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Masters Research Project

Perceptions of the use of a Blended Learning approach to improve student performance in Web Development Courses in Selected South African Higher Education Institutions

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ABSTRACT

A Blended Learning (BL) approach is an effective approach in integrating the face-to-face methodology and the use of information communication technologies into teaching and learning. Blended Learning provides students with the best practices from both rich traditional classroom practices to modern technological learning experiences. In relation to this context, this research seeks to explore the perceptions of the use of a blended learning approach to improve student performance in web development courses in selected South African education institutions.

The result of this research indicates online presence of content created by the lecturers for the students. This is just mere presence of courses on the technologies available in the higher education institutions. It does not show the proper integration of traditional face-to-face approach and a BL approach. The traditional classroom still prevails despite the advantages and success of use of a BL approach. Lecturers can be regarded as having technological content knowledge (TCK) and failing to integrate it with pedagogical knowledge. There is need for the lecturers to be trained on the Blended Learning Curriculum model (BLC). The BLC model focuses on the integration of technology, pedagogy and content. This integration is what is needed for the successful implementation of BL in the various institutions.

Successful implementation of a Blended Learning approach will go a long way in improving student pass rates and driving an upsurge in the programme completion rate.

DECLARATION

I declare that this research report is my own unaided work. It is submitted for the degree of Master in Education at the University of the Witwatersrand, in Johannesburg. It is has not been submitted before for any degree or examination at any other university.

Name of candidate

Signature of candidate

_____ day of _____, 2012

DEDICATION

This research is dedicated to my late parents, Jephias Mapurazi and Regina Madamombe Bvute.

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ABBREVIATIONS

BL	Blended Learning
BLC	Blended Learning curriculum
CHE	Council for Higher Education
CLE	Collaborative Learning Environment
ELE	Electronic Learning Environment
FET	Further Education and Training
GEDT	General Education and Training
HET	Higher Education and Training
ICTs	Information Communication Technologies
ILT	Information and Learning Technology
LMS	Learning Management System
LCMS	Learning Content Management System
NQF	National Qualifications Framework
VLE	Virtual Learning Environment

CHAPTER 1

INTRODUCTION

Most Higher Education colleges are implementing or have implemented Information Communication Technologies (ICTs) in their teaching and learning programmes. The implementation of ICTs depends on the business models and policies which govern teaching and learning in these colleges (Maldonado-Maldonado, *et al* 2004; Kruss, 2004). Most colleges are predominantly using traditional face-to-face teaching and learning approaches (Thorne, 2003; Clarke, 2008). There are questions which are raised when ICTs are implemented. These might include: Are ICTs going to replace the face-to-face approach; what drives the other, technology or pedagogy? As observed by Batson (2011:1), “Information technology, ironically, instead of disenfranchising the current higher education enterprise, is making it more vital. After all, we find that there was and is no revolution, just a gradual shift in emphasis toward certain kinds of existing learning experiences”. This shift in learning experiences with the use of technology should be complementary to the traditional face-to-face teaching and learning. As it has been realised that ICTs will not replace the face-to-face traditional learning environment, ICTs have now been accepted as complementary to this traditional learning experience. The gradual shift in emphasis towards pedagogical implementation of ICTs is taking root.

One approach which integrates technology and traditional face-to-face teaching and learning experience is Blended Learning (BL). BL is a training solution that mixes several methods, such as face-to-face training, computer integrated experience and self-paced learning (Valiathan, 2002). A Blended Learning approach is an effective approach in integrating a face-to-face approach and information communication technologies into teaching and learning (Garrison and Kanuka, 2004; Heterick and Twigg, 2003; Thorne, 2003; Twigg, 2003; Singh, 2003). BL provides students with the best practices from both rich traditional classroom practices to modern technological learning experiences. Thus this research seeks to explore the perceptions of the use of a Blended Learning (BL)

approach to improve student performance in web development courses in selected South African Higher Education Colleges.

The literature review discusses a BL approach in teaching and learning. Some of the key terms pertaining to ICTs and web development are briefly explained. The literature review also discusses traditional face-to-face and online learning approaches. BL is grounded in a constructivist theory (Huang and Zhang, 2008). The technological pedagogical content knowledge (TPCK) framework (Mishra and Koehler, 2006) is discussed and guides this research. This is a framework which focuses on the integration of technology, pedagogy and content knowledge.

Both qualitative and quantitative methodologies were used to carry out the research. Two questionnaires, one for the lecturers teaching web development and the other for the students learning web development were used to collect data. Interviews with the lecturers were carried out. The researcher also observed some of the lectures on web development. The research was carried out at three colleges of a private higher education institution in the Gauteng province.

Descriptive statistics were used to present and discuss the data since the data type was of ordinal type (Oakshott, 2006). Lecturers indicated that the use of a BL approach can improve the students' performance in web development course, although there is very little evidence in the usage of the approach. Relatively there was only internet or web-based solutions present in the colleges. Lecturers involved in this research thought the mere use of computers, internet or web sites constitutes Blended Learning. There are a lot of misconceptions. Lecturers are not aware of their lack of engagement with a Blended Learning approach. The lecturers (Section 4.2.1), have what is referred to as the technological content knowledge (Dagada, 2004; Mandell, Sorge and Russell, 2002; Mishra and Koehler, 2006; Wang and Woo, 2007). Profiling of lecturers indicated that they are adequately trained in the technological content knowledge. In this case they fail to integrate the third aspect, which is pedagogy. They fail to operate in the

intersection of these three (the triad intersection) of technology, pedagogy and content knowledge.

These findings are limited to the few private colleges which participated in the research. The lessons learnt from this research are useful to both private and public higher education colleges. “It has already been mentioned that being conscious of the pitfalls and managing problems enables organisations to integrate successfully in the corporate learning environment” (Dagada, 2005:127). The same is true for the colleges in higher education to consider the important insights from this research for the future successful implementation of a BL Approach across different subject areas or courses. The successful implementation of Blended Learning may lead to improving programme completion rates (Garrison and Kanuka, 2004; Heterick and Twigg, 2003; Thorne, 2003; Twigg, 2003; Singh, 2003). Literature has shown that where a BL approach has been implemented, in the cases of Stanford University and University of Tennessee, the completion rate increased (Singh, 2003). The fact that the participating colleges in this research are technologically equipped to implement Blended Learning has great assurance for teaching and learning experiences in all colleges. Each student has his or her own workstation and 99% have mobile devices as observed and gathered in the questionnaire.

1.1 PURPOSE OF STUDY

The purpose of this research is to explore the perceptions of the use of a Blended Learning approach to improve student performance in web development courses in selected South African Higher Education Colleges.

1.2 CONTEXT OF STUDY

The South African Education system comprises General Education and Training (GEDT), Further Education and Training (FET), and Higher Education and Training (HET). Higher Education and Training has “more than a million students

enrolled” (www.hesa.org.za/hesa, 2010) in public institutions. The following statistics have been recorded: “36 public higher education institutions: 21 universities and 15 technikons” (Kinuthia and Dagada, 2008). The figures obtained as of January 2009 show that there were 79 registered and 15 provisionally registered private higher education institutions” (www.southafrica.info/about/education/education.htm, 2010).

There is a concern about the higher education completion rate in various programmes in both private and public education colleges. A number of issues have arisen. A lot of blame is directed at the secondary education system, especially the introduction and use of outcomes-based education in GEDT. The research will not focus on where the responsibility for these current challenges lies, but rather aims to examine the perceptions of the use of a Blended Learning approach to improve student performance in Web Development Courses in selected South African higher education institutions. The Web development course is one of the courses which is offered for the Information Technology Programming diploma. The course was used as it was convenient, in that it fell within the time frames in carrying out this research, which included the application and granting of ethical clearance and the requests for consent from participants and the principals of the participating colleges. The completion of any course contributes to the completion of a given programme. This requires the completion rate for programmes in higher education to be improved.

Blended Learning has a theoretical basis of constructivism (Huang and Zhang, 2008). Constructivism provides a foundation of existing knowledge with which the student interacts. In this interaction, the students solve real-world problems and new knowledge and new understanding are generated. Blended Learning integrates traditional face-to-face classroom practice with use of technology to optimize learning and understanding. The use of Blended Learning in web development will be explored in this research. The model to be looked at involves the Blended Learning curriculum (BLC) model. The thrust of the BLC model is pre-analysis, activity and resource design and instructional assessment (Huang

and Zhang, 2008). Pre-analysis deals with the analysis of learners' characteristics, the learning outcomes and Blended Learning environments. Activity and resource design deals with the objectives, activities and teaching methods. Instructional assessment looks at the manner in which the learning and mastery of what has been taught can be measured. This thrust will form the basis of Blended Learning usage in this research.

As observed by Czerniewicz, (2007:91), "... Concerns are moving beyond technology and towards effective learning in the electronic environment". This was earlier observed by Msile (2006). There are debates which have looked at the issue of technology in education, and concerns were centred on pedagogy versus technology, specifically which comes first and which drives the other. Czerniewicz is indicating the shift in this debate. One should consider what is meant by effective learning. Effective learning deals with, or focuses on, the students' acquisition, understanding and use of learnt concepts. The trend then is shifting to the understanding of concepts when electronic environments are used in the teaching and learning process. The core of this research is to explore and use one of the teaching and learning approaches. The study intends to explore this shift from simple learning of technology to that of application of technology to enhance teaching and learning in a web development course. The other aspect is that pedagogical considerations should not be trailing technology but should rather determine the usage of technology in it. This requires that effective learning in electronic environments must have a solid base in pedagogical issues. Pedagogy should determine and lead the usage of technology in the teaching and learning process. The research will look at one of these pedagogical considerations in the teaching and learning of web development in Higher Education Institutions. A Blended Learning approach will be used to guide and offer an effective electronic learning environment. This shift envisages the pedagogical approach rather than technology driving the change in teaching and learning.

There are varying projects in the use of ICTs in many Public Higher Institutions of learning. Funding of these institutions limits the effective implementation of ICT projects. On the other hand, in Private Higher Education Institutions, funding is not as limited and the provision of ICTs is therefore not limited (Maldonado-Maldonado, *et al* 2004; Kruss, 2004). With this abundance of resources, it remains to be seen if the resources are fully utilised. One would assume that there is greater usage of ICTs in private higher education institutions but this may not be the case.

1.3 PROBLEM STATEMENT

1.3.1 Main Problem

Any student who embarks on studies looks forward to completing the course or programme for purposes of employment, self-advancement, self-actualization and many other motives. A lot of resources, public, private and individual are used to undertake any studies. It becomes imperative that students complete their studies. BL complements and incorporates the advantages of both traditional face-to-face and on-line teaching and learning strategies. It has been seen that BL increases student completion rates (Garrison and Kanuka, 2004; Heterick and Twigg, 2003; Thorne, 2003; Twigg, 2003; Singh, 2003).

1.3.2 Research Questions

The major question is: What are the perceived benefits of a Blended Learning Approach (BLA) in improving student performance in a web development courses?

