classroom. Another concern raised was the ability of students to self-manage the learning process and that this could limit the promise of e-learning. However, the literature indicates that as roles shift there is a sharing between educator and student of the new roles, and that self-management of the learning experience should hold promise because students are in general not known to turn down the opportunity of becoming part of their learning experience. The term “learning how to learn” in this case would have equal relevance for the student and the educator.

The loss of the formal classroom is seen as a threat, but the advantages of this receding role are acknowledged as being the key to the future of all forms of education and a vehicle towards educating the masses. The challenge is for students to grasp the opportunity to play a role in their own metacognition and become more concerned with the process of education than with specific answers.

Time is a serious threat to any fledgling process as it does require additional thought and planning. The literature however suggests that the development of creativity between students and educators in planning and preparing the pedagogic process might even cut down on time required.

Pedagogy traditionally emphasized content and what was to be tested. E-learning is seen in the literature to be in direct opposition to this. This is the inherent strength of e-learning as this pedagogy suggests that through gaining confidence in managing the process rather than finding the answer the student should attain higher levels of cognition and learning.

Three layers of content, interface and infrastructure are seen as key to the e-learning process and the literature questions the efficacy of e-learning were any one of these to be absent. My response to this is that e-learning may be more comprehensive than the traditional methodology and that it may depending on the circumstances, elicit varying levels of these three critical elements, depending on the topic being studied and that it may therefore be more effective than the traditional methodology.

An interesting concern raised is that of the lack of one-on-one communication in e-learning. The literature reveals though that this is only a limitation in the traditional methodology. Referring to the opportunity of interaction between more than one student and more than one educator, the literature refers to a broadening rather than a narrowing of communication. I however contend that it will be very

important in future to ensure that the traditional examination will need to be matched with the non-traditional pedagogic system.

The perception in the literature that educators will need to develop skills to utilize fully the technology at their disposal is a reality. However in my opinion the onus is on the educational institution to foresee this educational limitation and to take the necessary steps to counter it.

In the literature, there is a caution that up to now the internet methodology has been driven by technology and not by educational theory, and it is suggested that educational theory become the basis to align e-learning with the accepted epistemological process. It is in this regard that a blended approach, encompassing a wide range of student capabilities and their cognition, is recommended.

Finally, the literature study suggests a dualistic, symbiotic relationship existing between technology and pedagogy which can be aligned with the theory of social-constructivism. Internet technology according to Herrington and Oliver (2000: 23-48) is seen as enhancing social-constructivism by providing a more comprehensive bouquet of communication opportunities between the various participants in the social-constructivist theory.

4.2.4 Implications of e-learning for the educator

A great deal of emphasis is placed on the changing role of the educator in the new pedagogic process, with the emphasis being weighted in favor of the role of facilitation rather than being the “unquestioned authority”.

The emphasis on this new role lies in strategizing, and the willingness to be exposed to new technology, and to adapt the old pedagogy by using the new pedagogical tools. The educator’s role is seen as a growth opportunity whereby new pedagogic tools are developed and utilized, new learning environments are explored and created, networking is creatively developed and the multi-media at the disposal of the educator is matched to produce individualized programmes available to students twenty-four hours a day, at any location.

It is clear from the literature that although the methodology is aimed at creating a discovery path for the student, this will also be very much part of the educators’ experience as both are exposed to internet methodology.

4.2.5 Implications of e-learning for education

Despite the threat of alienation of the student by internet technology, mentioned in the literature, the general perception is that internet technology must be the driving force in preparing students for the future world of work. The educator is seen to be the facilitator who is able to introduce the alienated student to a broader peer audience allowing for the new technology to interact effectively with the limitations that social factors might create. The literature sees schools as developing into community centers, centralizing the production of the learning material but, decentralizing the place of learning. It is felt that it is necessary that specialists design the online study material, that there is a movement to a classroom-free environment, allowing learning to take place at any place and at any time.

4.2.6 Motivation for educators for the introduction of internet methodology

The literature (French, cited in French et al., 1999: 9-24, Jonassen et al., 2008: v-10 and Lindeberg, 2005) emphasizes the relationship that must be developed between internet-based learning and the educator, with the latter being expected to take up the role of catalyst rather than a specialist in all fields. Apart from this threat, there is the expectation that the educator should develop a higher level of awareness of the self and of the student and be able to utilize various approaches to present in-depth knowledge in a simple and more interactive manner.

The individualized approach envisaged sees the student making the what, how and when decisions in the learning process and in particular benefitting from the advantages of being able to learn at any place and at any time. In order to facilitate this, educators are motivated to begin slowly by utilizing the skills that they already have as the building blocks of the future pedagogic process. Reference is made to three trends developing in education: user created content; mobility which refers to the laptop being utilized anywhere; anytime and the setting up of learning communities which can also be created anywhere, anytime.

The literature (Lindeberg, 2005) speaks of educators committing themselves to the role of facilitator able to nurture problem solvers who are in turn able to apply their findings to new problem situations. It also refers to close relationships between the educator and the student being developed, with a greater degree of respect between educator and student, thus countering the threat of alienation of the student. An excellent motivation for the introduction of new technologies in education is the quick response available not only to the educator but also to the student.

Finally, the literature (Woo & Reeves, 2007: 20) reveals that despite the pros and cons of the traditional pedagogy and the internet pedagogies the best outcomes are achieved when the most suitable pedagogy is matched with the problem to be solved. This serves as motivation for the view that a blended learning approach will for the foreseeable future present the best option.

4.2.7 Conclusion

The modern world of work requires problem solvers and higher order thinkers which the literature envisages can be achieved optimally by blending internet methodology with traditional methodology. This ultimate goal is seen to be a catalyst for producing lifelong learning. This study of the literature provides us with the background against which the conclusions drawn from the empirical study will be assessed.

4.3 SUMMARY OF THE EMPIRICAL STUDY

Each one of the eight themes that emerged from the interviews had specific relevance to the study and the following conclusions are made regarding each:

4.3.1 Role and involvement of e-learning at the school at present

In this theme, three aspects are to be noted:

- *What participants are already doing*

  All of the participants are involved in varying degrees with internet-learning. The scale of involvement stretches along the spectrum of accessing past exam papers, interaction with subject discussion groups and study advisors locally and internationally, communicating with various subject institutes and, at the highest level, interacting and sharing ideas between educators. A characteristic that emerges quite clearly is that development along this path is closely related to the willingness to interact with individuals and groups of individuals in various learning areas which already exist, and that the further the development along the continuum, the more sharing between individuals and groups of individuals takes place and is facilitated.

- *The tools that could assist educators*

  Educators identified these tools which include data projectors, laptops for students and educators, and access to Cambridge and EduAdmin programmes on the internet. A recurring theme was the need for a stable network and the importance of internet training with the

Computer Driver's License seen as the indispensable starting point. Mention was also made of data-loggers to assist in making whiteboard work more effective.

- *The perceived opportunities*

  The internet is strongly recognized as an excellent means of communication. Participants were clear in identifying its role as a link with parents, students and educators locally and globally. The students were perceived to be a driving force in the introduction of internet learning as they were seen to be one step ahead in the technological field. Educators particularly saw great opportunities in being able to access the internet after hours and from their residences, and perceived the availability of a wide range of materials as a vehicle to allow the school to raise its level of pedagogy. In assessing student participation in the e-learning process, three aspects stood out clearly: that students were able to access school websites from anywhere on the campus, and indeed from anywhere in the world; this has special relevance for an international school. Secondly, because students display varying intellectual ability, the traditional system has limitations in dealing with work at different levels of difficulty and internet pedagogy is seen to be offering a solution to this problem, particularly regarding the sourcing of grade materials. Thirdly, the educators identified the opportunity that e-learning offers to observe how other educators in different parts of the world deal with a topic or a problem.