The research sub-questions are:

1. What are the benefits in the use of blended learning in web development?

2. What are the perceptions of users on the use of pervasive technologies as tools for blending?

Data for the research was collected using two questionnaires: one questionnaire for students and the other for lecturers. Interviews were carried out with the lecturers teaching web development. The researcher made lesson observations. The research was carried out at three colleges. These are the only colleges which gave their consent for the research to be carried out. Only one of the colleges had moved on to use Blended Learning. Some lecturers expressed the intention of using Blended Learning and there were some misconceptions concerning integration of Blended Learning in their lesson deliveries. Lecturers involved in this research thought the mere usage of computers, internet or web sites is Blended Learning.. Lecturers are not aware of their incompetency in the usage of a Blended Learning approach. The researcher recommends that lecturers should be trained in the chronological step-by-step implementation of the BLC model (Huang and Zhang, 2008). This might help in the integrating of the traditional face-to-face approach and an online learning approach. The lecturers have both the will and intent to use a Blended Learning approach, which is a positive development.

1.4 SIGNIFICANCE OF THE STUDY / RATIONALE

This study can be used to improve the delivery of teaching and learning of Web Development courses in Higher Education Colleges (Garrison and Kanuka, 2004:100, quoting Heterick and Twigg, 2003). Blended Learning is entrenched in the theoretical base of constructivism (Huang and Zhang, 2008). Students learn when a basic foundation is exposed to them and the students engage in solving problems. This assists the learner to apply and integrate the foundation knowledge to new knowledge. The educational rationale of blending, according to Huang and Zhang (2008), is to improve learning, provide for “deep learning” and active participation of students in activities which build communities of practice. The students are encouraged to observe, and to participate in activities with others.

The students mature into well groomed individuals within their communities of practice.

1.5 DELIMITATIONS OF THE STUDY

The study will be limited to four Private Higher Education Colleges in Johannesburg. These colleges offer the same National Qualification Framework (NQF), Diplomas in Information Technology at level five (5). The diploma is accredited by the Council of Higher Education (CHE). Web Development is one of the modules offered in the Diploma in Information Technology Programme. The course content, course materials and assessments are the same across the colleges.

1.6 SUMMARY

Chapter 1 introduced the research, research purpose, the context of the study, problem statement, research questions, significance and rationale of the study, delimitation of the study and definition of terms. The context of the study provided the sources of the problem and focus of the research. The problem statement stated the main research question and the minor research questions were provided under research questions. Significance and rationale of the study provided the relevance of this research, the relevance being the improvement of student performance. Consequently, improvement of student performance increases the throughput of Higher Education Colleges to the world of work and increases course completion rates. The delimitation focused on the parameters through which the research was carried out. Chapter 2 provides a literature review; chapter 3 discusses methodology; chapter 4 covers presentation, analysis and a discussion of the results; and chapter 5 gives the conclusion and recommendations, reference and appendices.

Chapter 2 reviews the use of a BL approach in teaching and learning. The concepts on ICTs, Education Technology, Blended Learning and Web Development are also presented.

Chapter 3 outlines the research methodology used in carrying out the research. Both qualitative and quantitative methodologies are used. The research instruments are also discussed.

Chapter 4 presents the research results and analysis. Descriptive statistics are used. Usage of the Blended Learning method, pervasive technologies and perceptions on the usage of Blended Learning are analysed. Discussion of results is also presented.

Chapter 5 provides the conclusion and recommendations of the research. These are followed by references and appendices. Appendix A is a glossary of key terms used in the research, Appendix B contains the student questionnaire, Appendix C, the lecturer questionnaire, Appendix D, interview protocols, Appendix E, observation instrument, Appendix F, an extract of the policy governing the use of mobile phones, Appendix G, collected usage of e-folders, Appendix H, usage of SMSs and Appendix I, the consent form.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter draws on the existing literature to review, in some detail, the use of Blended Learning (BL) in teaching and learning. Before discussing BL there is a need to identify and elaborate on some of the concepts which are aligned with BL, these being, Information Communication Technologies (ICTs) in teaching and learning, educational technology, learning management systems (LMS), learning content management systems (LCMS) and web development. The literature review will also discuss the traditional learning approach and an online learning approach.

2.2 ICTs AND THEIR USAGE IN THE TEACHING AND LEARNING PROCESS

ICT projects have been implemented in a number of private and public colleges in Gauteng. These projects also included the use of BL. Blended Learning has been implemented in some higher education institutions such as the University of Pretoria (UP). UP has a strategized use of e-learning - “at policy level, it promotes a flexible, blended-learning model, where the main teaching method comprises traditional lectures, tutorials and practical sessions supplemented by a mix of other delivery modes including web-based supported learning, interactive television, stand-alone multimedia and video” (Czerniewicz, 2007:93). Fresen and Boyd (2004) also share the same view. UP has also experimented in intense usage of e-learning. There is a course in Masters in Education, which is internet-based (Czerniewicz, 2007; De Villiers and Cronje, 2005). However, the challenges that have been experienced in the use of technology at UP are the ever-changing versions of interface and e-learning technology platforms. This challenge is faced by a number of institutions. This impacts on the use of technology. Lecturers are

very reluctant to relearn the newer software (Czerniewicz, 2007; Kinuthia and Dagada, 2006).

Considering the University of the Witwatersrand (Wits), Czerniewicz (2007) and Mhlanga (2005) indicated that Wits has settled for Blended Learning by accident. Technology has overtaken the institution in the implementation of a pedagogically driven approach. Having looked at the two institutions above, the researcher subscribes to the notion that pedagogy should lead the implementation of technology in the teaching and learning process.

It has been difficult to cite examples of usage of a Blended Learning approach in Private Colleges. Key literature on private higher education mainly concerns infrastructure, finance and control and business behaviour (Maldonado-Maldonado *et al* 2004; Kruss, 2004). Usage of ICTs can also be cited from Bangladesh experiences in private higher education colleges (Huda, Tabassum and Ahmed, 2009). The experiences or lessons learnt in Bangladesh can also be implemented in South African higher education colleges. There is a need to move from a mere administrative approach for ICTs in colleges to a more practical Blended Learning approach to improve teaching efficiencies. Although Private Colleges have invested much in ICTs, the major usage of ICTs is in teaching computer-related courses, use of digital libraries, internet connectivity and end user computing. It seems at the moment that the major focus of Private Colleges is to provide tutorial tuition for distance education programmes offered by other universities such as the University of South Africa and external international universities. This points to the business behaviour of Private Colleges in Higher Education providers. (Maldonado-Maldonado, *et al* 2004; Kruss, 2004). Traditional face-to-face classroom delivery is predominant. The business model's emphasis is on having a small number of students per given class. This research will explore if there is usage of a Blended Learning approach in Private Colleges. ICTs are readily available in Private Colleges. The question of funding might be an insignificant issue to the implementation of a well-guided Blended Learning approach. Computers and ICTs are vital to successfully implement Blended

Learning. Bates (1995:227) indicates, that, “Computers are more likely to become “transparent” or “invisible” in the e-learning process, similar to the significance of “electricity that carries the power to a refrigerator” is now to the refrigerator user. The researcher also draws a congruency from this, that ICTs in Blended Learning will become well-integrated such that they end up being insignificant or invisible.

There are also different views which emerge in the use of educational technologies. Shelly, *et al* (2006) argues “Educational technologies are the tools whose effectiveness is determined by the knowledge, skill, experience, level of training, and ethics of the user”. Their views highlight the usage of ICTs in both schooling and tertiary curricula. They highlight that the usage of ICTs is dependent on five key components or factors: knowledge, skills, experience, and level of training and ethics of the user. One would like to ascertain if these five aspects exist within the teaching fraternity since these determinants are critical. In the institutions to be used for research, the lecturers are highly qualified and experienced. In schools and tertiary institutions, the use of ICTs varies from administrative usage such as student registration systems to capturing the information on students’ enrolment and other related items and then recording of marks and simple analysis of results. School secretaries use ICTs as tools to type personalized letters and send electronic mails (e-mails) and other message forms for basic communication. Teachers use it for recording basic information, poems, stories, and delivery of softcopy notes (Shelly, *et al*, 2006). In this varying usage, educational technology is implemented due to the speed at which data or information can be stored, retrieved and accessed as a support to routine day-to-day educational administrative chores. ICTs are merely tools. However, Gourley (2009:5) disagrees with the usage of technologies as simply tools: “I absolutely do not agree with the view that ... technology is just a tool”. She goes on to give five key trends on the impact of ICTs on tertiary education. Her trends include increase in globalization, the evolution of collective intelligence, the rise of games and culture, the evolving field of visual literacy and ubiquity and utility of mobile devices. Her points tend to be the futuristic view of the implications and trends of educational technology in tertiary education. A number of institutions have looked

at this idea and have gone on to implement a variety of educational technologies in teaching and learning approaches. Among them are the use of e-learning programmes such as Blackboard/WebCT, telephone and video conferencing.

ICTs are also used as curriculum-specific content subjects. A range of these includes computer science, computer studies, computer applications technology (CAT) and information technology (IT).

When one looks at the uses of ICTs, one cannot doubt the usefulness of educational technologies. This spans literacy (skills), application (of ICT in a subject-specific area such as simulation in accountancy), infusing or integration across subject areas and ICT specialization. ICTs enable students to engage and improve efficiency in a number of ways, in terms of the way things are done, and the speed at which tasks can be achieved. They also enhance collaboration. Having discussed ICTs and their usage in education, the next section, 2.3, will briefly explain some of the key terms in electronic learning environments.

2.3 EDUCATIONAL TECHNOLOGY

Educational Technology, sometimes referred to as learning technology, ICTs, or educational media, just to mention a few, involves the study of usage of technology in the teaching and learning process. These and more terms referring to educational technology will be used interchangeably to mean or refer to educational technology. In South Africa, the government has defined ICTs (Government Gazette, 2004:15) to “represent the convergence of information technology and communication technology”. ICTs are a combination of the use of computer technology and communication technology. Computer technology includes hardware, software, communication networks, and the exchange, dissemination and management of information and knowledge. The technology has had a lot of impact on how individuals work, live and learn. Educational technology involves the usage of technology to achieve a teaching and learning process. “Hence, educational technology properly refers to a particular approach

to achieving the ends of education” (Ely, 2000). The usage of educational technology may depend on theoretical frameworks in the teaching and learning scenarios. The theoretical frameworks vary from behaviourist, cognitivist and constructivist. The theoretical frameworks will not be a subject of consideration in this review. However, any discussion on educational technology should not leave out learning management systems.

2.3.1 Learning Management Systems

Learning Management Systems (LMS) automate the process of learning administration. “The Learning Management System (LMS) manages the delivery of self-paced, e-learning courses. The LMS lets you publish courses and place them in an online catalogue and/or assign courses to learners. A learning management system is a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content” (e-learningconsulting.com, 2010). Overall it (LMS) should be able to do the following: centralize and automate administration, use self-service and self-guided services, assemble and deliver learning content rapidly, consolidate training initiatives on a scalable web-based platform, support portability and standards, personalize content and enable knowledge reuse. With this taken into account, what then is a learning content management system (LCMS)? At times people interchange the use of LMSs and LCMSs, the next section, 2.3.2, will distinguish LCMSs from LMSs.

2.3.2 Learning Content Management Systems

A Learning Content Management System (LCMS) is a related technology to the learning management system, in that it is focused on the development, management and publishing of the content that will typically be delivered via an LMS. An LCMS is a multi-user environment where developers may create, store, reuse, manage, and deliver digital learning content from a central object repository. The LMS cannot create and manipulate courses and it cannot reuse the

content of one course to build another. The LCMS can, however, create, manage and deliver not only training modules but also manage and edit all the individual pieces that make up a catalogue of training. LCMS applications allow users to create, import, manage, search for and reuse small units or “chunks” of digital learning content and assets, commonly referred to as learning objects. These assets may include media files developed in other authoring tools, assessment items, simulations, text, graphics or any other object that makes up the content within the course being created. An LCMS manages the process of creating, editing, storing and delivering e-learning content, Information and Learning Technology (ILT) materials and other training support deliverables such as job aids (Morrison, 2003). The use of ICTs enables BL and Online learning approaches. This research explores the use of a BL approach in web development. The next section, 2.4, will look at web development.

2.4 WEB DEVELOPMENT

Web Development is a broad term for the work involved in developing a web site for the Internet (World Wide Web) or an intranet (a private network). This can include web design, web content development, client liaison, client-side/server-side scripting, web server and network security configuration, and e-commerce development. However, among web professionals, “web development” usually refers to the main non-design aspects of building web sites: writing mark-up and coding. Web development can range from developing the simplest static single page of plain text to the most complex web-based internet applications, electronic businesses, or social network services (IIE, 2010).

Web development provides the technical information and skills needed to design and create a website. The course on web development looks at non-design aspects of building web sites such as, as previously stated, that of the use of mark-up language or any authoring packages to code and come up with a web site.

Having discussed the technical terms, it is time to look at traditional and online learning approaches.

2.5 TRADITIONAL LEARNING APPROACH

The traditional learning approach provides an environment where lecturers present “a monologue to large groups of students” (Bach, Haynes and Smith, 2007:124). Bach, Haynes and Smith (2007) describe it as more of a cinema show where a lecturer stands in front and presents the lecture while students watch with little engagement with what they are supposed to learn. Bligh (2002) argues that this type of lesson delivery is inefficient. Lectures usually last for a minimum of an hour and learners’ attention span is in the region of 20 minutes (Bach, *et al*, 2007). There is little effort to get feedback from the learners (Laurillard, 2002). If a student fails to attend the lecture, one can either approach the lecturer to get what was covered during one’s absence, or would rely on other students who attended the lecture. Students will not gain from the advancement of modern technologies and usage of more interactive and adaptive learning approaches if only this approach is implemented. There is a need to look at the usage of both traditional and online learning approaches, which can be achieved by blending. Online learning approach will be discussed in the next section, 2.5.

2.6 ONLINE LEARNING APPROACH

Lectures are provided over the internet. The Online Learning Approach can be viewed in two modes, asynchronous and synchronous lectures. Asynchronous lectures are when the lectures are available over the internet. Learners can access the lectures in their own time. The learner is in charge of work time and pace. This might not go down well with some lecturers as they argue it encourages students not to attend lectures (Bach, *et al*, 2007).

Synchronous lectures are prearranged. The times are set for all the students to attend the lecture online. When the lecture is being delivered students can actively participate during the session. The major problems with these lectures are

technological. This may range from availability of bandwidth, network capacity and in some cases software installation and fixes (there might be restriction rights for security purposes) which might be required time and again. Both traditional and online approaches do not offer great learning experiences. There are advantages and disadvantages to using these approaches. BL provides greater opportunities for teaching and learning as it incorporates and takes in the advantages of both approaches, it aggregates them. The next section discusses BL.

2.7 BLENDED LEARNING

The aspects of Blended Learning will be examined. The major issues under Blended Learning are:

- 1) What is Blended Learning?
- 2) What is being blended?
- 3) How is it blended?
- 4) Why is it blended?
- 5) Should courses be blended?
- 6) How will blending be carried out in Web Development courses? In addition,
- 7) Why should Web Development courses be blended? These points will

be examined in more detail.

2.7.1 Defining Blended Learning

Blending “focuses on mingling together in ways that lead to a well-balanced combination, to mix, mingle, to unite intimately, so as to form a uniform or harmonious mixture” (Osguthorpe and Graham, 2003:229). Garrison and Kanuka, (2004:95) give a similar definition to blending as “the thoughtful integration of classroom face-to-face learning experiences with online experiences”. Singh (2003:52) reiterates that “blending learning combines multiple delivery media that are designed to complement each other and promote learning and application

learned behaviour”. The major aspects, which can be derived from the three views above, are the forming of a unification of one or more items. A purposeful mix of items is required. Garrison and Kanuka introduce the usage of online experiences and classroom face-to-face learning experiences. Singh brings in the aspect of media usage to complement each aspect of the learning process. These are some of the things used to define Blended Learning. Also important is a unity of purpose. This unity of purpose is the improvement in the teaching and learning experiences. In blending, the items retain their properties and the good properties are brought into synergy. An example which comes to mind occurred during the period of Ian Smith’s government (1965 to 1979) in Rhodesia (now Zimbabwe); to break sanctions on fuel and reduce importation cost, petrol (fuel) was blended (mixed) with ethanol (fuel or alcohol) to form a blended petroleum product. This product was used to fuel the vehicles. It combined the qualities of petrol and ethanol leading to the reduction of importation costs. Blending in this case was used for importation cost effectiveness. In learning, blending can be used to unify the acquisition of knowledge, behaviours, skills, values, preferences and understanding. This is used to improve and advance learning experiences. This clearly shows why this approach should be used as a means to improve student performance in Web Development course.

2.7.2 The Blended Learning Curriculum Design Model

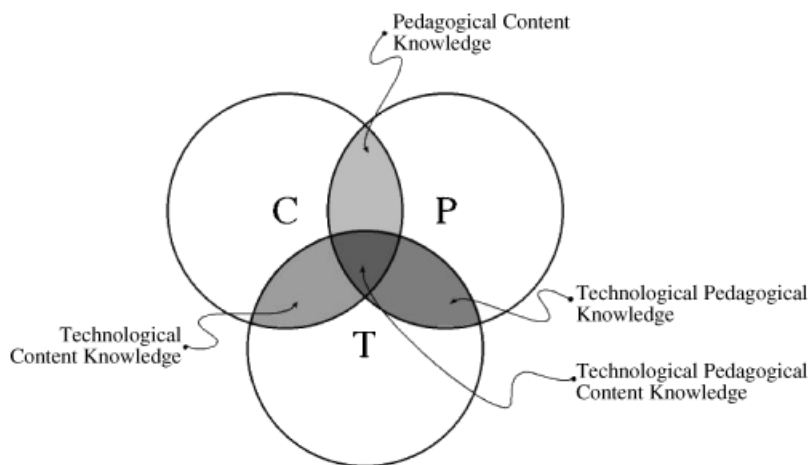
The Blended Learning Curriculum (BLC) design model comprises 1) pre-analysis, 2) activity and resource design, and 3) instructional assessment, according to Huang and Zhang (2008). Pre-analysis focuses on learners’ prior knowledge, learning styles, objectives of the course and Blended Learning environments. Activity and resource design lays out the teaching and learning activities. Instructional assessment deals with the measurement and evaluation of performance of students. Instructional assessments will also feed back to pre-analysis and activity and resource design sections. There are a number of processes which have to be followed for one to implement BL.

2.7.3 Technological Pedagogical Content Knowledge (TPCK) Theoretical Framework

Why do we need a theoretical framework in carrying out research? Research is a scientific enquiry aimed at solving problems. It should be standardized and provide dependable solutions (MacMillan and Schumacher, 1993; Slavin, 1992; Cohen and Manion, 1994). As such, a framework provides a lens through which the process of carrying out research, methodology, collection of data and the analysis and evaluation thereof, is standardized, guided and scrutinised. Theories, frameworks or models are “conceptual lenses through which to view the world” (Mishra and Koehler, 2006:1043). Quoting Chalmers (1976), Mishra and Koehler (2006) argue that the framework guides the research question, the sort of evidence to be collected, methodology and strategies for analysis and interpretation of data. With this in mind, Technological pedagogical content knowledge (TPCK) is the theoretical framework which guides this research.

TPCK focuses on technological knowledge (T), from commonplace or simple technology such as the chalkboard right up to advanced digital knowledge of ICTs, pedagogy (P), the process and practice of teaching and learning, and content (C), which brings in the subject matter. These three form a triad and the integration of all three is well illustrated in Figure 1.

Figure 1: Technological Pedagogic Content Knowledge



“Figure 1 illustrates how the three circles, Content, Pedagogy, and Technology, overlap to lead to four more kinds of interrelated knowledge” (Mishra and Koehler, 2006:1025). The implementers of BL should have all three of the pillars of technology, pedagogy and content for them to be very efficient and effective. The integration of the three (TPCK) provides valuable teaching and learning experiences. Teachers and lecturers need to adopt technology to the pedagogical strategies as most forms of software tools are usually created to solve industrial problems rather than pedagogical problems (Zhao, 2003). Educators, armed with content knowledge and pedagogy should be able to draft the technology to meet the teaching and learning environments.

In brief, in teaching web development, one needs to have content on the subject matter and pedagogy to be able to represent and use technology in the teaching of web development. In the context of BL one has to be able to integrate the traditional face-to-face and online teaching approaches. TPCK enables one to formulate and enunciate the manner in which one approaches teaching and learning (Mishra and Koehler, 2006).

2.7.4 Characteristics of Blended Learning

The three characteristics as given by Huang and Zhang (2008) are flexibility in the provision of learning resources, supporting learning diversity, and enrichment of the e-learning experience. The provision of resources is mainly through the usage of a virtual learning environment. Flexibility provides for both asynchronous and synchronous availability of teaching and learning experiences. Learning will know no boundaries; students will be able to learn anywhere and at any time without being restricted to only classroom experiences. Diversity caters for students' varying learning styles and abilities. The virtual learning environments (VLEs), collaborative learning environments (CLEs) or electronic learning environments (ELEs) provide for a number of learning pathways. The provision of rich eLearning experiences provides for collaboration through facilities such as forums, discussions, self-assessments and charts among other things.

2.7.5 The Nature of Blended Learning

Osguthorpe and Graham (2003:229) list what is to be blended: “1) Online and face-to-face learning activities, 2) Online and face-to-face students, and 3) Online and face-to-face instructions”. Singh (2003:51-54), on the other hand, provides the following as to what is to be blended: “1) Blending offline and online learning; 2) Blending self-paced and live, collaborative learning; 3) Blending structured and unstructured learning; 4) Blending custom content with off-the-shelf content; and 5) Blending learning, practice, and performance support”. This research will blend the use of SMSs, e-mail, face-to-face teaching and the use of box.net (which provide e-folder) as an electronic platform or folder.

2.7.6 Blending Web Development Courses

The many ways of blending can be derived from the above quotations (see section 2.5.3). Blended Learning calls for rethinking and redesigning the teaching and learning relationships. Some of the things which come into play are, according to Garrison and Kanuka (2004), policy, planning, resources, scheduling and support. Policy will define the way in which the blending takes shape. It will direct how Blended Learning is conducted, in terms of the time allocation for the use of an online learning approach and for the traditional face-to-face approach. Planning involves the setting up of aims and goals, and the costing and management of media. Resources look at financing, human and technical availability. Scheduling will involve the integration of traditional and online ways of presenting the course. Dedicated student support will provide to students the technology and time management. The other issues involved would be asynchronous and synchronous interactions of student-to-student, and student-to-content in the teaching and learning of web development. There are also other frameworks which have been developed, such as the Khan’s octagonal framework.