4.3.2 Previous exposure and experience with e-learning

As could be expected, the previous experience of participants of internet learning has been varied and haphazard. The ICDL course which has been offered at the school only covers the rudiments of computer usage and this raises the question of identifying and implementing relevant training opportunities more suitable for internet learning. While participants are extremely positive towards the utilization of the interactive whiteboard, this facility was also seen as an area requiring hands-on training.

The school recently embarked on a peer-assisted training drive. A message that emerged very strongly from all educators involved was the importance of all educators utilizing the school's computerized administration system, Edu-Admin. This had eased most staff into a relationship with the internet and it was foreseen that the educator peer mentorship programmes would be an adequate development at the present moment.

4.3.3 Limitations of the traditional classroom

Virtually all participants agreed that the traditional classroom could not and would not be replaced by internet learning. The limitation of the traditional classroom did not lie in the actual delivery of the knowledge but rather in the environment that it created which participants perceived to have limitations. The traditional system was seen to create and perpetuate the problems of the barrier of motivation of the students and accompanying disciplinary problems, laziness, homework not done and subsequent poor results and monotony. It was clear that it could not solve the presentation problems associated with three dimensional structures and dealing with students of mixed levels of knowledge and mixed ability. It was also seen to perpetuate the role of the educator as the main source of information and to be lacking in its ability to provide a student the opportunity for independent problem-solving.

Participants felt that the e-classroom provided time and space for practicing independent logical thought and also an excellent counter to the limitation of the traditional method where work done in a class on the chalkboard according to the traditional method is, once erased, gone for good. It was felt that disciplinary problems and boredom were directly linked to poor pacing and selection of suitable levels of material: for example, lower and higher cognitive processing skills development. The traditional system was seen as a limiting factor with regards to the length of the school day and the reach of the classroom, particularly where remedial work was required. Finally, the vast difference between the limits to information and knowledge in the traditional system and the overload of knowledge in the internet methodology highlighted the incomplete and limited scope of traditional education refer to Chapter 2, section 2.3.4 of this study.

4.3.4 Limitations of e-learning

When discussing the concerns participants raised regarding e-learning, it is worth noting that many of them can be attributed either to poor understanding of the role of internet-learning in the classroom or a lack of understanding of the management required to make internet learning an integral and productive part of the classroom. Reference needs to be made to the importance of the symbiotic relationship that should exist between the two pedagogies and how each should be utilized as effectively as possible as an extension of the other depending on the outcomes to be achieved. I shall attempt to elucidate in each case mentioned:

- *Plagiarism / computer intellect / diversity or superficiality*

  Participants indicated that students merely copy work from the internet and do not understand. Also the lack of intellect with which a computer program is able to respond is

questioned. Unfortunately, the participants fail to understand that this is indeed an opportunity created by internet learning as it creates an opportunity for students to exercise the necessary skills to understand and interpret what they are reading and to intellectualize what they are receiving from the computer program refer to Chapter 2, section 2.3.4 of this study.

- *Distractions*

  Some participants indicated that students were able to "hide behind" their computers and feign interest while being busy with something completely different on the screen. Another participant however said that once interactive whiteboards became the norm there would no longer be any need for controlling students with laptops in the classroom and that they (the laptops) might even become obsolete. In the light of the advantages of internet learning countering the limitations of the traditional classroom which was closely associated with lack of motivation, these comments about the limitations of e-learning appear negligible when the advantages are considered.

- *Information overload/time wastage*

  The management of information overload is an extremely important consideration for the future as it is closely associated with time wastage which is another point raised as a limitation of e-learning. A great deal of research needs to be done in this area to ease and speed up the task of locating specific information and of developing the ability to sift through what is irrelevant and to be able to focus only on relevant information. It would be expected that the search engines available at present will be developed further in the near future and it is suggested that the utilization of these search engine become an area of focus of study for students and educators.

- *Ageing technology*

  This is also a legitimate concern, and the onus will be on management, the educator and the parent of the future to ensure that equipment and programs are regularly updated and sufficient memory is available for the required applications.

- *Distraction from exam focus*

  A concern was raised by participants that the vast resources of internet could divert the attention of the student and the educator away from an important focus of the pedagogy which is the successful completion of an examination. However, mention was made by the participants that the

examination requirements will require adjustments in future to accommodate internet learning although it is agreed that the objective of meeting the syllabus requirements must be met.

- *Slow internet*

  The issue of slow internet and power cuts is certainly something that must be resolved the more dependent educators become on internet learning as all their preparation could come to nothing if there is no power or an intermittent internet feed. As the utilization of the internet progresses at school level these restrictions which are very much a part of a third world economy will need to be addressed as a matter of urgency. It will become essential to supply first world technology to students who are studying at the school but who originate from first world economies.

- *Availability of facilities*

  The more that educators become dependant on internet learning, the greater will be the need to resolve the issue of slow internet, and power cuts, as all their preparation could come to nothing if there is no power or an intermittent internet feed. As the utilization of the internet progresses at school level, these limitations, which are very much a part of a third world economy, will need to be addressed as a matter of urgency. It will become essential to supply first world technology to students who are studying at the school but who have extensive exposure to first world technology.

- *Availability of facilities*

  The concern was raised that specialized whiteboard facilities are limited and can only be accessed when the computer educators' labs are free. This too is a pressing concern and the Management of the school has decided to install digital projectors in all classrooms which can immediately be utilized with the WI-FI facilities available in every classroom. This is a less expensive option and allows the whiteboards to be phased in progressively as educators develop their skills in utilizing what they presently have in the classroom.

- *General limitations*

  Of the general limitations mentioned, the challenge of developing the skills of the staff in utilizing the interactive whiteboard and the possibility of the personality of the educator being overshadowed by technology needs to be addressed. The symbiotic relationship that should exist between the traditional pedagogy and internet learning should be seen as the driving

force in developing whiteboard skills which will have due regard for the role of each in the final pedagogical outcome delivered.

- *The cost implications*

  The cost implications of the WI-FI system and the threat that the school governors may withdraw financial support for such projects should not be over emphasized with regard to the school which was the subject of this study. Elsewhere however this could be a major concern and a limitation to the implementation of internet learning.

4.3.5 Motivation for educators to engage in e-learning/advantages of e-learning

Participants were able to identify a number of advantages that e-learning would hold for their classroom practice. These revolved mainly around the heightened interest factor, the extension of the teaching/learning day and the increased capacity for visualization and for giving explanations in the teaching situation. It was felt that because the students were now able to access far more learning material and were operating in an environment to which they had a positive disposition meant that the expectations set by educators would be increased particularly in the field of discovery. This would provide work of a more relevant standard and create greater opportunities for exposure to and assessment of a wider range of opinions and arguments.

A key motivator for educators is the envisaged plans for creation of subject websites which educators perceive to be opportunities to extend classroom contact time and to allow for extended interaction not only between educators but between students at the school and across the globe. The opportunity for providing assistance to students “anytime, anywhere and any place” (refer to Chapter 2, section 2.4.3 of this study) was seen as an advantage not only for the students but also for the educator.

Educators were of the opinion that internet learning could provide a higher level of graded learning to cater for students of varying ability and of varying knowledge levels.

The following were in addition highlighted as positives:

- Downloading of whiteboard lessons on flash drives and being able to take them home after a lesson
- Downloading of question papers and memoranda
- Minimization of students’ behavioural problems because of lack of interest
- Heightened interest in the didactics

- The creation of opportunities for educators to break away from testing exactly the way the student was taught to a situation where more creative thought and assessment by the students would be required and eventually be catered for in the examination system
- Cross-curricular opportunities as opening new vistas in pedagogy
- The ability of internet learning to separate the student from the classroom situation and likewise the educator from having to be in the classroom was identified as a major step forward as internet technology would allow for decentralization of the classroom in terms of space and if necessary in terms of time and the educator would be empowered to teach from anywhere, at any time either to a central venue or a scattered student population
- The vast field of opportunities opening up in terms of communication with the production, preservation and sharing of learning material seen to be a further major advantage represented by internet learning

4.3.6 Resistance to internet learning

The participants downplayed the level of resistance, and responses were geared more towards the counteraction of resistance. There appeared to be a consensus that resistance would be counteracted and that it was quite possible to achieve this.

The general opinion was that lack of exposure was one of the main causes of resistance and that it was only a matter of breaking down the fear of experimenting in order to counter it. Emphasis was placed on the need for educators to learn to use the internet more effectively, as their inability to do this at present is possibly a cause for resistance.

There appears to be a belief that some educators are set in their traditional ways as they have obviously achieved success with these methods over time. It was felt that their introduction to internet methodology should not be compulsory and that the catalyst for participating in internet learning should be the results that those who are involved in internet learning would be able to achieve. Peer assistance was also seen as valuable in smoothing the process.

Gradual introduction to the internet at the school by means of the expectation that the administration system be internet based, and the systematic breaking down of the fear of the computer as the enemy, was seen as important in the induction process. The fear of being replaced by a computer and of the computer itself is still part of the mindset of some educators and it was felt that a gradual introduction and confidence-building through systematic scaffolding would bring dissenters into the fold.

This would hopefully eventually lead to all educators leaving behind their comfort zones and moving from the position of “unquestioned authority” figure or “the sage on the stage” (Jonassen et al, 2008: v-10) to a situation of managing the pedagogical process efficiently.

4.3.7 Blended learning

Participants were unanimous in their thinking that traditional pedagogy would remain the backbone in any endeavour to incorporate internet learning to the pedagogy. Developments in the pedagogy appear to have outstripped the development in the final outcome of the pedagogy: the manner in which the examinations will be conducted, and format, content and expectations.

For internet learning to really make the impact of which it is capable, its blending with a suitable examination system will require careful study. If not addressed, this factor could hamper seriously the introduction of internet learning in the classroom.

Until such time as curricula are adapted to suit the progress that is being made in internet learning, the opportunity will exist for proponents of the traditional system to disregard internet learning and regard it as a useful yet dispensable tool. It would be unfortunate if the benefits perceived by the participants were to be discarded because of an oversight in this area of the delivery of the curriculum. The threat exists that educators will at the slightest sign of doubt or failure return to their traditional methods.

Internet learning needs to be seen to be addressing specific deficiencies in the traditional pedagogy and also adding value to the pedagogy. Participants referred to a movement in South Africa towards home-schooling and decentralizing the pace of learning and creating centralized resource centers from which internet learning can operate and in the former instances that it can serve. The centralization of knowledge and the decentralization of the learning experience appear to match well with the internet pedagogy.

4.3.8 The future of e-learning

Despite participants being unsure about the extent of influence being claimed for the future of internet learning, the general opinion was that internet learning is not merely something for the future but that it is a present reality and that educators must equip themselves hastily to meet the challenge.

It is felt that although the concepts taught will remain the same, e-learning will revolutionize the content that will be delivered and also have benefits for students.

The study reveals the urgency with which educators need to set the pace in developing the necessary skills to cope with the transition from traditional to a blended approach with e-learning, and to develop and adapt the necessary skills. They need to assume responsibility to provide solutions for the bottleneck which will no doubt be created at certain points. Despite all the technical resources at their disposal, the introduction of internet learning will create its own problem areas which are difficult to anticipate. The role of the educator in transforming the educational process and making a success of it cannot be denied.

4.4 SYNTHESIS OF RESEARCH FINDINGS

This section highlights similarities between the literature review and the empirical study noting aspects not covered in either of these procedures and any contradictions that may have arisen. The section is divided into three sub-sections:

- role of and involvement in e-learning at the school at present
- previous exposure to experience with e-learning (with the educator staff at the specific school)
- the future of e-learning

Each one of these sub-sections is discussed as they pertain to the research question of providing motivation for the introduction of internet technology to the pedagogy.

Role of and involvement in e-learning at the school at present is an aspect relevant to the study. In the interviews, it appeared that there was an appreciation by the participants of the availability of a system which allowed access to resources from across the world. Two problems emerged which were not directly dealt with in the literature study: the fact that not all classrooms were equipped with data-projectors which had a limiting effect on utilization of internet methodology; and also the problem of a network which was unstable, very often being off-line because of load-shedding by Eskom.

Advantages identified were that the school was reporting to parents via the internet, that the educators were able to work from their residences directly into the school's website late at night, and that students had internet access throughout the campus. It was felt that the school, had made a great

head start in facilitating school computer-based learning and that students through their expectations had forced educators to acknowledge that this form of education had become a reality.

Previous exposure and experience with e-learning (with the educator staff at the specific school). The interviews revealed that training in interactive technology and e-learning pedagogy had been haphazard, very informal and tended towards self-instruction. What had assisted the educators at the specific school was the insistence on using the administration system of the school to process results and reports; this is done via the school's website. Two factors promoted the use of the internet at the school directly: firstly, sponsorship by the school for educators to complete the ICDL course, and secondly free twenty-four hour a day access for educators on campus with both intranet and internet access facilities. The ICDL course was reported not to be ideal training although it provided basic computer proficiency; it was not geared closely enough to internet training. A credible development at the school was the development of mentorship programmes whereby educators who are more proficient in internet technology and methodology assist and train those who are technologically challenged.

Regarding the future of e-learning there is general consensus in both the literature and empirical studies that e-learning is here to stay and its future appears to lie in a blended approach being adopted. The empirical study did however add a rider which contradicts both the literature and the general empirical results. Participants stated that e-learning might still not reach the dimensions that people are claiming for it, that it may only remain in vogue until the next major technological development and that it could be replaced by some alternative, more powerful system in future.

The summaries of the literature and empirical studies reveal that there is agreement on the following aspects of the study: the limitations of the traditional classroom, the limitations of e-learning, the motivation for educators to engage in e-learning, and the advantages of e-learning and blended learning. What was evident was the need to utilize the new technology in the pedagogy in order to provide the most holistic educational experience possible.

An encouraging factor was the agreement of the participants in the empirical study on the shortcomings of the traditional and e-learning pedagogies, the recognition of the need to change, and the recognition of the limitations of the educator not only in terms of computer/internet literacy but of his/her role as facilitator rather than as the sole bearer of knowledge. In the literature study, there was much mention about internet methodology isolating the student, and the impression was left that the

student may end up in an educational vacuum. Counter arguments were however raised, regarding the extended communication available through the internet. This was supported in the interviews where educators indicated that there were clear advantages in entering into internet discourse with students after class hours.

What emerged from the interviews but did not appear in the literature study was the extension of the interactive whiteboard beyond the classroom, as students at the specific school were already downloading lessons, board work and homework, on their flash-drives directly from the educator's computer or whiteboard. This adds a dimension to the classroom which allows the student to extend the classroom learning experience to the homework or preparation period. Lessons produced in the classroom are no longer limited by time and place.

4.5 CONCLUSIONS

The research question driving the research was, "How can educators, at a private, international school, be motivated to introduce internet technology in the learning environment?"

The literature and the empirical study revealed the necessity for the pedagogy to remain in touch with new demands of technology and specifically internet technology. It was concluded that there was no alternative for education but to explore the development of a methodology which could encompass and optimally utilize the opportunity presented by a new technology. It is for this reason that the outcome of the study refers to internet methodology as a development of internet technology.