This framework elaborates on the following aspects:

- 1) Institutional (mainly administrative);

- 2) Pedagogical (teaching and learning frameworks);
- 3) Technology (hardware, software and communication utilities);
- 4) Interface design (instructional design, content development, LMS, LCMS and VLEs);
- 5) Evaluation (assessment and performance analysis);
- 6) Management (planning, allocation of resources and control);
- 7) Resources;
- 8) Support; and
- 9) Ethics.

The pedagogical dimension in a Blended Learning approach deals with the content, learners' needs and learning objectives. The technology to be used involves the use of SMSs, e-mails, electronic folders (e-folders) and internet.

2.7.7 The Need for Blending

Teaching and learning has to be blended. Osguthorpe and Graham (2003:231) clarify why blending is necessary. Blended Learning enables pedagogical richness, improving student learning. It also increases access to technology. There is increased social interaction, which leads to the idea of formation of communities of inquiry. Learner control and directing of their learning on what and why they will study are encouraged and referred to as "personal agency" (Pask, 1969). The cost-effectiveness is one of the things considered when Blended Learning is used. It increases the capacities of institutions, as there is an interchange of students between traditional face-to-face and technological-driven programmes. Not all web development concepts can be transformed fully to a computer-based or internet-based learning environment. Blended Learning often involves the facilitators or lecturers in the designing of the programmes. The programmes are simple and offer ease of revision on the resources used.

2.7.8 The Case for Blending Web Development Courses

The following views have been expressed regarding the use of Blended Learning: “We know that not all students like learning exclusively online” (Macdonald, 2008:2). “Balance of media is essential to make learning and teaching effective” (Macdonald, 2008:3). This view is also shared by Laurillard (2002). Blended Learning provides the alternatives to a traditional face-to-face classroom and the use of online technologies. This mix balances the media to be used for effective learning. It breaks the monotony where the teacher or lecturer has to stand in front of the class and deliver the lesson or lecture, with more interactive synchronous and asynchronous learning technologies. Given the advantages of blending, definitely blending the web course will bring greater value to students learning experiences. There is evidence that blending improves teaching and learning (Garrison and Kanuka, 2004:100, quoting Heterick and Twigg, 2003) that blending “increased course completion rates, improved retention, [and led to] better student attitudes”. This might also be translated to the South African context and may improve the completion rates not only in a web development course but in programme completions in general. From Stanford University and University of Tennessee cases, Singh (2003:53) shows that there was an improved completion rate and achievement of better learning outcomes. Again, the issue of an increased completion rate was established and this also might work if a web development course is blended. Blending makes the course more effective and helps in the achievement of goals set out for the course. The major problem in institutions of Higher Education in South Africa is completion rate. The use of a BL approach may go a long way in driving the increase of completion rates similar to what happened at Stanford University and University of Tennessee.

BL was also used in a number of industrial training environments, namely DIAGO PLC, Daimler Chrysler UK LTD, Avis Europe PLC, Basic Skills Agency and Computeach International (Thorne, 2003). In all cases there was an improvement in performance, coaching and training were more interesting, useful and interactive, achievement targets increased, and they saw increased pass rates.

Industrial training can be tailored and used in tertiary institutions which may end up realising the benefits of BL in a similar way to the companies which implemented BL.

Blended Learning improves communication skills, critical thinking and the assimilation of content. It also provides for communities of inquiry, which give free and open discussions on particular knowledge domains. It provides everyone with space to respond; unlike face-to-face instruction delivery on its own, which is limited to the period of the lesson, the course increases its effects to individual students. Users enjoy "... work in isolation when embarrassed by their lack of skills ..." (Thorne, 2003:110). The space for everyone to respond is provided for, via electronic platforms for the shy ones and direct responses in class when face-to-face environment is provided for less shy ones. Unlimited feedback is provided. Students can also opt to provide feedback or ask questions anonymously. Clearly, student expectations are met.

This research envisages an increase in completion rates in the web development course if BL is implemented, and consequently an increase in the programme completion rate in tertiary institutions. This will go a long way in solving this issue of low completion rates faced at Higher Institutions of Education in South Africa.

2.8 CONCLUSION OF LITERATURE REVIEW

Blended Learning can be extended to other software development courses and distance education programmes apart from the Web Development course. This further extends the performance of students in the diploma programme and adds on to an increase in the completion rate (Garrison and Kanuka, 2004; Heterick and Twigg, 2003; Thorne, 2003; Twigg, 2003; Singh, 2003).

ICT literate students work independently, as this tends to be their nature. With this added advantage, it should be easier to implement BL to students doing web development and IT programmes.

On the other hand a complete online course results in increased learner isolation and in turn an increase in dropouts. “Fully online courses also experienced higher attrition rates” (Rovai and Jordan, 2004:3; Carr, 2000). To balance this, there is a need to explore the mixing of traditional face-to-face and online technologies. This has many benefits for both the facilitator and students. The major reason for this research is to explore and establish the ways in which Blended Learning is being used to teach web development.

Blending of traditional face-to-face teaching and use of technology will be used in teaching web development at one of the participating sites. The technology will involve the use of SMSs, e-mails, electronic folders (e-folders) and internet. “Electronic mail is a convenient way to keep in touch with students, to give oneself time to reflect on an appropriate answer yet still respond within a short space of time” (Taylor, 2002:24). Online learning will provide a vehicle to distribute course materials. The box.net electronic folder will be used. The materials for students to use will be uploaded. A universal resource locator (URL) will be sent via either e-mail or SMS to students. The students are required to log on and access the materials. This can be done at any place and any time suitable to the students. The other consideration is the use of pervasive technologies, namely readily available technological gadgets such as cell phones or mobile phones. Kovalik and Hosler (2010:380) concur in that, “... almost every student has a cell phone”. The other advantage is that students do not require a lot of training in the use of these technologies. Market, Sanchez, Weber and Tangney (2005:282) note that cell phones “require no technology training and are not intimidating”. Most of the students are always texting messages on their mobile phones. The phones have become their second nature and generally the students are engrossed in them. This vehicle can be used to the advancement of introducing formative and self-assessment on technical terms used in web development. Kovalik and Hosler

(2010, 381), Cavus and Ibrahim (2009), Thornton and Houser (2005), Goh and Hooper (2007) and Lu (2008) go on to state that SMS is also useful for learning vocabulary and new technical English language. A lot of web tags or elements, which constitute the technical English, are used in web development courses and this is where SMSs become valuable.

“Blended Learning is the most logical and natural evolution of our learning agenda” (Thorne, 2003:2). It is the “... opportunity to create learning experiences that can provide the right learning at the right time and in the right place for each and every individual, not just at work, but in schools, universities and even at home” (Thorne, 2003:18). This natural evolution should be upheld unless teaching and learning become extinct by failing to adapt. It is the reasonable way to provide our learners with such valuable experiences and spells out clearly that there is a need to use a Blended Learning approach in the teaching of web development.

CHAPTER THREE

METHODOLOGY

This chapter describes the methodologies which have been used in this research. The research is based on the main research question: What are the perceived benefits of a Blended Learning Approach (BLA) in improving student performance in a web development courses? It looks at the ways which can be used to answer: 1) What are the benefits in the use of blended learning in web development? and 2) What are the perceptions of users in respect of the use of pervasive technologies as tools for blending? Both qualitative and quantitative methodologies are used.

3.1 RESEARCH METHODOLOGY

The idea of research is to solve problems. Solving educational problems is not an ad hoc or piecemeal work. It is a systematic and well organised way of collecting, analysing and interpreting data in order to solve the problem. MacMillan and Schumacher (1993:2) argue that educational research is a “scientific and disciplined inquiry using quantitative and qualitative approach”. It is a standardized process and follows established procedures to arrive at a solution. “Research is best conceived as the process of arriving at dependable solutions to problems through planned and systematic collection, analysis, and interpretation of data” (Cohen and Manion, 1994:40). Slavin (1992) also concurs. Solutions are arrived at in a logical and verifiable manner.

The research used both qualitative and quantitative approaches. The qualitative research approach involved interviews and observations. Two questionnaires were used to gather data for the quantitative research approach. One questionnaire was designed for student and the other for lecturer respondents.

3.1.1 Qualitative Approach

The qualitative method offers in-depth views and experiences from participants. It is open to new discoveries. The qualitative method is limited to the particular experiences of the respondents. By their nature, private colleges have very small classes and this led to the number of participants being small. In this research, participants came from Higher Education Colleges at which the researcher was working. Four sites out of five in Johannesburg were used for the research. The total number of the enrolled participants in web development courses was 80.

The methods used to collect data were face-to-face interviews and lesson observations. Follow-up interactive interviews were conducted with the lecturers after the use of questionnaires. This was done in order to get a deeper understanding of the responses provided. Observations in class were used to capture the strategies used by the lecturers.

The student questionnaire (see Appendix B) was divided into three sections. The first section was used to collect the demographic information on the students. Section two had yes and no questions. This was designed to elicit information related to answering the research question:

What are the perceived benefits of a Blended Learning Approach (BLA) in improving student performance in a web development courses?

Section three had questions with a Lickert scale aimed at eliciting information related to:

What are the perceptions of users on the use of pervasive technologies as tools for blending?

It was also used for the question:

What are the benefits in the use of blended learning in web development?

and the use of open ended questions at the end was in line with this question. The lecturer questionnaire was similar to that of the students with the first section looking at demographic information. The second section, with questions with a Lickert scale elicited information on:

What are the benefits in the use of blended learning in web development?

and section three and four looked at the sub question and main question:

What are the perceptions of users on the use of pervasive technologies as tools for blending?

What are the perceived benefits of a Blended Learning Approach (BLA) in improving student performance in a web development courses?

The interview questions were used to collect more information from the lecturers on how a BL approach is used in teaching web development to improve student performances. The observation instrument was used for data triangulation. Triangulation provides for cross-examination of data collected and enhances the validity of the data collected. The advantages and disadvantages of these instruments are discussed in the ensuing paragraphs.

An interview offers a face-to-face meeting between two or more people in which the respondent answers questions posed by the interviewer (Manion and Cohen, 1994; Macmillan and Schumacher, 1993; Silverman, 2000; and Slavin, 1992). The researcher used semi-structured interviews. The advantages of interviews include a high success rate of obtaining responses as compared to questionnaires; the interviewer can clarify questions where the respondent does not understand; it also allows estimation of attitudes due to observations on non-verbal communication by respondents such as observing facial expressions; and can provide a sound basis for the development of a questionnaire. The disadvantages of interviews are that they are time-consuming; when looking for a suitable place to carry out the interview.

The questionnaire presents information to respondents in writing and requires written responses from the respondent, in the form of short answer, word, tick and circling. The questionnaire permits anonymity, provides the opportunity for a respondent to think through answers before responding, can be given to many people at the same time, provides greater uniformity in measurement situations, data collected is easy to analyse and can be administered directly, by mailing or electronically. The major disadvantages of questionnaires are that they do not

provide flexibility of responses and the return rate may be low (Leedy and Ormrod, 2005; Zikmund, 1987). To avoid the lower return rate, the researcher administered the questionnaires in person, allowed the respondents to respond and collected the completed questionnaires within the lesson or time allowed to do data collection.