The participants' responses were not negative to the development of internet methodology in their pedagogy, and agreed with the literature study that the use of internet technology in the classroom was no longer a choice but a necessity and that by refraining from utilizing this new medium not only the holistic educational offerings but also the limitation of the education didactics would be the result.

The study was conducted in such a manner that the outcome of the research could answer the following sub-questions to the research question. These were the driving force behind the study and, despite topics being covered that both the literature and empirical study were not always directly focused on the aim was always that the most holistic approached be followed to through light on the sub-questions and eventually produce a richer product.

The four sub-questions were:

4.5.1 What are the limitations of the traditional education system as experienced by educators?
4.5.2 What viable solutions can be suggested for internet technology to address the limitations?
4.5.3 What concerns can be identified regarding e-learning?
4.5.4 How can educators be motivated to introduce internet technology in the learning environment?

The responses to these were as follows:

4.5.1 What are the limitations of the traditional education system as experienced by educators?

It was felt that before any motivation could be advanced in support of the research question, it would be necessary to assess the influence and the relevance of the traditional education system. In my view, both the literature and empirical study reveal a respect for the traditional system and a strong appreciation not only for its role in the past but also in the future. In particular, the empirical study revealed that educators dislike discarding a system which has produced results in the past despite its major shortcomings. They felt that it should remain and play a role in any future pedagogy. It was very clear that the limitations of the traditional education system were embedded in its insistence on a correct answer supplied by a pedagogue who could dispense information. A further implication of this was that it had limitations in terms of the development of higher order thinking skills, and that it did not cater well for varying abilities which often lead to disciplinary problems, problems with homework, problems with concentration and lack of attention.

Participants in the empirical study suggested that internet-based pedagogy would provide solutions for these limitations as it was geared towards enhancing self-study opportunities, inter-communication between educators, educators and students and students and students, and that it was more likely to capture the attention of the student and to counter the negative effects of the traditional system.

4.5.2 What viable solutions can be suggested for internet technology to address the limitations?

Both the literature study and the empirical study highlight the creation of a more social setting for the learning process. In this regard, the development of internet technology has allowed for a methodology which can draw on the recent developments in networking. The sense of belonging and each student's having a vested interest in not only the learning process but also the development of the learning process enables learning in a wide variety of forms to be extended beyond the classroom, and discourse to take place as and when required, with various options available to the individual. The

student through the availability of twenty-four hour a day communication is no longer isolated but part of a community of students where assistance and guidance is available at the press of a button. The hope and encouragement generated by this environment enables varied abilities to be catered for and the negativity and lack of performance of those left behind or bored in the classroom situation should be countered.

4.5.3 What concerns can be identified regarding e-learning?

Many of the limitations mentioned in the literature and empirical study can be attributed either to lack of understanding of the internet methodology or the influence of the traditional system. Many of the negative comments can be related to the influence that the correct answer has on all our experiences in education. An understanding of internet methodology would suggest that this is not the ultimate goal, which is rather the process of arriving at a solution whether it be correct or incorrect. The time-consuming aspect mentioned by educator and student becomes irrelevant when one considers that an hour spent in the classroom period can now extend to twenty-four hours. Concerns were raised by the participants about the availability in South Africa of stable networks and electrical system. This will certainly have to be addressed as education becomes more dependent on internet technology. In my view, the unavailability of computers in the classroom for individual students should not be seen as a serious concern as internet methodology is easily communicated via an interactive whiteboard system in the classroom.

Once the student is beyond the classroom, an individual internet facility and connection is necessary and this is a matter to be addressed. I am of the opinion that initially the greatest concern regarding e-learning would be the withdrawal of the educator from the pedagogy and the loss of direct participation of the educator in the pedagogy, as in the initial stage of the introduction of internet technology the educator may misinterpret the role of facilitator and may withdraw completely or alternatively may encroach on the discovery opportunity afforded the student. Also in the initial stages of the introduction of internet methodology, it may be necessary to be on the lookout for poor application of the technology which could produce a result of a poorer quality than that of the traditional system. A fine balance will initially be required in a blended approach, between the traditional and the internet pedagogy.

4.5.4 How can educators be motivated to introduce internet technology in the learning environment?

I am of the opinion that the greatest motivator for any educator or student is a positive outcome whether it be in the form of a positive result, or a positive comment or encouragement to persevere.

Experiences of educators who are already relatively deeply involved in the new methodology indicate that matching the learning process with the interests of the modern student bears positive outcomes in a short period of time. The modern student is brought up on the fruits of technological development and responds naturally and immediately to the prompts of this form of communication. A positive student willing and able to work, study and discover beyond the formal classroom appears to be a positive motivator for educators.

The availability of creative visual stimulus material produced by colleagues and sometimes students themselves lends impetus for participation.

The ability of the classroom to extend beyond its physical boundaries allows the educator to communicate with students, to answer questions and to guide students from an environment which is somewhat stress free and very unlike the often tense and structured environment of the classroom. The quality of responses can therefore be of a higher standard than would be the normal rushed comment during or at the end of the lesson. A momentum is given to the learning process which is now extended beyond the classroom and fired by the opportunity to be part of a more complete educational experience. This in my opinion can only have a positive effect on the confidence of all students who are able through internet learning to work at a pace which suits them best. It is exciting for any educator to know that work produced on the interactive whiteboard in the classroom, including notes that have been added during the instruction process, can be saved by all students on their memory sticks at the end of a lesson and taken home and studied further.

Educators are also assisted through interaction with colleagues across the world who are facing similar curricular demands. This assures them that they are not alone and can exchange ideas and support across the globe. For the student, the advantage lies in being the recipient of a pedagogy rich in participation by other pedagogues and peers.

In general, this study has revealed that internet technology has enabled the pedagogue to join the ranks of the students as they together enter, uncharted territory, a process by which both stand to learn a great deal and which promises to take education to a higher level.

Both the empirical and the literature study hold the promise of major advantages to be gained by educators in embracing internet technology in their pedagogy. Despite the daunting challenges there

are major motivational advantages to be acquired in terms of a holistic educational experience for both the educator and the student.

This literature and empirical study indicates the potential that internet learning has to act as a motivator for the student and the educator to rise to a higher level of understanding as to what the pedagogy should represent. This motivation provides strong support for the core principle of the research question which pertains to the motivation for educators to introduce internet technology to their pedagogy.

4.6 RECOMMENDATIONS

It will be the combined pressure created by the positive aspect of internet learning, and educators who are knowledgeable and aware of these advantages and opportunities for success, that will apply the necessary pressure for the curriculum to be adapted and modified to make best use of the methodology available. As all learning is geared towards providing the student with the greatest educational benefit, it should be a priority for all involved to conduct research to ensure a trouble-free introduction of e-learning to the curriculum. For the new processes to be successfully introduced, it is of paramount importance that courses on the new methodology be developed for the student, the educator in training and for practicing educators. Technological methodology training cannot be left to schools to provide, and in future years e-learning methodology must become an essential part of educator training. It is suggested that the constructivist approach to redesigning the learning process as propounded by Powell and Kusuma-Powell (2007: 57-59) be followed. This should ensure that the educator's role in internet learning remains of paramount importance with the major shift being in the management of the transfer of knowledge rather than transferring own knowledge.

The study also identified the problems associated with the induction of the new educators and new students into a system where internet methodology was being applied. A structured mentorship programme is suggested to ensure smooth integration into the system in order to ensure that the educational process proceeds in a stable manner. It is suggested that further developments in internet learning regarding available resources, hardware and software and the expected developments regarding each of these be the focus of an in-depth study in order to pre-empt future problems and to plan for further stages of the scaffolding process.

The necessity for feedback from the marketplace as to what the real world requires of the student of the future is highlighted. It would be prudent not to neglect the skills that the real world requires of the person of the future. I am of the opinion that internet learning is well suited to address this issue as the world is increasingly requiring problem solvers to emerge from the education system.

Furthermore, investigation is required into what the future of the school will look like and to what extent internet learning will play a role in shaping it.

Finally, this study touches on the needs not only of educators and students but of parents to remain current with educational developments. Parents need to be well informed about the needs of the real world, and about what is required to develop their children into meaningful contributors to it, so that they as parents can be included by exposing them to the new methodologies and become more efficient in their role that they must fulfill in their children's education.

It is my opinion that the roles of educator, student and parent will be of paramount importance in the success of the introduction of e-learning methodology in the classroom, and that the acceptance of the system by all parties will be crucial in providing effective education for the future.

There is a need for technological conferences such as the 2nd International Schools IT Conference and the ECIS (European Council of International Schools) Technology Conference to be presented for the benefit of progressive IT education in other parts of the world as propounded by Burgess (2009: 36) and Mathew (2009: 37-38). There is an urgent need for investment by the corporate sector and Government in not only developing a technological infrastructure for education but also a methodological training framework to ensure successful implementation of e-learning. The proliferation of technologies and their attendant methodologies in places like Europe is an encouraging sign for the future of e-learning pedagogy.

The aim of this study was to provide motivation for educators to introduce internet technology in their pedagogy. In this section, the need has been identified for various role players to play their part in not only supporting but also stimulating this motivational aspect of the new pedagogy. A unique opportunity exists for role players, to take notice of the major shift that is taking place in education. The motivation for the educator should be the key role that he/she holds in this process as facilitator and manager of a new and empowering world educational movement.

4.7 SUGGESTIONS FOR FURTHER RESEARCH

This research implies that many related topics are still in their fledgling stage of development. There is a great deal of scope in related areas of study which could benefit the development of e-learning pedagogy which has emerged as an important driving force for the successful implementation of e-learning.

- As the role of the interactive whiteboard has developed and become more important in the modern classroom, the role of the educator in the learning process has taken on a new dimension and the role as manager of the educational experience has become even more important. The relationship between e-learning, the whiteboard and the educator remains a fruitful area for study, as it has become evident that the whiteboard has the capacity in the classroom to remove the dependence on a large number of computers and can focus the attention of the students on specific internet sites without the necessity for them to gain individual access. This impacts on research on training student educators and on in-service training.

- The layout of the school of the future needs to be reconsidered not only in terms of the positioning and size of classrooms but also in terms of the allocation of specialist classrooms for specialist subjects. The movement away from the dependence on the formal classroom provides new opportunities for study.

- Regarding specialist classrooms, more information is required to determine whether they are still necessary and how the technology available now and in the future may determine their layout. An example of this is the present questioning of the investment in library books. With the advent of e-books and the opening-up of national libraries on large scale via the internet to the public, investment in internet technology appears more viable than the investment in books per se.

- It is suggested that ongoing research be done to match internet methodology to changing internet technology over time. As “cool tools” Stefanics (2008: 16) proliferate, so will the need for matching methodologies to be developed.
- Finally, I propose that as this study has been limited to a secondary international school, further research on this subject at the primary and tertiary educational levels be carried out.

4.8 CONCLUSION

Internet technology and its related methodology holds great promise in furthering a holistic education for students, by bridging the divide between the traditional educational system and the envisioned expectations of the current and future real world.

This study has accentuated the rise of a global interactive society. No part of the global society is unaffected by developments elsewhere. Particularly with regard to education, isolation is no longer a reality and developments in technology spread swiftly, broadly and comprehensively. This will eventually impact on all countries' education systems.

This study has revealed how educators can be motivated to incorporate internet methodology to their classroom teaching. It emphasizes the opportunity that exists for educators to play a role in creating a more holistic educational context matched to the requirements of the real world. It is evident from this study that the educator can play a meaningful role by blending the traditional and the new technological pedagogies to this end.

Despite the rapid progress of e-learning it is apparent that educators can enter the technological environment at various levels of competence and by utilizing the resources that are available to them to enhance their pedagogy.

This study contends that it is no longer a matter of choice but of urgency that educators be motivated to introduce internet-learning into the learning environment, and that the perceived limitations of the traditional system may be countered by blending internet-technology in a symbiotic relationship. This could fundamentally link content and context more effectively. The challenge for educators will be to manage the exposure of the students to new levels of content and context by means of the development of a more effective and adaptable internet methodology.

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ADDENDUM A

DETAILS OF THE WI-FI FACILITY AVAILABLE AT THE SCHOOL

GENERAL: The purpose of the facility is to provide a:

- secure internet and wireless network facilitating intranet and internet connectivity
- Mail Server facility through which the school can manage and maintain its own e-mails
- Web Proxy Server which caches web pages and enables web page access control
- wireless environment in which users at the nine hostels, staff and administrative personnel are able to access and browse the intranet and internet and send and receive e-mails

Secure system

The configuration includes a Linux firewall that provides the network with the highest possible level of security, controlling spam and viruses as well as managing bandwidth usage. The configuration consists of one computer and one Gentoo Linux Operating system with USL system software.

Mail Server

This configuration provides the school the flexibility to manage and control its own e-mails. The service provider streams all mail for the domain for the school's website to this mail server. The administrator at the school has to manage, create, delete and adjust all addresses in-house. The configuration consists of one computer (the same computer as for the Firewall) and one Gentoo Linux Operating system with ULS system software.

Web Proxy Server

This configuration provides the administrator with a tool with which to fully control web access. For example, all destructive sites such as those containing pornography, violence and other undesirable content can be managed, controlled or blocked. Included are one computer (the same computer as for the Firewall) and one Gentoo Linux Operating system with ULS system software.

Wireless Network

This connects all hostels and any number of staff residences to the network without having to install expensive cable solutions at these premises. This network is secured by the firewall and also by the

specific type of hardware which is used for this solution. The configuration consists of:

- main routers - Mikro Tik 802.11abg
- antennas - 5.8GHz and 2.4GHz Omni antennas
- antennas - 5.8GHz Sector antennas
- general
  - improved Nstreme performance
  - QoS control
  - P2P traffic filtering
  - high availability with VRRP
  - bonding of interfaces
  - firewall tunnels
  - STP bridging with filtering
  - high speed 802.11a/b/g wireless with WPA2 encryption and authentication
  - WDS and Virtual AP
  - HotSpot for Plug-and Play access
  - RIP, OSPF, BGP routing
  - Remote WinBox GUI and Web admin
  - Telnet/mac-telnet/ssh/console admin
  - Real-time configuration and monitoring

The following table reveals the extent of the WI-FI technology installed across the 54 hectar campus.