Observations gave the researcher the opportunity for direct contact with the population under investigation. It provided first-hand information and was a primary source for data collection. The disadvantage of this method is that any person under observation may behave differently or might manipulate what is to be provided to the observer. Three lessons were observed where web development lessons were conducted. Face-to-face lessons were observed and the researcher was on the lookout if the lecturers refer students to any form of online environments and reference on the usage of any BL approach. Permission was sought before the lesson observation. The students were informed well in advance before the lessons were observed.

Given the advantages and the disadvantages of the research instruments, it was in the best interests of the research to use these three so that one countered or obtained a good balance in terms of the utility values presented. Questionnaires, interviews and observations provided for data triangulation. Triangulation provides for cross-examination of data collected and enhances the validity of the data collected.

3.1.2 Quantitative Approach

A quantitative approach is considered the best to use if research involves identifying variables, which influence outcomes (Creswell, 2003). Quantifiable variables included the ratio of students to workstations and the availability of mobile devices to the students. The quantitative approach identifies and explains relationships of measurable variables (Leedy and Ormrod, 2005). The measurements can be repeated and findings compared to a standardised test

without any bias (Inn, 1996). If one had to check on the variables considered one would get similar findings. Questionnaires were distributed to lecturers and students. The researcher asked for time for participants to complete the questionnaires which were then collected by the researcher. This ensured that a large percentage of the questionnaires were returned. There is a general trend towards a high non-response rate (Zikmund, 1987; Leedy and Ormrod, 2005). Collecting questionnaires may contribute to more truthful and sincere responses as respondents are assured of confidentiality, although the quality of feedback may be determined by the comprehension and understanding of the respondents (Leedy and Ormrod, 2005). A questionnaire has an advantage of directed and close-ended questions. This will limit amassing unrelated and unnecessary information. However, questionnaires may not provide in-depth understanding of respondent opinions.

The structure of the questionnaire enabled the researcher to collect demographic information of the respondents. This looked as if the respondents have the prerequisite technological content. The information gathered was grouped into three sections for the questionnaire used for the students and four sections for that used for the lecturers. The student questionnaire had the following sections: demographic information, technologies used in Blended Learning and views on the use of face-to-face, online and electronic teaching, and learning in web development. The sections for the lecturer questionnaire were: demographic questions, opinion on the use of Blended Learning, the extent to which Blended Learning was used, and the use of pervasive technologies.

When the responses were collected, the data was tallied and descriptive statistics were used to cross-tabulate the data. The analysis of the data is explained in chapter 4.

Documents on students' pass rates and other related issues in web development courses were obtained from the participating institutions for analysis. The documents comprised result analysis sheets compiled by the national office of the

participating colleges. These were used to determine if there is any improvement in the quality and pass rates of students, visa-a-vie any trend in increase of completion of the course. The use of both qualitative and quantitative methods also triangulates data collection.

3.2 POPULATION AND SAMPLE

3.2.1 Population

The research sample involved the lecturers and students in the chosen colleges. The participants in this study consist of lecturers involved in the teaching of web development and students studying web development.

3.2.2 Sample and Sampling Method

Two levels of sampling were used. To start with, the researcher had to consider how many colleges would be used. A tool sample size calculator (www.surveysystem.com, 2010) was used. The sample size calculator is a free tool provided by Creative Research Systems. It determines the population needed to be interviewed in order to get results that reflect the target population as precisely as needed. The tool provided a scientific empirical base for sampling and determining the number of colleges to be used in the research. The confidence level was set at 95% and a confidence interval of 18.52. The sample size calculator then gave four colleges to be used out of five colleges. With this confidence level the researcher settled on using four colleges.

Having considered the number of colleges to be used, the second level of sampling was to get the number of participants. Purposeful and convenience sampling was used, which has a deliberate selection of participants, in order to have respondents who contribute valuable information to the study (Silverman, 2000). The respondents selected are either teaching or learning web development courses at the chosen colleges. The total number of participants for the student

questionnaire was 57 out of 80 enrolled in the web development course. The other students were not available during the times when the researcher was collecting the data, so a 71% response rate was achieved. The researcher had aimed to use all students doing web development. The size of the sample could be considered adequate (Ritchie, Lewis and Elan, 2003). The lecturer questionnaire was distributed to the four lecturers teaching web development at the four colleges. The lecturers were also interviewed by the researcher. The researcher went on to carry out lesson observations taught by the same lecturers. The aims of the observations were to have primary collection of data to see if lectures would lead to the usage of a BL approach. It also provided the aspect of triangulation of data collection.

3.3 THE RESEARCH INSTRUMENT

Three research instruments were used (see Appendices B, C and D in this report). Two questionnaires were used, one for the students doing web development courses and the other for lecturers involved in the teaching of the courses. The third instrument was an observational tool, which was completed by the researcher. This completes the aspect of triangulation of data collection which has already been explained under section 3.1.1.

3.4 DATA COLLECTION PROCEDURES AND ANALYSIS

Questionnaires were administered to both students doing the web development course and lecturers teaching the course. The questionnaire for students was modified to suit their language level and only to include items pertaining to them. An interview instrument was used as a follow-up to the questionnaire distributed to the lecturers. The third approach was doing lesson observations. No electronic equipment was used for recording. A pre-formulated observation sheet (see Appendix E) was used to record the observations.

Of the initial four colleges targeted for this research, only three gave their consent. The other college asked for more information which was supplied to them, but they did not respond. Therefore, 57 students completed the questionnaire out of a population sample of 80, a 71% achievement. The students who did not complete the questionnaire were absent on the days the questionnaires were distributed. All the lecturers involved in the teaching of web development completed the questionnaire, although one lecturer did not complete two items of section three of the questionnaire and a second did not answer a short response question.

The lecturer interviews took between 30 minutes and an hour. These interviews were conducted in rooms of the lecturers' choice at the college sites used in the research.

According to Oakshott (2006:84), "Knowing which category your data falls into is very important as it determines what type of statistical analysis you perform". The data collected ranged from discrete to ordinal and nominal data types. Discrete provides unit values such as numbers of people involved which is countable and are complete units, (for example see section 2, and question 10 in Appendix B). The ordinal data type collected provided ratings or ranks to individual items where the respondents had to circle or tick to strongly disagree, disagree, neutral, agree and strongly agree (for example see section 3, question 5 in Appendix B).. Nominal data does not provide any order in what is responded to. Ordinal and nominal data can be referred to as categorical data. The data can be placed in groups (for example see section 2, question 10 in Appendix B, values of this question have been grouped to come up with figure 2: Web sites liked by student participants, section 4.1.3). With this type of data type collected, mainly descriptive statistical analysis and presentation was used. Data collected was tallied and aggregated for each college and a total of all colleges were tallied. Aggregation was also in line with the ethical considerations which were promised in the consent forms: that data and information collected will be used in group response input to keep the individual responses anonymous. Summarisation and interpretation of qualitative data or responses were done.

3.5 LIMITATIONS OF THE STUDY

One of the sites did not give consent for the research to be carried out. This reduced the size of the population sample. The confidence interval was still satisfied. Generalisation of findings could not be done. The type of data collected was mainly ordinal data type. It does not provide for the mathematical allocation of values to the responses. There is no implied ranking of the data collected.

3.6 VALIDITY AND RELIABILITY

This study can be replicated using a similar methodology. The instruments used to collect data are accurate. Golafshani (2003) and Moss (1994) argue that reliability and validity is a measure if results can be reproduced and be consistent under similar methodology. The number of students in private colleges is relatively small. The researcher does not envisage a drastic growth in numbers so the degree to which data is collected repeatedly cannot vary a great deal from this research. The usage of a tool sample size calculator (www.surveysystem.com, 2010) provides for the number of colleges to be used in this research. The sample size calculator was used to determine the population needed to be interviewed in order to get results that reflect the target population as precisely as needed. The confidence level was set at 95% and a confidence interval of 18.52. The sample size calculator then gave four colleges to be used out of five in Johannesburg. The responses fell within the calculated confidence level. The size of the sample could be considered adequate (Ritchie, Lewis and Elan, 2003).

3.7 ETHICAL CONSIDERATIONS

Although an ethical clearance was sought and granted before carrying out the research, the nature of this research does not raise many ethical considerations beyond the usual need for keeping respondents identities anonymous and aggregating the responses for the research report. The researcher first applied for

consent to carry out the research with the colleges' authorities, these being the principals, of whom consent was granted by three colleges. Consent from individual students and lecturers were sought, and both students and lecturers signed the consent forms. All the students who participated were above the age of 18, the legal majority age. The ethical clearance application was submitted to the University of the Witwatersrand ethical clearance committee through the Wits School of Education and the clearance to carry out the research was granted. The application was submitted with the consent letters from the participating colleges.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

This chapter reports on the use of a Blended Learning approach to improve student performance in web development courses in South African Higher Education Institutions. “For many reformers, Blended Learning is an exciting instructional model because it combines the best elements of both face-to-face and online instruction” (www.eschoolnews.com, 2010:2).

The major research question was: What are the perceived benefits of a Blended Learning Approach (BLA) in improving student performance in a web development courses? The sub-questions were: What are the factors affecting the use of a Blended Learning approach at sites in South African Private Higher Education Institutions?; What can be blended in web development courses to improve student pass rates?; What are the benefits in the use of blended learning in web development?; and What are the perceptions of users on the use of pervasive technologies as tools for blending? Of the initial four colleges targeted for this research, only three gave their consent. The other college asked for more information which was supplied to them, but consent was not forthcoming. Only two items were not completed in the student questionnaire. The last two questions are the ones missing information.

4.1 RESPONSES FROM STUDENT QUESTIONNAIRES

4.1.1 Demographic Profile of Respondents

Table 1 below summarises the demographic profiling of the respondents. It shows the number of respondents per occupational category. A “student” refers to full-time students who are not engaged in any form of employment. Students / Employed are full-time students who also work after or before lectures. Full-time students constituted 96% of the respondents, of which 82% of respondents were

male. The age group 18 to 21 is predominant at 81%. The bulk of the respondents have matriculated, i.e. 98%.