Mail Server, Web Proxy Server, Firewall	Mail and Proxy Server hardware
Wireless System	Main Access Point (1) Hostels (9) Residential Sites (13). One (1) access point per residential site Security Area (1) Hostel Housemaster flats and tutor flats. One (1) indoor access point per master flat and one (1) access point per every two (2) tutor flats. Eighteen (18) indoor units Technician's Room. One (1) indoor unit Tuck Shop and Uniform Shop. One (1) access point Classrooms (6 buildings, 18 classrooms). Six (6) access points
Network Cabling	Physical Education and Theatre Annexe Office

ADDENDUM B

WI-FI INSTALLATION PLAN

ADDENDUM C

IT/E-LEARNING RESOURCES AVAILABLE AT THE SCHOOL

Computer facilities for educators

- The school purchase plan to acquire a personal laptop is available to every educator, these computers being renewable every second year
- Twenty five (25) of the thirty-eight (38) full-time educators have made use of this benefit of acquiring a laptop. The remainder either have their own laptop/computer or have exercised the right not to acquire a new laptop
- To ensure that every educator delivers the minimum computerized administration requirements three computers are available in the staff workroom throughout the day and night
- Free and unlimited connectivity to the intranet and internet is available throughout the day and night on the campus as well as at staff residences on the campus
- Classrooms do not have to be supplied with fixed computers as the majority of educators use their own laptops in the classroom
- Microsoft Office is the programme which is loaded on to all computers at the school. Educators are encouraged to search widely for subject related software, much of which is available free on the internet. Subject departments are advised to budget annually for any subject specific software that they wish to purchase in the year. It is a requirement that EduAdmin be loaded on all school computers and personal laptops
- The use of internet methodology in the classroom is optional but encouraged, however all educators are required to be proficient in administering the administration program EduAdmin
- The school has identified introduction of computer technology and e-learning as one of its major goals to be achieve. Although the utilization of internet methodology in the classroom is optional there is the expectation that educators will make every effort to become proficient in this methodology and it is envisaged that the facilities available will act as catalyst for this development. The computer is no longer a mystery to educators in their personal capacity but the goals set by the school will hopefully demystify the utilization of internet methodology in the classroom

Computer facilities for students

- Students are encouraged to bring their laptops to school. Mainly students who take Computer Studies as an examination subject, do so
- Two fully equipped computer centers are available for specialized Computer Studies teaching and for use by subject educators when available
- A third computer centre is dedicated to the teaching of TEFL (Teaching of English as a Foreign Language)
- In total 75 modern computers are available in the three laboratories
- There are 420 students enrolled at the school
- Internet and intranet connectivity is available to all students on the campus throughout the day and night
- The intranet and internet facility is also available to the nine hostels on the campus
- Specialized classroom equipment:
    - one interactive whiteboard is available in a centralized venue which is available to educators throughout the day
    - Twelve digital projectors have been installed in classrooms
    - It is envisaged that in the course of 2010 all staff requesting a digital projector and an interactive whiteboard will be supplied with the facility
    - The eBeam interactive whiteboard which is more affordable will be implemented in 2010 instead of the traditional interactive whiteboard. This will allow for interactive whiteboards to, become a mobile facility which can be utilized in any classroom against a white wall. The advantages of the eBeam are specifically that three interactive whiteboard facilities are now available at the same cost as one traditional interactive whiteboard and that its mobility will allow educators to use the interactive whiteboard in any venue in the school

ADDENDUM D

INTERVIEW SCHEDULE

INTRODUCTORY QUESTIONS

How long have you been teaching?

How long have you been teaching at the international school?

What subjects have you taught in previous years including subjects you are currently teaching?

What positions of leadership have you held at the school over the past year?

What role is the internet presently playing in activities related to your work?

QUESTIONS FOR PARTICIPANTS

What barriers to learning do you experience in the traditional classroom?

What have you done in teaching your subject to overcome these barriers?

How do you believe could e-learning assist you in meeting the challenges of the traditional classroom as mentioned previously?

What resistance do you foresee would be encountered from educators expected to implement e-learning in teaching?

What would be the greatest motivation for you to use the internet in teaching? (What could the school do to facilitate this?)

How do you foresee e-learning eventually enriching the learning experience of students?

SUPPLEMENTARY QUESTIONS

How do you foresee the future of internet-based learning in relation to the Cambridge curriculum as it is at present? (Would the curriculum have to change?)

How can educators become better equipped for e-learning?

Could you suggest a plan for the implementation of the use of the internet at your school?

Do you feel e-learning is just a passing fad or something that will stand the test of time?

Is there anything else you would like to add?

ADDENDUM E

INTERVIEW 5 - AN EXAMPLE OF AN INFORMATION-RICH TRANSCRIBED INTERVIEW

Interview held with an educator at a private international school which has recently introduced wireless interactivity across the campus on Tuesday, 7 April 2009 at 15:00

I: Good afternoon Sir.
Thank you for being prepared to take part in this study.

I: How long have you been teaching?
E: This is my eighteenth year teaching.

I: How long have you been teaching at the international school?
E: It is my second year.

I: What subjects have you taught in previous years including subjects you are currently teaching?
E: Mathematics and Science.

I: What positions of leadership have you held at the school over the past year?
E: None

I: What positions of leadership have you held at previous schools?
E: Head of department of mathematics.

I: What role is the internet presently playing in activities related to your work?
E: The internet is playing quite a good role in relation to our work. We are using it to put marks on reports for students and also comments and we also use the internet to access websites that give us support material for teaching mathematics.

I: What are the websites that you are using to get the support material?

E: Websites … all of them are non-subscribeable I hope the school will start subscribing to some of them … we will make recommendations … but, I ... we are using the Cambridge websites, the teachers' CIE. We also have MyMaths and we also have Graphic … ummm something. I can't remember what it is. And there are many more that we use.

I: Are you mainly using websites or does the school provide you with software?

E: It is not software, it is websites that we are mainly using from on the internet.

I: Do you share helpful information or websites available to you with your colleagues?

E: We do share the websites. I remember when I went for a workshop in Jo'burg in October last year I brought back a whole array of websites that I, when I did my report-back to the department I gave all those websites to the teachers in my department … and I see some of them are logged on to those websites and that they are using them.

I: Are all the educators at this school using websites in their subjects?

E: Uhm … I wouldn't really say that all the teachers in the school are using websites. I would be hard pressed to find out how a Setswana teacher would use websites in their classroom for example. I think most of us are now using websites now.

I: Is that only in the Mathematics department?

E: In the Mathematics department yes I can safely say that we are all using … some material from the websites.

I: How are you experiencing the use of the internet to post reports, using EduAdmin for administrative tasks?

E: I find this form of administration quite easier to use than doing it with pen and paper, because if a comma is misplaced all you need to do is just put it in the right place and so on whereas if you were doing it on the hardcopy you'd make a mistake on the students' report you'll have to do it all over again. And the other issue is that you could always work even late at night and post them on the website and then the others would also need to access them there and then rather than to wait for tomorrow when offices are open. I find that quite helpful.

I: So your school has a working website?

E: Yes it is a working website which is supposed to be updated after every fortnight.

I: Is it updated?

E: Yes, it is updated.

I: What form of feedback do you receive from staff, parents and students regarding the website and the system of reporting?

E: Yes, we do get positive response from most of our clients with this form of reporting, but here and there you find that here and there our service provider lets us down and one cannot access the information that he or she wants. That's the only problems we sometimes experience.

I: Is your website safe to post the students' reports, and other personal information, account details etc.

E: It is a safe website … there are sites where everyone can access … then the report area every parent has a code to access his or her own child's report … and you can't access reports for other students if you don't have these codes. So it is quite safe to do it that way.

I: So, you've experienced no problems so far with this system?

E: 100% we haven't had any problems in that regard. It is quite secure.

I: Have you been exposed to the internet and e-learning in your studies?

E: No, I haven't.

I: Any other time, prior to joining the international school?

E: Yes, at the former school where I was we were actually in the process of introducing e- learning at the school, and myself as the head of the department was piloting the project with a private company in Harare.

I: At the international school are you being given training focusing on e-learning?

E: Not any that I am aware of, I am sure the assumption is that of everyone is computer literate.

I: What barriers to learning do you experience in the traditional classroom?

E: The problem that I get from that kind of teaching is that sometimes you get into the classroom where there is this assumed knowledge, where you assuming … suppose you are starting a new topic then you assume that everyone is at this take … and you try and get those questions to find out whether they are exactly at that level … some are and some are not. Especially with us being an international school where we are getting students from all over the world … it then becomes difficult to try and find material for those students who are lagging behind as to where the assumed knowledge should be while using a textbook … but with e-learning I'm sure you can quickly log-on to the website where you can get the relevant information and bring up these guys to the level that you want to. So that is one major problem that we have with the traditional method.

The other issue is that with the traditional way students will always be writing in their exercise books and the teacher will always be doing it on the chalkboard and once you erase it from the chalkboard it is gone for good. If the student hadn't been writing in his exercise book he has it. But with e-learning you could actually monitor that … well at this computer area work is not happening … and at that one working is happening … if the system allows it to be that way … so from the teacher's desk you can actually see if the students are working or they are not. This is another barrier you find which you cannot deal with in the traditional way … you have to be moving around constantly.

I: Are there any other barriers you can think of in the traditional classroom?

E: The other barrier we would have … there is a topic in Mathematics called Transformation which is actually transforming one shape into another shape … with the traditional methods of teaching all you can show on the chalkboard or on paper is the original figure and the final image figure … but the processes that took place for one to rotate a triangle at a centre to another point cannot be shown. Now … with e-learning you can actually show the whole movement taking place and I'm sure students will understand it much better.

I: Do you have any behavioural problems in the traditional classroom that may be a barrier to your teaching?

E: Well one of the problems might be that sometimes the teacher's voice gets a bit monotonous and students tend to wander about in their minds or some even do fall asleep. I'm sure if you have e-learning material then you have another variation to your lesson so you could always

vary your lesson from one to the other to the next one. Besides the computer screen is quite captivating so I think the students' retention would be much more than in the traditional way.

I: Do you find that if you use the internet to overcome some of these barriers other barriers are experienced?

E: Of course other barriers would start to jump up … we start finding students working on web-sites that they are not supposed to have logged on to and you would also find that some students who are not quite that computer literate would have problems in now following the lesson with e-learning so they needed to be upgraded in their computer skills so that they can come to the same level.

I: In your classes do you find students making themselves guilty of plagiarism or even finding assignments not being done independently?

E: Ja, I find it quite often happening especially the weaker students when they haven't done their work, if it is help then it is fine … but sometimes in Mathematics three or four students are making the same mistake and then you start wondering if there isn't any plagiarism or not. Which is something that could be quite prevalent with e-learning if students just get to copy, paste and send information.

I: Have you then used websites in the presentation of math classes?

E: I wouldn't say I've used present websites live in the classroom but what I've done is download the information from the websites and then we use it in class. Because we do not have computers in our conventional classrooms.

I: Would websites be checked before assignments are given to students, or would it take the form of self-study activities?

E: Ja we would check it first.

I: You've answered many of the questions I still wanted to ask you …. But let's carry on.

I: What resistance do you foresee would be encountered from educators expected to implement e-learning in teaching?

E: When I look at our school most of the teachers here we are quite seasoned in the game and it is very difficult to teach an old dog new tricks … (chuckles) … So depending on their interest in computers … because not everybody's interest is the same interest in computers. Some are not really that much interested. You have to push them to do the reports on the computer and so on and so on. So that could also pose a challenge to the teachers themselves. And besides the level of their computer skills would also come into play … and I don't think teachers would like to attend classes where they upgrade themselves just for computer skills so that they can be able to implement e-learning in their classes.

I: Do you think there would be other barriers?

E: The other barrier that I could find is when you have prepared your lesson very well to go and use e-learning websites … we all have it in place … and then five minutes before the lesson Eskom does its own thing and then there is no electricity (chuckles) … … So once you get frustrated that will happen once, twice, trice you start to say well this could be kind of useless way of doing things and so on. And also the other thing that could frustrate teachers is the level of computer skills of the students themselves, because sometimes they need to teach the students the computer skills necessary for them to apply or use the e-learning. More so in Mathematics where it is not just a question of getting the keyboard and starting to type away, there is Mathematic software that one needs to know which one does not necessarily get from a computer lesson … these are specialised ones that can only be taught by people who know what they want in Mathematics.

I: That is very interesting, so you are saying that educators have to teach their students to learn a new way of learning to apply information in a new way?

E: That is quite right. So time may not be on our side for that … (chuckles)

I: What would be the greatest motivation for you to use the internet in your teaching? Including resources you might want to have in the classroom.

E: The greatest motivation would be that I have a greater contact with my students both in class and outside the class we can contact each other very well using the internet. You do the assignment and there are questions to ask so they just ask the questions, post them on my mail. I see them, give responses and so on and so forth. So even though we are not seated side by side or seeing each other there we would still have contact any time of the day … the one beauty of e-learning.

And the other thing is that you would be able give different students in terms of ability different kinds of homework, not just from the textbook. Say well the textbook this is the textbook so questions 1-10 will be done for homework by everybody … you then choose your 1-10 for the weaker guys, another set of ten for the stronger guys and so on and so forth. And everyone is involved in meeting the needs of those ones. The weaker ones you can always contact them later on as I was saying and then could always push them up to the required standard.

I: You are saying then that you will be available anytime, anywhere and any place?

E: Exactly … (chuckles)

I: Would that not be a problem for you as an educator, that students are expecting you to be available 24hours a day, anytime, anywhere and any place?

E: It could become a problem depending on what is going on in your life at that particular moment, but I'm sure in the main that that will be plus for us as teachers and also for the students. But here and there it could create problems and I can see that.

I: Would you put in place restrictions to prevent this from getting out of hand?

E: Maybe you could restrictions to … well … You can contact me between this time and that other time … Not at two in the morning … or on a Sunday afternoon … (chuckles)

I: How do you foresee e-learning eventually enriching the learning experience of students? Focusing on problem solving …

E: It is quite helpful in that students can go on and research on these things and rather than having to go to the library and remember the correct textbook, the correct page. With the website all you have to do is maybe type in your problem and the website will give you options as to where to go and you should be able to do the research much faster and then come up with a solution as it were. It should also then be able to interact with from the same class or different schools as it were. We are operating at the same level to come up with a solution. So we find that intra teaching is also taking place student-to-student as well as teacher-to-teacher.

I: Do you find students who have access to the websites and internet are keeping you on your toes, with the information they receive?

E: Ja, that will be fine with me. I don't have any problems with it. I assume that every teacher should be well on top of the situation in the class in terms of the information that needs to be discussed vis-a-vis the syllabus. I do understand that there are some students who will go out and find information that is not necessary for the syllabus … you can always try and channel them in the right direction … say well this is fine … this is what you saw on the internet but we don't really need it right now … wait for a year or two. Here we need to concentrate on this area here.

I: You've mentioned previously that Eskom or the service provider lets you down. Now you have to revert back to the traditional way of teaching. Do you see educators having to blend the two forms of teaching?

E: In fact, e-learning should never replace the traditional way of teaching it should only compliment it. It shouldn't replace it. Because if you replace the traditional method with e-learning it is like you replacing the teacher with the computer which is not workable. It should only compliment it. Even though you have prepared a lesson to use e-learning you should always have some components of the traditional way of teaching which should then carry on in that particular day.

I: How do you foresee the future of internet-based learning in relation to the Cambridge curriculum as it is at present? (Would the curriculum have to change?)

E: In fact computer based learning is going to be the future of learning especially with Cambridge. I hear now they want to do all their marking on-line (chuckles). At IGSCE they want to do all the marking on-line now which is quite good in that it should be faster to do, collect marks and then publish results.

I: Would this now be in a country without Eskom?

E: Well Cambridge exams are still marked in the UK so all we have to do is after the students have written the exams is scan them and send it through to them and then they do it. It should make life easy for administrators to collect the question and the answer scripts and send them … it will get there with the click of a button … rather than having to ship or fly them out there.

I: Following the Cambridge curriculum, do you have to adapt your lessons in order to incorporate e-learning?

E: I can't adapt the lessons to suite the internet that is one thing I cannot do because I have a syllabus to complete, I'll have to find the suitable material from e-learning sites to suite my

lesson, Ja … maybe for the first few years that would require some research on the teacher's part on the internet to find out which ones are quite suitable, which ones are better than the others. I'm sure it will be a worthwhile investment for future learning.

I: Do you have concerns that using e-learning activities, though interesting, may distract the focus from exams and exam results?

E: One would have to guard against that because working on the internet … it does not matter how good the website is, you can get carried away with things that are interesting there. Always remember that your focus is on the exam requirements, the syllabus … what is it that you need to cover with it … just go that far … and then during the students' spare time you can let them go on the full strength if they want to research more on certain topics and so on, but ultimately making sure that the syllabus requirements have been met.

I: How does your school compare with other schools around the world, with regard to the use of e-learning and results?

E: I don't know about results from other schools but what I do know for certain is that our results can improve quite a lot if we start implementing e-learning because whenever you use e-learning every student even the one who is most docile in class are all wide awake and seems to be paying attention … (chuckles) …

I: Do you have concerns about students using the internet for other purposes while you are busy teaching through e-learning?

E: The internet administrator does monitor the websites that should be used at the school, once she sees the website being operating on something it shouldn't she notifies the teacher that they can't be using the site.

I: You mentioned docile children paying more attention during e-learning … Do you experience any hyperactivity among students who are more active in class?

E: Some could become quite hyperactive, but it depends on how one responds to the computer in the classroom … not necessarily would those who are hyperactive in class suddenly become hyperactive when exposed to the internet. Different groups behave differently on the computer.

The level of computer literacy that the students have is also a factor, the better it is the more active the student is.

I: You have said that educators who are not skilled on the computer need training … Would that be true for students who aren't skilled as well?

E: For us to implement e-learning fully in the school, students should have a minimum of the ICDL qualification.

I: What is the ICDL?

E: The International Computer Driver's Licence.

I: Is this provided at the school?

E: It is provided here in the computer lessons for students.

I: Is this optional or a requirement?

E: It is a requirement that every student goes through that course ... and then I'm not sure for those who come at A-level because then they can choose computers as a subject on its own. But if you come from somewhere else where you did not do computers … those are the ones that will be lagging behind and will have to be pushed up.

I: Should e-learning be made compulsory for educators to use in their teaching?

E: I don't think so, because making the internet compulsory to use you are actually imposing methods to use in the classroom for the teacher and different teachers thrive on different methods to teach, so it should still remain optional to the teacher.

I: Is the school and students being held back from better achievements by educators who may be resistant to using e-learning as a teaching method?

E: Ja … they would be holding the school back in a number of ways because…and a Mathematics website designed for ISSA students only and we have and English website as well…now for example the maths teachers are saying: No, no, no, no we don't want to have anything to with internet then that starts interfering with other subjects. For somebody to understand Science they have to understand a little bit of Mathematics and if he can't operate on the computer with

Mathematics then also you have problems with Science. So it will be holding back the other departments because of the interrelationships between them and also students will have to be bifocal, when I go to his subject my main resource will be on the internet … but for this subject other subjects it is the textbook or the magazine whatever the case may be.

I: Do you think that different educators' classes as they progress have an influence on students? Meaning one year you are taught traditionally and the next e-learning and every year it differs?

E: It could hinder the progress of students in learning, of course … when one was using internet before and the next time it is stopped or … one wasn't using internet at all and then the next year the food and drink is only internet then I think that transition will hold them back.

I: Are students expecting to be taught through e-learning?

E: Some students do … as I've said they are a mixed bag here. Some students come from the four corners of the world. Some students do expect us to use the internet to teach. Others are quite surprised that … Ay,you guys are giving us material from the internet … (chuckles).

I: So you receive positive feedback when using e-learning?

E: Yes, we always receive positive responses when we use the internet, look … If I give you a piece of paper that is computer typed … it is easier to read. Each one of them has his own hardcopy rather than having it there on the chalkboards it is not the same thing.

I: Any negative feedback from students?

E: Sometimes the internet is slow to open up the sites and it takes up a big chunk of time and students are just there standing … waiting in front of the computer for it to open up the website … it takes some time and it is quite frustrating. Then as a teacher you want to divert them from the slow opening and then you say oh well let's start doing this on the board and then all of a sudden as you are in the middle of solving that or making that discussion it comes up on the internet and every one changes their focus. So that one is kind of a hindrance as well.

I: Could you suggest ways in which educators can become better equipped for e-learning and how the school or management could motivate educators to use the internet?

E: First and foremost the management needs to make sure that the educators are all computer literate; management can motivate them by maybe paying for training for those to reach an acceptable level of computer literacy. Also if teachers request that they need these websites at their disposal that should be made available for them. Some of them are subscribeable but they don't come quite cheap … (chuckles) made available to them that's one way I think educators can be motivated to embrace e-learning into their teaching.

I: What e-learning resources do you think should be made available in every classroom?

E: The whiteboard, many pc's around in the classroom … maybe the teachers would like to have laptops with them … and that the internet network should be accessible from all classroom which they are at this school fortunately for us. Ja, but not every classroom has a whiteboard unfortunately. If you need to use the internet you either have to go to one lecture place where there is a whiteboard or you have to liaise with the computer teachers when their labs are free.

I: How many students do you generally have in your classroom and is there enough space in the computer labs?

E: In our maths classrooms fortunately our students are in sets so they don't really go above twenty. If you have twenty that's the highest number, and the computer labs that we have are designed for up to twenty five students so we always have a surplus of computers in the lab.

I: So basically your biggest problem would be availability of space … to book space.

E: Availability of space ja …

I: Could you suggest a plan for the implementation and use of internet at your school?

E: Maybe we would need to invite experts into the school who could give … uhhhh a programme that could give courses … it could run a course in school with the educators which will show the pros and cons of using the internet and how internet and e-learning could be implemented in certain subjects and so on and so forth. That then would raise interest in the educators to embrace the internet in the school … and also all students should be required that they should have a certain level of computer skills. Maybe each student should have a laptop to his or her disposal all the time at the school … just like they have at their disposal textbooks and exercise books.

I: Would you say the school or parents should fund the laptops?

E: In my belief if we let parents fund them it could take us a bit longer. All we need to do is build up the cost of the computer in the school fees for a period of time and suggested for everyone … then we are all on our way. We all have the same kind of computers … the same laptops as it were … which we know they all operate at almost the same speed. Rather than having one have a very fast and the other a very slow one which will start dragging the whole class behind. But if we all have the same type, which are almost the same age then we'll be working at the same speed.

I: Would you see it as a concern that although training will be presented, some educators would only see the training as a lovely learning experience and not use any of their training?

E: Well, if the school is geared up to do that, then it should be done quite timeously when everything else is in place. Once it has happened the students expect the teacher to use the internet … it should start happening … it should happen. Rather that train the teachers today and ring the laptops in the third term, obviously that would be a waste. It needs to be timed properly.

I: Do you feel e-learning is just a passing fad or something that will stand the test of time?

E: I think e-learning is here to stay for a while … I am not sure of what the level of development in technology in cyberspace involvement is but I'm sure it is here to stay for a while.

I: Are there things that in future you would really like do with e-learning that you can't do at the moment?

E: Catering for different levels of students in my class. With the internet you can generate the same test different types of difficulties for different students. You would also generate different tests, with different questions for students of the same level … so that plagiarism can go away, I can test on for example the same topic, four students with four different tests but with the same objectives that are accomplished.

I: Is there anything else you would like to add?

E: No, I think I am fine.

I: Thank you for your time.

E: You are welcome.