Table 1: Demographic profile of student respondents

	Category	Number of respondents	Percentage
Occupation	Student	55	96
	Student / Employed	2	4
Gender	Male	47	82
	Female	10	18
Age groups	18 to 21	46	81
	22 to 30	10	17
	31 to 40	1	2
Educational level	Grade 12	56	98
	Diploma	1	2

4.1.2 Technology Usage by Student Respondents

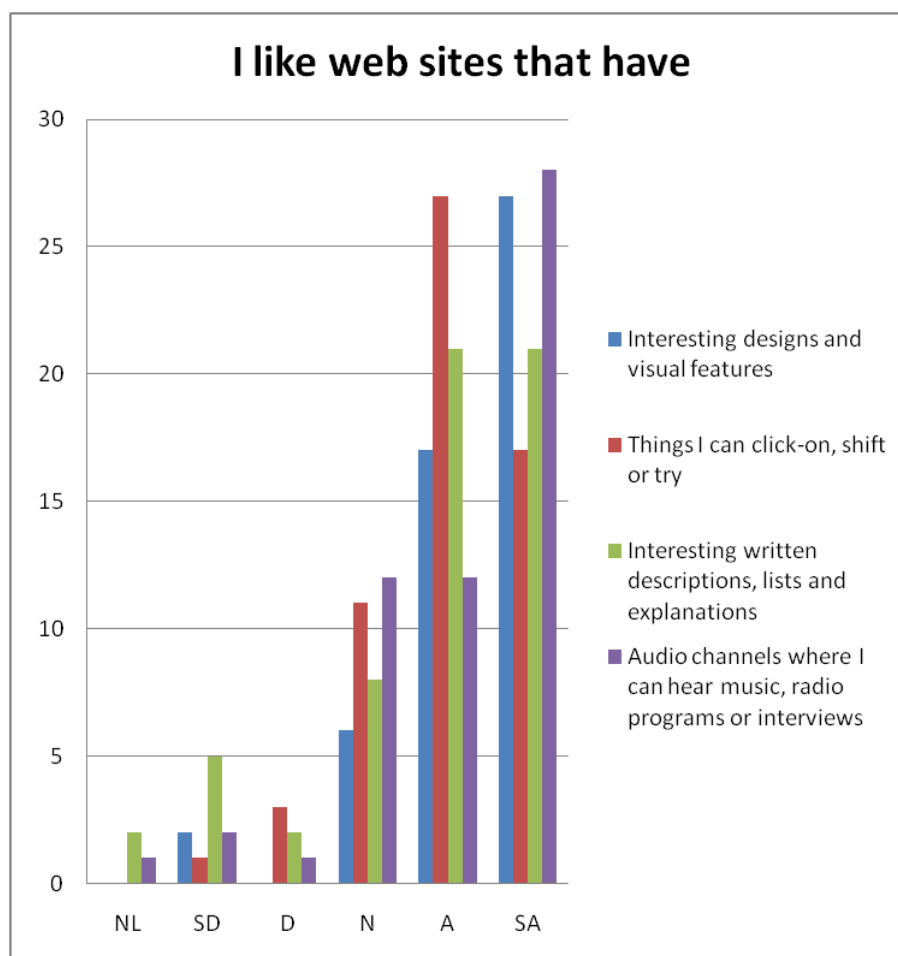
Ninety-six per cent of the respondents have mobile phones, 63% have used e-mails and 91% have used the internet in learning web development. Only 12% have used SMSs, while 16% used mobile phones in learning web development.

The availability of mobile phones might not positively correlate to the usage of the technology to learning.

4.1.3 Ranking of Perceptions on Blended Learning

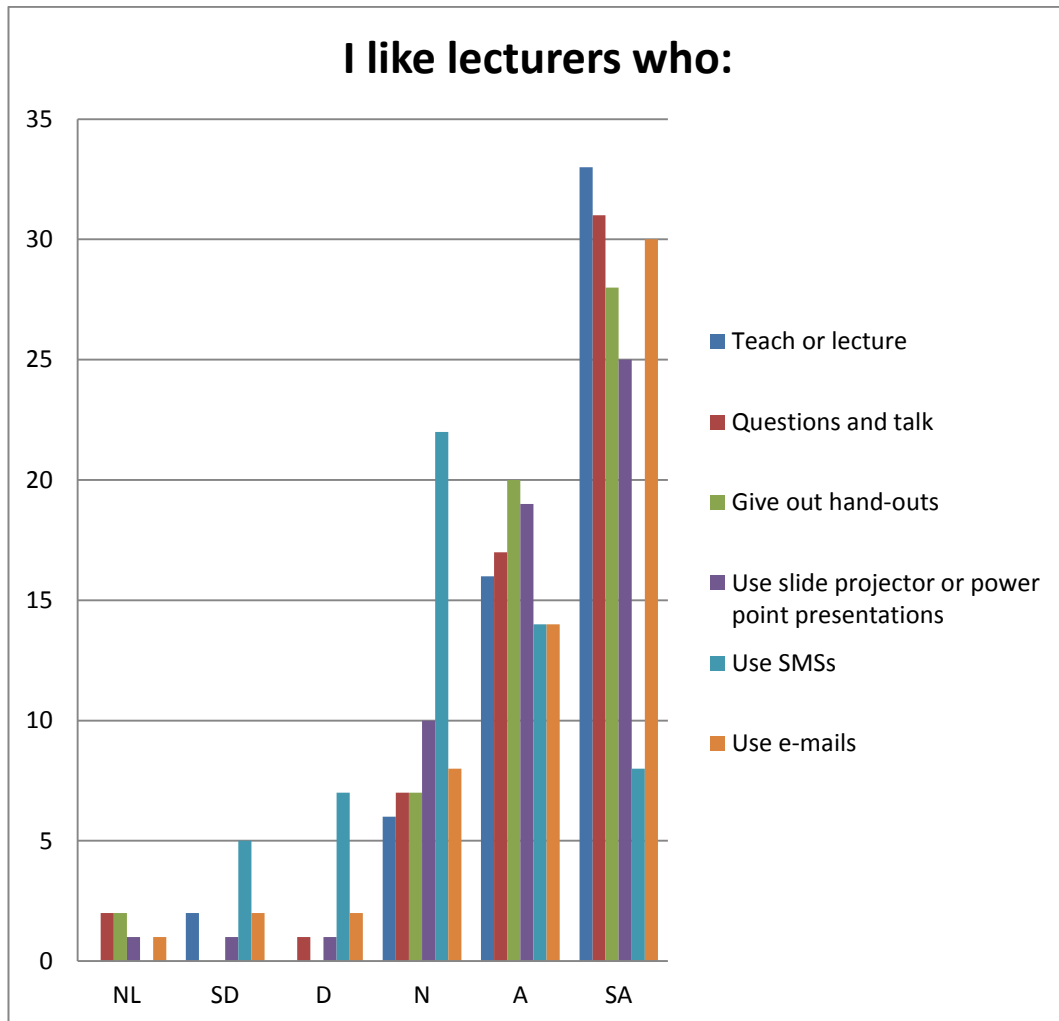
Fifty-seven students completed the questionnaire of a population sample of 80. This is a 71% achievement. The students who did not complete the questionnaire were absent on the days the questionnaires were filled in. The graphs which follow show: Figure 2 - Web sites liked by student participants; Figure 3 - Comparison of face-to-face and blended method; and Figure 4 - Comparison of preferences of media.

Figure 2: Web sites liked by student participants



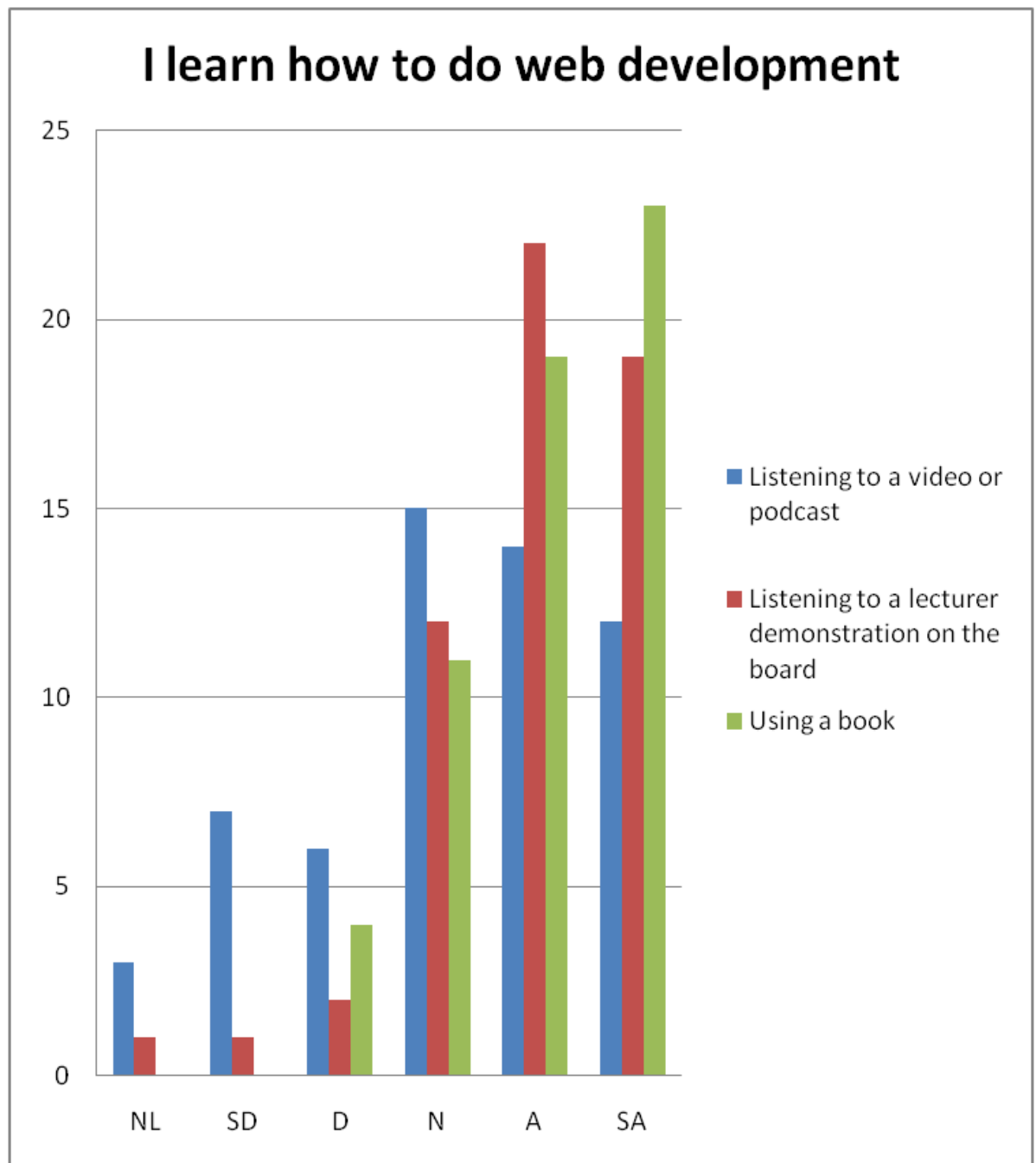
Key: NL – Null Value, SD – Strongly Disagree, D – Disagree, N – Neutral, A – Agree and SA – Strongly Agree.

Figure 3: Comparison of face-to-face and blended method



Key: NL – Null Value, SD – Strongly Disagree, D – Disagree, N – Neutral, A – Agree and SA – Strongly Agree.

Figure 4: Comparison of usage of media



Key: NL – Null Value, SD – Strongly Disagree, D – Disagree, N – Neutral, A – Agree and SA – Strongly Agree.

4.1.4 The Usage of Blended Learning

Sixty-eight per cent agreed that the use of technology improves understanding of the concepts. Some of the responses given included: “improve communication, complementary, improves understanding and interest”.

4.1.5 Suggested Technologies for Use with Blended Learning

This includes both software and hardware to be used. The software mentioned included Notepad, JavaScript, Microsoft (MS) FrontPage and MS Expression. Hardware and related technologies given are: internet, videos, computers, SMSs, email, mobile phones, podcasts and media players.

4.2 RESPONSES FROM LECTURER QUESTIONNAIRES

4.2.1 Demographic Profile of Respondents

Table 2 below shows the number of respondents per occupational category. Student / Lecturer only refer to lecturers who are teaching web development and doing further studies. Web Development Lecturer refers to lecturers who only teach web development and were not engaged in any studies at the time of the research.

Table 2: Demographic profile of lecturer respondents

	Category	Number of respondents	Percentage
Occupation	Web Development Lecturer	3	100
Gender	Male	1	33
	Female	2	67
Age groups	20 to 29	1	33
	30 to 39	1	33
	40 to 49	1	33
Educational level	Diploma	1	33
	Undergraduate	1	33
	Postgraduate	1	33

4.2.2 Ranking of Perceptions on Blended Learning

The number of respondents is three, which is very small. This was the number of lecturers involved in the teaching of web development at the three colleges. All the lecturers agreed that Blended Learning improves dialogue, exploration sharing, collaboration, interest, quality, and participation, personalises the learning environment, discussion, community of inquiry, interaction, repeated opportunities and immediate feedback. The item which they strongly disagreed

with was: What is your view that Blended Learning and use of educational technology destroys human relationships, group learning? Two lecturers completed this item and agreed that a Blended Learning approach, if used, stimulates the students in learning and improves understanding of concepts taught.

4.2.3 Usage of Blended Learning in Teaching Web Development

All lecturers indicated that they have used a blended approach in teaching web development courses. Again, three respondents were involved.

4.2.4 Extent to which Readily Available Technologies have been used in teaching Web Development

Of the respondents, 100% have mobile phones, 63% have used e-mails and the internet and 33% used mobile phones in teaching web development. None of the lecturers used e-folders to make web development materials available to their students.

4.2.5 Suggested Technologies for use with Blended Learning

All provided cell-phones as a technology to be used. The reason given was that it is readily available. The other technologies suggested were the use of SMSs, IMMs, e-mails, You Tube videos, virtual learning environments and virtual libraries.

4.3 INTERVIEW RESPONSES

The lecturers have directed their students to use on-line tutorials. These are mainly found on the W3 Schools web site. The other method which they have used was to develop a web site where notes for the course were deposited. In the use of Blended Learning, lecturers indicated that their roles will then focus more on

facilitation: “If Blended Learning is to be used, lecturers become facilitators rather than lecturing”.

The students and lecturers have skills required for them to effectively participate, teach and learn if Blended Learning were to be used. This was an indirect admission from the lecturers that a Blended Learning approach was not being used.

4.4 LESSON OBSERVATIONS

In all the lectures observed, the lecturers used face-to-face teaching. No educational technologies were used. Most of the traditional presentations of lessons prevailed. The lecturer would start by introducing the objectives of the lesson, then go on to illustrate on the board. Thereafter the students would be assigned to do short exercises on the concepts covered. The other lesson observed was more or less of the lecturer going through the objectives of the modules. The lecturer asked questions on the coverage of these objectives and the students would point out the areas which they were not comfortable with, that is, the areas that they felt were not adequately covered during the course of the semester. The lecturers would then explain the concepts to students. At the end the students were given past examination papers to work through.

4.5 SUMMARY OF RESULTS AND DISCUSSION

The students’ responses indicate an appreciation of the use of technology in the learning of web development. The lecturers acknowledged that a Blended Learning approach can be used in most of their information technology courses. They also indicated that Blended Learning can improve the students’ performance in web development courses. There is very little evidence of the use of educational technologies, much less a Blended Learning approach as observed by the researcher during lesson observations.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

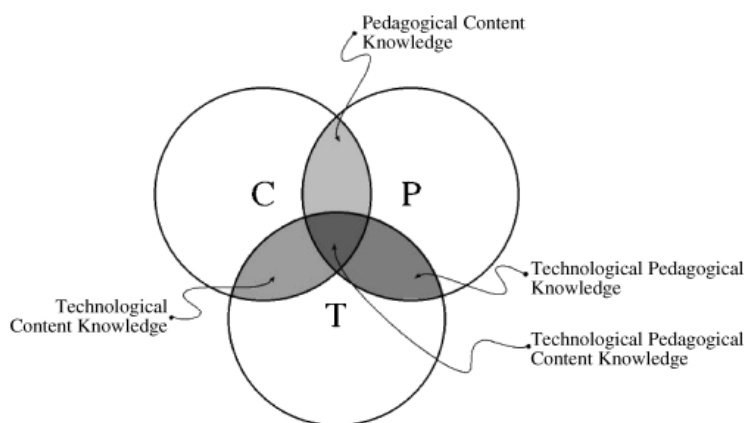
This research explored the use of a Blended Learning approach in South African Higher Education Institutions. The main research question that the study set out to answer was: How can a Blended Learning approach (BLA) be used to improve student performance in a web development course? It attempted to determine to what extent this approach is used in Private Higher Education Institutions. The research has presented the results and the results analysis (Chapter 4). The results show that there is very little usage of a BL approach in the teaching of web development course. A BL approach, from the literature review, involves meaningful combination or integration of traditional classroom face-to-face and online teaching approaches (Osguthorpe and Graham, 2003; Garrison and Kanuka, 2004; Singh, 2003; Valiathan, 2002; Smith, 2001). This is not so for the private higher education colleges where the research was carried out. The colleges are still engrossed in the traditional face-to-face lesson presentations. The focus on small classes and the type of business models in private colleges' leads to more traditional face-to-face learning and teaching experiences (Maldonado-Maldonado, *et al* 2004; Kruss, 2004). This was also noted during lesson observations by the researcher. Some of the experiences which could be noted include the involvement of students in communities of learners, social interactions, constructive learning experiences and usage of LMSs for one to point out that a Blended Learning approach is used. However, none of these approaches was in evidence in any way. The students are only referred to sites for them to read through the content. The major site which the students are referred to in these private colleges is W3Schools. The notion of usage by lecturers and students during their lessons is seen simply as their basic interaction with the Internet and technology platforms.

5.2 CONCLUSION

The colleges which participated in this research are competent enough to implement a Blended Learning approach. ICTs are readily available, the computer laboratories are well equipped with computers, overhead projectors, television receivers and video players and proxima projectors. The availability of mobile devices to students is 99%. It is very unfortunate that only one of the colleges had to an extent used Blended Learning as identified in the relevant literature. In the other colleges, there was a lack of understanding of the very basic principles of Blended Learning on the part of the lecturers, even though the expectation is that lecturers should deliver world-class Blended Learning principles. Relatively there was only internet or web-based solutions present in the colleges.

Lecturers involved in this research thought the mere use of computers, internet or web sites constitutes Blended Learning. There are a lot of misconceptions. Lecturers are not aware of their lack of engagement with a Blended Learning approach. From the demographic profiling of lecturers (Section 4.2.1), lecturers have what is referred to as the technological content knowledge (Dagada, 2004; Mandell, Sorge and Russell, 2002; Mishra and Koehler, 2006; Wang and Woo, 2007). The lecturers lack the pedagogical aspect. They fail to operate in the intersection of these three (the triad intersection) as illustrated by the diagram below.

Figure 5: Technological Pedagogic Content Knowledge



Source: Mishra and Koehler, 2006:1025

The lecturers need to integrate the three for successful implementation of a Blended Learning approach. Students are able to use the computers and related technologies for a Blended Learning approach as shown by the demographic profiling, Section 4.1.1 and from lesson observations, Section 4.4. The traditional face-to-face lecture activities should also be integrated with e-learning-based activities. Students are also very enthusiastic about the potential use of technologies in learning as observed by the researcher. This can be exploited and used to the advantage of blending the programmes for improved student learning experiences.

These findings are limited to the few private colleges which participated in the research. The lessons learnt from this research are useful to both private and public higher education colleges. The lecturers need to integrate the three spheres of knowledge, namely knowledge, pedagogy and content. “It has already been mentioned that being conscious of the pitfalls and managing problems enables organisations to integrate successfully in the corporate learning environment” (Dagada, 2005:127). The same is true for the colleges in higher education to consider the important insights from this research for the future successful implementation of a Blended Learning approach across different subject areas or courses. The successful implementation of Blended Learning may lead to improving programme completion rates (Singh, 2003). The fact that the participating colleges in this research are adequately equipped to implement Blended Learning gives great assurance for teaching and learning experiences in all colleges having such well-equipped facilities.

Blended Learning can provide the coined five Cs: Creativity, Collaboration, Critical thinking, Communication and Character (Strauss and Myburgh, 2001). When students collaborate, they form communities of practice. In collaboration the group of students will work together towards collective goals and aims. This engages students intellectually and can be done both face-to-face or on an e-learning platform. By engaging in collaboration, the students also learn how to communicate and build on the characteristics which are useful in the world of

work during their learning experiences. Creative work is also enhanced as the students learn critical thinking skills to solve practical problems assigned to them. A Blended Learning educational rationale is to provide for “deep learning” and active participation of students in activities which build communities of practice (Huang and Zhang, 2008).

5.3 RECOMMENDATIONS

From this research it is apparent that there is a need for lecturers to be trained to operate in the triad sector of integrating the Technology, Pedagogy and Content Knowledge (TPCK) (Mishra and Koehler, 2006). This could make a significant contribution in assisting the lecturers to implement Blended Learning. The training of lecturers in the chronological step-by-step implementation of the BLC model (Huang and Zhang, 2008) will assist in integrating traditional face-to-face approaches and online learning approaches. A stronger commitment from lecturers to begin to implement such innovative approaches is an important component in achieving greater use of a Blended Learning approach in South African institutions of higher learning.

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APPENDICES

Appendix A: DEFINITION OF TERMS

The following concepts and terminology were used, as defined by Dagada (2009):

Asynchronous learning: Interaction of learning through the facilitator or media and the learner has a time delay.

Blended Learning: Learning which combines traditional and on-line learning.

Computer-Based education/training/learning: Usage of computers in training and management of training.

Content Management System: Software, which controls and enables the design, development, testing, approving and posting of content on web pages.

E-folders: electronic folders that one can create, edit, delete and append data, information, notes and related documents. These are internet based and are available anywhere where one can access them on the internet. These include box.net, dropbox and skydrives.

E-portfolio: electronic portfolio is a purposeful collection of student work that illustrates a learner's effort and achievements (called artefacts) in various aspects of learning (Wade, Abrami and Sclater, 2005).

Face-to-face learning: The traditional classroom learning process.

Information communication technologies (ICTs): "represent the convergence of information technology and communication technology" (Government Gazette, 2004:15). ICTs are a combination of the use of computer technology and communication technology. Computer technology includes hardware, software, communication networks, and the exchange, dissemination and management of information and knowledge.

Learning management systems (LMS): Automates the learning administration.

Learning content management systems (LCMS): A learning content management system is a related technology to the learning management system, in that it is focused on the development, management and publishing of the content that will typically be delivered via an LMS.

Online community: Web-based or internet-based communication or collaboration space.

Online learning / electronic learning / computer-integrated education (CIE): learning is provided by use of computers and computer networks. The facilitator and learner might be separated.

Synchronous learning: Real-time, or at the same time learning. Facilitator and learner are connected at the given point in time.

Teleconferencing: Two-way communication geographically spaced using audio and visual communication systems.

Virtual classroom: Web-based or on-line space used by learners and facilitators to conduct lessons.

Virtual learning environment (VLE): Web-based or on-line space or system to support teaching and learning.

Appendix B: Questionnaire answered by students

Dear Survey Respondent

This survey forms part of a course requirement for Master of Educational Technology degree at the University of Witwatersrand. The course requirement is to perform research in the teaching of Web development. The results from this survey are purely for academic purposes.

The sole purpose of this study is to look at the mixing of traditional face-to-face, online and electronic teaching in web development. Participation in the survey is voluntary and confidential. No personal contact information is required. All responses will be anonymous. Your responses form part of a group of responses input to the research project.

The three sections of the questionnaire are:

- Section 1: General information on respondent
- Section 2: Are readily available technologies used?
- Section 3: Views on use of face-to-face, online and electronic teaching and
 learning in web development.

The survey is quick and easy. It requires either ticking or circling your answers.

Thank you for participating in this research.

Taurai Hungwe

MEd Student

University of Witwatersrand

Section 1: The questions below are to provide background information.

Please circle the appropriate option.

1.	Career/Livelihood	Student			Student and Employed	
2.	Gender	Male			Female	
3.	Age group in years	17 and below	18-21	22-30	31-40	41+
4.	Educational level	Grade 12	Diploma	Undergrad	Postgraduate	Other/Specify

Section 2: To what extent have readily available technologies been used?

Please circle your answer.

5.	Do you have a mobile phone?	Yes	No
6.	I have used SMSs in learning web development.	Yes	No
7.	I have used mobile phones in my web development programme	Yes	No
8.	I have used e-mails learning web development.	Yes	No
9.	I have used the internet in learning web development.	Yes	No

Section 3:

Please tick your appropriate option in the corresponding box.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly
10.	I like web sites that have:					
	Interesting designs and visual features	2		6	17	27
	Things I can click-on, shift or try	1	3	11	27	17
	Interesting written descriptions, lists and explanations	2	5	2	8	21
	Audio channels where I can hear music, radio programs or interviews	1	2	1	12	28
11.	I like lecturers who:					
	Teach or lecture	2		6	16	33
	Questions and talk	2		1	7	31
	Gives out hand-outs	2			7	20
	Uses slide projector or power point presentations	1	1	1	10	19
	Use SMSs		5	7	22	14
	Use e-mails	1	2	2	8	14
12.	I learn how to do web development best by:					
	Listening to a video or podcast	3	7	6	15	14
	Listening to a lecturer demonstration on the board	1	1	2	12	22

	Using a book		4	11	19	23
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13. Do you think use of technology improves your understanding in web development? Why?

14. What technologies would you suggest to be used for learning web development? Why?

Appendix C: Questionnaire answered by lecturers

Dear Survey Respondent

This survey forms part of a course requirement for Master of Educational Technology degree at the University of Witwatersrand. The course requirement is to perform research in the teaching of Web development. The results from this survey are purely for academic purposes.

The sole purpose of this study is to explore the use of Blended Learning in the teaching of web development. Blended Learning combines traditional face-to-face and on-line learning. It is an integration of classroom face-to-face learning and online experiences. It is the complementary use of combined multiple delivery media to promote learning (Dagada, 2009; Garrison and Kanuka, 2004; Singh, 2003).

Participation in the survey is voluntary and confidential. No personal contact information is required. All responses will be anonymous. Your responses form part of a group of responses input to the research project.

The three sections of the questionnaire are:

Section 1: Demographic questions.

Section 2: Does Blended Learning improve the teaching of web development?

Section 3: Have Blended Learning been used?

Section 4: Are pervasive (readily available) technologies used in teaching web development?

The survey is quick and easy. It requires either ticking or circling your answers.

Thank you for participating in this research.

Taurai Hungwe

MEd Student

University of Witwatersrand

Section 1: The questions below are to provide background information.

Please circle the appropriate option.

1.	Career / Livelihood	Student Lecturing	and	Web Development Lecturer	Others Specify	
2.	Gender	Male			Female	
3.	Age group in years	18 to 19	20 to 29	30 to 39	40 to 49	50+
4.	Educational level	Diploma	Undergraduate	Postgraduate / Honours	Masters	Other/Specify

Section 2:

Please tick your appropriate option in the corresponding box.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly
5.	Blended Learning improves:					
	Dialogue	1			1	1
	Exploration sharing	1			1	1
	Collaboration					3
	Interest					3
	Quality					3
	Participation				1	2
	Personalise the learning environment				1	2
	Discussion				2	1
	Community of inquiry				2	1
	Interaction			1		2
	Repeated opportunities					3
	Immediate feedback				1	2
6.	What is your view that Blended Learning and use of educational technology destroys human relationships, group learning.	2			1	
7.	Does the use of educational technologies improve the teaching of web development?				1	2

Section 3:

Please circle your option.

8.	I have used Blended Learning web development.	Yes	No
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9.	I have used online and face-to-face learning activities.	Yes	No
10.	I have used online and face-to-face student activities	Yes	No
11.	I have used online and face-to-face learning instructions.	Yes	No
12.	I have implemented blending offline and online learning.	Yes	No
13.	I have implemented blending structured and unstructured learning.	Yes	No
14.	I have implemented blending self-paced and live, collaborative learning.	Yes	No
15.	I have implemented blending custom content with off-the-shelf content.	Yes	No
16.	I have implemented Blended Learning, practice, and performance support.	Yes	No

Section 4:

To what extent has pervasive technologies been used?

17.	Do you have a mobile phone?	Yes	No
18.	I have used mobile phones in teaching web development.	Yes	No
19.	I have used SMSs in teaching web development.	Yes	No
20.	I have used e-mails in teaching web development.	Yes	No
21.	I have used e-folders in teaching web development.	Yes	No

22. What is your opinion in the use of Blended Learning in teaching web development? Why?

23. What technologies would you suggest to be used for teaching and learning web development? Why?

Appendix D: Interview questions

1. State the methods that you use to teach Web Development.

2. If you are to improve your student pass rate, which methods of teaching will you recommend and why?

3. Which technologies do you use when teaching web development?

4. Name the web sites you have recommended to your students for the web development course.

5. How many students are currently enrolled in the web development course?

6. How many students were enrolled for web development course and how many passed in the years:

2009_____

2008_____

2007_____

7. To what do you attribute these pass rates?

8. What are the roles of teachers or lecturers if Blended Learning is to be used in teaching web development?

9. What facilities would enable Blended Learning?

10. Which of these facilities are available at your institution?

11. Which electronic lesson deliveries have you use?

12. Are there any prerequisite skills for lecturers or students for one to implement Blended Learning? Which are these prerequisites if any?

13. Can students self-instruct in web development?

14. What is the rule on use of mobile phones in the institution?

15. What other academic and administrative components could be delivered using mobile phones?

16. For which other subjects can Blended Learning be implemented?

17. What is your understanding of Blended Learning?

Appendix E: Observation instrument

Lecturer's Name			
College			
Date of Observation		Classroom Venue	
Start Time of Observation		End Time of Observation	
Programme and Module			
SELF REFLECTION			
Date of completion of this document			
Lecturing methods used			
Educational technologies used			
What other things, methods or technologies could have been used?			
THE REFLECTIVE PRACTITIONER: COMMENTS			

Lecturer's Signature _____

REVIEW OF TEACHING SKILLS BASED ON BEST CLASSROOM PRACTICE		
ADVANCE PREPARATION OF STRATEGIC LESSON DESIGN		
1	Uses specific teaching strategies to meet the learning outcomes to accommodate the student	
2	Evidence of well-planned additional quality materials and learning activities; e.g. notes (hand outs), readings, worksheet, quiz, key questions, PowerPoint presentation, multimedia, video/audio clips, OHP transparencies.	
ATTENTION TO METHODOLOGY FOR THE LEARNING EXPERIENCE		
3	Makes use of different visual aids; e.g. photographs, posters, samples, etc.	
5	Promotes student use of the library to access information and refers them to additional materials; e.g. relevant readings/websites/databases, etc.	
6	Promotes the use of multimedia/technology to support best teaching practice through own use of appropriate technology, where relevant.	

Observer's Signature _____

Appendix F: IIE Policy and regulations

- a) use a cellular telephone during any academic period, i.e. lecture, seminar, tutorial, laboratory session or examination;
- b) bring within the precincts of the Institute, or have in his or her possession or control, or supply or dispose of to any other person within the precincts of the Institute, any firearm of any kind; and
- c) bring within the precincts of the Institute, or have in his/her possession or control, or supply or dispose of to any person within the precincts of the Institute, any object which is capable of being used for the infliction of bodily harm.
- d) visit no any pornographic site or view, download or save pornographic material from any source through the use of IIE equipment.¹

¹ Item .1.3.2 h - S: 2008-11-20

Appendix G: Collected usage of e-folders

- Someone has previewed your 'ALT model answer to sms question.docx' file on Box.net

Box.net

Box.net
noreply@box.net

•

• [Send email](#)

• [Find email](#)

[Add to contacts](#)

To hungwe_taurai@hotmail.com

From: **Box.net** (noreply@box.net)

Sent: Wed 9/01/10 12:05 PM

To: hungwe_taurai@hotmail.com

Someone previewed your 'ALT model answer to sms question.docx' file

File name: ALT model answer to sms question.docx

Path: All Files / DITP1 / [Web Development](#)

Preview time: 5:05 AM (GMT-07:00 PDT) on Sep 1, 2010

View File

To access this file or add a comment, visit this link:
http://www.box.net/files/email/hungwe_taurai@hotmail.com/0/item/f_486065238

Box.net - Sharing should be simple.

Time to add users or storage to your account? Give us a ring at 1-877-729-4269.

You can change email preferences by visiting <http://www.box.net/settings/privacy>

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Appendix H: Usage of SMSs

CellNo	message	StudentNo
+27780386809	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	21556
+27798125643	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	20737
+27789667128	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	22949
+27730972198	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	23296
+27788269695	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	23319
+27735083423	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	23321
+27826812366	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	25351
+27731107709	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	25611

+27729282153	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	25627
+27746642878	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	25853
+27730898687	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	25911
+27844765007	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	26045
+27736342207	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	26331
+27735453450	Whats the purpose of ALT in IMG tag Why is it important. For points Respond and win. thungwe@varsitycollege.co.za	26405

Appendix I: Consent form

Study title: Perceptions of the use of a blended learning approach to improve student performance in web development courses in selected South African education institutions

Dear Participant,

Introduction:

I, Taurai Hungwe, am doing research on the use of Blended Learning in web development. Research is just the process to learn the answer to a question. In this study, I want to learn how this might improve performance in the study of web development.

I am asking or inviting you to participate in this research study.

This research will involve the use of relevant websites, SMSs, e-mail and a questionnaire. The research will run during the second semester, 2010. About thirty students will take part at this College.

There are no risks involved.

The benefits of this study may assist you in enhancing your understanding of web development. Alternative procedures and methods will be used to gain more understanding of web development.

You will be given pertinent information on the study while involved in the project and after the results are available.

Participation is voluntary, and refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and that you may discontinue participation at any time without penalty loss of benefits.

Confidentiality: Efforts will be made to keep personal information confidential. Absolute confidentiality cannot be guaranteed. Personal information may be disclosed if required by law. Organizations that may inspect and / or copy your research records for quality assurance and data analysis include groups such as the Research Ethics Committee. If results are published, it may lead to individual / cohort identification.

My contact details are:

Taurai Hungwe
Varsity College
Waterstone Drive
Benmore, 2196
thungwe@varsitycollege.co.za
Tele: 011 784 6939
Mobile: 079 040 7170.

You may contact for reporting of complaints or problems the Human Research Ethics Committee, Wits School of Education.

Specimens for research will be stored until the publication of results and thereafter will be destroyed by shredding

Yours faithfully

Taurai Hungwe

M.Ed. Student

Wits University

I ,..... give my consent and agree to participate in the research being carried out by Taurai Hungwe, student number 402247 of Wits University.

Signature: Date: