CHAPTER 1 Introduction and Background: Dynamic Flexible Delivery and Learning

TABLE OF CONTENTS

CHAPTER 2 Literature review: Digital economy, innovative, flexible delivery

CHAPTER 3 Learners and HE flexible ICT models

CHAPTER 4 Research Design & Methods, Rationale for Integrative Programme & Engineering

CHAPTER 5 Research Application: Perceptions and Analyses - Delivery and Learning

CHAPTER 6 Findings, Conclusions and Recommendations

CHAPTER 1 Introduction and Background: Dynamic Flexible Delivery and Learning

This chapter consists of the introduction and orientation to the study, followed by the outline of the problem, purpose of the study, motivation and rationale. A brief description is given of part of the research design and methodologies applied, the population from which the sample was chosen is described, followed by the sampling techniques applied, the expected targets, and, lastly, the expected outputs of the research process.

1.1 Challenges facing the application of the ICT models COOL (myUnisa) and DVC at Unisa[1]

It is common knowledge that buying sophisticated sporting equipment will not turn the purchaser into a competent, super-fit athlete unless the purchaser applies effort in building his/her muscles through the equipment. By the same token, buying high-tech cutting-edge technology for teaching and learning purposes does not spontaneously and automatically lead to any form of learning. It is the object of this study to establish clearly whether Unisa's models for information and communication technologies (ICTs), in the form of COOL (which was replaced by myUnisa in the merged institution) and digital videoconferencing (DVC), are being utilised optimally for teaching and learning.

ICTs dominate our lives. In fact, they have ushered in a new era known as the knowledge economy. Although labour and resources continue to play their part, knowledge is perceived as the hub of this new economic era in which geographical

[1] 1 January 2004 was the official launch of the new Unisa, which was the result of the merger process between Technikon SA and Unisa, and the incorporation of Vudec (the distance education wing of Vista University). It is in line with the spirit of the merger that the activities and results of this research are done under the auspices of the new Unisa institution.

space and time are overcome and controlled through the might of the “high-techs”. Speed in delivery, speed in access, speed in production and speed in distribution are increasingly becoming the norm in our modern world through the use of ICTs. The following quote points to the impact of ICTs on the economy:

> *"We are living in a new economy - powered by technology, fuelled by information, and driven by knowledge. The influence of technology will go beyond new equipment and faster communications, as work and skills will be redefined and reorganized."* (i.e. according to —U.S. Department of Labor, 1999)

In the field of education, efforts have not been spared in trying to reap some of the benefits witnessed in socio-economics through the application of ICTs, particularly in the context of distance education (DE). If applied correctly, ICTs could help remove the distance from distance education by eliminating some of the debilitating factors such as time, space and pace; what is even more attractive about them is their decentralised nature which could free the learner from the educational provider and thus simultaneously provide the learner with a great variety of learning resources (Khan, 2000:2; Fletcher, 2003:5). This worldwide fascination with ICTs did not escape the attention of Unisa (Florida) for long.

According to the strategic planning of Unisa’s senior management, DVC and related multimedia have been identified and touted as the strategic tools to help redress shortcomings such as the dwindling new registration numbers due to clients’ dissatisfaction with service, and the poor results due to poor performance by learners in examinations (ITC Advisory Committee Minutes, 1998). Naturally, poor results produced by any institution are seen as a failure by the community to prepare its youth or learners for the future. Other critical problems noted are the high dropout rate during the course of the year, several instances of bungled communication with the learners (as clients)

and increasing competition for the market from other DE institutions (nationally and internationally).

From as early as 1997, the former Technikon SA (TSA) decided to introduce its ICT models in the form of COOL and DVC under the auspices of the Integrated Technology Centre (ITC). COOL, or [**C**]o-[**O**]perative [**O**]nline [**L**]earning, was said to be a catalyst to set TSA's mission in motion, i.e. to provide a more flexible, client-centred environment for TSA learners. It was also said to be a technical solution to help overcome some of the common problems associated with distance education, e.g. lack of speedy responses to learners' queries, the problems associated with having to post printed courseware, costly telephone calls and unreliable faxes. Above all, it was seen as a remedy to overcome the problems associated with the shortcomings of using mixed technologies. Basically, COOL consisted of the teaching tool (a few modules available in .pdf format), Unisa Online and specially designed interactive multimedia units (COOL homepage, 2003.

The Online and Multimedia Unit, as part of ITC, consisted of 11 staff members (web designers, programming language experts, system program experts, graphic and animation experts). The rationalisation process implemented in 2002 resulted in the merging of the Integrated Technology Centre with the Information Technology Directorate to form Information Communication & Technologies (IC&T) at the beginning of 2003.

DVC was introduced in 1998 as a complementary service to COOL and other media, to provide face-to-face audiovisual interactions between the Unisa community and its

business partners, and also as a cost-saving means in communication between head office and regional/branch offices (Sekgwelea, 1999:1-2).

So has the introduction of COOL (and later myUnisa) and DVC helped to alleviate the problems related to distance education? Are COOL (myUnisa) and DVC being utilised optimally for flexible delivery/learning in terms of improved access, quality and cost-effectiveness? For now it suffices to state that not all the targets intended to be achieved through the use of these technologies have been achieved. Consequently, the above critical questions are the focus of this research.

ICTs are highly regarded, both within Unisa and externally, as the appropriate solution for teaching and learning in the South African DE context. Furthermore, this opinion is shared by some key members of the South African government. In an article in *City Press*, the President of South Africa is quoted as saying: “The introduction of information and communications technologies (ICT) in schools and its use to enhance education was the only guarantee that future generations in developing countries would not suffer a new form of slavery” (Mbeki, 2002). He emphasised the fact that this move of adopting ICTs would empower the future citizens of the developing world to be equal and active members of the global information society.

Unfortunately, the fascination and obsession with ICTs do not automatically result in optimal use of ICTs in education. James (2001:1) comments on the bad navigation and web design practices that were encountered while evaluating websites according to ergonomic principles. These faults end up repelling potential visitors from becoming regulars to certain websites (James, 2001:1).

It is common knowledge that the new dispensation (following the abolition of apartheid and its laws) in 1994 kick-started the transformation process in South African society from a divided nation into a unified one. Education, as the catalyst for change, needed to undergo change, as it was in a state of disarray at the time. At the core of educational transformation in SA is a body known as the South African Qualifications Authority (SAQA). It uses the National Qualifications Framework (NQF) for ensuring standards, quality and equitable access. Rote learning, the approach associated with the cheap educational resources used by the apartheid regime to subject the disadvantaged black African community to subserviency, was replaced by outcomes-based education (OBE). OBE is preferred for its learner-centred quality; it also promotes technology-enhanced learning environments, valued for their capacity to afford the individual learner a wider choice of manipulation of data in the quest to construct his/her own meaning. However, despite the benefits associated with this new system, it has proven a mammoth task to get OBE off the ground. The learners' shortcomings are still appalling, according to Badat (2002), who observes that the teachers/lecturers "…continue to produce graduates who lack knowledge, attitudes, skills, literacy and numeracy to effectively execute their responsibilities as employees…". Various ministries and business leaders have expressed concern at the shortage of high-level job skills and performance.

Furthermore, there are an alarming number of graduates who fail to respond to the changing economy and society, and global competitiveness. In addition to a lack of proficiency in skills, learners are still experiencing enormous difficulties in choosing a career – they appear to still be suffering from the vestiges of apartheid education: one of the tenets of apartheid education was to ensure production of the so-called "hewers and tillers" of the land, rather than scientists and business people. It should therefore not be surprising that there is a high demand for financial managers, computer experts and

engineers (Bennet, 2000:3), while the unemployment statistics for school-leavers and graduates with improper qualifications continue to increase, particularly among the previously disadvantaged black community. Obviously, mastery of the science and technology related subjects at matric and post-matric level is still beyond the reach of the majority of the latter group.

As if those problems were not enough, South Africans are also struggling with other complex issues: transformation; reparations (land/material wealth); reconciliation; health and nutrition; taxation; corruption in public, labour and corporate sectors; inadequate skills; the creation of robust production and manufacturing industries; crime; unemployment and a growing informal sector; refugees; globalisation, to mention but a few. Obviously, without a sound educational basis, the fruits of democracy will remain a pie in the sky for the majority of the disadvantaged; and global competitiveness will be hard to attain.

Unisa is an advocate of flexible learning through the use of cutting-edge technologies – in the form of COOL (myUnisa) and DVC (Sekgwelea, 2004, Sekgwelea, 1999, Kilpert, 2001). Nunan (2000:16) defines flexible learning as “an enabling concept that relates to the provision of resources, the application of technologies and the provision of support and services enabling more effective learning (and management of learning) by the learner”. In its mission to ensure flexible learning, Unisa regards collaboration with the employer (learnership programmes) as a significant aspect of its programmes. Furthermore, recognition of prior learning (RPL) is also highly valued in learners’ development programmes to empower the disadvantaged learners by crediting them for their relevant experience. In addition, Unisa’s mission of providing academic as well as

practical skills and hands-on experience is fully in line with what South Africa and the world yearn for.

With all the flexible resources at its disposal, Unisa appears to be well placed to address the problems emanating from levelling the playing field in education. However, having the right formula in place is one thing. Applying it is quite another – hence the objectives of this research, namely to determine the effectiveness of using ICTs, and to also come up with a dynamic innovative approach to applying ICT models to ensure successful flexible learning at Unisa.

1.2 Becoming aware of the problem

There were few examples of COOL interactive multimedia modules (TWO well-known cases based on Library and Management courses). In addition, few modules out of more than 200 courses were hosted on COOL in .pdf format: the implication of this was that thousands of registered learners who made the effort to visit the website, in response to the promotion of the COOL site, did not find their course materials on the site. To make matters worse, often the learners encountered what appeared to be lecturer apathy in the form of minimal participation by the academics in group discussions via COOL.

The DVC roll-out plan was dogged by several problems, one of which was – and still is – underutilisation. Generally, Unisa staff prefers travelling in order to attend to core business, e.g. contact sessions, administrative related meetings and seminars, rather than videoconferencing.

There are known problems which could be easily resolved if the usage of DVC were consistent and encouraged: maintenance expenses; insufficient staff; limited understanding of the technology by both Unisa and the vendor, the bandwidth size is problematic for quality in audio and video at 128kbps, instead of the required norm of at least 256 or 384kpbs (i.e. as the required minimum rate of transmitted digital videoconferencing (DVC) materials).

Institutional policy regarding COOL (myUnisa) and DVC remains unclear: the production of online materials is also done in print to ensure access; the implication is that learners with online learning facilities do not need to use them as they have the same courseware delivered in print format. To make matters worse, the staff is not encouraged through the use of feasible ICT examples to buy into the use of these models; obviously increased buy-in of the academics would impact positively on increased migration of the learners to use of ICTs.

There is no monitoring of users versus non-users of ICTs. In other words, despite allocating sizable budgets for technology application by Unisa to different units/directorates/programme groups, at the end of the day there is no follow-up in terms of accountability in ICT applications.

1.3 Formal research studies on COOL and DVC

Undoubtedly, the application of ICTs for delivery in education is still in its infancy. Experience has shown that it is through repeated successful use of technology that one begins to master the technology and obtain satisfactory results. At the turn of the millennium, Stephenson (2001:x) remarked on the lack of major formal research in the

area: “[T]here is little systematic research evidence that shows the effectiveness of the ICTs, further, this assertion serves to highlight the early days’ phase of ICTs. The medium is said to be too young for any satisfactory evaluative longitudinal study to have allowed the ‘completion of such a study; as if not enough, it is still evolving rapidly”. A year later, this observation about a lack of research no longer holds water, as several studies have since been published.

With regard to TSA’s COOL, interestingly, four studies were conducted. While the researchers have to be commended for their efforts, one cannot help noticing the glaring gaps prevalent in some of these studies. The first one was completed in 1999, followed by three others in 2001. Of these three studies, only one cites the 1999 research work on COOL. This can be seen as a consequence of the failure to publicise completed research work – which often results in duplication of certain studies. The fourth study is based on the online questionnaire presented to learners by the ITC staff. Most of these cited studies used learners in the social sciences as their main sample (except for the ITC questionnaire, which sampled lecturers as well), as well as qualitative methodologies. Other equally important stakeholders such as the designers, developers and tutors were omitted from the said studies.

According to some findings, COOL was underutilised as a resource: quite a number of lecturers were reluctant to use it (Cloete, 2001:193-257). The learners complained of less visibility by the lecturers in their group discussions (Integrated Technology Centre, 2001). The research said little or nothing about how the administrators and tutors valued COOL (Cloete, 2001). According to Cloete (2001:193-257), there was no chance of overcoming the identified shortcomings. More than 50% of the learners/users did not regard it as an important tool for their future studies; the majority did not see any need

for it because of the lack of access, while others felt that online studies would be a delaying factor in their studies because of their lack of computer literacy.

In analysing sampled questionnaires on DVC (as a supplement to flexible technologies), Sekgwelea (1999:6-7) reached the conclusion that hurdles such as costs, lack of clear policy and insufficient infrastructure were deterrents to the optimal application of DVC at Unisa.

Essentially, it is as a result of both the researcher's practical observation and the abovementioned research that the researcher became aware of what seems to be a serious dilemma facing the application of ICTs (COOL/myUnisa and DVC) for flexible learning at Unisa.

1.4 Problem statement

In view of the assessment of conditions by the researcher, and the research conducted by Cloete (2001) on COOL, Sekgwelea on DVC (1999) and others, it seems that Unisa's ICT models are currently underutilised by educators and learners. This could have serious negative consequences for Unisa as a distance education or open learning institution because of the following reasons:

- The serious financial losses which the institution would suffer since it already made huge financial investments into the purchasing of ICT equipment and infrastructure.

- It would also imply that ICTs, which is regarded as a key flexible learning platform in distance education, is not in fact such a key flexible learning platform as widely believed at Unisa and elsewhere.

A dynamic application of the current ICT models could also serve as the remedy to averting what appears to be an impending disaster.

1.5 Research question

In view of the problem stated above, the main question which this research would have to attempt to answer is the following:

1.5.1 Main Research question: Does the application of ICTs (COOL/myUnisa and DVC) facilitate and enhance flexible learning at Unisa, particularly in line with teaching and learning, as intended?

1.5.2 Sub-problems (Sub-questions)

The following subproblems can be identified:

a) What are characteristics of successful ICT models which render them to be referred to as effective tools of teaching and learning in a DE context?

b) Users' perceptions of COOL (myUnisa) and DVC in terms of the following critical aspects:

- Academic function: To what extent do ICT model designers and developers (in particular, of COOL/myUnisa and DVC) cater for the needs of the users?

- Administrative support for the academic function: The reliability of ICT models (COOL/myUnisa and DVC) in delivering, receiving, storing and allowing interactions about academic and crucial administrative support information for both lecturers and learners is critical for the success of flexible learning.

c) Relevant instructional methods in the delivery of the academic content, e.g. constructivism, behaviourism, outcomes-based and learner-centredness, are some of the prime influencers of current educational practice.

d) Does the application of COOL/myUnisa and DVC models help to address the shortcomings associated with the DE context, such as insufficient optimisation in learning, lack of face-to-face contact, high drop-out and failure rates?

e) What are the strengths and weaknesses of the ICT models in flexible learning? One of the strengths advanced by Jones (1998:45) is that the ICTs, as a medium, are capable of bringing alternative schooling to fruition – the schooling is not restricted to formal school buildings and the privileged few.

f) Given its ICT model status, is Unisa fully qualified as a flexible institution? If not, what are the possible weaknesses inherent in the current ICTs that could hamper their successes? How could such weaknesses be overcome?

1.6 Purpose and aims of the study

The purpose of this study is to determine the best practice of flexible delivery/learning through the support of ICT models. Based on a literature review (Khan, 2000), ICTs are applied in DE contexts largely due to the following benefits that may be reaped by the stakeholders: improved access, improved retention rates, the reduction of costs and improved throughput.

To be more specific and precise, the aims of the study are as follows:

- To establish whether ICT models as applied in DE contexts do positively enhance the teaching and learning process in general.
- To determine whether the clients' needs for top-quality service are met. Specific attention is given to a sampled group in the academic division Applied Natural Sciences and Engineering (ANSE) at Unisa and selected institutions.
- To determine whether COOL's (myUnisa's) reliability as a communication tool in conveying academic administrative support information and courseware is up to standard.
- To evaluate the impact of current ICT-based courses on teaching and learning.
- To assess learning activities delivered through ICT models for different kinds of students.
- To help raise faculty's and learners' level of familiarity with COOL/myUnisa and DVC, thereby helping to demystify the said technologies. This involves the following:

    - To help allay myths associated with technophobia, namely that ICT in education might replace the academics in education (as robots did in industry).

    - To provide viable guidelines to DE institutions contemplating the adoption of an ICT model for teaching and learning purposes. Furthermore, guidance should be given regarding possible problems encountered while using ICTs, as well as solutions to these problems. At the same time, the success achieved in using the ICT models and the mechanisms that need to be put in place to achieve their optimal usage for flexible delivery and learning need to be highlighted.

- To advance what may be seen as a best practice model of the appropriate use of ICTs (COOL/myUnisa and DVC), among others, comprising the approved instructional design strategy, e.g. constructivism as instrumental in flexible delivery and learning. In this context, flexible delivery and learning is not just about place, time and pace, but there are learner choices/interests to consider. Use of ICTs with constructivism as the educational paradigm appears to be one of the viable combinations to bring about the realisation of the intended flexible delivery and learning.

It is common knowledge that educational institutions may go to great lengths in putting the cutting-edge technology in place, but as long as the learners have no access through poverty (lack of finance to buy the appropriate hardware/software), such technological structures become white elephants. In fact, some of the research claims that some lecturers' reluctance to use ICTs is due to lack of access as the main stumbling block. In the same breath, the academic and administrative staff's reluctance to use DVC for their core business (administration and educational delivery) is cited as due to high costs. Realistic, viable alternatives have to be provided to overcome these hurdles that may rob many learners of access to the digital technologies and thus full participation in the promising future.

1.7 Motivation/rationale for the study

Teaching/lecturing is an art/profession that is not easy to master in a face-to-face setting. In distance education, this skill becomes even more difficult to master "as the teaching and learning behaviours are separated" (Keegan, 1980:50). An additional obstacle arises when trying to achieve the product of this profession through the use of

technology (as in ICT models), as this approach calls for the application of tried-and-tested instructional designs. Hence the need to conduct research in the application of ICT models to verify whether all the preconditions are being met within the prototypes developed and produced.

More academic research studies are needed by Unisa to evaluate the effectiveness of COOL/myUnisa and DVC for the enhancement of flexible learning. The correct application of technology should make a major difference in the DE context; unfortunately, this is usually lacking. Mayes (2001:2-3) sounds a word of caution to some educationists who tend to be overwhelmed by new technologies. There have been instances where new electronic technologies in education have been touted as part of a new revolution or paradigm, when in fact they amounted to mere hype and did not bring about any significant changes. It is for this reason that when new models of ICT are proclaimed as being responsible for a new paradigm in education that demands reorganisation of learning materials, critical questions need to be asked and credible answers with sufficient evidence need to be provided to prove that this is not just more empty rhetoric.

Improving quality and service to satisfy clients (learners, lecturers and administrators) is what ICT service providers should be striving to achieve. In the face of government subsidy cuts and rising costs that increasingly have to be borne by the learners, the least that educational institutions can do is to provide their learners with high-quality course materials. The concept of high quality in course material implies more than just content; it also refers to the various instructional/delivery methods and assessment strategies used. Nowadays learners require various forms of literacy (audio, video,

graphics, pictures and animation), not just word-based literacy, in order to survive in the global digital economy. Lecturers and administrators, on the other hand, require a reliable ICT model that does not compromise the quality/value of their product/service to the learners.

Another benefit of the need to evaluate use of ICTs is to ensure delivery with equal standards, and thus help root out censorship and information control or gatekeeping. A good example of information decentralisation is the Internet (Levinson, 1999:198). The bureaucracy and political control that is used to make information and education the preserve of the elite few is being minimised. As such, cyberlearners, irrespective of their background, are in a good position to compete with their contemporaries on an equal footing as long as access cost is not the insurmountable hurdle.

The Internet encourages learning through active selection of choice by individuals rather than passive reception of education, as in lectures (Levinson, 1999:198). This corresponds with what Jones (1998:163-4) refers to as transfer of power to individuals. If harnessed correctly, this power enables individuals to transform their lives, irrespective of their background or environment.

The digital platform has also brought about a new trend — the convergence of technologies. Although the basis of this convergence is online technology, it is in use that it becomes integrated seamlessly with other technologies, such as DVC (in a complementary way). This phenomenal use of technologies could also be likened to cross-management of channels to create synergies. It is a product of channel integration rather than fragmentation. Appraising the strengths of both passive, passive and interactive media, interactive and interactive media to ensure that consumers

receive clear untainted message is daily becoming a common phenomena (Top Brands, 2003).

This research study forms a critical part of the researcher's aim to undergo self-enrichment through the journey undertaken, but more importantly, to help in appraising instructional technologies for appropriate application within the educational setting.

The findings of this research are likely to help save Unisa a considerable amount of money through better utilisation of ICT models and resources.

To eliminate the duplication and wastage associated with the past policy of apartheid in higher education, rationalisation and merging processes have been introduced as a solution. The new Unisa should benefit from the use of reliable research data in deciding whether to retain or improve structures within ICTs.

Interest in ICTs is not limited to research at tertiary level; rather it is prevalent in all areas of our socio-economic life. It is envisaged that this research will be of interest to parastatals and government departments such as SAQA, the Department of Arts, Science and Technology and the South African National Civic Organisation (SANCO), with specific reference to improving the public life of all South Africans, particularly the disadvantaged communities, thereby helping to minimise poverty and the digital divide. It is envisaged that the outcome of this research will also contribute positively to the process of the design, development and application of ICTs for the enhancement of teaching and learning in Open Distance Learning (ODL) contexts.

Last, but not least, the researcher intends sharing the results of this research with peers and educators, through presentations at seminars and conferences and through publications in reputable academic journals.

The theoretical concepts informing the instructional content and methods of ICT models now need to be considered.

1.8 Paradigm

Researchers and educationists judge the value, scope and uniqueness of research in terms of how it compares with the prevailing paradigm. A paradigm is defined as a world view that advances a set of assumptions and a philosophical framework to help study the real world. Its main function is to help guide the process of enquiry through the use of appropriate methods, given the nature of phenomena being investigated (Clarke & Dawson, 1999:37).

1.8.1 Fundamental paradigm – constructivism

Constructivism is defined as learner-centred, with the emphasis on the problem approach in a teaching context. Problematic scenarios are created for the learners to solve, consisting of problems chosen according to the learners' needs and interests. The ultimate aim is to assist the learners to construct meaning from the given learning situation. Constructivism is more about experiential reality, and it is adaptive (Von Glaserfield, 1995:7).

ICTs are essentially aligned with constructivism pedagogics – where the emphasis is on the individuals' constructing their own truths in new learning models from the interactive lesson. It is for this reason that Hills (in Abbott, 2001:6-8), Cunningham (in Dick, 1991) feels that future courses may not test the learner's memory limit. Rather, they will provide learners with strategies for obtaining information quickly and ordering it into logical sequence, together with problem-solving capacity. On the other hand, theoretical concepts/frameworks given to emphasising memorisation and cognitive application also serve a valuable function in informing the design and development of ICT models. It is therefore critical for instructional designers to keep these in mind.

Instructional designers/lecturers should structure the problems according to explorative and real-life situations so that the learners, in their search for a solution, can acquire meanings while perusing the given materials.

According to the learner-based approach, the lecturer/teacher acts mainly as a guide or facilitator in the learning process. The learners (on the other hand) are not passive recipients — rather, they are doers. The instructional activities are problem-based, with several correct optional answers included in the learning materials for interrogation and further probing by the learners before identifying them as correct answers.

1.8.2 Paradigm shift associated with use of high-tech ICTs to ensure flexible learning

According to Nunan (2000:17-24), the following trends are popular and should be borne in mind by instructional designers, online and multimedia developers, DVC strategists and other educationists while developing instructional materials: globalisation, from teaching to learning, from semi-elite to semi-mass and lifelong learning.

1.9 Definitions of key concepts

Normally the research document is characterised by key concepts that serve as the backbone to the whole research process. Key concepts in this instance are flexible learning, optimal utilisation, underutilisation, effectiveness, asynchronous, information society, digitisation, information communication technologies (ICTs), instructional technology and interactivity.

In addition, the terminology of distance education, technology-based teaching and learning and the multimedia used could cause confusion. No group appears to agree on which term to use, e.g. “distance education” is seen as synonymous with “distance learning” or “e-learning”. According to Jackson (2001), academics and students do not appear to talk the same language, and this hurdle could be a drawback to the institutional community in addressing pertinent issues of their mission or vision.

A concerted effort is needed to agree on certain basic terms, otherwise how would the institutional community begin to converse not just about DE but also ICTs as the vehicle of communication? It is vitally important that a list of basic terminology be drawn up and made readily available to the affected community to help fuel their discourse. In the end such basic terminology in DE and basic technology would serve as the guideline to

clarity in policies, directives and proposals associated with the growth and development of the institution.

Key concepts

Optimal utilisation: Meeting all the set targets, attaining the most favourable set targets/conditions through blended learning in flexible delivery and learning.

Effectiveness: Experiencing the definite desired effect/result; the enhancer and enabling qualities of the programme could engender the value of appreciation in the recipient; depending on the nature and objectives of the programme, they could also engender the spirit of a knowledge-based society that is in keeping with principles and directives of lifelong learning.

Underutilisation: Failure to achieve the set targets, being non-effective, the effect of falling below the established optimum level. In scenario 1, no attempt is made by the affected party (lecturers/administrative staff) to make use of the prescribed/recommended ICT-based programme. In scenario 2 an attempt is made but is off target due to misinformation, applying the shortcuts or a lack of necessary resources.

Synchronous: Characterised by live and real time.

Asynchronous: Not real time.

Other important concepts, please refer to the Glossary..

1.10 Research design

According to Welman and Kruger (2002:46), the research design is a plan used by the researcher in testing the hypothesis or deriving the answer to the research question. It serves as a tool in helping the researcher to determine the effectiveness of applying ICT models to flexible learning. It enables the researcher to:

- conduct exploratory studies through practical testing of the technologies,
- choose the sampled population and
- phenomenologically or quantitatively engage the chosen sample in collecting the information to arrive at conclusions

Furthermore, it compels the researcher to consider carefully the orientation of his/her research study in terms of the great dichotomy – quantitative versus qualitative approaches (Welman & Basson, 1995; Walford, 1998).

1.11 Quantitative paradigm

According to the positivists (Hughes, 1990:39), the world, whether natural or social, operates

according to strict laws or deterministic structures, which it is the business of science to discover. These structures can be described formally and quantitatively.

The quantitative paradigm sees reality as something that is objective, existing independently of human perception. It assumes that this single reality can be exposed through the same logic of enquiry as found in natural sciences (even if discovered in social phenomena).

1.12 Qualitative paradigm

According to this paradigm, there is no single objective reality that can be subjected to objective measurement; rather, there are multiple, subjective realities. Individuals and groups are capable of constructing their own version of reality. In terms of this approach, the researcher's task is not to establish which version corresponds to the truth, but rather to ensure that different versions are recorded and reported accurately.

The attempt to limit interaction by positivists in social research is regarded as short-sighted by the advocates of the qualitative paradigm. In fact, the latter believe that the task of the social researcher is to gain insight and understanding through closer interaction with the social phenomena. Subsequently, the great dichotomous debate forces the researcher to make a choice of being either a purist or pragmatist. As purists, social researchers are opposed to applying both quantitative and qualitative paradigms interchangeably in one study. They dismiss the idea as a futile exercise because of the distinct, variable positions occupied by pure sciences and social phenomena.

Proponents of the theory of a paradigm of choice argue that the research study should not be restricted or subjected to methodologies of a single paradigm, as this could stifle innovation and understanding. The evaluators are urged to utilise whatever methods appear to be the best suited for the context and situation (Patton, Cook & Reichart, 1979 in Clarke & Dawson, 1999:62). A practical approach and methodological appropriateness are advocated rather than methodological orthodoxy. Babbie and Mouton (2001) and Hathaway (1995:539) call it the integrative qualitative and quantitative approach, or pragmatist's approach.

While the current researcher views the appropriate approach as essentially qualitative, since the objects of study are social products, his choice is the integrative approach, which promises to meet the challenges underlying the task at hand.

1.13 Integrative approach

Hathaway (1995:539) defines the integrative pragmatist approach as “quantitative and qualitative methods viewed as capable of informing one another throughout the research process…, the two approaches [are] capable of simultaneously bringing to bear both of their strengths to answer a research question”. The advantage of this research method is that it allows the researcher to draw upon the strengths of both approaches in answering the research question.

1.13.1 Qualitative–quantitative dichotomy

Quantitatively, reality is seen as absolute truth existing somewhere detached from the human being, to be discovered through scientific rational methods.

Qualitatively, reality is neither to be found in absolute/objective truth nor subjective truth; rather is to be located somewhere between these two, as a result of the dynamic transactions between the two, emanating in subjective multiple realities (Clarke, & Dawson, 1999:34).

1.13.2 Reasons for the choice of integrative programme evaluation

Compartmentalisation renders an easy solution but not necessarily the right one. For instance, if it is scientific research, then apply positivism; alternatively, if it is social

research use the quantitative approach, so it is the common practice (norm). This stereotypical view of the research scenario did not appeal to the researcher, simply because it limits the researcher's scope of unravelling undiscovered territory.

Secondly, if it is social research is one supposed to ignore certain issues and pretend that measurable variables cannot be formulated while qualitative approach is in use? Under educational psychology several constructs are usually put to the test to justify whether learning is possible or not when certain conditions are applicable. To a large extent, several constructs that are to be formulated, such as optimal utilisation as opposed to underutilisation, learning as opposed to no learning, use of ICT models as opposed to no ICT use, are measurable entities which relate to both qualitative and quantitative aspects of methodology such as an integrative approach. To expose such constructs to the exclusive treatment of either the qualitative or quantitative approach is to do an injustice to the study.

Thirdly, integrative programme evaluation is far superior to any of the quantitative or qualitative approaches applied separately. It encompasses the good of both worlds (i.e. the positivist and socialist); therefore it has a built-in bridge that makes up for the known shortcomings usually associated with the abovementioned approaches. Logically, the sum of the whole is always better than/superior to its entities. Rather than concentrate on the differences, the integrative programme evaluation allows the researcher to look for the complementariness, e.g. both application of ground theory (through focus interviews) and conducting self-administered structured questionnaires (SASQ) with different samples of the same population. In a nutshell, both the formative and summative phases of the integrative programme research design culminate in

harmonious combination of both the qualitative and quantitative aspects, thus emerging in the required rigour if correctly applied.

1.14 Methodology

The integrative approach is brilliantly encapsulated by social researchers as programme evaluation. Rossi and Freeman (in Babbie & Mouton, 2001:335) define programme evaluation as “the field of social science utilising the whole range of social science in assessing or evaluating social or intervention programmes”.

Undoubtedly, the application of programme evaluation methodology should help unravel and answer the key research question and its subsidiaries as explained in section 1.5.1.

In terms of programme evaluation, the set of questions will have to be dealt with according to a prescribed set of categories (Scriven in Clarke & Dawson, 1999:8):

- Formative evaluation is done to provide feedback to programme designers, practitioners and participants on whether there is any change needed to improve the programme’s worth or value. The emphasis is on establishing the weaknesses, flaws and strengths, how different components fit together, and if there are any deviations from the original planning of the programme intervention. Furthermore, establishing the perceptions and experiences of the stakeholders is critical for the evaluators’ understanding of how the programme functions. Consequently, formative evaluators are in a good position to provide feedback in the form of information and advice to programme practitioners to improve it (Clarke & Dawson, 1999:7).

- Instruments intended for participatory studies and focus interviews: Focus interviews (using an interview schedule, audio recorder and telephone interviews) and observation techniques were administered to samples for collection of data. The exploratory studies are intended to help establish the degree of effectiveness of ICTs for flexible learning. Critical instruments will be based on establishing real needs, attitudes and users' or potential users' opinions about the value of these technologies in relation to support and learning of their coursework. A similar interview schedule was completed by the subjects chosen from the academic and administrative support functions of flexible learning.

  Because of its known limitations when applied to human beings as subjects, the observation technique was applied with other supporting techniques such as self-administered questionnaires in monitoring the application and use of the ICT models for flexible learning.

- From the exploratory studies the researcher learnt that setting up online via independent service providers (ISPs) can be more costly and tedious in that the user may need two lines for the setting-up; often if the setting-up is incomplete or there is line break-up during the call - on reconnecting you may not necessarily be linked to the same technical assistant thus leading to more costs.

- Few modules were hosted in .pdf format on COOL. In the case of DVC, a lack of reliable technology and other resources discourage academics and administrators from being keen users. Other shortcomings include lack of

promotion of the model, a lack of administrative technical staff, and the fact that the number of sites and bridge facility were often out of order.

- Summative evaluation is concerned with the overall effectiveness or impact of the programme with a view to recommending whether it should continue or not. It is mainly quantitative, detached (as inspection) and conclusion-oriented (single report on programme to funders/policy-makers). The main question (Scriven in Clarke & Dawson, 1999:8) is why the programme produced or did not produce the desired results. For instance, in terms of cost-effectiveness, is the budget for setting up the ICT models justifiable in terms of user throughput? Do COOL/myUnisa and DVC facilitate and enhance flexible learning as planned by Unisa?

- Surveys: The questionnaire items were based on the following construct areas: The technical flair/skill of the users with regard to use of hardware, software and Human Computer Interfase issues; the content organisational strategies regarding theoretical aspects, formats, pacing and rhythm, interaction, visual, textual, and graphic effects; the user variables (age, gender, socio-economic background, attitudes) (Duby, 1985:98); and rating of COOL/myUnisa and DVC for flexible delivery and learning in terms of various aspects such as design, telecommunication, courseware delivery, instructional resource, storage capacity, use and performance as a flexible learning medium.

1.15 Dynamic application of ICTs

Dynamic application of the ICTs for flexible learning needs to be conducted occasionally. It is the researcher's strong feeling that dynamic use of ICT models should form the substantial part of the solution mooted in this research: in one hand, there is increasing demand by the learners on their institutions to better prepare them for the future and concomitant challenges as posed by globalisation. As a result, there is the problem associated with massification, in which numbers of learners at tertiary level have quadrupled lately, while the lecturers' numbers and physical buildings have remained unchanged. How can equity and quality in teaching and learning be ensured, particularly in the face of the lack of resources prevailing among the poorer communities?

On the other hand, the quantum leap in technological development has provided a platform to better deal with constraints of lack of resources, time, pace and place. In the same vein, the dramatic ICT developments have emerged in trends such as convergence, miniaturisation, multifunctionality and portability which serve as fertile grounds for innovation. To a large extent, dynamic application of ICTs in this instance would be characterised by trying solutions proposed and tested elsewhere (and experimenting with the known models) in a novel way. Other aspects include applying the identified ICTs (COOL/myUnisa and DVC) in a complementary way. Above all, the researcher is aware of the fact that ICT teaching-based models are not a panacea in themselves. Therefore there is a need to ensure that the proposed technological solutions are guided by instructional designs and theories (Hernes, 2003:24-26). Affordability, portability, transferability and seamless integration play a major part in the mooted strategy as part of the new technology.

1.16 Demarcation of study

In the context of Unisa, examples of ICT models examined were COOL/myUnisa and DVC. Users of these models are learners, academics and administrators.

1.17 Sampling subjects

For the purpose of this research, the focus is on learners, lecturers and administrative staff, i.e. tutors and tutor managers (regionally), making up the Unisa community nationwide. Other key players represented within Unisa are the IC&T and Centre for Courseware Design and Development (CCDD) staff. Representation of at least 30% of all the key stakeholders was aimed for through systematic, stratified randomisation techniques.

As previously mentioned, quite a number of qualitative research studies have already been conducted on social sciences courses. The researcher decided to test the ICT models in question on the basis of a purely scientific course. The Acting Dean of Applied Natural Sciences and Engineering (ANSE) gave an approval — allowing the researcher to conduct this research within the ANSE Programme Group. COOL and DVC unit staff under the IC&T were also willing to participate. Here follow the subjects according to their roles:

1.17.1 Multimedia and online developers

IC&T are the developers, hosts and custodians of COOL (myUnisa) and DVC at Unisa. They are responsible for the design, programming and web-hosting of COOL (myUnisa), and the production and operational use of DVC.

1.17.2 Academic staff (ANSE)

This includes the acting dean, or director, chief lecturers and lecturers, who yearn to provide their learners with good quality education. Respondents had to be in a position to help their learners overcome commonly known DE-related problems through the applicable media.

1.17.3 Role of support directorates

These directorates provide support for administrative and academic matters (regions), while design and development of courseware is done by the CCDD and later the Institute for Curriculum Learning and Development (ILCD).

1.17.4 Learners

Obtaining high-quality education through flexible learning is the service that Unisa learners pay for.

1.18 Anticipated shortcomings of the study

There are shortcomings implicit in the study. The results to be derived cannot be generalised to a wide spectrum of courses tackled at tertiary level. Furthermore, while the results may be relevant to Unisa's ANSE Division (being part of a DE institution), they may not always be relevant to programmes provided for within the residential institutions. These shortcomings will hopefully prompt other researchers with similar interests to pursue research in the areas not covered by this study.

When this study was initiated in 2001, it was intended for the former TSA institution. The introduction of the new Unisa compelled the researcher to align this study with the new

emerged institution. Implication of this change means that from 1 January 2004[2], this study's concern was no longer with roughly 70 000 students, but 250 000 students, academic and administrative staff not in the region of 1 000 plus, but close to 3 000 plus. The change in focus impacted negatively on the original budget and scale of resources (time, and population samples) set previously for the original study. Overstretching of the said original resources may have affected the study negatively and even forced it off-target.

The researcher had to tread with utmost caution when dealing with the designers, developers and producers over sensitive areas of their work. The task was rendered trickier by the fact that the researcher happened to come from the same background, so his cue may have been misjudged.

1.19 Ethical considerations

The researcher kept in mind and adhered to ethical considerations, as stipulated in Unisa's 2002 guidelines and regulation procedures.

As a result of these ethical considerations, this research is a product of disciplined investigation; it is characterised by: (i) acknowledgement of copyright, sources and sponsors where applicable; (ii) adherence to rules of confidentiality and privacy as they relate to individuals, groups – participating and contributing to the purpose or aspect(s) of the study; (iii) observance of the law; (iv) precision in content and supporting evidence; and (v) controlled observation, where applicable. The principles of logic,

[2] The official launch of the new Unisa saw the culmination of the first phase of the merger headed by the Interim Council. Immediate priority tasks of interest to this study were the alignment and integration of staff and learners, the ICTs, courses and new teaching learning strategies, under the auspices of the new Unisa (New Unisa Update, 2003:1-4; *Sunday Times*, 2003:22).

trustworthiness and credibility were also upheld throughout the research process (Reference Method for Unisa, 2004:20,125).

1.20 Expected outputs of this research

The main output is multifaceted.

It is hoped that there will be clear confirmation of Unisa's optimal utilisation/underutilisation of its ICTs, and therefore its success/failure to enhance teaching and learning within the flexible learning context.

The strategy to improve the application of ICTs for flexible learning consists of the following:

Better design, implementation and evaluation strategies of the integration of the ICTs for educational delivery and learning will be clearly outlined and defined for the new Unisa's potential users. The said users will be empowered with knowledge of its capabilities and shortcomings, particularly those with use of ICTs for flexible delivery in engineering and related fields.

- An applied body of research, consisting of practical methods such as project evaluation and development, embracing relevant themes, paradigms, principles and theoretical frameworks relevant to this study area, necessitates, among other things, the co-operation of different units and directorates within Unisa. Unfortunately, the said co-operation is a rare feature among internal structures of many institutions such as Unisa. Nevertheless, it is an invaluable attribute that needs to be developed among the institutional units.

Other outputs that are equally important include the following:

- Pertinent research questions and findings that are critical, but fall beyond the scope of this research, are to be highlighted and recommended for further study by other researchers. Consequently, such questions and findings will act as the foundation for further academic research, both locally and internationally, following publication of the results.

- To recommend for adoption or testing credible ICT model/framework; with clear specifications of how to apply it, how to adopt it, and effectively apply it particularly with reference to the Engineering science subjects.

- ICTs cover a wide spectrum of socio-economic life, e.g. parastatals and government departments, and are helpful in benchmarking correct technological standards for educational delivery by, for example, the NRF, research community, SAQA and the NQF.

- A contribution will be made towards bridging the looming digital divide between the “haves” and the “have-nots”, and the technological capacity to attend to the diversified needs of the Unisa community.

- This research could be a possible source of reference for merged institutions now dealing with integrating ICT structures.

- Publication and presentation at conferences would be an excellent advertisement for Unisa and a good return on the money invested in sponsoring this study.

1.21 Layout of the dissertation

The remainder of the dissertation will consist of the following chapters:

Chapter 2. Literature review

Chapter 3. ICTs models, their applications at Unisa, and elsewhere

Chapter 4. Discussion about Research Design and Methodologies

Chapter 5. Application of Research Design and Methodologies

Chapter 6. Data Analyses, Findings, Conclusions and Recommendations

1.22 Summary

Chapter 1 provides the introduction to the research problem and setting. There is also a brief description of the research design and methods to be applied in the study.

CHAPTER 2 Literature review: Digital economy, innovative, flexible delivery

2.1 Introduction and background

Chapter 1 provided the introduction and orientation of the study, followed by the outline of the problem, purpose of the study, motivation and rationale. Part of the description of the research design and methodologies to be applied were given, the population from which the sample was chosen was described, followed by the sampling techniques applied, the intended targets as the research process unfolds, timelines and required resources, and lastly, the expected outputs of the research process.

Chapter 2 discusses some key aspects of the literature review. The contextualisation of ICTs and flexible learning is traced to what is referred to as the third wave revolution, which is characterised by the knowledge or digital economy, the new age economically active individual known as the knowledge worker, globalisation and its concomitant lifelong learning lifestyle, mainly associated with the DE setting. Educational sympathisers with an eye on digitisation and its related developments maintain that if ICTs are adopted correctly, they could leapfrog the process of transformation in developing countries. Credible evidence of this is noticeable in instances where the use of technologies has changed the face of some DE institutions from purely correspondence institutions to mixed or blended learning institutions. Inevitably, this leapfrogging scenario encouraged the researcher to think deeply about what would make a well-constructed online and related ICT educational model. However, use of an educational model to bring about the desired results would be insufficient if it were not based on pedagogical aspects, e.g. educational theories. The key elements to a digital paradigm shift also need to be taken into account as technology is changing all the time.

This chapter concludes with consideration of the difference that could be made by possible adoption and implementation of a dynamic innovative model.

2.2 Sources and their value

The researcher's main sources come from the period 1980-2006. Readings that fall beyond this period are rare, less than 5%, and tend to be made up of rare, reliable and dependable sources.

Primary sources consulted make up at least 70% of the sources used in this project. They are mostly preferred by researchers for their reliability and dependability in conveying the information required for use by the researcher or writer.

Secondary sources were used rarely and only in instances where primary sources were not available. The researcher's reluctance to employ secondary sources stemmed from the possibility that they were likely to be flawed, or may have contained misinterpretations or even secondary prejudices.

2.3 Why a literature review?

A literature review helps to avoid duplication, or reinvention of the wheel – in a nutshell, it helps an aspiring researcher to be well-informed about the scope and area of research. How preceding authorities dealt with subjects, gaining wisdom, findings that may give the researcher insight into how to handle the problematic areas, areas advanced by both primary and secondary sources as requiring further treatment, literary evidence that may serve as partial, complementary or supplementary and that point to the solution being sought by the researcher are all important aspects dealt with through a literature review.

2.4 Historical perspectives on growth of ICTs and knowledge phenomena

Education is seen as preparing people for life. Issues such as viable socio-economic life, quality of life and good standards of living are central to qualitative education. However, it is said that nothing is as permanent as taxes and death, other things are just temporary, the same as mortals. Certainly, the same cannot be said of the third wave revolution (Hope & Hope, 1997), ICTs and knowledge management, for their presence cannot simply be dismissed or ignored.

Can ICT be classified as a subject or a tool (Abbot, 2001:44)? There are mixed feelings regarding this topic. On one hand, some argue that ICTs are mere tools to be used to study and transmit education. On the other, advocates of ICTs argue that they deserve to be treated as subjects worthy of study. In other words, online education means two things – taking the advertised course, say Maths, together with the course of how to study and conduct oneself online (Levinson, 1999:196). Unlike the technology that came before ICTs (e.g. overhead projectors, audio cassettes), which was merely used as an aid for the teacher, the impact of ICTs has far surpassed the role of an aid, and is even seen in the light of changing the traditional roles of the teacher and learner in teaching/learning situations. ICTs are transforming the whole process of schooling - including shifting the choice of the curriculum from the teacher to the learner (Donnelly, 1998 in Abbot, 2001:117; Snook, 2000; Fletcher, et.al. 2003).

ICTs seem set to even make Ulrich's prediction about "the traditional form of schooling model based on buildings as inappropriate" come true (Ulrich, R.1998:70). In other words, the ICTs' premise is very much in line with the alternative form of schooling. According to Abbot (2001:4), the evidence to support the strength and influence of ICTs

is pervasive. It manifests itself in both the technological and social changes taking place, e.g. there is now Internet shopping, banking and communication among virtual/cybernet communities. Educationally, any new vision is taking shape in the new way of accessing information and relating it to others. It is also noticeable in the move towards doing away with school buildings - teachers and students are heading for a home-school environment, with possible redress of inequity issues as part of the deal (Ulrich, 1998, Snook, 2000, Gooler & Stegman, 1995).

ICTs are said to have ushered in a new third wave digital economy (Hope & Hope, 1997). During the second wave revolution (technology and blue collar workers) the high productivity returns/profits depended on productivity flowing through people into machines. In the third wave economy, the productivity flow has changed in that it now flows through computers into people.

Knowledge workers are that rare species (during the period of dislocation) qualified to measure up to customisation of the sophisticated marketplace. For their prosperity and survival, organisations need them desperately: they need to headhunt them, attract them and reward them satisfactorily, as well as further train and educate them.

Digital pathways (easy to enter, surf and exit, and affordable through mushrooming satellite and related technologies e.g. bluetooth, infrared, WAP and online) will serve as hunting grounds for products and services to serve the needs and aspirations of sophisticated digital customers. Here customers in the comfort of their digital living rooms will be at liberty to surf for the products and services that measure up to their taste. Therefore organisations need to build digital capabilities that are flexible and

adaptable to measure up to the looming market demand that appears to be too tricky to handle (Hope & Hope, 1997:14).

Knowledge workers (Hope & Hope, 1997:12-14) are highly computer literate. They have several roles: firstly, they are knowledge researchers and compilers, making information available to fellow workers through organisational hubs and networks. Secondly, they are readers, analysers and critical appliers of compiled information (databases) about their organisation and are more than dependent on memory for daily operational tasks. They have the high sense of reading complex situations, analysing them and drawing out hidden relationships that would not be easily noticed by routine-inclined people. Obviously, the individuals referred to here are well-groomed in critical analysis skills – drawing out the most critical information to help their organisation grow and become self-sustaining. Their sense of rational selectivity is sharp and to the point, not easily overwhelmed by too much information.

Knowledge (carefully compiled information about the resources and clients) for the knowledge worker “appears to be highly valued than even gold in this Third Wave economy” (Hope & Hope, 1997). This is not knowledge dependent upon the clever two-thirds of the individuals of the organisation. Rather, it is information that is carefully selected, developed into a database and embedded into the organisational system. This organisational wealth is made available to all the employees of the organisation to use it wisely to make the organisation grow and become sustainable. Basically, it is about the resources, products, services, clients or customers and how they are used. To achieve maximum effectiveness, knowledge is systematically accumulated, shared and deployed to achieve the core competency of the organisation, e.g. frontline workers use it to attend to immediate needs and solve problems of their clients, management uses it

to understand how the business process led to the results achieved and how to do work/business, thus giving their organisation a much needed competitive advantage. Partnership, trust, sharing and loyalty are considered crucial to make this third wave a success.

Ruml (1999) and Haddid & Draxler (2002) concur with the preceding picture that the digital economy has quadrupled the importance of skills required for knowledge workers and knowledge management. As the third technological revolution continues, knowledge will replace natural resources as the asset's most critical entity to economic success. Consequently, there will be an increased need for new knowledge due to technological and educational changes. Inevitably, adult education will be a necessity throughout this millennium as the quest increases to help renew and impart new skills needed. New technology (online, multimedia and digital high-tech happen to be the core) and even ways of doing business are evolving at a blinding rate, and the skills to use it must keep pace. Knowledge will become a global equaliser. In the global economy employers can search globally for the lowest production costs. In the same vein the best knowledge workers can search locally and globally for the highest wages and the best firms. Interestingly, the relative earning power of older skills compared with newer skills will change dramatically, and newer skills will sell more than older experience (Ruml, 1999).

2.5 Paradigm shift associated with high-tech environment and flexible learning

How much does one need to be sensitive to issues such as the generation gap (industrial versus new age imperatives) and environmental changes (socio-economic factors) when planning new educational models? According to Nunan (2000), it is imperative that the question "Which direction does the wind of change blow?" be asked by educational practitioners, instructional practitioners and media producers and

developers before embarking upon such a task. With this question in mind, all the pertinent issues should be able to be addressed, such as learner interests, relevant and appropriate instructional materials and methods, market demands, science and technology to mention a few. Compliance with the paradigm shift is more favourable, implying that desirable relevant matter is being produced rather than being in conflict with it. The fluctuation of the paradigm change is measured in popular trends, which are discussed below.

2.5.1 Globalisation

Education, like other disciplines, enjoys centre stage in global markets due to the adoption and application of high-tech elements. However, in line with globalisation, flexible learning centres are forced to redesign their curriculum, from the local to the international global economy. Furthermore, there is an element of diversification of the curriculum in order to appeal to both the local (as well as accommodating the interests of the previously disadvantaged) and international communities.

2.5.2 Customisation as opposed to the Fordist culture

Simply put, the emphasis has shifted from the Fordist culture of production (mass production) to consumerism (market-based products) (Nunan, 2000). As much as commercial industries lately refrain from producing in greater quantities in the hope that their products will be absorbed by the greedy market, the orientation is now determining what the potential customer’s interest is in an organisation’s products and providing what is desired by the customer. As educationists, the tune is much the same as in industry: they should be bound by the same rules that see the customer as the important factor to satisfy in service delivery (Haddid & Draxler, 2002).

Customisation in the context of this study implies that tailor-made educational products must be produced for example CBI CDs or DVDs, games, simulation or virtual reality by the School of Engineering for their learners. With the new culture of consumerism, value for money and fitness for purpose are highly regarded, i.e. outputs have to be in line with consumer satisfaction.

The first priority in terms of consumer satisfaction is determining whether learners enjoy the immediate result of their educational qualification and whether they get value for their money. As the users of the new educational system, they are expected to cough up more for their education (due to cuts in government subsidies). It is therefore not a coincidence that learners demand more in terms of their choice and quality from the educational system (Pearce, 2006).

The second priority is determining whether industrial and corporate expectations are satisfied. The role that industry and corporates often play as potential donors and employers of the graduates is significant. Therefore, they also have a say in terms of the qualities they would like to see in graduates. It is therefore incumbent upon for example Engineering to appreciate and treat input/evaluation given by bodies such as ECSA seriously.

Last but not least, the communities where the graduates come from see the graduates as a long-term investment to plough back something valuable in return to their own communities as they grow in stature.

2.5.3 From teaching to learning

The resultant paradigm shift has turned tertiary education upside down – from faculty productivity to student productivity, e.g. through online learning the transmission model of teaching has been displaced. Learners are responsible for the control of navigation, resource use and interaction with peers and academic staff (Nunan, 2000:17), while lecturers should maintain a facilitative role.

2.5.4 From semi-elite to semi-mass

There is increment in government cut of educational subsidies. Hence rationalisation and mergers of institutions are the order of the day. Consequently, these new measures force institutions of learning to operate as corporate bodies. With the same resources in the face of increasing masses, institutions are expected to teach more and to meet the demand at hand with less resources. Thus semi-elite is out the window, and semi-mass is in.

There is a shift from “ivory tower universities to multi-varsities with programme diversification and matching academic staff specialisation to flexi-varsities, featuring market specialisation and academic staff flexibility” (Nunan, 2000:17). The implication of this shift is that different service agencies within universities are now challenged to see their operations link seamlessly through the organisation of an online system with services offered just-in-time and by the system itself (Snook, 2000). An important consideration in supporting online delivery is the development of enabling devices such as wizards, templates and shortcuts for the construction of subject information, study guides, tests, quizzes and subject home pages.

2.5.5 Digitisation

All formats of media here are reduced to numbers or binary code as in computer language, to render them conversant with one another (convergence of technologies). When telecommunications and computers use the same language it becomes easy to integrate their functions so that telecommunication networks can acquire computer intelligence. Digital transmission makes it possible to send voice, video and data simultaneously (Tiffin & Rajasingham, 1995:103). Using digital technologies such as myUnisa as part and parcel of the videoconferencing link is what needs to feature more, as long as at the end of the day the set-up has been properly planned with relevant educational outcomes.

2.5.6 Information society

This is the description given to the 21st century society. Its biggest problem is the proliferation of information. Unfortunately, too readily available information does not simply translate into a learned society; rather the opposite seems to apply here. Therefore it is critical that advanced educational systems (COOL, SOL and DVC) be developed to help learners develop skills of how to trace sources they require information about and how to select the relevant information for the task at hand (Alana, 2002; Sekgwelea, 2006).

Thinking on one's toes (time is a valuable asset) and the ability to process so much information within a few seconds create the sense that the sky is the limit. Television is a daily reflection of how global society lives – it is now common knowledge that during normal news bulletin presentations, two or more sources are used for newscast presentations, e.g. there is the conventional reader/presenter as well as text that scrolls across the screen face of what is referred to as prime newscast (Primetime News, 2007.

eTV, 23/06, 19h00. Depending on one's ability to read, view or listen simultaneously, one is given significant amounts of information to process, that relate to local, national and global events.

Digital PVR technology has also added another dimension to channel hopping, and digital satellite viewers can largely cater for their distinct tastes in viewing. This technology allows simultaneous viewing and recording of channels, and rewinding and playback of certain aspects of the recorded materials during the live broadcast. The choice of the smart digital learner with PVR as a learning tool is no longer limited to few hand-outs and referenced sources doled out by their instructor. Educational channels have quadrupled with the dawn of satellite and digital television.

The digital society is also spoilt for choice when it comes to controlling the state of the environment in terms of distance, space, mobility and time through the digital power afforded by mobile technologies. People's ability to communicate has been enhanced. Miniaturisation, portability, retrieval, storage and sharing capacities of diverse forms of data are overwhelming. Interoperability and instant messaging are critical to achieving communication, giving new meaning to own place, pace and at the right time. Instant messaging in education is seen as suitable for small group interaction as it is synchronous, and also has capacity to answer the questions posed by learners; possible problem areas can now be attended to with ease. All of a sudden, there is now an increase in potential support technology that can be tapped into for DE setting. Other potential gadgets/devices are the iPod, Palm PC or Pocket OS that could be fully exploited for educational use as long as they have right platform to support them.

2.5.7 Knowledge workers

Knowledge workers or symbolic analysts are those people who can produce new designs and concepts, as opposed to following standard procedures and producing familiar products. The secret is to learn techniques in gathering new insights from instructional settings and to translate these into new products (Reich in Jones, 1997:xxi). Improved ICT-enhanced models, such as myUnisa and DVC, should convey strategies of how to tackle this challenge.

2.5.8 Lifelong learning

This simply implies that experience is now fast running out of favour compared to new skills and knowledge. During the Industrial Revolution and mass production era, technology and skills tended to be more stable, and change in profession was not that dramatic. The knowledge economy has shaken this stability due to rapid changes in digital technology. Consequently the new digital economy tends to favour newly acquired skills as they supposed to be attuned to globalisation and the new digital economy (Ruml,1999; Haddid & Draxler, 2002; Sekgwelea, 2006).

2.5.9 Digital divide

The digital divide is seen as the new-form enemy during the dawn of accumulation of wealth or poverty. The implication is that those with access to appropriate use of digital technologies stand a good chance of generating and accumulating wealth for themselves, whereas those without access and proper use of such technology are faced with poverty (Watson & Hill, 1984:87; Sekgwelea, 2006). Another implication is that the race for digitisation has no early beginners, hence the progress achieved by the Indians and Chinese who have made their mark on the global economy cannot be ignored by even the superpowers (thanks to the legacy associated with optimal use of digital power by the said countries).This means that when developing ICT-based

instruction, alternative viable solutions should be provided for those learners who cannot access the ICT-based material due to the lack of relevant technology.

2.6 Changing scenarios in DE

A number of authorities (Collis & Moonen, 2001; Nunan, 2001; Davies & Samways, 1993) see the prerequisite of flexible learning as the separateness between the learners, the recipients of education, from their lecturers or tutors. Without the media as the means of communication through which the distance between the learner and the lecturer is overcome, teaching and learning are almost impossible.

2.6.1 Distance education

Distance education is defined as the learning system where the teaching behaviours are separate from the learning behaviours. The learner works alone or in a group – guided by study material arranged by the instructor who, together with the tutors, is in a location away from the learners. However, the learners have an opportunity to communicate with their lecturers or tutors through various media such as correspondence, computer, online learning and videoconferencing (Flinck, in Keegan, 1980:4; Rumble, 1989: 41; Davies & Samways, 1993)).

The term ‘distance education’ belongs to the days prior to the 1990s where distance was the main barrier in DE contexts. To be precise, terms such as distance education, flexible delivery, e-learning, mixed or blended learning denote the use of technology in overcoming distance as a barrier by DE institutions. Obviously in the past, DE institutions depended mainly on print (as correspondence) materials for the teaching and learning of their learners, for new technologies had not made their mark yet in education or were still evolving. Ironically, typical DE institutions, even in this day and

age of advanced technologies, are still dependent on old technologies, i.e. print and telephone, for delivery. Other technologies are utilised merely in a superficial fashion to give the appearance of being “up there” with the best DE institutions in the world. Where does the new Unisa fit in this picture? Has it overcome its DE original status to be characterised as providing flexible learning, e-learning or blended learning? Is DE fully institutionalised?

2.6.2 Flexible delivery

Essentially flexible delivery means utilising more advanced technologies, e.g. COOL, or SOL and DVC, in teaching and learning. A comprehensive definition is advanced by Simmonds (1995), British Association for Open Learning (2000) namely that flexible learning is a generic title for open learning, distance learning and resource-based learning. It is amenable to a wider range of services such as initial assessment, accreditation of prior learning, action planning, individual learning programmes, assessment on demand and work-based programmes, to mention but a few. The crucial factor should be how teaching and learning occurs in flexible learning. It has to be seen to be occurring at the learner’s place, pace and own time. How does Unisa fit in this respect with the use of its ICTs?

Further light cast upon the term ‘flexible learning’ is provided by Collis and Moonen (2001:4). They see it as the product of four key interacting components, viz. technology, pedagogy, implementation and institutional framework. In flexible learning, learner-centredness associated with learner choices is the critical focus. It is doing away with situations where key decisions are made by instructors for their learners – in fact the learner has a choice to make about the content, instructional methods, practical/

theoretical options, media, location and language (Collis & Moonen, 2001:5; Nunan, 2000; Davies & Samways, 1993).

The questions in the light of the above are: Does the new Unisa qualify as a user-friendly, flexible learning institution? Does it provide teaching at the learner's own pace, place and time? Does it cater for learner choices through its ICTs?

2.6.3 Technology as an enhancer of flexible delivery and blended learning

Educationally, it is now a known fact that technology does more than overcome distance: its appropriate and relevant use could modify conditions for DE learners to such an extent that they feel like they are in the traditional classroom. The idea for striving for replication of the traditional classroom did not occur accidentally in DE; the traditional classroom setting has been touted as the optimum model to achieving teaching and learning. To enhance flexible delivery, educational planners have adopted the use of mixed media: usually different formats of media, e.g. audio/video cassettes, PowerPoint slides and DVC may be used by the presenter during the same session. Alternatively, myUnisa may be supplemented with DVC by the lecturer to bring flexible delivery closer to resembling the traditional classroom.

The business of going online by placing content online, rendering it more interactive (Cronje' 1997:30) with supplementary use of DVC and active participation by the learner seems to answer the desire for the ideal flexible delivery, as espoused by Lockwood (2003) that the lecturers, should aspire to work smarter rather than harder. The emerging model is known as blended learning.

Blended learning, according to Bates Tony (1997:98), & Jackson (2001), could be described as a blend of both traditional synchronous face-to-face classroom (lecturer-led) learning and asynchronous technology-based learning, e.g. use of CBT, VLE, dubbed DVD, and DVC. Blended learning is used to achieve various learning aims in the format of self-study by individuals, or in the facilitative mode by lecturer-led groups, or as an interactive means for individuals and groups. Oliver (2004) sees it as the use of both teacher and technology in mixes that engage the learner with the appropriate learning situation.

The appropriate blended learning environment consists of learning designs. These learning designs are characterised by essential didactic principles such as “engagement of learners, acknowledgement of context, challenge of learners, and the involvement of practice”, according to Oliver (2005).

Well-structured blended models prove popular as they provide a broad range of learning contexts which address different learning styles of the learners and thus help to reduce the high rate of learner dropouts. The design setting’s main aim of effective blended learning is to achieve higher order learning through tasks, support and resources.

Authentic learning tasks are based on constructive philosophy, with the following as underlying principles (Oliver 2005):

- They have real-world relevance.
- They are ill-defined, requiring learners to find their real meanings.
- Authentic learning tasks are complex, requiring learners to find their true meaning over sustained periods.

- They provide the opportunity to learners to examine tasks from different angles using different resources.
- They provide the opportunity for collaboration.
- They provide the opportunity of application of judgement and values.
- They are seamlessly integrated with assessment.
- They are integrated across a broad spectrum of different courses.

2.6.3.1 Vital elements of blended learning

Learning support is seen as the vital element of blended learning, and occurs in the form of mentoring, co-learning and coaching as a result of the learner interacting with the tutor/lecturer, or other learners. Such learner support gives rise to:

- Higher order learning/critical thinking activities not evidenced in individual learning settings; also scaffold learning not seen in individual settings.
- A sense of belonging, involvement and motivation for participation.

Learning resources provide the content that learners use to achieve their learning outcomes. Critical factors in this instance are:

- How well the resources support the learning outcomes
- The appropriateness of the resources
- Their currency and relevancy (Oliver, 2005)

In the face of the proliferation of more resources intended for blended learning, other considerations have arisen: how to overcome the barriers that might limit reuse and interoperability. The feasible solution has been the SCORM (Sharable Content Object Reference Model) stored in digital repositories, overseen by ADL (Advanced Distributed Learning). The discovery of the stored resources is facilitated through the use of

learning object metadata and the shared vocabularies used as descriptors in the discovery process. Guidelines are also provided for the designers and developers of how to go about the process of reuse and interoperability, using the act of discovery (Oliver, 2005).

High content is described as shovelware: content is loaded, there is little or no interactivity and the dropout rate is very high, estimated at about 50%; in other words, the material is similar to old correspondence materials. In this instance high production costs are a waste. Animation and attractive screen designs do not alleviate the major hurdle associated with shovelware, which is one-way dispensing of information.

Process-high content is characterised by a level of interactivity between learners and their lecturers; in some instances, lecturers may serve as facilitators and once the interaction is set rolling, then the lecturers disappear from the scene. The attrition rate here is said to plummet as low as 3-5% (Oliver, 2005).

By its very nature process-high content requires the team approach based on a project management model to ensure that various types of expertise are exploited to produce appropriate, relevant, qualitative programmes for the learner (Bates Tony, 1997; Oliver, 2005 & Simmonds, 1995).

Group activities act like fuel to creativity, critical thinking and the socialisation process. The course should be started with as many in-person meetings as possible. If the group is properly cultivated, this should set the ball rolling - for it serves as a magnet for those who missed the first come-together session.

The group must be commended for its efforts in making it to the virtual session. In fact they must feel valued and wanted; time spent online working per day is recommended at roughly 3 hours, and at 8-10 hours per week.

Learners are to be divided into groups of six. Often if there are more than six, one member tends to be isolated. If there are fewer than 6, the group tends to dissipate if, say, two become unavailable due to other commitments.

Lecture facilitation is achieved through discussion threads strictly designed for learners. Therefore one of the activities could be the group discussion - summarising discussion topics for the others so that the other groups need not cover the original elaborate topic already covered unless something has been overlooked.

Although discussion threads are strictly recommended for learner group discussions, it may be advisable for the lecturer to visit the site from time to time as a means of gauging interest and work covered, and at the same time evaluating how the discussions are progressing, whether the learner contributions are on or off track, and for signs of creativity, insight, analytical and critical abilities.

Module/course design and development as a process-high e-learning programme

According to Oliver (2005) this is a highly complex task that is normally undertaken by a team of experts:

- Subject matter – role manned by the faculty (lecturers and tutors), who provide the module content
- Project manager – responsible for timelines, deliverables and interfacing of all roles
- Instructional designer - responsible for logic and flow, modification of delivery methods

- Graphic artist – makes optimal use of design tools, e.g. catchy screen designs, graphics, animation
- Programmer – allocates programme according to different application categories, e.g. content, administration and learner biographies; presentation format: textual, graphics, animation, sound and video; format: one-way vs. two-way
- Video/sound producer – provides/edits in required sound/audio video clips
- Web editor/master/electronic originator - responsible for origin and uses of the VLE

Depending on the allocated budget and complexity of the task, the workload may vary from 32 to 225 hours of work resulting in a one-hour e-learning programme (Oliver, 2005).

2.6.3.2 Types of multimedia software packages as bases for Web-based VLE

Authoring tools, e.g. Authorware or Macromedia's Director, are recommended.

Real-time Virtual Environment (live e-learning) is a software suite intended to handle live real-time facilitation of e-learning or interactivity with Web-based e-learning, However, it is not intended to provide for performance aspects by the learners nor for their administrative work.

Learning Management System has synchronous and asynchronous provision of learner coursework in an integrated way. The to-do list comprises both active coursework, assignment tasks across a whole spectrum of courses undertaken by the learner, assessment and goal-tracking tools (Oliver, 2005; DVD Today, 1999).

2.6.4 Flexible delivery and learning model

Flexible learning is more “about enhancing the learner’s access and the choice and control over their learning”. It is also concerned “with students’ opportunities and choices for interaction with other students, institutional staff and resources used for learning” (Dekkers & Andrews, 2001; Executive summary: An integrated flexible system for Higher Education in SA, 1998), as in the use of myUnisa and DVC.

Through explorative ventures into learner needs and lifelong learning, aspects such as learner independence and responsibility, learner autonomy and empowerment, time management and learning relevance have emerged. Constructivism replaces behaviourism as the main philosophy – active participation and learner-centredness are now seen as the main driving forces (Dekkers & Andrews, 2001; Lockwood, 2003:6).

2.6.4.1 Co-operative education

Co-operative education seems to be the answer for now and the foreseeable future. It is a question of higher education carving its niche by identifying, designing and developing projects that are appetising to the corporate world, such as the Micro-Finance Skills Project (MFSP) 2003, which is a bank SETA initiative in line with the Skills Development Act 97 of 1998. Three-year development targeted training is the main outcome, with the banks and Departments of Labour and Education as the custodians. This project focuses on professional development in the micro-finance lending sector: areas treated are client services, risk management, cash management and loan book management, marketing and staff management. Future anticipated projects involve research into the skills needed in the sector, research needs of small, micro and medium enterprises and training of borrowers. Such projects would inevitably involve the use of ICTs as they have proved to be a success in the corporate world. Similar projects with engineering

skills and qualifications as foci would most likely sell among learners if ECSA and the Engineering Department were to jointly nurture and develop them as a means of alleviating the dire need for skilled technicians and engineers.

Within the co-operative environment, a further step is *collaborative learning.* This phenomenon occurs when ICT-supported learning is structured in such a way that it encourages interaction and co-operation among learners, lecturers and experts regardless of where they are. Apart from modelling real-world interactions, ICT-supported learning provides learners with the opportunity to work with people from different cultures, thereby helping to enhance learners' team and communicative skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields (Tinio, 2002:11).

2.6.4.2 Issues for successful implementation of flexible delivery/learning

According to Dekkers and Andrews (2001), the main thrust of flexible delivery should be to improve learning opportunities for learners. There must be various flexible delivery/learning modes and options that hinge on learner-centredness; these should be supplemented by learner-lecturer and learner-learner interactions.

There must be a mechanism for evaluating and showing the effectiveness of flexible delivery and learning outcomes to show its real value, for it to be truly appreciated for its concrete value rather than mere hype. Ad hoc application of the model raises too many questions that act as a deterrent and measure of doubt.

Adoption and application of flexible delivery/learning strategies must be preceded by the transitional period that allows sufficient training of key stakeholders: academic staff must be exposed to new presentation methods and skills in the use of ICTs, and content designers/developers, media developers and learners should be allowed time for training on how to use ICTs for teaching and learning.

A team approach in implementing flexible delivery and learning is also important, so the use of models is necessary to ensure that all the necessary basics are put in place. Just mere access through the use of myUnisa does not equal flexible delivery. It is also important that the necessary expertise be engaged to transform the content into true format with the emphasis on learner-centredness.

Several researchers (Jackson, 2004; Dekkers & Andrews, 2001) do concur that during the early days flexible delivery/learning strategies can increase the workload of the participants; therefore it is advisable to forewarn the participants of such side effects. Again, as far as learners are concerned, issues of equity and access can be detrimental. Therefore, it is important to keep alternative back-ups in place to accommodate those learners who may not afford the extra costs associated with a change in mode of delivery. The necessary pre-emptive measures should be put in place to guard against incidental expenses that could be too costly for the affected learners.

Flexible delivery/learning is only possible when all the parties have access to the main technology being utilised in the presentation platform. This aspect does place a limit or constraint on the flexibility in flexible delivery with its overemphasis on synchronicity

such as with DVC sessions. However, it is naturally applicable to the Unisa model in preplanned contact sessions, tutorials, seminars, etc. that form part of some courses.

Special in-service training workshops for underqualified teachers in the use of online and DVC are a must. The good news is that the main centres in SA are blessed with the availability of both online and DVC technologies.

Depending on the capacity of Unisa's Engineering Department, an in-service training model for underqualified teachers could be developed. This could be linked with the in-service training provided by the Department of Education. What this means is that the University interacts with and complements the Department's in-service training centres in what they are doing in the form of short modules and courses in areas staffed by underqualified teachers. Essentially, special programmes could be developed and taught through workshops via interactive technology to empower underqualified teachers in certain areas. This undertaking should lead to the awarding of merit certificates if requirements are successfully met, and act as an incentive to the new qualifiers to follow some of the diploma/degree programmes offered by the University. Such merit certificates should be weightier than the age/experience exemption – as in the case of the RPL (Recognition of Prior Learning) qualification.

2.6.4.3 Online related technologies

The Internet refers to the massive network of networks connecting computers around the globe. Through the Internet, one computer can communicate with another as long as they are connected to the Internet using the same URLs. Information travels over the Internet using one variety of languages called protocols (Askov et al., 2003). Packaging of the digital platform consists of various formats relating to each other digitally to form

one whole (image, text, graphics, audio, video, animation, etc.), as in myUnisa, to form part of the Internet technology.

E-mail uses the Standard Mail Transfer Protocol for the transfer and receipt (exchange) of text messages (Askov et al., 2003). As part of the digital family e-mail can serve as the link for sending and receiving packages in various formats, e.g. data, image, text, graphics, audio, video, animation, etc., as long as they are in computer/digital format. However, the age of dominance of e-mail will soon come to an end, as email is predominantly seen as the “conveyor of dead content”. Wikis, weblogs and podcasts are seen as posing a threat to e-mails, particularly in pedagogical contexts. However, the effect of such threats may not be felt overnight, particularly in school settings, as broadband technology and storage capacity are still out of reach of many.

The World Wide Web (WWW) is a critical part of the Internet. It is an information-sharing model that is built on top of the Internet. It uses the Hypertext Transfer Protocol (http) to transfer documents containing text, graphics, sound and video. True multimedia digital platform is attainable in WWW. Viewing of WWW documents can be done through browsers such as Explorer, Netscape or Opera, on any computer irrespective of its operating system or software. The designers of websites usually include hyperlinks that refer/link to other websites containing similar topics of interest under discussion (Askov et al., 2003). As in the case of the Internet, packaging of items is digitally possible.

Fagoonee, (2001) describes the e-learning era as the means of becoming literate in what- ever subject one chooses through the use of various modes of cutting-edge technologies, e.g. stand-alone computers, multimedia (CD-ROM, DVD), online through

computer networks (that is, file sharing: LAN/WAN), content portals, electronic libraries and Web-enabled classrooms. Its common features are speed, technological transformation and human mediation. Its other features are asynchronicity and synchronicity. It is learner-based, personalised, responsive and performance-driven (Fagoonee, 2001:8B4-6). Typical e-learning courses are characterised by the treatment of the whole course via online (including even the awarding of certificates virtually), with human intervention occurring rarely. The question is whether there are any examples of e-learning courses at the new Unisa.

For much of their time learners study on their own at a distance, utilising various forms of technology, but come together for face-to-face interaction at various times. The use of myUnisa and DVC in a supplementary way through peer-to-peer or lecturer-to-learner interaction would be closer to this mode of mixed or blended learning. It is also described as the approach that combines both the traditional classroom approach and technology-mediated model (Tinio, 2002) in an attempt to provide the best possible teaching and learning experience.

2.7 Pedagogical perspectives: Theories, methodologies and learner styles

According to Robson (2000), course design and learning theories, e.g. theories by Skinner, Piaget, socio-cultural theories, neo-Piaget theories, and theories on information processing and constructivism, are critical factors in evaluating online learning in open education and flexible learning. It is said that no matter how much things change, some things still remain the same. This adage applies here, too, for the design and development of online and multimedia material still require the influence of taxonomies of learning, motivation and reinforcement theories

2.7.1 Constructivism

Several authors and researchers concur that constructivism serves as the most suitable theory for technology-based learning (Fletcher,2003). According to Perkins (in Dick, 1991: 41), it is essentially learner-centred with the emphasis on a problem approach. Problematic scenarios are created for the learners to solve, consisting of the problems chosen according to the learners' needs and interests.

The philosophical basis of constructivism is that it is a theory that has its meaning in language and its associated socio-cultural context, and communication. It is mainly through communicating using language that transmission of knowledge, norms, and standards has traditionally occurred in education, whether it is through a lecture, courseware or experiments. The lecturer can never construct meaning on behalf of the learner (Perkins in Dick, 1991: 41).

The instructional/learning context is that lecturers should structure the problems carefully so that, in the course of finding a solution, learners naturally pass through and acquire topics of relevance (Cunningham in Dick, 1991: 41). The goal of such an exercise is exhorting active, co-operative learning from learners through exploration and construction of real-life situations. To engineering educational practitioners, and learners in particular, the preceding description may sound appealing as the field is scientific and practical. And with the available technologies, engineering learners should not just day-dream about the possibility of experiencing fascinating presentations in engineering, but they should experience it and even be part of it.

According to Bransford in (Dick 1991:42), people learn best when they are engrossed in the topic and they are even motivated to seek out new knowledge and skills because they need them to solve the problem(s) at hand.

The participants' roles change: the lecturer/teacher acts mainly as a guide or facilitator in the learning process. The learners are no longer passive recipients; they are now doers. The instructional activities are problem-based with several correct options hidden from the learners.

2.7.2 Experiential learning

This is required and acquired by work-based learners through co-operative education for their practical part of the course. Co-operative education is undertaken where industry teams up with an educational institution (such as Unisa) and allows its workplace to be used by the learners for their practical teaching. This is seen as more relevant qualitative education.

There are certain teaching methodologies within experiential learning. Reflective and critical self-awareness (Bransford in Dick, 1991:42) are collaborative methods of learning. They are important for helping develop critical thinking through discussion and clarification of own ideas and evaluation of others' ideas. Critical approaches are workshops, group meetings and discussions, co-operative learning and use of relevant technology. Experiential learning demands commitment, receptiveness, active interest and participation by learners.

2.7.3 Co-operative learning

Co-operative learning is problem-based and emphasises interaction among group members to solve a problem as a group. Every member of the group is responsible for making a contribution (Cunningham in Dick, 1991: 42). Its characteristics are positive interdependence, individual accountability, heterogeneous grouping, shared leadership

and responsibility for self and others. Social skills are taught through this process. The lecturer observes and intervenes when the need arises and the group processes their effectiveness.

2.7.4 Outcomes-based education and constructivism are complimentary

At the core of educational transformation in SA is a body known as the South African Qualifications Authority (SAQA). It uses the National Qualifications Framework (NQF) for ensuring standards and quality. Outcomes-based education (OBE) is its key educational theory. The philosophy of OBE seems to have a lot in common with basic philosophical tenets of constructivism which advocate the idea of embedding assessment in context (Cunningham in Dick, 1991: 42). For starters, it is learner-centred; as in the case of constructivism, technology-enhanced learning environments are valued for their capacity to afford the individual learner wider choice of manipulation of data in the quest to construct his/her own meaning and it acknowledges different learning rates and styles both in the learning situations as well as in the attainment of the qualifications.

The outcomes-based learning strategy is that specific outcomes are context-specific, i.e. they describe the competence which learners should be able to demonstrate in particular areas of learning at certain levels. These outcomes should be assessed according to criterion-referenced methods, which means that performance standards and criteria are clearly communicated to learners. Learners are measured against prestated criteria and not assessed against other learners' performance, as has been practised in norm-referenced assessment. This process is seen as far more transparent, in that learners know what is expected of them and assessment does not depend on the subjective judgement of the lecturer.

The similarities between the two theoretical foci make a strong case for constructivism's acceptability in the South African context by the regulatory body. However, there are other theories whose input cannot simply be brushed aside concerning our current teaching and learning practices (which tend to be more about the recollection of facts). Other types of constructivism include adult learning, cognition, behaviourism – these could complement ICT-based courses or modules designed according to OBE principles.

2.7.5 Non-linear model (hypermedia)

According to Spiro (in Dick, 1991: 42), ill-structured knowledge domains compare favourably with real-life scenarios. Various complex concepts, occurring in an irregular way, are collectively known as ill-structuredness. As it would be expected they pose serious problems for traditional theories of learning. The implications are that ill-structured domains cannot be facilitated in a logically structured linear way. Logically, there is a need to find a way to present the same concepts in different ways and at different times, in rearranged contexts (scaffolding). Any single explanation of a complex concept will omit important knowledge facets that would be more important in different contexts.

Hypermedia can also be seen as "a criss-crossed landscape of interconnectedness made possible through hypertext". Hypertext Markup Language or HTML) is a highway design allowing for interconnectivity between various subjects to an infinite number of sources. Hence the importance of the concept maps to help learners with navigation – mainly for highlighting which nodes have been visited and via which links a previous link/route can be reached.

Hypertext protocol is an enabler to cope with ill-structured domains because of the following abilities: it copes with rearranged instructional sequences, multiple dimensions of knowledge representation and interconnections across knowledge components (Lazenby, 1998:33).

2.7.6 Instructional strategy

For learning to occur, the environment should be structured in such a way that it changes continually while maintaining the same instructional essence of what is required for the learner to interact and construct meanings.

Interaction means the environment changes when the learner manipulates it, and the feedback the learner receives continues the negotiation process, e.g. artificial intelligence and intelligent expert system programmes provide scaffolding and diagnostic feedback – with a built-in adaptative learning process. Interaction is seen as simulating the exchange between two people while communicating meaningfully. Interaction depends on the mode in which interactivity occurs, the number of participants, the frame and the level of sophistication of technology (Cronje', 1997:30).

2.8 Virtual learning campus (e.g. myUnisa) reenergised through emerging collaborative relationships in flexible delivery

The virtual campus is an electronic platform that can be accessed at any time and place. It is flexible enough to allow self-pacing for individual learners (as in differential learning styles) according to units of work that make up coursework on the website. This platform also provides for immediate feedback, record keeping, tracking of progress and live interconnected links where hypermedia is concerned. However, any given virtual

learning environment (VLE) is limited (archaic) when it comes to addressing issues of collaboration unless it has been updated with the gadgets that allow one or more people to make an input, to print, or even to forward. These “new” collaborative technologies are called wikis, weblogs and podcasts. With collaboration as their main attribute, they have helped give new meaning to online learning and other related ICTs. Furthermore, wikis, weblogs and podcasts can be added to the old VLEs by way of revamping them and rendering them suitable for educational delivery.

2.8.1 Wikis

Shabajee (2004) states that the word ‘wiki’ is Hawaiian, meaning quick. It is created through a land area network (LAN) being linked via the gateway to the Internet. Wiki has special capacities – it allows users to read and write (they can read, then respond immediately (input)), or alternatively they can download the item. It also allows one to try new applications (through installation) within the same environment. It is seen as taking collaboration to new heights by allowing interaction of expertise from different fields – as in a workshop setting (Shabajee, 2004).

According to Morrison (2004), the main uses of wikis in academic settings are virtual group study rooms, timetabling and course administration, resources for research groups and user support and documentation.

New technology wikis are not without technical glitches. Morrison (2004) reports that these glitches comprise inaccessibility in some instances, use of arcane language (not Wysiwyg - “what you see is what you get”) and the need to apply some acceptable use policy when it comes to exporting and archiving articles.

2.8.2 Weblogs or blogs

According to Shabajee (2004), weblogs entail real-time discussion (from logging and web), with the Internet Relay Chat (IRC) as the main technique. They are online journals where individuals or small groups can write and post ideas for publishing. In the same vein such ideas are easily accessible to interested readers who are at liberty to post their own reactions (input). In a way it amounts to “micro-publishing” due to the resultant form of “influence, debate, campaign” that occurs as opposed to email where content is seen as “dead”.

Shabajee (2004) sees the benefits of weblogs as countless: blogs are said to be easy to develop, requiring no technical know-how as in HTML; they also have in-built multitasking capacity of “searching, indexing, tracking and aggregating” of content (Morrison, 2004). They give participants/users the immediate ability to look up references/resources from within the conference/lecture and share them with fellow participants by posting them (i.e. their findings) to the IRC channel. This leads to a multiplier effect to the process of enquiry; thus the traditional conference/lecture presentation paradigm is shaken up. Blogs may be read and written through different platforms or hardware, e.g. PDAs (personal digital assistants) or iPods, and even new unknown devices (Morrison, 2004).

The main disadvantage of blogs appears to lie in their nature to be susceptible to abuse. According to Shabajee (2004), presenters have complained of participants writing critical things about them, or the participants fooling around among themselves. The good thing is that such mishaps can be corrected through the application of regulatory measures that do not also curb academic freedom or even freedom of expression (Shabajee, 2004).

Common uses of blogs in academic settings could be personal knowledge management, a class/cohort website (announcements, schedules, readings, etc.), posting student work for viewing/comment by peers, personal journal with viewing/comment by teacher/tutor, publication of tutor essays, links or commentary to seed discussion, community forum, or reporting. Blogs were not developed with the academic environment in mind (Morrison, 2004), so contextualising blogs would mean developing them according to different academic interest groups, such as learners, academics, administrative staff, alumni, the local community and the rest of the world.

2.8.3 Mobile network technologies

IM, SMS, connecting online via mobile, WiFi, iPhone, PDA, Blackberry, touch screen, wireless broadband, TV link, just-in-time, anytime, anywhere concepts have been taken to higher levels; change in technology seems to be occurring at whirlwind speed. Simply put, the world appears to be undergoing major changes to keep up with the digital revolution in motion. It is no wonder that education authorities are encouraging researchers to find ways of exploiting this plethora of mobile technologies for the delivery of teaching and learning. At Unisa SMSs have been used as part of the communication link with the student community. So far the few academics who have taken the plunge and been using it have no regrets, just praise.

2.8.4 Podcasts

Bistow (2004) defines podcasts as the online stored audio and video repositories or file clips that can be “pushed” to any accessible online user without the user’s interest or even intervention. The advantage of podcasting is that these files can be downloaded through portable media devices, thus fulfilling the need for DE learners for anywhere

and anytime learning experiences, and actually living up to the mobile learning experience. The disadvantage of podcasts is that the possibility of intellectual property rights violations does exist and therefore caution needs to be exercised to ensure that no rules are broken.

2.9 Demystifying the pedagogical aspects of online (myUnisa) and DVC learning

The following measures will go a long way in clearing up misconceptions and mysteries associated with the use of ICTs for blended learning. The mooted solution here should be seen as a mere scratch on the surface given the scope of this project.

2.9.1 Model software according to acceptable educational theory

As in other contexts of flexible delivery, some of the key questions to be asked are: How does learning take place? How does one learn to learn at tertiary level? How should DE learners be engaged in active learning situations instead of being passive recipients of content? Undoubtedly, these questions serve as drivers and parameters that necessitate the use of acceptable educational theory by content experts, lecturers, designers and developers. Walker (2000) explains that it is for this reason that the said stakeholders should encourage efforts to stop learning from being associated with the regurgitation of facts and few demonstrated skills when it comes to online learning. Actually, the best learning practice should be demonstrated by involving the learner meaningfully in selecting materials from sources, the materials should be according to the learners' interests, they should be communicated in an intelligible language to the audience (say tutors, markers, lecturers), meaning that the learner has to develop a sense of anticipation as to what is likely to work or fail under varying conditions. The preceding underlying principles as advocated by Walker (2000) are traceable to experiential and constructivist theories. The resulting internalising of facts should imply both reflection and application of the acquired

facts in unpredictable, relevant situations. In the end, the best online educational materials should also aspire to satisfy conditions such as problem solving, critical thinking and assimilation of new with old experiences required by the 21st century learner (Walker, 2000; Bullen, 1998).

2.9.2 Design, delivery and management of courseware in online and multimedia environments

Online and related ICT-based flexible delivery materials should in varying degrees require attention to the following phases as espoused by Goldberg and Salari (1997), and elaborated upon by James (2001); & Robson (2000):

2. 9.2.1 Design phase

A presentation tool is needed that allows the course designer to determine the layout, colour, text, counters for the course page and human-computer interface (James, 2001).

2.9.2.2 Delivery/communication phase

This should consist of a set of learners' tools that can be integrated into any course. These tools include communication tools (conferencing systems, chat and e-mail), learner evaluation and self-evaluation tools (online, automatically marked quizzes and content-related multiple-choice questions), a searchable image archive, a course calendar, a linkable glossary database, learner collaboration and presentation areas, learner content annotation, learner home page generation, course navigation, indexing and searching tools and account administration (James, 2001).

2.9.3 Human-computer interface relationships

Other factors are the elimination of the geographical barrier through technology, and human-computer interface (HCI), i.e. the relationship between the learner and the technology. The HCI relationship is important for the human being to get the most out of PC technology in line with their set target as it could result in either a successful or an unsuccessful mission. Robson (2000) states that interaction is seen as a vital aspect of learning through socialisation and feedback. The overall importance of interaction as facilitated by the HCI hinges on the following criteria:

- How learners relate to technologies that support interaction
- How learners relate to support mechanism within the course
- How this affects their subsequent persistence or discontinuation

There are three types of HCI:

- User control of the machine or program
- Dialogue between user and machine/program (CD-ROM navigation)
- System emulation of an environment (virtual reality)

Aspects to be studied are the frequency of their use and the rationale behind their use (Robson, 2000:157).

The role of hypertext as part of the HCI is to present knowledge in an interesting fashion, to eliminate the artificiality of reinforcement and loss of dynamic interaction with the teacher/lecturer, and to reduce tendency to present all curricular into a sequential structure.

2.9.4 Web tools in course/module development - online instruction implications

The use of integrated features of Web-based courseware tools is no longer a farfetched idea, according to James (2001). A single authentication scheme, a directory structure, a consistent interface and a simple way to publish and update content are the main domains of such integrated Web-based courseware tools. Also available are new generations of course tools (CTs) providing features that allow instructors to adapt components according to varying learning outcomes of a course. The use of such tools can promote collaborative learning, enhance critical thinking skills and give learners an opportunity to participate in virtual tutorial discussions (James, 2001).

> Course materials are developed by using a graphical Web interface. Web-based CTs can be considered as a workbench for putting together text, graphics, video and audio files. This can be done without any knowledge of HTML. The latest Web tools (CTs) also have ‘wizards’ that guide the developer in creating course elements. They offer additional features such as bulletin boards, chat facilities, email, discussion groups, calendars and online assessment.

A supplementary element to be considered by designers and developers (Robson, 2000) is automated adaptation to individual needs: quality courseware must measure up to the needs of an individual learner. Individualisation is seen as the tool that leads to high educational outcomes. However, its drawback is that it does not expose learners to varied learning experiences. Learning based on cultural, gender and development is the norm in individualisation. The ideal scenario is that the courseware should be able to provide for the novice as well as for the advanced learners.

Educators need to harness the power of the preceding new generation of tools to meet the growing demand of learners who have become used to education, business and

entertainment sites that are interactive, personalised and easy to navigate. These new tools affect all aspects of distance education, from course creation and communication to interaction and record keeping. Each tool has instructional implications, of which designers need to be aware (James, 2001; Kaplan, 1997:1-4).

2.9.4.1 Administration and management tools

This aspect consists of a set of administrative and management tools that aid in the delivery of a course. It consists of features that allow for creating (or importing) student accounts, archiving e-mail messages, student discussion groups and mark assessment. In addition there are functionalities relating to student progress tracking, course access tracking, and a categorised question database and online quiz creation tool (with historical statistics on performance and automatic marking), a questionnaire delivery and report tool, student access control, grade maintenance and reporting tool.

There is three-way interaction:

- Student with content
- Student with instructor
- Student with other students

However, some of the web tools may be limited to use given intellectual property rights, patent rights, costs and incompatibility issues (James, 2001; Kaplan, 1997:1-4).

2.9.4.2 Viable alternative

A viable alternative to incurring the heavy costs associated with intellectual property and proprietary rights is to use Open Source Software (OSS) (2003) developed by SAKAI's collaborative community and learning Web-based tools. OSS is seen as a "new lease on life for the deprived ICT aspirants" according to *Sunday Times Business Times*

21/12/2003:3) as far as VLE's is concerned. The positives of OSS are that the virtual community of programmers collaborate in its development. According to the State Information Technology Agency (SITA), it is free of charge to users and there are no annual licensing fees; its source codes are not under copyright so users can easily copy and adapt them for their use. It is already available on free software such as Sun Microsystems' Linux operating system.

Apart from its reasonable cost, the other benefit of OSS is its potential to develop the local IT industry by allowing users access to source codes. In the case of the proprietary software, e.g. Microsoft, the relationship between client and source providers remains unequal, that is, clients feel disempowered because they cannot access source codes and thus there is no development of new skills. Of the 45 million-odd websites available on the Internet, 67% are said to be OSS-based. The myUnisa portal is one of them.

The negatives of OSS are that migrating from licensed commercial software to OSS is neither easy nor cheap. There is no incentive for OSS developers to continue improving OSS; logically, there is a tendency for OSS to lag behind licensed software, e.g. in some areas such as accounting, but it is advanced in others, e.g. graphics animation. It is also not easy to adapt OSS to specific requirements of the organisation (Open Source Software, 2003)).

2.10 Prerequisite skills for manipulation of online technology and multimedia

To help empower users (learners, in particular) should be thoroughly conversant with both technical and software related basic skills (PC set-up, connecting & accessing data through networks, and use of application software in manoeuvring data) for a given VLE, e.g. myUnisa.

2.10.1 Hardware/software skills

Technical skills such as hardware controls and use of software (James 2001) to manipulate data are critical to be able to harvest the required learning from the Web. Web-based CTs are needed to develop instructional materials. The use of appropriate teaching and training skills attainable from the software is also of paramount importance. This is a content resource and teaching strategy to impart learning. It contains a good student interface, i.e. it has a general approach to a typical understanding of the student population, the environment and the desired learning outcomes. Therefore the evaluation tool used should consider the extent to which teachers give control of information acquisition and processes to the students, as this develops an understanding of an area. The teacher's role is that of manager and facilitator as opposed to information deliverer.

The user's background, skills and level of competency are critical for the user to harvest the benefits of a given site.

Access to information through computers does not guarantee automatic learning. A comparable example is taking a membership of gym club, which does not automatically turn the club member into a fit member. Designed learning experiences do facilitate learning for a keen learner if applied correctly. An individualised approach employs multiple pathways to cater for the varied needs of learners. This occurs through use of appropriate technology. The role played by the student in internalising such learning also counts. When delivering content through HCI, particularly hypertext, the constraint resulting from partitioning information to fit in with the screen size as opposed to paper documentation must be taken into consideration.

2.10.2 Searching skills

Irrespective of how basic searching skills might seem, they are very important to flexible learning. A CD-ROM containing keywords with unfamiliar materials could be a major problem to learners lacking the skill to search. Limitations in searching are usually caused by a limited vocabulary. Unfortunately, some search engines do not allow misspelling. This leads to unsuccessful searching. The suggested solution is that filter techniques should be used, such as those provided by advanced search options. In supplying the relevant required information, the filter then predicts how well each piece of data searched would meet with the user's need, but leaves the decision regarding relevance to the user. It also gives summaries. It ranks documentation according to probable relevance (Robson, 2000).

2.10.3 Browsing skills

These could be seen as low or high cognitive, depending on the nature of the search tasks.

2.10.4 Navigation skills

These are required for the process of accessing multiple sources of information and can turn out to be a problem when there is an increment in the manipulation of data. According to Robson (2000), navigation is also about making connections between individual students and data. Two major problems need to be overcome here: disorientation and cognitive overload. Probable solutions suggested are to provide a detailed index and table of contents as in the case of paper documentation. Students should be presented with a navigable, automatically computed overview of the contents of the document collection arranged in a clustered hierarchy. The technology must have built-in trackers of individual users to help orientation spatially and cognitively. Designers

and developers are advised to use blue hyperlinks in a hypertext environment to allow the user to get an idea of targets without actually following the link. They should also include browsers which users can use to scroll through the entire network as well as rearrange nodes. For large networks Robson (2000) cautions that students should be able to zoom in on a portion of the network, as it is impossible to view the entire network due to screen size limitations (Walker, 2001).

Navigation, browsing and searching skills are, according to Robson (2000), important for hypertext as it consists of interwoven cross-reference data. It is a complex system of tangled data.

2.10.5 Management skills

Skills such as making notes and manipulating source code and data files are essential in managing learning by students and help to reduce a course's complexity. Management tools should focus on investigation (Robson, 2000) rather than mundane tasks such as bookkeeping and saving. Again, it is recommended that the interface function of the computer be familiar and user-friendly. Familiar metaphors, such as "home", that relate to real situations, should be used. In the educational setting the student and not the computer should be responsible for the control of this situation. The screen layout should incorporate the workspace, control area, status area and message area. During the design phase special needs should be considered for the novice and learners with disabilities (Robson, 2000).

2.11 Design and composition problems to avoid - instructional implications

2.11.1 Navigation

James (2001) reports that the navigation between websites tends to provide designers with a major challenge. If the design is poor, users are likely to experience countless usability problems. To pre-empt this problem, aspiring designers have to adopt and apply general principles in the design of HCIs. The key design elements for the implementation of a viable website are simplicity, support, visibility, reversible action, feedback, accessibility and personalisation (James, 2001).

2.11.2 Menus

Menus must be easily navigable and usable. However, too limited information still makes it difficult for the user to anticipate what to expect (Robson, 2000; James, 2001).

2.11.3 Information delivery

Both complex and simple platforms of the websites surveyed scored low with the users, particularly with such sites informing the user as to the principles and scope of the discipline of the subject.

2.11.4 Site usefulness

Some of the factors that render sites useless and thus discourage the users from making frequent visits to the site are limited content, unclear concept, inactive hyperlinks (as forms of reference) and outdated content.

2.11.5 Disorientation

Robson (2000) advises designers and developers to pre-empt this problem through safety mechanisms such as two-/three-dimensional models. Furthermore, bookmarkers and fish-eyes help to minimise the disorientation problem. Robson (2000) maintains that students would like to know where they have navigated to in the network, where they

came from and where to go to next. When readability is limited due to screen size, as one node does not fit into one screen, this leads to disorientation problems.

However, like every dark cloud has a silver lining, Robson (2000) feels that the negativity of disorientation could act as the catalyst to facilitate discovery learning.

2.12 Critical factors leading to successful implementation of online instruction

Learners need to be helped to learn through computer technology - they need to be oriented (Robson, 2000). Online instruction is still used largely as a source of text-based materials (though multimedia is taking over), a medium of interaction, a source of new knowledge and a gateway to information.

Cognition is synonymous with learning: the designer's school of thought often influences how materials are structured and arranged. Linear texts (as in paper-based hand-outs) are Skinnerian. Hypertext materials (compiled according to CBI techniques) of association are arranged according to learners' interests. In a learning-by-browsing system the learning is based on the conceptual relationship between the hypertext links. The modelling technique allows students to engage in refining, supporting and establishing interrelationships of phenomena. The modelling environment allows flexibility through the use of programming languages to develop Computer Based Instruction (CBI).

Appropriate attitudes need to be nurtured. Positive motivation elements need to be provided to retain students' attention and interests, e.g. interactivity, use of personalised graphics and icons must be captivating. Measures must also be applied to ensure that relevant help or troubleshooting ideas are handy for the frustrated user(s). Students need to develop appropriate attitudes toward the technology used to acquire learning. This

attitude will most likely be formed through knowledge of their system as the basis. At the same time they also need to develop positive attitudes and values consistent with the field of their study (Robson, 2000). Needless to say it takes a good measure of interest and curiosity as the fuel to propel one to discover the secrets and mysteries lying within the unchartered territory of one's field of study.

The staff (both academic and administrative) and other users have to undergo standard training on the use of the technology prior to its introduction. Failure to introduce staff to training is seen by Ruml and Freeman (1999) as well as throwing the said staff to the wolves. The negative consequences could be the lack of confidence and respect by the staff for their courses that may now seem alien.

Challenges faced by lecturers (Greyling, 2000; Kaplan, 1997) at worst can be appalling if necessary precautions have not been put in place:

- Resistance to change and fear of technology arise mainly from insecurities or being removed from centre stage to the sidelines, and lectures being made public, even if password protected. After all, there are hackers who can beat the best security made up of impenetrable firewalls within the blink of an eye.
- Time management in project development of courses can be a crisis if the process is not managed carefully. Aligning all the required expertise in courseware development (in a multimode approach and to liaise with the telematic course developers) can sometimes create tensions with existing workloads that need to be managed with sensitivity, since these processes have to be managed in parallel with each other. In the end the process could be too costly to manage.
- High ICT literacy in online course development is a prerequisite. Many courses are often not easily converted to online as their subject experts may have low ICT literacy.

Hence transfer of skills within the organisation is critical and has to be managed to ensure that the process of online multimedia courseware development takes off and becomes self-sustaining.

- To ensure that online-based course systems function smoothly, lecturers have to create the necessary infrastructure to facilitate the course from home. The implication here is that the lecturer may have to bear extra costs to make this happen.
- Distribution of multimedia content over the networks is still a head-ache with institutions battling access to broadband technology; Rakow (1997: 61-64) compares the frustration emanating from trying to send multimedia over the inadequate networks to that of trying to drive golf through the garden hose: networks simply choke-up. The question of capacity and inadequate infrastructure could be addressed through workstation strategies (involving schedule and download to workstation, high-speed LAN, schedule and download to server, dedicated video-server network) thus making benefits associated with converging technologies a reality.
- Mere ignorance of significant matters, such as copyright issues unique to online courses and materials, pose a challenge to the course facilitator and course developer. The crucial questions that crop up from time to time are the ownership rights and updating of course materials. These can be a sore point for affected parties.

Dealing with intellectual property rights is a matter of life and death, as it involves bread and butter issues and cannot be left to chance. According to Jackson (2001) and Kaplan, (1997), in many institutions this is often a matter of contention between the academia and the university. Some universities allow their academia to own their intellectual property rights, others opt for sharing, while still others retain these rights. Some intellectual property rights models pay academia for their development efforts, others allow them to own the finished product and when they leave, they are allowed

the right to purchase licence rights to relocate with the materials. If that licence is purchased by the new institution, the subject matter experts as the owners are given 33% of the earnings. In a nutshell, this tells us that the flexible institution needs to pursue this matter and make sure that it has clear policy in place to ensure that both parties' rights (those of the institution and members of the academia) are protected.

Often, underutilisation of technologies becomes a mystery. The preceding selected points make up some of the possible causal factors that may lead to underutilisation. They may amount to misplaced priorities, lecturers may be given too much work that does not allow them to utilise technology, the insufficient resources might not warrant proper use of media, top management may be concerned about good results without implementing correct measures of quality control, academics might not be rewarded when they achieve great results and quality learning among their learners.

Several challenges likely to be encountered by learners Bates Tony (1997: 96); Greyling, (2000); Van Wyk, (2000) are listed below:

- Due to techno-phobic tendencies, some learners may find it difficult to learn through ICTs. Some learners prefer traditional learning environments to online learning due to the belief that they learn more through face-to-face interaction.
- Poor computer literacy creates problems for learners with low ICT literacy: they have to learn how the technology functions before delving into the learning of the course content.
- Access to the necessary infrastructure can be a tricky affair in some parts of SA, more so to disadvantaged learners. This means that it is also necessary to make room for alternatives to this digital divide obstacle. However, at the same time learners should

be encouraged to engage whatever means possible to overcome problems of access at all costs as it is to their own good, particularly in the future.

- Ciolek, (1998) warns the potential web-based learners of inaccuracies and mediocrity due to continual state of flux some websites experience; that over-dependence on such web sources may be very costly to the learner or scholar as some authors tend to rush their findings before verifying them.
- Time delays with some facilitators taking longer to respond than expected can demoralise learners. In the same vein, the difficulty in getting hold of facilitators or help when technology related glitches are experienced, can disillusion learners about using ICTs for learning.

2.13 Dynamic application of ICT models

World developments are not static. High levels of creativity and genius are required so that educational growth keeps up with the demands imposed by the changes. Industrialisation and its successes are quickly waning out. New technological changes and the use of these technologies as the main drivers of our socio-economic life have ushered in a new era. The resultant information society is faced with new challenges to ensure its survival and sustenance. The mastery and creation of knowledge as the source of power is seen as one of the crucial factors regarding growth and development in this new climate. It is now common knowledge that the capacities of problem solving, selectivity, critical thinking and ability to be flexible to a changing environment are some of the skills expected of the 21st century learner. Market-driven as opposed to product-driven is becoming the heartbeat of our economy (Haddid, 2002; Bates Tony, 1997); hence the need for educators and users to be continually engaged in innovative modes to keep up with the emerging processes at hand.

For at least the three previous decades innovative approaches of various forms to the application of technologies for teaching and learning have been proposed and tested without much success. Concern-based Adoption Models (CBAM) are some of the models tested without much success (Collis & Moonen, 2001:45-51). Several crucial lessons can be learned from such attempts as there seem to be common faults that are pervasive throughout failed models: new is not always better; ironically, new technological models are seen as waste of time and resources by some. One of the greatest loopholes in innovating is moving from innovation to implementation. This is often due to the vague picture in terms of outcomes. Often the fear of the unknown is the greatest distracter.

Common characteristics that seem to be associated with successful innovative models are:

- The model must show relative value/advantage.
- Values and needs of the individuals (users) must be accommodated.
- Room must be allowed for trialability, particularly the degree to which new ideas can be tested in non-threatening circumstances.
- Observability – the degree to which the effort made will be observed and valued by others.
- Room for modelling and copying of new inventions by potential adopters is critical to the diffusion process. Therefore marketing campaigns are critical.

The undesirables to be avoided at all costs are:

- Complexity – the degree of innovation is perceived to be difficult to use by others.

- Impact of the individual's social network on the decision to use technology (Collis & Moonen, 2001).

2.13.1 Implementation

Change processes need to be ready for the successful integration of innovative strategy (such as myUnisa and DVC). Yetton's (1997) three-step process model aspects could come in handy, i.e. how to change factors from vision to implementation. There is normally a wider gap between the vision and implementation phase that requires observation and caution by both visionaries, designers and developers. If applied in the context of the myUnisa and DVC virtual learning environment, Yetton's model will require adjustments to target mainly the drawbacks/loopholes that have been identified and isolated as the root cause of the problems.

The ideal life cycle of new technological ICT model (innovation) in educational settings as recommended by Collis (1996), Fullan (1991) and Moonen (2000 in Collis & Moonen, 2001:47) consists of well defined steps to follow. However, these should not be used as a straightjacket. The steps are presented below.

- Pre-initiation and initiation phase: Step 1 is applying a top-down/bottom-up approach or even mixed approach variations. In step 2 decisions are based on previous experience and aligned with the mission and educational theory and in step 3 the strategic plan is used as a guide to move the institution from current unwanted position A (of lack of appropriate use of ICTs for teaching and learning) to the targeted B (of relevant and optimal use). This is followed by step 4, which involves putting together an implementation team and determining the appropriate technology to be introduced and its implementation strategy.

- Implementation phase: Step 5 consists of formative evaluation, i.e. gauging the progress in line with the new changes and using goals and targets set during the initiation phase.
- Scalability phase: How popular the idea is, how it is sold and how available resources are used in catering for the increased numbers with more peers buying into it are all factors here. Step 6 involves revision and fine-tuning in line with the emerging reality. The change scales should go beyond the volunteers.
- Implementation cycle: This is usually a five-year period. Decision-makers may change and collective memory is difficult due to role changes, new role players and new subinnovations. The initial goals may be lost sight of and there may be no clarity regarding the roadmap. These possibilities as distracters are likely to occur along the way, and may force a change in focus if they are not handled carefully. Unfortunately, often new original innovations do not go beyond step 6 because of the said distracters.

What happens if users have the choice of either using or refraining from using technology? This sounds familiar with the myUnisa and DVC models. Lecturers cite the failure of learners' registering with myUnisa as the main reason for clinging to print-based material rather than converting to online. With DVC, costly technology is still the excuse being used by some even in the face of no charges being borne by individual departments or directorates. To a certain extent the answer to these problems lies within the 4-E Model explained below (Collis & Moonen, 2001:4, 53).

- Environment: When aligning the institutional vision, goals and mission with technological innovation for educational delivery, common sense could also come in more handy than anything else. The situation may need to be

reassessed and the information campaign factors evaluated to ensure that all the stakeholders have been brought up to speed with the latest changes.

- Effectiveness: The perception of the short-term gain brought about by the new changes through new technology is equally important as the long-term one – all lead to tangible benefits. Learning effectiveness is the main factor, with the subfactors being improved communication, individualised/collaborative aspects of learning and group learning as part of the curriculum outcomes. How often do advocates and custodians of technology get to share the fruit harvested by some of their users with the current or even potential users? This is one of the major costly oversights that eventually leads to the inevitable flop in new innovations.
- Ease of use: Whether using technology for educational delivery is easy or difficult leads to individual perceptions of ICTs (hardware/software) as being user-friendly or otherwise.
- Engage: This refers to the individual's sense of personal engagement with the technology.

In a nutshell flexible learning is about changes in higher education. Key questions to be asked are: What is the institutional perspective to drive this change? More collaborative institutional efforts is required than that put in by 'occasional pioneers'. What factors have influenced those institutions that have embraced flexible learning and technology use? What motivates their policies? (Collis & Moonen, 2001).

Flexible learning is about learner choices. The situation where key decisions are made by instructors for their learners is phasing out. In flexible learning the learner has choices to make about the content, instructional methods, practical/theoretical options,

media, location and language (Collis & Moonen, 2001:5; Saba, 2000). How about instructors' choices – does the facilitative role embrace/serve their interests sufficiently? Some of these questions will be answered further on in the discourse.

Will technology be used to bring about the desired change? According to Collis and Moonen (2001:52-54), this remains the critical unsolvable question when the planned change gets underway. In a way the question confirms the researcher's hunch that social researchers ought to revisit this area to try and clarify the blurry picture of how to successfully implement the process of the innovative use of technology. Often colourful visions/missions are advanced, but converting them to viable projects by following a strategic plan often proves tricky for the organisers/project managers. Various detractors are blamed for the shortfall: tangible results are expected immediately (whereas the life cycle of the implementation cycle model should be at least more than five years), and what is mistaken for original innovations are merely modifications through new innovations or subinnovations. Often pioneers are replaced by newcomers and as a result the crucial collective memory does not exist. Deviation from the original aims/objectives therefore takes place. Project teams as spearheaders ought to be institutionalised as a precautionary measure as the life cycle of the project becomes short. It is not surprising that project workers tend to concentrate on how to extent the project life cycle rather than the project outcome. Worst of all, alienation of educators creeps in as they are not selected as part of the ICT project teams.

2.13.2 Integration

Integration must be directed by prerequisites as suggested by Tinio (2002), namely educational planners, policy makers and users must be clear about “the dynamic approach to application of ICTs for flexible delivery”, strategy and its outcomes.

The institution’s adopted strategy and its goals (as proposed) must be clear and precise. The selected technologies (myUnisa and DVC) and the reason for their selection must be well-spelled out. Highlighted within the choice of the technologies myUnisa and DVC must be the requirement for optimum utilisation of all the aspects of the above-mentioned technologies (presentation, demonstration, practice, reflection, critical thinking, interactivity, collaboration) to meet the needs of the users.

2.13.3 Institutionalisation

Through the institutionalisation phase the mooted strategic approach (innovation) now becomes part of the normal running of the institution, easily sustainable as one of the others, making up the whole of the technological process. The innovative strategy to bring about the ICT-enhanced educational reforms requires the critical factors of planning, clear objectives, guidelines of how to achieve them and target dates, political commitment and sufficient resource allocation.

An in-depth analysis of the current educational situation must be conducted. Why are CTs not doing as well as initially planned? What are the drivers of/impediments to the use of ICTs in line with finance, curriculum, pedagogy, infrastructure, language and content?

A comparative analysis must be made of the best practices of ICTs locally and internationally. This helps to provide a better picture for the institution’s own

planning/adoption/implementation /institutionalisation model. It empowers the educational planners and policy makers to adopt the best strategy for their own local context by realising how ICTs can be used for different purposes in different contexts, and even how to overcome constraining factors such as human resources and finances. Stakeholders need to be identified and interests across different groups harmonised. A sample needs to be selected and the adopted strategy/model piloted for effectiveness as a means of uprooting flaws.

2.13.4 Optimal utilisation as opposed to underutilisation

Optimal utilisation could be defined as access to the ICTs by the users, and the full use of the applicable ICTs for teaching and learning. Relevancy and appropriateness are motives for adopting/integrating technology in education. Saba (2000) and Bates Tony, (1997) argue that educationists are given to adopting technology in distance education for the wrong reasons; they see it as a cost-saving measure and efficiency tool. Instead, the main reason ought to be to cater for the individual learner's interests. If current technologies, such as online facilities and multimedia, are used without proper learning strategies, i.e. mainly "as shovelware", and without sensitivity to individual learners' interests, that spells disaster (resulting in mediocrity and poor quality) for the whole learning process.

Underutilisation can be seen in failing priorities (objectives, mission/vision, institutional perspective, pedagogy), dissatisfied learners, no ICTs to access, or the failure of the available ICTs to meet stipulated needs. There is no growth, only deterioration and serving mediocre goals. A poor product/service is the ultimate result, despite the costs.

In the end, dynamic application of ICTs (innovation) means the mingling of old and new ideas to come up with the appropriate solution for teaching and learning. It should be borne in mind that plans or newly adopted strategies are not applied in a vacuum. The model adopted is not cast in stone: some things will work as planned, others to the contrary. There will be a need to go back to the drawing board sometimes and adjust strategies, time allowing.

Passion by the drivers is essential and crucial – however, there is need to embrace fellow pioneers and share ownership of the model. A sense of belonging/togetherness should be inculcated among emerging committed ICT-concerned groups.

Tolerance, commitment, empathy and persistence may be some of the crucial ingredients to help the group thrive in the face of adversity and to achieve the goal of planting/re-energising the ICT seed. Good lasting products are borne out of planning, adhering to the plan during implementation, persistence and hard work. Mistakes made along the way should not be swept under the carpet. If it helps to heal the wounds, laugh at them – sometimes this helps because it reflects the human aspect, but most importantly, mistakes must be corrected and caution exercised that such mistakes will not be repeated. Stickability should be the guiding light, that is sticking to the whims and designs of the chosen model, as this helps to map out boundaries of the model. Above all, it also helps to keep focused on the mapped targeted goals.

2.14 Summary

Chapter 2 covers salient points gleaned from the literature review, which consisted mainly of sources that the researcher felt added value to the discourse at hand. The contextualisation of the ICTs and flexible learning is traced to what is referred to as the

third wave revolution, which is characterised by the knowledge/digital economy, knowledge workers, globalisation and concomitant lifelong learning. This chapter considered what would make a well-constructed online and related ICT educational model, and discussed essential pedagogical aspects, e.g. educational theories and instructional design, and interfacing the whole process with strategies for VLEs. The chapter concluded with consideration of the difference that could be made by the possible adoption and implementation of a dynamic ICT model.

CHAPTER 3 Learners and HE flexible ICT models

3.1 Introduction

Chapter 2 covered salient points gleaned from the literature review. The contextualisation of ICTs and flexible learning was traced to what is referred to as the third wave revolution, which is characterised by the knowledge/digital economy, knowledge workers, globalisation, concomitant lifelong learning and associated distance education.

The delivery of quality education remains one of the key challenging questions at both primary, secondary and tertiary education levels. There is no doubt that the stakeholders in education, including government, corporate and public society, see part of the solution as the adoption and implementation of a viable ICT model in alleviating some of the identified problems. Generally, DE institutions are expected to play a critical role in addressing the need for quality education. It is equally critical that the use of ICTs by DE institutions (myUnisa and DVC models at Unisa) help address some of the identified challenges head-on rather than window-dress them. Chapter 3 will determine whether this is the case. Mere assessment of the prevailing situation suggests otherwise, as both myUnisa and DVC appear not to have seen good days (they are very much on the sidelines) in terms of their mandate. There is a vital role that could be played by DVC in matters relating to pedagogies, provided that all the necessary prerequisites are met. How Unisa's ICT-based models compare to other models in South Africa is the question to be answered in this chapter, and international practice, seminar and conference papers analyses are included as well. In the quest for a viable solution to problems encountered in use of ICTs for flexible delivery and learning, the

above questions form the basis upon which the researcher tackles this aspect of the research.

3.2 Use of ICT model to overhaul South Africa's educational cultural landscape

3.2.1 Transformation challenges facing secondary and tertiary educators

When the latest matric results (2006) are studied, there are mixed reactions. Gauteng appeared to be one of the few provinces with achievers (dubbed Mandela's children) who "met Mandela's expectations", according to Gautengonline (Provincial Gov Portal dated 28/12/2006). According to the keynote speaker (Jhb – Press Release) Premier Shilowa, the success of the achievers marked the results of a "sustained culture of learning", effective teaching and learning and the successful introduction of a new curriculum, culminating in a 78,35% pass rate, improved by 3,45% over the previous year, surpassing even the National Department of Education's target figure of 78% in the process. Furthermore, the celebrated achievement meant that "the selfless service" rendered by the "unsung heroes and heroines" whose drive was to see "healthy, skilled and productive people" was emerging. Last but not least, the celebrations also marked 'girl power' as girls produced more distinctions than boys (Motshekga, (2007) MEC for Education).

Most unfortunately, not all the provinces were in a celebratory mood over their results. Others even decided to mete out serious punishment such as redeployment or dismissal to principals heading underperforming schools. According to the *Mail and Guardian homepage*, 05/01/2007, in a bid to protect their members, unions such as SADTU went to great pains to come up with counterproposals such as "continued monitoring and target support" to such schools instead of what they termed "threats" to

diffuse the powder keg situation (Sadtu: Support needed for underperforming schools, 2007).

Drug problems, serious violent crime, teenage pregnancies and dropouts continue to haunt the majority of South African schools despite 12 years of the new democratic dispensation. Undoubtedly, the Department of Education has had a mountain to climb in trying to solve some of these problems while levelling the playing field at the same time. Initially the major task has been uprooting apartheid in the school system. However, one has to bear in mind that it took more than 48 years of the Nationalists' reign to perfect the apartheid machinery. Among other thorny issues, the integration of different departments has proven tricky – particularly regarding redeployment and distribution of resources. The former poor historically disadvantaged schools (HDSs) are increasingly being abandoned for the wealthy former model C schools by middle class children (including those from the emerging black middle class). The biggest drawback seems to lie with the authority given to school governing bodies (SGBs), whose prerogative in determining tuition fees seems to be the main cause of segregation (with finance as the predominant factor). These former model C schools happen to be predominantly located in formerly white suburbs, thus resulting in the desertion of the HDSs located in poor black townships. Hence *Mail & Guardian's* appropriate caption and observation that Apartheid continues to haunt SA's schools, (2006). It is not surprising that the worst cases of crime, anarchy, dropout and lack of quality in teaching and learning are experienced in such poor schools.

The newly adopted outcomes-based curriculum as the replacement for the fragmented and segregatory apartheid model curriculum has met with some resistance (due to the perception that it results in underqualification, poor teacher: learner ratio, a shortage of

resources to deploy the curriculum and lack of capacity) in some circles. Debates concerning the outcomes-based model continue to rage in both public and corporate sectors. It is for this reason that the Federation of Unions of South Africa (FEDUSA) laments -South African education system and economy fail its pupils,(2006). Sadtu: support is needed for the underperforming schools, (2007) also denotes the gravity of the situation. The syllabus is said to be difficult to implement due to underqualified teachers and a lack of resources, and things are made even more difficult for the ill-prepared school leavers by industry which insists on hiring experienced workers (Kelly heads for JSE, 2007).

The issue of appropriate qualifications has been raising significant concern for some time now. The production of irrelevant skills is the downfall of South African universities (Bennet, 2002). The said hurdle is reiterated through the article titled South Africa's system fails its matriculants, 2006. Year in and year out, more and more of our diplomands and graduates seem to wonder through the streets from one firm to another without qualifying for the job due to irrelevant qualifications. As a result, South African industrial and commercial markets with a specific need for rare skills in engineering, accounting and IT have numerous positions that remain unfilled for a good part of the year. As such, these positions according to Bennet, (2002) & Kelly heads for JSE, (2007) become easy pickings for qualified internationals.

To make matters worse, global standards appear to be out of reach for many of the South African schools tested in research study of international standing (Mngxtiama, 2002).Participation in critical subjects such as Maths and Science (by the Third International Maths and Science Study of Gr 8, 2007) saw SA ranking low among 50 participating countries. This sorry picture was further corroborated by the numeracy

results of the United Nation's Educational, Scientific and Cultural Organisation (2007), which showed Gr 4 learners of South Africa trailing behind others elsewhere..

The preceding account poses a serious question about the quality and standard of the pupils who subsequently sit for matric – the question that has not escaped the attention of the university, public and corporate world. As a result, a number of universities have also introduced bridging programmes as means to offer school leavers yet another chance to gain access to university. At the same time, this bridging opportunity acts as a lifesaver for these universities, which would soon be out of business due to the scarcity of the matriculants who pass with distinctions in their exemptions (as they are quickly snapped up by the competing universities both locally and internationally).

The debate about white collar (professional, highly skilled) educational material versus blue collar (low or semi-skilled) material has been put on hold lately in that the country has turned to look for more blue collar careers in certain respects. As such, it is not surprising that some of the university qualified graduates spend more time job-hunting than their blue collar counterparts (with mere certificates). In fact, organisations have to be more selective when it comes to university qualifications or degree programmes, as some are not sellable/marketable, depending on the prevailing economy. As more stadia and road construction projects roll out in line with the planned 2010 FIFA soccer festivities to be hosted in SA, this trend of an increasing demand for semi-skilled artisans is likely to continue.

Though hard to believe, it does appear that, despite the increased accessibility of Africans to elite tertiary institutions, research and the dominance of the sciences, Maths and technology remain the domain for the privileged few.

The university's credibility in this respect is also at stake (Badat, 2002). Badat (2002) asks whether taxpayers are getting value for their money. Some universities have joined the negative swansong by reporting that some of the students who finished matric with several distinctions were forced to undergo their bridging courses as they failed their entrance examinations.

Students' inefficiencies are appalling, reports Badat (2002). He says that "we continue to produce graduates who lack knowledge, attitudes, skills, literacy and numeracy to effectively execute their responsibilities as employees. The consequences are borne by the poor, the young and the aged in the inability of the public service to deliver effectively. Various ministries and business leaders have expressed concern at the shortage of high-level personpower as well as the inability of many graduates to respond to the changing economy and society. Not surprisingly, the quality of the recruits, the nature and the appropriateness of their qualifications and training, the international competitiveness of graduates in some fields, is increasingly being questioned."

Not all the blame should be apportioned to tertiary education; some should also be apportioned to the failure to lay a sound base for higher education by secondary education. The critical question that needs to be answered is: How is tertiary education helping to tackle this problem? Can tertiary education afford to solve the secondary education problem of lack of quality? Pointing a finger has never been the solution and it is not going to be the one in the near future either – therefore tertiary educationists or academics have to help bring about lasting solutions to provide better quality in

secondary education, e.g. through working closely with them particularly in areas of need, and conducting relevant research in identified relevant problematic areas.

Umalusi as the matric examination authority needs to be given the necessary support by the stakeholders – governing bodies, educationists, public and corporate bodies. Where wrongs are observed, constructive criticism should be given, and where credit is due for excellent service, the relevant merit must be awarded.

Mistakes such as blatant maladministration of schools could be curbed by inviting the culprits to compulsory administrative development courses in the form of short seminars and workshops. However, in the case where such culprits do not seem to improve, then their lack of delivery should be discouraged at all costs by metering out appropriate disciplinary measures. Like all staff related matters, unions must be involved so that workers' rights are not compromised.

Universities have had their fair share of problems. The merger of some education institutions was introduced three to four years ago with a view to rationalisation and eradication of some apartheid vestiges (Sowaga, 2002.). Unfortunately, this move has not gone well with some of the institutions, as they began losing their staff in droves. Unisa did not emerge scot-free from this dramatic change. Despite the anticipated positives that are visible, such as current enrolment of about 250 000 students, one wonders how much damage or benefit has been experienced by the institution(s) undergoing the transformation change; probably the attempt at answering the preceding question could serve as another viable area of research.

3.2.2 DE as possible solution to socio-economic Ills

Good quality of life and prosperity are some of the ideals that propel the majority of South Africans to make the most out of their daily toils. However, there are a number of telling drawbacks that make the going tough adult literacy among the black majority at 25%-29% is appallingly low; then there is unemployment, the HIV/Aids pandemic, violent crime and homelessness as major deterrents that are most likely to cause the masses to lose faith in the government, and possibly lead to the eventual threat to budying democracy. The failure to deal effectively with crime is seen as the likely cause of the increasing incidents of vigilantism, and then it is also exacerbated by the question of Illiteracy as Threat to Democracy, (2002). .Obviously, good quality education serves as a solution to some of the identified problems. However, these challenges cannot be tackled through the normal schooling process, hence the importance of the DE institutions. These institutions allow the poor and disadvantaged learners to be engaged economically while at the same time they are learning and preparing themselves for the unknown future. It is for the same reason that the government has thrown its weight behind the DE institutions such as Unisa (Sekgwelea, 2004; Kilpert, 2001; Pityane, 2006).

3.2.3 Government's ICT vision, strategies and policies

It would seem that the government's commitment and intentions to use ICTs as a part solution to political and socio-economic ills through the Information Society and Development (ISAD) forum (2002) are well spelt-out, purposeful, encouraging and above all, focused and achievable. ISAD is located within the Department of Communications as a strategic initiator and developer of ICT policies and implementation guidelines in government business and the community at large. It has been created in terms of Chapter 2 of the Intergovernmental Relations Framework Act

of 2005. Its main vision is to harness information and communication technologies for socio-economic development and to establish SA as an advanced information society in which ICT tools and information are key drivers of economic and societal development. ISAD is aware of the need to develop and establish information and communication technologies across all spheres of government, civil society and the private sector to create a better life for all South Africans.

ISAD is the forum to ensure that provinces participate in policy development of their ICT programmes and to make sure that ICTs are part of the solution to alleviate poverty by improving people's living conditions in their functional areas. It is also tasked with evaluating ICTs' performances in various sectors, and implementing corrective measures where failures or loopholes are noted. In the final analysis optimal use of ICTs should allow social cohesion and realisation of democratic values (equality, merit and prosperity), as it empowers society to express its constitutional rights to the caring and responsive government institution.

Above all, ISAD is intended as a strategy to enable government to provide essential services such as e-Health, e-Education, e-Government, etc. in line with the Accelerated and Shared Growth Initiative (ASGISA) and the Joint Initiative on Priority Skills Acquisition (JIPSA) (ISAD 2002).

Obviously, government's expectations of social organs such as Unisa's models (myUnisa and DVC) are very high, for it is through social organs that innovative interventions in helping to address the preceding social ills could be expedited. This expectation is eloquently expressed through an article entitled ICT prevents new form of slavery (2002) in which Mbeki's Paper Bridging the digital divide: ICT infrastructure for

poverty alleviation (2002) states that the “introduction of information and communications technologies (ICT) in schools and its use to enhance education was the only guarantee that future generations in developing countries would not suffer a new form of slavery”.

According to the article, Mbeki (2002) told his audience (business leaders and NGO representatives) that the adoption and use of ICTs would empower the future citizens of the developing world to be equal and active members of the global information society. It is imperative for developing nations to be ICT literate so they can have an active role in the new world economy. This new form of literacy is likely to replace the importance that literacy occupies in our daily lives today. ICT could also be used in the health sector as a means to improve health literacy among the poor.

However, the biggest challenge for the effective use of ICT in education remains the lack of adequate and affordable infrastructure in most developing countries. A possible solution could be redeveloping special programmes that give special attention to meeting special educational needs of ICT infrastructure. The introduction of special educational rates and giving regulatory exemptions to business and other stakeholders supporting the use of ICTs for educational delivery will go a long way in alleviating financial constraints.

3.3 Prospects: The new Unisa as a flexible learning institution

Higher education in a post-apartheid South Africa is required to meet a number of demanding agendas, all of which are spelt out in the Higher Education Act (1997). Resource-based and open or flexible learning are regarded as a means of freeing the

quality and success of teaching and learning from dependence upon decreasing levels of staff numbers and campus buildings.

3.3.1 Learning strategies

Flexible learning at Unisa is supposed to provide the learner with a choice of learning strategies as well as the choice of place, pace and time. The learning strategies could include a combination of face-to-face tutorials or lectures, practical and experiential learning opportunities, access to study material, mixed media instructional material and even input by the employer into the learning process. In some cases there can be interinstitutional collaboration in the interests of economies of scale. Ideally the learner should be able to choose the combination that best suits his/her personal circumstances (Unisa homepage, 2004; Kilpert, 2001:115-120).

The principle of access is said to be applied without discrimination along the lines of quality and equality with merit as the determining factor. Consequently, all students, despite their disabilities, religious beliefs, gender and race, are said to be afforded an equal opportunity to higher education. It is unthinkable for the new Unisa as a DE institution to achieve this principle without using ICTs as one of the critical factors when considering educational delivery strategy. However, the critical question at this stage is what Unisa's prospects are as a flexible delivery institution.

3.3.2 Profile of Unisa learners

Unisa learners consist of a mix of unemployed and employed people and there are slightly more males than females. The unemployed act as a potential pool of job-seekers. To some, Unisa is the only viable option of entry to tertiary education due to lower entry level requirements and reasonable tuition fees compared to conventional

residential fees. Generally, successful DE learners are characterised by a deep sense of intrinsic motivation. (Keegan, 1988) They can drive themselves to achieve the best possible credit without the push imposed by the academics that may be required in the case of the residential learners. At the same time, there are those who find the going hard at first as new school-leavers. University life coupled with the distance education way of doing things tends to be just too much. These learners often find their footing through special orientation programmes provided by Learner Support (and they refocus by heeding the message and lessons given by the Student Support programmes (Unisa homepage; Kilpert, 2001; Heydenrych, 2002). However, above all, it is now common knowledge that South Africa is regarded as the land of possibilities and opportunities, and the key to unlocking the door to such opportunities is seen as sound education. Some learners do go all out, despite the odds and hurdles of being DE learner, of being a lone learner, associated with the part-time studying conditions, and come through their diploma/degree studies with flying colours.

Some learners have just finished school and are enjoying the sense of freedom away from the clutches of parental guidance. This might also be costly when it comes to studies. Others have the going rough, with having to divide their attention between family, work and studies – just striking a balance can be more taxing than a game of Russian roulette. Overall, these are the people who prefer little or no interference with their choice of where to receive their tuition, and like to study at their own pace and at their own time (Sekgwelea, 2004; Lallana, 2002).

3.4 ICT models: Strategy, implementation and use

3.4.1 Strategy, implementation and growth of COOL

COOL is the former TSA's ICT model. COOL was billed as "a virtual campus - a technological solution to facilitate effective online teaching and learning". It did not only serve as a useful distribution tool for courseware and tutorial letters, but it also enabled two-way communication between students (group discussions), students and academic staff (lecturers and tutors), students and industry specialists, students and their content. It provided administrative assistance and details, thus reducing the need for costly telephone calls (ITC Strategy Report of TSA, 1998).

COOL was expected to enable the former TSA to attain a competitive edge over its competitors through research, development and evaluation of new media. It was also expected to enhance access and equity, redress what were seen as gaping problems and raise quality in teaching and learning. COOL was also intended to facilitate collaboration between different directorates, programme groups and centres, and even institutions, thereby ensuring synergistic and collaborative relationships to blossom and result in quality products. Furthermore, it was expected to integrate the appropriate use of electronic technologies throughout TSA as it consisted of online (Internet, intranet, extranet, virtual-NEW UNISA), the Electronic Graphic Unit, Multimedia Unit, Audiovisual Unit, and Photography (ITC Strategy Report of TSA, 1998).

At the same time, it was seen by the planners (Integrated Technology Centre or ITC) as the viable solution to the problems associated with place, pace and time, i.e. lack of speedy response to queries, posting printed courseware, costly telephone calls, unreliable faxes and bungled communication with learners. These problems had a resultant increase in client dissatisfaction, dropout rates, poor examination results, as

well as putting TSA under enormous pressure from its competitors, both nationally and internationally (TSA's ITC Advisory Committee Minutes, 1998).

To get to grips with ITC's origins (from TSA's perspective), ITC was launched as a directorate in 1998 following some informal consultations conducted since 1996 with programme groups and support directorates. To carry out its mandate, ITC put together a team of highly qualified IT and multimedia professionals. This team was not easy to retain, given their marketability. COOL was modelled according to the constructivist model (see figure 1), with the main components as administrative (student database) and academic (content delivery) communications.

3.4.1.1 COOL's shortcomings

In no time, the COOL prototype, which was written in HTML (and now FLASH), was up and running. Being the only customised institutional online tool at the time (1998), COOL was received warmly in many quarters within old TSA (now new Unisa).

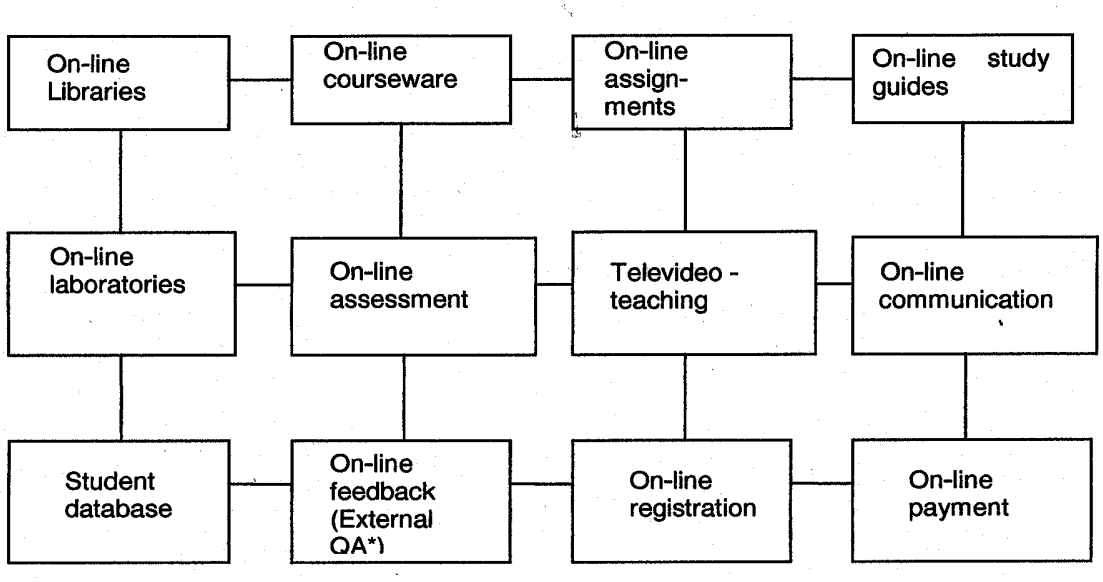


Figure 1 Constructivist virtual campus: students' online, lecturers (academics) online, staff (administrative) online. (ITC Strategy Report of TSA 1998)

However, a problem of COOL was that it provided a small amount of content in the form of a few courses, loaded in PDF format (as the bandwidth was said to be low). Another miscalculation by the institution that stifled ITC from meeting its obligation was the decision to treat the ITC directorate as a business entity. In other words, ITC was given the mandate to charge for its services and products to the institution at a profit so that it should be able to sustain itself. The various academic departments and administrative directorates were supposed to budget for the use of ITC technology in their annual budgets. The departments and directorates would then use their approved budgets to acquire the required technological services or products from ITC. This contentious policy created conflict among the staff. Some staff members claimed that their budgets were insufficient to meet their technological needs, and others complained that ITC's service costs were too high, and as such decided to outsource their ICT related projects; others used technological budgets for reasons other than online and DVC, and they got away with it. These shortcomings have been highlighted by researchers (Cloete, 2001; Phaahla, 2002; ITC Report 2001; Sekgwelea, 2004) at one stage or another as:

- The main drawback was that there were too few courses/modules on the COOL site.
- COOL's usage was limited to a mere administrative tool.
- The marketing venture created false hope/expectations as COOL fell short of promises made.
- Loss of focus – failure to realise full-scale online and multimedia production.

3.4.1.2 COOL's successes

Despite the initial teething problems with COOL, its early mark was noticeable as some programme groups tended to rely heavily on its services.

Interestingly enough, the infatuation by some researchers with the ICT's development, or their dire need for self-improvement or even their concern for appropriate use of these ICTs made COOL (Cloete, 2001; Lazenby, 1998; Odendaal, 2001; Phaahla, 2002) and DVC (Sekgwelea, 1999) their happy hunting ground. The cited research reports give detailed accounts of the highs and lows, merits and demerits of applying these models (COOL and DVC) for flexible delivery.

ITC was not given development research support. While the ITC directorate served a useful purpose in being the happy hunting ground for many scholars, in turn the directorate failed to capitalise on the very same research to improve itself. This could be due to lack of insight by the institution to give the necessary support for the creation of an ICT related research office that would deal with the analysis and growth in the use of ICTs for educational delivery and learning. Considering the progress or lack thereof in the use of ICTs, the need for such an office appears to be long overdue.

3.4.2 Student Online Learning Environment (SOL)

SOL fell under the Bureau for Learning Development (BLD) and its origins as an online technology to provide for the needs and services of the former Unisa are relatively the same as that of COOL in the former TSA. It was established in 1995.

Implementation strategy and growth of SOL

SOL's vision was "making direct impact on the learning experiences of every student by using the internet communication technologies". SOL saw the "maximisation of course

support, service provision, course enhancement, and full course delivery" as critical elements to delivery and learning (SOL Symposium, 3/10/2003).

SOL's mission was the "declaration of war against alienation of learning stakeholders by striving to make resources accessible and enable communication through the help of online communication technologies". Furthermore, its commitment was stated as ensuring free communication and sharing of resources by everybody involved in learning environments through "fostering awareness, changing systems and adapting teaching practice" (SOL Symposium, 3/10/2003).

The successes and failures of SOL appear to be similar to that of COOL.

3.4.3 myUnisa

The harmonisation of COOL and SOL led to the birth of myUnisa.

The migration process marked the formal amalgamation (side by side) of COOL and SOL. The process involved the transference of both sites to the same website now called myUnisa. Hiccups that had to be overcome included ensuring that the former content and its related administrative support functions would be available and ready for use by the staff and learners. Enabling the same functions that used to be possible under the old websites also had to take place. Lecturers, tutors and staff at large were implored to ensure that they took time to check that the new site (myUnisa) was rendering the expected service. Again the relevant stakeholders were implored to exercise patience in the case of mishaps, or problems, such as lost data (Misek, 1999). Furthermore, users were advised that huge files might not be easy to transfer, etc. Apart from checking for precision in transferred data, academics were expected to create discussion forums, for instance.

While the ICT staff are currently involved in the process of selling myUnisa through the migration progress, the biggest challenge remains winning over some of the departments and programme groups that have not grabbed the opportunity of adopting ICTs for course delivery. The shortcoming of the programme of action applied here is the lack of periodic summary progress reports to all users concerning this migration chapter. Depending on how it is handled, a simple progress report can create some kind of healthy competition. To the successful participants it can act as a tool to spur them – depending on how accolades are given to celebrate their feats. To those who are struggling or failing, it could be a tool for introspection and determining where they went wrong and what needs to be done to get where the winners are. Through the reports as the crucial yardstick, those lagging behind are thus offered a lifeline to apply the successful implementation strategies. Obviously, the flawed strategies would generally be avoided. Furthermore, such reports could also act as a basis for discussion forums, and thus an incentive for creating a healthy atmosphere for co-operation. In the process, such reports would possibly serve to spur stakeholders on, and indicate to them that there is accountability after all, rather than leaving this matter hanging, or to the discretion of individual departments.

The factor of a possible deadline for the migration process is important in that it gives a clear picture of how many are on board and how many are still lagging behind. Unisa has been through a merger, with many staff leaving the institution and many new staff joining. There is a chance that some may not be coming on board due to a lack of knowledge. There is also a chance that a deadline could produce viable, as-yet hidden information and thus expedite the process of implementation.

From the assessment of the annual budget allocated to the use of ICTs for flexible delivery, it is the University's wish and main motive to see its whole community committed to the adoption and optimal use of ICTs for course delivery. Therefore it remains the priority to root out loopholes and weaknesses in ICT models to reach established targets by all and sundry in reasonable time.

3.4.3.1 Internal research effort (ITC Compiled database on use of COOL by TSA's learners, 2001)

Internal research was conducted in which participants were invited to group focus interviews and share their inputs of how to improve the myUnisa portal. No report had been generated at the time of writing this dissertation. No publicised report following the forum is a failure to maintain the stakeholders' kindled interests as to what happened. When dealing with a community as vast as Unisa, it should always be borne in mind that reaching out is important to communicate vital information through all formats of media, even to learners residing in remote areas. Therefore, there is a need to disseminate as much information as possible.

3.4.3.2 Lessons for academics

The Institutional Centre Learning & Development /ICLD (formerly Centre for Courseware Design & Development/CCDD & Bureau of Learning & Development/BLD), at the time of writing, was to provide lessons for academics on how to develop interesting interactive materials through the use of myUnisa. This exercise had the target date of 13 February 2007 on the Florida campus and 22 February 2007 on the Pretoria main campus.

Reserving a space in the daily Intcom to show how the whole process is progressing would go a long way to winning over the reluctant staff members who do not believe that ICTs are there to help make their jobs easier, as part and parcel of the digital economy. Shrouding ICTs in secrecy does not get its proponents anywhere, particularly as far as the war against the digital divide is concerned.

3.4.4 Digital videoconferencing (DVC)

Distance educators have been trying for a long time to take the distance out of distance education but to no avail. DVC seems to be one of the communication tools with great potential for providing the alternative solution to the elusive access to knowledge in DE, but only if applied appropriately and relevantly as the other ICTs. Its advocates seem to concur that it is not lacking in the aspects of interaction, collaboration, knowledge building and critical thinking, provided the defining features are met (Bullen, 1998; DiPaolo, 1993; Dolhon, 1998)

3.4.4.1 Background of DVC

The former TSA introduced DVC at the beginning of 1998 as a pilot project with the main purpose of providing a means for the staff at the main campus in Florida to communicate meaningfully with the four regional offices located at Bloemfontein, Cape Town, Nelspruit and Pietermaritzburg and to utilise it as a supplementary tool in flexible delivery (Sekgwelea, 1999:1).

DVC allows real-time face-to-face communication over a distance. Communication in this instance implies speaking and seeing each other at the same time, irrespective of the distance that separates the connected parties through the technology (DVC). Its unique benefits include allowing a virtual classroom session to be conducted, which

promotes enhanced social interaction. Seeing or hearing each other helps boost confidence in communication; input can be obtained or problem areas can be elaborated on, immediate feedback can be provided and there is a sense of individualisation where learners can establish their own strong and weak points. The sense of isolation often experienced by DE learners is eliminated and costs are reduced.

3.4.4.2 Strategy, implementation and growth of DVC

DVC has unique benefits. Unisa subscribes to a decentralised model of education. Apart from the main campuses at Pretoria and Florida/Roodepoort, there were eight regional offices[3] and six subregional offices, all of which were responsible for carrying out both academic and administrative functions as required by students in their respective areas. The problems of distance and time usually crop up if the need arises to introduce change or disseminate information to all regions within limited space of time. Often such changes or information dissemination require both graphical and verbal elaboration at the same time. As a result, DVC was introduced mainly as a means to save costs and time due to its unique capacity of being such a powerful audiovisual tool and overcoming distance. Hence, the phrase “let the ideas do the travelling rather than people” (a slogan touted by MCT vendor, 1998). This also promotes DVC as environmentally friendly, in a sense (Sekgwelea, 1999).

3.4.4.3 Instructional priorities of DVC for flexible delivery

DVC is the answer to a certain degree (as a time- and place-bound medium) in raising the level of interactions and thus leading to active participation by the learners, building on each other’s contributions as learners and raising their level of critical thinking in the

[3] Since the merger, the number of regions and subregions is about 30. There are 16 regional sites with typical architectural videoconferencing codec units, with one bridging facility.

process (Interactive into the future, Videoconferencing 1999). DVC is suitable as a medium through which critical dialogue could be conducted among the learners and their instructors/lecturers. However, the success of DVC (in inducing critical thinking) is dependent upon factors such as appropriate course design, instructor interventions, content and students' characteristics (Bullen, 1998).

a) Learning environment (far site)

Increased attention must be given to the location, its appearance and comfort. Ideally, special rooms are built for videoconferencing purpose only. However, in the case of available multitasking rooms, their conditions could still be modified to meet basic ideal requirements for DVC. In fact, the DVC's learning environment should closely resemble the treatment normally afforded TV studios as far as room lighting, colour and environment noise level are concerned; where possible, acoustics should be fitted to minimise distracting noise levels (Bates, 1993).

b) Environmental protocol for the learner/participant site

The room must be placed far from distracting noises, e.g. toilet facilities, air-conditioners, heaters and equipment. Alternatively, the room should be fitted with systems that can screen out non-human noise. Furthermore, steps should be taken to ensure that the local participants are not distracted unnecessarily (Bates, 1993).

The room size should be sufficient to accommodate a normal size group of learners, e.g. 10 to 25. There should be enough room and tables for various groups and individuals. The room environment should be pleasing and comfortable. Walls should be neutral with non-reflective surfaces to prevent glare. Furthermore, a background colour

must enable the participants to be seen better remotely (Bates, 1993; Reed & Woodruff, 1995).

A windowless room is the best option, for the windows can cause problems with the video camera and make it difficult for the participants to be seen. If that is not possible, drapes instead of blinds must be used to cover the windows. Blinds generally lead to incorrect focus of the camera. Tile floors should be avoided; extra noise should be kept down by installing anti-static wall-to-wall carpeting.

Objects must not be placed behind the participants, as they might distract remote viewers. (Bates, 1993; Bevies & Samways, 1993)

c) Facilitator environment (near site)

The same principles of room design as those of the learner environment should be applied here. However, sometimes conference rooms may be used. In this case the conference room should extend roughly 2.5 to 5 metres in front of the facilitator. This helps the facilitator to see remote locations clearly whether sitting or standing.

Tables large enough to place the instructor's notes and guides within easy reach should be used. Basic tools for facilitation are a document camera, laptop or computer key, which must also be within easy reach. Any (inexplicable) pause during the live DVC class acts as a distracter to the attention span of the participants (while the presenter may be looking for missing notes, pens, pointers, erasers and so on- such occurrence should be pre-empted through well planned dry-rehearsal). A whiteboard should be positioned nearby. A preview monitor should be installed to the left or right of the main video monitor. This is meant for previewing graphics and items on the document

camera before sending them. The facilities with single monitors do allow window-in-window functionality as another way of making up for the missing second monitor. However, the facilitator/operator must remember to set this function on (Bates, 1993; Reed & Woodruff, 1995).

Distractions, such as items placed behind the facilitator, should be avoided. The colour of clothes also affects the learning environment. The facilitator must avoid extremely bright colours in preference to soft ones. Also hats, caps and bright jewellery which may reflect light should be avoided. The facilitator must maintain eye contact with the camera rather than the video monitor as this gives the impression that he/she is looking directly at participants at remote site(s) (Bates, 1993; Bevies & Samways, 1993).

3.4.4.4 Guidelines for the optimal use of the DVC classroom

There must be sufficient workspace around the facilitator's computer and display. Strong back lighting, such as facing the camera towards a window or other strong light source, should be avoided. Only cool white (3 200 degree Kelvin) fluorescent or white incandescent lights should be used, if possible. Clear incandescent or older fluorescent lights tend to cause yellowish video images. The number of participants sharing a desktop video PC should be no more than two or three at each location. More than this makes it too hard for individuals to see or be seen on the computer monitor (Davies & Samways, 1993; Bates, 1993).

a) Presentation skills and teaching and learning outcomes

Excellent face-to-face presentation skills are a necessity since DVC hinges on real time. Additional skills required to render it more effective are:

- Audience attention (getting and maintaining the participants' attention is critical here)

- Apply attention-gaining techniques
- Employ a general alerting technique to ready participants
- Use voice cues or alerting sounds
- Visual changes in the environment, i.e. pointing the camera to another part of your area, at well-calculated intervals act as suitable stimuli
- Use stimuli that are directly related to the key learning points of the programme; highlight concepts through the use of visuals, e.g. computer graphics or document camera
- Maintain attention (presentation skills need to be developed)
- The presenter/facilitator should have a warm personality, which normally develops with practice
- Vary the message frequently – group certain complex ideas and skills and support them with other stimuli such as visuals, video tapes and questions, use of cues to maintain attention, e.g. icons or pictures for highlighting key points
- Use the voice like a professional public speaker by varying pitch, tone and volume
- Print material should also be used to gain and maintain attention by highlighting critical areas
- Use italics to show important points
- Visuals and reviews of critical and complex areas must be included
- Provide print backup material to support the live two-way video programme

(Bates, 1993; Reed & Woodruff, 1995).

Appropriate teaching strategies are to be applied: the participants must feel comfortable interacting with the facilitator and other remote participants (learners). Successful

learning outcomes are the product achieved when the participants are able to comprehend the context and organisation of the programme. Integrating various media material, e.g. use of myUnisa portal, could form a critical part of DVC in the form of blended lessons.

b) Traditional classroom basics applicable to interactive DVC settings

Interactivity as the key activity to designing and facilitating DVC should play a decisive role. Users must employ the tactics in the designs that require the learners to respond and contribute to discussions (depending on the nature and type of planned lesson). Lecturers/tutors need to assume a more facilitative rather than directive role. The planned activities must elicit interstudent communication. Others should include lecture and student interaction (Bullen, 1998).

c) Relevant content

Only “need to know” concepts and skills must be presented in such a way that learners are able to tie them into their previous experience, current interest and the real world.

Key meaningful content aspects should be backed up by visuals, aids and other supporting tools to increase retention and possible interest (Bates, 1993; Bullen, 1998).

d) Participation

The participants should be encouraged to take an active interest in their learning plan activities that involve the learners at the same location, and that also enables interaction between participants at all locations. These activities must enable learners to demonstrate learning. These may be anything from answering questions or extensive problem solving such as case studies, brainstorming or simulations (Bates, 1993; Bevies & Samways, 1993).

e) Content organisers

The programme material should be organised into meaningful pieces and built upon. The facilitator should check for understanding at frequent points prior to moving on to the next chunked piece and allow for complex content to build from earlier learning. Generally, organising content into specific categories will help participants learn the material better.

Practical courses such as Engineering could also be conducted through simulating concepts or models as these are not easy to explain through text or even graphics. However, Elmo Document Camera could be used for close-ups on still pictures, electronic gadgets and small machinery items. Furthermore, complex content areas such as practicals, demonstrations and depiction require the use of interactive model software that could still be flighted as part of the DVC presentation.

f) Dry runs

Rehearsals are recommended, particularly for the new users of the technology. Familiarity with the system helps boost confidence. Consequently it becomes easier for the facilitator to easily deal with any surprise eventualities that might crop up during the “live presentation”. Pre-set the camera (near end, far end) the showroom button, preview documents, slides and pictures to be set. It is therefore advisable to arrive 15 to 20 minutes before the actual video conference to ensure rehearsal of the main points of the programme.

g) Format structure

Once all the preceding critical aspects have been taken care of, the programme must be structured in the “preview-present-review” format, according to Bates, (1993).

- Preview content **-** here the participants are to be cautioned of certain content to be covered. A relevant preview structure is to be applied, e.g. outline of written objectives or role playing between two presenters.
- Present content - the content organisers and interactive activities (already discussed) are used.
- Review content - content organisers and participation activities, e.g. simple questions/ answers to complex ones, are used.

h) Influencing factors of instructional methodology

Tutors and lecturers should bear in mind that events during the DVC presentation will be influenced by the age, socio-economic status, sex and background of the students, characteristics of the teacher/lecturer, support in terms of time and resources, on-campus/off-campus students, geographic distances, isolation, modes of instruction and psychological and physical environments. Therefore it is advisable for the presenter to handle them sensitively during the conference. It is also important for analysing the interdependence of teaching and learning according to the diverse nature of institutions (Robson, 1996; Bullen, 1998).

3.4.4.5 DVC's successes

The need for real-time face-to-face interactivity with learners, counterparts and colleagues in distance education has largely been addressed through the use of the system. It has been used mostly for administrative purposes, such as meetings, training, HR issues (interviews for jobs, disciplinary hearings) and seminars, and also for academic purposes, such as tutoring by certain programme groups. DVC has also been used for oral examinations. (Sekgwelea, 1999; Reed & Woodruff, 1995)

The Real Estates department adopted a flexible approach by taking advantage of the recording facility available in videoconferencing, and thus developed video cassettes of sessions for asynchronous use by learners who could not attend live sessions.

The bridge service, which is very unique in videoconferencing, offers the capability of interlinking three or more sites simultaneously. As a result of this unique feature, users (both internal and external clients) tended to be keener to use the DVC system if the bridge was fully operational. When the bridge was faulty, DVC business tended to be very irregular.

The role of DVC as a supplement to COOL for flexible delivery purpose (Sekgwelea, 1999:1, 22) was unfulfilled as both DVC and COOL continued to be used separately.

3.4.4.6 DVC's shortcomings

Unfortunately, as the DVC equipment aged, technological faults increased in number. Known problems that required urgent attention were upgrading the ISDN bandwidth from 128kbps to at least 256kbps or more, building redundancy into DVC hardware/software and related use (expertise) and replacing the old units with new ones. A lack of clear policy (between travelling and use of DVC) and budgeting for DVC as an ICT item were also problematic (Sekgwelea, 1999).

Prominent features of the new system are architectural DVC codec, 384kbps ISDN connectivity, monitors, microphones, improved, audio and video capacity, one-to-one/one to many linking options, bridge for simultaneous interlinking,, integration of various technologies, data projectors with projection to big screens, audio/video

playback, PowerPoint presentations, Internet links, various data images, CD/DVD playback, whiteboard, touch screen and document camera.

The new system was rolled out in early 2006. So far 14 units have been fitted to some of Unisa's main sites. This new technology offers superb solutions in terms of seamless integration of blended learning. However, so far, little appears to have been done as far as critical aspects such as strategy, policy and promotion are concerned.

Generally, the use of ICTs for flexible delivery does render more positives than negatives where the adopted strategy is for the achievement of flexible delivery and learning. Where the underutilisation appears to be more prevalent than the anticipated positive results in usage, it is because of major flaws in the adoption and implementation strategies, deployment of resources and sometimes through the failure to integrate models wholly. In such instances it is important to realise that the cause of failure does not lie with the technology itself, but rather the way it has been deployed. The overall shortcoming as far as underutilisation is concerned appear not to be limited to Unisa, but does also occur in other educational settings of high repute, both locally and internationally, where the drive is for the attainment of flexible delivery through use of ICTs (please refer Table 3.1 below).

3.5 Comparative analyses of ICT use at Unisa and globally

Context	Researcher /author	Peri=od	Methods	Title/questions	Findings/recomm=endations	Conclusion
Local, COOL (online)	Cloete, L. COOL, Unisa	2001	Qualitative case studies	Education and training of cataloguers: Training resource programme through mixed technologies, e.g. print, audio, video, COOL	Negatives: Underutilisation of COOL by learners and lecturers. No cataloguing content, just computer literacy. Positives: Unisa COOL is self-pacing and provides immediate feedback.	Positive: Sampled group satisfied with pilot – mixed technologies. Drawback: Failure to use different resources in a complementary way by learners.
Unisa	Odendaal, A. COOL, Unisa	2001	Qualitative case study: PM III	Interactive online for distance education	Advantages outweigh disadvantages. Role change training for lecturers needed. Learners need PC and online skills.	Evaluate retention and pass rate aspects of online media. Results descriptive due to small sample.
Unisa	Van Buren-Schele, C. COOL, Unisa	2001	Qualitative literature search & pilot study about interactive online	Challenges facing developing countries – design and development of online courses	Challenges are lack of services, resources, infrastructure and appropriate skills.	To bridge digital divide, emphasise flexibility and cheaper rates.
	Integrated Technology Centre internal research team, COOL, Unisa	**2002**	Responses to structured online questionnaires	Open to Unisa COOL learners – “respond & win a prize” used as bait to gain respondents	Growth in numbers of accessible learners. Lack of lecturer participation in group discussion (complaint by learners)	Learners see more positives than negatives to using COOL.

Context	Researcher	Period	Method	Title/Question	Findings	Conclusions
TSA (now Unisa)	Lazenby, K. COOL, Unisa How does a virtual campus facilitate constructivism in higher education?	1998	Qualitative grounded theory	Descriptive: Virtual/online Unisa and constructivism	More research studies needed into processes, strategies and structures forming virtual learning; technology-enhanced assessment within flexible learning.	COOL and DVC merge traditionally separate educational practices into one optimised system with better results, e.g. richer learning opportunities, global contexts and experts.
Univ. of North London,	Sandercock, G.R.H. Web used as supplementary tool in traditional residential situation.	2001	Action research using both qualitative and quantitative methods	Learners' performance and evaluation of attitudes towards WebCT in the delivery of Applied Sports Science.	Positives: Offers wider choice regarding own time, place and pace. Negatives: Complacency by learners; technical glitches in linking.	Exaggerated claims by learners due to novelty of technology. No significant difference between CAL and traditional methods.
Manchester Metropolitan Univ.	Forsythe, R	2002	Integrative research	WebCT	More positives than negatives. Higher recorded uses by both learners and staff.	Greater breakthrough could happen in the form of integration of online as mainstream activity.

Contex=t	Researcher	Period	Method	Title/Question	Findings	Conclusions
Unisa (former TSA) (DVC)	Sekgwelea, S.M. Interactive Digital Videocon-ference	1999	Action research	Application of DVC as supplementary tool for flexible delivery at Unisa	Many positives: Meaningful communication tool, cost-saving and compatibility with varied media. Negatives: unsolved technical glitches and lack of capacity.	DVC is decreasing in popularity. Probable causes -insufficient infrastructure and unclear institutional policy.
Univ. of Idaho	Univ. of Idaho College of Engineering	1996		Interactive video-conferencing in DE.	Negative: Universal standards between different brands minimise resolution.	Keeping remote sites equally involved.
	Fletcher, McKinon, Nolan, Sinclair	2003	Empirical research study: Evaluation of traditional vs. ICT instruction	Does this stuff really work? Comparative evaluative study: technology-based vs. traditional approach	ICT instruction more effective than traditional one: 30% saving in costs; generally students tend to prefer technology-based approach despite the novelty factor.	No longer relevant why should we undertake study for technology-based instruction(evidence abounds).More important is why should we not undertake technology -based instruction?
Gloucest ershire Universit y	Laurillard	2004/5	Evaluation effectiveness of WebCT residential university context	Effectiveness of WebCT in nf2f institution	Rate of adoption and implementation of tec =hnologies to vary with different groups; greatest fear expressed by staff – online likely to disc =ourage learners to attend f2f classes; co =nflict e-learning (DE) vs. personal contact.	Avoid one size fits all approach; it is imperative to apply different strategies according to varied users; piecemeal approach without clear policy likely to lead to failure.

Context	Researcher	Period	Method	Title/Question	Findings/Recommendations	Conclusions
Univ of Cape Town	Learning from the rhetoric of academics A Deacon and C Wyn-Sculley	2005/6	Educational technologists working with academics across higher education institutions, encouraging more effective use of technology in teaching through use of social constructivism	Hands-on , educational technologists, academics approach participation with architectural students and film students – studies' findings encouraging	Immediate observation - Possibly not unexpectedly there was almost no discussion of the educational technology and learning theories. What was done to encourage opening up? Using rhetoric and other analytical tools.	There are suggestions that using rhetoric and other related analytical tools open up interesting reflective spaces for educational technologists to learn how academics function as change agents; Observations: Academics spent much time talking about the work students produced, why it impressed them, and how this was a product of collaboration with educational technologists.
Univ of Cape Town	Cheryl Brown and Laura Czerniewicz	2005/6	Exploration of disciplinary differences in the use of ICTs for teaching and learning in higher education institutions. Laurillard's conversational framework (2002) used as way of	Disciplinary differences in the use of educational technology		There are indeed differences in both the frequency and ways that different disciplines use ICTs. Some suggestions are offered as to why this might be so.

Context	Researcher	Period	Method describing ICT use in terms of five key teaching and learning events, and Biglan's framework (1973) of classifying different disciplines.	Title/Question	Findings	Conclusions
RAT Online The Wheel Spanner: An Online Self-defence Course	S. Yates	2006	Research output intended for output in kinaesthetic skills and knowledge - how can they be learned online? Purpose – lead to useful insights into other knowledge domains. Facilitate the process of learning to use the wheel spanner, normally used for changing car wheels, for self-defence.	To evaluate how these complex learning environments can be created and delivered, and what learning and evaluation approaches are appropriate. Also time to challenge conventional beliefs of what can and cannot be learned online. May be possible to bridge the difficulty of access to and delivery of specialist or "hard-to-find" educational courses and knowledge.	Starting point is findings of a previous pilot online Rough and Tumble (RAT) course (a South African martial art). Researcher uses "eclectic-mixed methods-pragmatic paradigm" which allows him to use different theories to carry out both formative and effectiveness evaluation. The main goal of the research project is to design and deliver online courses with theoretical framework and conduct evaluation which informs redesign of these courses to improve the learning experience for participants.	Positive feedback from course participants: a favourable and effective learning experience. Negative feedback: technical functionality. Other possible conclusions (by the writer): as long as the users & implementers are comfortable with the application and use of technology, there appears no limit as to what can be achieved.

Context	Researcher	Period	Method	Title/Question	Findings The development, delivery and evaluation is	Conclusions
					therefore always in a formative state. Various technologies used to facilitate collaboration between course participants, e.g. discussion forums, live video and text chat, whiteboards and virtual self-defence rooms. Participants also deliver learning outputs which include mind maps and video recorded assessments. Learner output is added to a RAT knowledge base called the RAT CD-ROM.	
ASCILI-TE, Perth Conferen ce	Nian-Shing Chen & Craig Zimitat Differences in the Quality of Learning Out-comes in a f2f blended course	2004	Concern here is not testing recall of few memorised facts as proof of the effective-ness of use of ICTs	Testing here is for deeper & higher levels of meaningful lear =ning; whether when based on pre- & post-test results,conducted through	Even though pre-tests showed substantial difference between f2f & virtual online groups, post-tests showed same results. However, this does not imply	E-learning potential lies in harnessing the technology power, range of learning experiences and resources (particularly communication tools) to support learner

Context	Researcher	Period	Method	Title/Question	Findings	Conclusions
	Versus wholly online (adult industrial learners) courses			SOLO tests, the results would reveal any significant difference between f2f and virtual online learning	same learning owing to RPL, relating new learned experience to old experience. (masters learners)	from non-traditional background;the whole range of communication mechanisms to enhance interactions is deemed necessary.
Man-Chester Metro-politan Uni-versity	Naidu, S. visiting scholar @ MMU	2003	Action research, preliminary survey results.	Trends in Faculty Use and Perceptions of E-Learning; Possible causes Reason for lack of interest in e-learning: lack of time to develop materials; lack of knowledge and understanding of WebCT; lack of technical support; concern about their own IT skills; concern about student ability to use WebCT; concern about accessibility for students.	General lack of interest in adoption and use of e-learning by faculty for educational delivery; the lacklustre finding not confined to MMU, but comparable to other institutions where similar e-learning ventures are undertaken; advanced barriers to the under-utilisation are lack of institutional support; limited resources, e.g. time and finance, lack of information, knowledge and expertise in e-learning technologies.	Possible corrective measures: overcoming identified barriers to e-learning; apply clear policy; research & innovate; eliminate competing interests (comfort zones vs. fear of the unknown); sufficient supply of time and other resources required for ICT development, which would also act as indication of commitment by the institution; reinforcement and showcasing of the work produced by the early adopters/pioneers; rewards and incentives for work well done;

Context	Researcher	Period	Method	Title /Questions	Findings	Conclusions
						motive for adoption should be for educational concern as the driver.

TABLE 3.1: Summary of empirical analyses of ICT models such as COOL and DVC (at Unisa) in comparison to other local, national and international research studies

3.6 Summary

The delivery of qualitative education remains one of the key challenging questions at primary, secondary and tertiary education levels. Government, corporate and public society see part of the solution as the adoption and implementation of a viable ICT model in alleviating some of the identified problems. Generally, DE institutions are expected to play a critical role in addressing the need for quality education. The use of

ICTs by these institutions should help address some of the identified challenges head-on rather than window-dress them.

In the next chapter, the researcher advances the rationale for the choice programme evaluation in research design and methodology. Furthermore, he expands upon the research design and methods used to delve deeper into the crux of this report. In closing, he elaborates upon why he chose Engineering Science as the basis for his study.

CHAPTER 4. Research Design & Methods, Rationale for Integrative Programme and Engineering

4.1 Introduction

In chapter 3 the researcher focused mainly on use of ICT models for teaching and learning. A sweeping assessment of the South African educational transformation landscape was also provided to give a broader picture of where Unisa, its competitors and partners draw their clientele (learners) from, and general challenges facing South African universities in the new South Africa. An in-depth description was also given of how Unisa uses its ICT models (COOL/SOL and DVC) for flexible educational delivery. The chapter ended with comparative analyses of the use of online and DVC technologies locally and internationally.

In chapter 4 the researcher's effort concentrated upon elaborating research design and methods he is to employ in gathering the research data. Further the researcher does provide a reminder of what the real cause of this study is: coming up with what is seen as the strategic innovative approach that would enable users to utilise ICTs effectively for flexible delivery should be seen as part of the answer. The other critical part of the answer lies in answering the question of whether ICTs are actually underutilised or optimally utilised in DE in line with users' needs. So far integrative programme evaluation research design and methodological strategy seems to stand head and shoulders above other designs and methods considered for this purpose (i.e. in getting to the core answer).

In research nothing is left to chance in the pursuit of new concepts or hard facts; it is for this reason that the researcher tended to rely on published engineers in education or engineers practising in education to gather hard or soft acceptable facts concerning Engineering as a field of study, and scholarly research elucidating current debates and challenges in Engineering.

4.2 Optimal utilisation or underutilisation of ICTs for flexible delivery

To address the pertinent questions raised so far in this discussion, proven research designs and methodologies had to be applied. According to Welman and Kruger (2001:46), the research design is a plan used by the researcher in testing the hypothesis or deriving the answer to the research question. It allows the researcher to consider carefully the orientation of his/her research study in terms of quantification and qualitative approaches. In the case of this research study, it also served as a tool in helping the researcher to:

- determine the effectiveness of the application of ICT models for flexible learning;
- conduct exploratory studies through practical testing of the technologies
- choose the sampled population and engage this population qualitatively and quantitatively through interviews and self-administered questionnaires as a means of collecting the data to a set of question items
- conduct, as a precondition to interviews, pre-recorded interviews with some of the sampled participants as a means of selecting, orientating and requesting an appointment for face-to-face or telephonic interviews

In this study the researcher chose the integrative approach because it allowed him to draw upon the strengths of both quantitative and qualitative approaches in answering the research question.

4.3 Reasons for using integrative programme evaluation

Generally, social behaviour is considered to constitute qualitative constructs. However, social constructs such as optimal utilisation as opposed to underutilisation are also measurable entities. Learning as opposed to no learning is also a measurable entity. ICT use relates to scientific practice: norms, ethics and limits.

However, the users are social entities. Hence the researcher's option for integrative programme evaluation, which is said to be more superior in that it deals with both qualitative and quantitative aspects equally well (Hathaway, 1995: 539-553).

4.3.1 Advantages (Clarke & Dawson, 1999): Rather than concentrating on the differences, the integrative approach looks for complementarities. Both applying ground theory (through focus interviews) and conducting empirical studies – testing for whether a combination of constructivism with ICTs is capable of rendering superior delivery or learning models (enhanced quality) to other models (e.g. print or mixed approach) - within this study is a possibility, of which given ample time and other resources could be exploited.

4.4 Sampling involves studying representative members of the whole population in order to draw conclusions based on the findings regarding the given phenomenon; sampling is important as the resources (time, finance and even effort) often do not allow the study of the whole population.

Characteristics of the sample are: representivity, risks involved in generalisation, however, risks minimized by greater representation of samples from various parts, inferences drawn, and consistency in similar results obtained and their replicability.

Any probability of the sampling error due to fewer incidences allowing use of the probability samples is minimised through use of the focus group interviews (Morgan, 1988)

4.4.1 Probability Sampling: it is highly recommended, as it affords the individual members of the population equal chance of selection as sample. As implied in the preceding sketching of the scenario, probability sampling technique should play critical role in helping to select aspects of the groups such as academics, tutors, professionals - producers and IDs (Welman & Kruger, 2001).

4.4.1.1 Advantages: affordability of equal chance for selection for the sample of the available members of the population is the main advantage as it minimizes the bias hidden in selection.

4.4.1.2 Disadvantages: probability sampling application strategy is based on readily available groups. When it comes to the selection of the learners, the researcher relied on non-probability sampling technique as the learners are not readily available on campus. While the individual learners may be readily available on campus from time to time due to various reasons, the various groups e.g. Electrical Engineering, are scarce, particularly when there are no pre-arranged appointment to meet with such group of learners.

4.4.2 Non-probability sampling: this technique compromises representation and therefore findings that are made from such samples. However, during the formative phase of the research, combination of both the accidental and quota non-probability sampling techniques are important (Welman & Kruger, 2001.)

4.4.2.1 Advantages: Generally, they are applied as they are very easy to employ and economical. They allow one to contend with the available members as acceptable sample.

4.4.2.2 Disadvantages: According to Ary, et.al (1990: 171) it includes methods in which elements are not chosen by chance procedures. The results depend on the expertise of the researcher.

4.5 Formative phase

The qualitative approach is a flexible, open, subjective, emergent process operational according to ground theory which is based on “no claim of knowing what they do not know” (Welman & Kruger, 2001).

Qualitative methodological techniques in data collection – auditing, monitoring and inspection - are handy supplements to an evaluation strategy. Depending on the nature of the ICTs and their applicable degree of use by the participants, the extent of the activities following auditing, monitoring and inspection vary according to the nature of activity or non-activity (Clarke & Dawson, 1999: 4-7).

4.5.1 Data collection techniques

At this stage of the study, assumption needs to be cast aside, and the researcher has to visit the actual research site, observe as participant researcher, survey it, test it (online

or DVC), check for what works and what does not. At the same time the researcher needs to bear in mind the paperwork important for this exercise, which comprises identifying variables to measure, choosing and devising appropriate instruments that are both reliable and valid, and administering the instruments in accordance with methodological guidelines that will help conduct a thorough search (Clarke & Dawson, 1999: 65).

4.5.1.1 Auditing

It is said a picture is worth a thousand words. Based on assumption, paying a visit to the technology site and observing how it actually functions should carry more weight into affirming or discounting certain expectations, drama, fascination and value for the keen visitor. In this study, auditing entailed determining how the programme was experienced by policy-makers, staff and learners (Clarke & Dawson, 1999: 4-7).

4.5.1.2 Direct observation

This is also critically important, and in this study helped to establish close working relationships with the “creators or administrators” and users of the programme – under responsive evaluation. (Clarke & Dawson, 1999: 4-7). Direct observation included a literature review about the concerned ICT models, and occasional visits to COOL or SOL, and sitting in on DVC meetings. The typical questions that would be posed in this respect are: Is the technology in use? What does it serve? When is the right time to conduct the observation?

4.5.1.3 Monitoring

Monitoring is the continuous surveillance of a series of events. It is an integral part of the implementation phase. The processes and procedures of the aspect being

researched are monitored as performance measures. Monitoring acts as a measure to ensure better focus on outlined goals, and any deviations (likely to lessen effectiveness of model) noticed are to be raised to be corrected. It is intended as value-free (Clarke & Dawson, 1999:6).

Critical aspects of performance monitoring are to identify measurable indicators. In this study, the indicators are the inputs (programme, content, and delivery techniques), outputs (learning, retention) and outcomes (behavioural change, pass rates) of the programme. Outcomes related to the decision-making process about accountability, e.g. improved thoroughput rates, better retention rates, and positive attitudes to the new Unisa. Process accountability is about efficiency in the management of resources and thus focuses on programme outputs (Clarke & Dawson, 1999: 6). The typical question that could be asked here is: Does a funded programme succeed in carrying out its mandate?

4.5.1.4 Inspection

Inspection carries with it an element of surprise or entails an unexpected visit (to ensure objectivity regarding the noted results, that is, to be very close to their original state). A top-down approach was used in the external evaluation. Classical examples of questions that could be asked in this respect are: Are codes of practice adhered to? Are minimum/maximum standards achieved? (Clarke & Dawson, 1999: 7).

4.5.1.5 Interpretative, naturalistic or constructivist evaluation

Meaningful interpretation results from meaningful natural social interactions with the social phenomena (Guba & Lincoln in Clarke & Dawson, 1999:57). The main concern here was gaining full comprehension of the subjective needs of the programme

“creators/implementers” and recipients that is those experiencing the problem that the programme was designed to alleviate. In this instance the valid questions are: What is your feeling towards the use of the ICTs (COOL, SOL and DVC) in your learning context? How do you rate SOL/COOL and DVC as delivery media? Do instructional design inputs meet your needs? The attempt at answering some of these preceding questions forms the crux of this report.

4.5.2 Survey

4.5.2.1 Personal Interview: Its strong point lies in their personal contact that ensures that the interviewer gets information through their interaction with the interviewee; other advantages include their flexibility - the interviewer is able to see the natural setting and environment of the phenomena; the interviewer is able to ask the interviewees for more explanation if response seems incomplete; in turn the interviewee could also ask the interviewer of the meaning of the questions. Interview schedule as the guide is important, and good knowledge of questions by the interviewer is required so that s/he could play meaningful role when it comes to leading the interview. (Ary, Jacobs, et.al. 1990: 418; Bottorff, 1993:245)

4.5.2.2 Face-to-face: the interviewer controls the interview situation; if interviewer is not careful may end up leading the interviewee to specific answers; it is costly time wise.

a) Advantages: personal contact ensures that the interviewer gets required information; results in high % of tape-recorded responses; the interviewer is there to clear unclear questions; the control of the question-sequencing is done by the interviewer; the recorder was meant mainly for capturing the dialogue and other idiosyncratic responses verbatim (Bottorff, 1993-5: 245); more importantly, the

interviewer is able to observe the respondent and the total situation in which s/he is responding**(Ary, Jacobs, et.al 1990: 418; Davies, 1980)** .

b) Disadvantages: – it is not anonymous, this factor may inhibit the interviewee - as the researcher happens to be there; it is for the very same reason that the researcher decided to avoid conducting some of the interviews as some of the affected samples were drawn from his work environment. In that instance the researcher decided to delegate the interviewer role to research assistants (after undergoing special training) as precautionary measure to avoid confounding results through his participation (Ary, Jacobs, et.al 1990: 418).

4.5.2.4 Telephonic Interview is intended to cover wider geographic areas within short space of time. It is also intended as reasonable tool to reach unreachable potential sample in what is considered danger zone. In this context, the technique became indispensable in the instance of remote inaccessible subjects as sampled members who could not be interviewed on campus. Although costly, it is claimed to yield high percentage of returns in responses. Inhibitive factor may be due to the respondent's doubt of the credibility of the interviewer (Ary, Jacobs. et.al 1990: 433).

(a) Advantages: It is more autonomous than the face-to-face interview. Accessibility is easy to the sample that may not be reachable under normal circumstances (Ary, Jacobs, et.al 1990: 433; Davies, 1980).

(b) Disadvantages: very costly, impersonal as there is no establishment of rapport, possibility of doubting credibility on the part of the interviewees may affect the results, great deal of skill is required on the part of the interviewers, and it is also discriminatory

with reference to households without telephones (Ary, Jacobs, et.al 1990: 433; Davies, 1980).

4.5.3 Unstructured Questionnaires: was used as part of the pilot. The answers obtained were used to develop the structured questionnaires for both the interviews and the self-administered questionnaires.

4.5.3.1 Advantages. Highly flexible, allows the respondents a lot of freedom in their responses, and allow room for additional new questions and answers (Ary, Jacobs, et.al 1990: 419; Glesne & Peshkin, 1992: 63-65).

4.5.3.2 Disadvantages: Very difficult to codes as they consist of incomparable data. Require more time on the part of analysing and classifying or even structuring data given by both the interviewee and interviewer (Ary, Jacobs, et.al 1990: 419).

4.5.4 Structured Interview Schedule:

4.5.4.1 Advantages. It is easy to fill in, and also for the interviewer to quickly analyse and evaluate the data; all the respondents use same frame of reference (Ary, Jacobs, et.al 1990: 419)

4.5.4.2 Disadvantages: it does not provide insight into the subjects' thinking whether s/he taken firm stance; some respondents may even attempt the questions they know little about by choosing what sound like reasonable answers (Ary, Jacobs, et.al. 1990: 419)

4.6 Summative phase

Objectivity to determine whether the ICTs (SOL, COOL and DVC) were used optimally or not was achieved through the use of surveys compiled of objective structured questionnaires and structured interview schedules (which restricted interviewee or respondent responses) and sampling techniques.

However, social context is critical to inductive logic; thus broad generalisations are derived from observed data through social interactions. This is called phenomenological subjectivity. Phenomenology was ensured through the use of structured questionnaires and in-depth interviews (Clarke & Dawson, 1999:40).

4.6.1 Self-Administered Structured Questionnaire: not limited in scope, it is applicable to far remote sites that would be difficult to reach by the researcher; it is favourably disposed to the ethical consideration of confidentiality; with the respondent feeling empowered, more information is then released that would say under interview situation be reserved by the respondent for possible fear of reprisals (Ary, Jacobs, et.al. 1990: 418-432).

4.6.1.1 Advantages: It is very cheap to administer, esp. in instances where samples are readily available, covers wider scope, it reaches far, and gives respondents greater sense of autonomy; and allows the respondents to reveal more information than they would say under the interview setting; what is even more, it is easy to analyse and summarize (Ary, Jacobs, et.al 1990: 421).

4.6.1.2 Disadvantages: very selective as it requires strictly readers and writers; it is characterised by low returns as the respondents could put it aside and forget about it; prearranged response options could be very frustrating and inhibitive to the respondents' feelings (Ary, Jacobs, et.al 1990: 421).

4.6.2 Focus Group Interviews: data collection

Group interviews are well-known for helping with insights into attitudes and opinions of groups (Glesne & Peshkin, 1992; Morgan, 1988).

4.6.2.1 Advantages: They are excellent tools for collecting rich qualitative data; the participants often correct or moderate their initial responses (false or extreme views) due to responses given by other participants during the focus interview; moderator/ facilitator encourages participants to respond in their own term, to the issues deemed important by them while maintaining focus; as such they outclass structured self-completion questionnaires with predetermined questions; recommended group size should be 6-12 to ensure balanced participation; it is seen as cheap if the finance is the issue; duration of about 1-2hrs is considered reasonable; it is highly flexible and applicable at various stages in the lifespan of project. The main advantage is testing for validity, and ensuring that the results obtained are replicable in their original setting (Lewis, 2000; Morgan, 1996; Foich-Lyon, et.al. 1981).

4.6.2.2 Disadvantages: there is a chance of suppression of true feelings by the participants due to the following reasons: disappearance of the cloak of confidentiality; inhibition of juniors by their seniors, client-professional relationship may also be inhibitive. The preceding side-effects associated with what is known as group dynamics could be lessened by conducting more focussed group interviews with standardized samples as shown in this research (Morgan, 1988; Morgan, 1996 Lewis, 2000; Foich-Lyon, et.al 1981)

4.6.3 Comparative analyses

Comparative analyses of both the qualitative and quantitative aspects are seen as essential for the provision of bigger picture in the analyses of the whole data (Ary, Jacobs, et.al 1990: 472). From a literature survey perspective, the majority of studies conducted to date in this field have pursued a qualitative approach. It was the researcher's feeling that perhaps a different approach in the form of the proposed methodology would reveal new realities or even serves to answer some of the questions posed by previous studies which have remained unanswered thus far. Most importantly, the researcher needed to establish whether use of ICTs for flexible delivery was optimal or not (Ary, Jacobs, et. al., 1990)..

4.7 Why Engineering as choice?

Engineering Department was chosen by the researcher to base the study on the following reasons:

- On reviewing documentary evidence (predominantly secondary data), it was clear that a number of studies in ICT had been based on the teaching and learning of social disciplines, e.g. Business Administration, Library courses. This study was to be the first of its kind, i.e. the use of ICTs for the delivery of flexible learning in sciences, e.g. Engineering.
- In addition, increasing calls have been made by both the public and corporate sectors for more scientists, with the engineering field identified as one of the scarce skills for the Accelerated and Shared Growth Initiative of South Africa (AsgiSA). It is therefore incumbent upon institutions such as the new Unisa to heed this call by promoting the learning of the sciences and improving the quality of their teaching.

- As Engineering is a practical subject, it stood to reason that all the possible combinations of flexible use of ICTs and application of constructivist pedagogy for educational delivery and learning and their effects would be highlighted.
- As the Engineering Department was keen to embark on a conversion of their courses into interactive multimedia {i.e. according to sentiments expressed by their Executive Director (2001), and Acting Executive Director (2002)}, the logical anticipation was that a lot of effort would be invested in building this project as their flagship. This expressed interest appealed to the researcher to settle for the willing known partner (as Engineering Department) for participation in building joint project rather than the unknown party.
- The researcher's knowledge of the sciences is limited; a Grade 12 level of Biology, Physical Science and Mathematics serve as the base. The add-ons along scientific lines have occurred at tertiary level in fields such as Geography, Statistics and IT. As far as Engineering as a course is concerned, little is known by the researcher. It is for this reason that the researcher depended greatly upon guidance offered by specialists or lecturers in Engineering.

To have a look at the Electrical Engineering curriculum in use, the researcher negotiated a syllabus copy from the concerned lecturer (in electrical engineering), an extract of which appears in the table below. The said syllabus (Madisa, 2001) has been lined up with Thijs, et.al. in Latinio (2006) progressive flexible delivery & learning table to show how Engineering material could easily be adapted for blended learning (with use of ICT model in mind).

Aspect	More ('emerging pedagogy') suitable for ICT models: myUnisa and DVC	Extracts from Electrical Engineering curriculum
Active	Activities determined by learners Small groups Many different activities Pace determined by learners	**4.1 Module 1: AC Fundamental and RLC Circuits (eng 1)** **1.1 Outcomes** The learner must be able to explain and identify various ways on how AC is generated. To draw, interpret and do calculations on waveforms of AC voltages and current. (Sinusoidal and complex waveforms) Explain what happens to the voltage-current relationship, when an alternating supply is applied to Series and parallel combinations of pure resistances, inductors and capacitors. Calculate impedance, current and voltage components and power factor, using **COMPLEX NUMBERS.** Calculate and understand the concept of resonance and its practical uses. Draw to a reasonable scale, phasor diagrams, representing AC quantities. Calculate the real, reactive and apparent power in

		any AC RLC circuit. Calculate the capacitance required to improve the power factor to a better power factor and understand why it is used in industry.
Collaborative	Working in teams Heterogeneous groups Supporting each other	**LABORATORY (Eng 1,2,3)** **FINAL DATE** **EXPERIMENT: NUMBER** **Mark Gained** **1 Preparation** 2 Presentation 3 Objective 4 Diagram 5 Apparatus 6 Procedure / Method **7 Results calculated and measured** 8 Does e.g. the circuit operates properly **9 Discussion/Conclusion (what does results mean)** 10 Problem / error handling / faultfinding

		TOTAL:
Creative	Productive learning Find new solutions to problems	**<u>DEMONSTRATION (Eng 1, 2)</u>** Your lecturer will demonstrate and explain the following: How to connect resistors on to a bread board. The use of a digital multimeter and analog multimeters. The analog ohmmeter information is for historical purposes only. Students will use a digital multimeter in all experiments. The basic principles of operation of a D.C. motor and D.C. generator The basic principles of operation of a transformer *Magnetic induction and Electromagnetic induction* *D.C. distribution.*
Integrative	Integrating theory and practice Relations	Draw the data tables for each resistor (i.e. ten data tables) to record the obtained readings. Calculate and record the expected values of the

	between subjects Thematic Teams of teachers	currents of all 10 resistors in their respective data tables before measurement is being made. Switch the power supply on and adjust the current setting to read 1A. Adjust the variable D.C. supply until the DMM reads 2 volts. Always use the expected (calculated) to set your DMM to correct scale and range. To measure current flowing through a resistor: Set the DMM when measuring current flowing through a resistor, remove any leg of the resistor which you want to measure current, and measure between the removed leg and the point where the leg was connected. The resistor leg indicated by a dotted line in the diagrams is the one that may be removed and used for measurement of current. Record the current as indicated by the DMM. Adjust the variable D.C. supply until the DMM reads 4 volts, and record the current. Adjust the D.C. supply until the DMM reads 6 volts, and record the current. What conclusion can you make from these procedures?…….

Evaluative	Student-directed Diagnostic	**<u>Practical Work (Labs)</u>** Laboratory work is an integral part of your course in electrical engineering, not only because you are able to verify some of the theory you learn in the class room, but also, because: It gives you practice in physically connecting up circuits correctly, If the circuit does not work as you expected it to, you get practice in fault finding. It gives you practice in adjusting and reading both analogue and digital multimeters accurately. It gives you practice in working and co-operating with other members of your team, and communicating with them. And finally, it gives you practice in report writing, and critically evaluating data.
Evaluative	Student-directed Diagnostic	**Eng 2, 20. Harmonics** Fundamental Wave and Harmonics- Different

		Complex Waveforms- General Equation of a Complex Wave- R.M.S. Value of a Complex Wave- Form Factor of a Complex Wave- Power Supplied by a Complex Wave- Harmonics in Single-phase A.C Circuits- Selective Resonance Due to Harmonics- Effect of Harmonics on Measurement of Inductance and Capacitance- Harmonics in Single and 3-Phase Transformers- Objective Tests. **4.4.2 Transformers** **4.4.2 Objectives** The learner must recall and demonstrate knowledge of different type of transformers and their applications. The learner must be able to derive the EMF equation of a transformer and draw the phasor diagram of a transformer on-load and off-load. The equivalent diagram of the transformer needs to be mastered. The basic calculations using transformation ratios must be understood and performed by the student.
Evaluative	Student-directed Diagnostic	***Electric Lighting (Illumination) Eng 3*** Main Contents:

		Introduction to light, the units of light measurement. Calculations of illuminance at a point on a surface, using the Cosine law. (4.1.1) Calculating the lighting requirements of a room, using the lamp lumen method. Study of different types of lamps: Incandescent; various high, and low pressure discharge lamps.

Table 4.1: Adaptation of Engineering syllabus according to Thijs, et.al in Latinio (2006) ICT-based model of Flexible delivery & learning

4.7.1 What is engineering education?

Engineering is described as the profession intended to manipulate energy, materials and information, thereby producing beneficial services and products to meet people's needs and interests. To succeed, engineers must possess and use information and skills that are both theoretical and practical. Engineering knowledge and skills is the product of the thoroughly organised laboratories, run by efficient producers and testers. It is a practising profession modifying resources to produce technology, materials, energy and new information.

It is also about conducting development laboratory – seeking to answer questions such as the following: Does the new behave as intended? What is the message carried by the experimental data? What is the nature of the product, ,that is, before designing and developing it? (Feisel & Rosa, 2006:121-122, 125-127, 128)

Engineering as occurring in research laboratory is more about a generalised broader knowledge of nature. The Internet and distance learning have renewed interest in the

use of laboratories in engineering education. With computer technology, instruments can be controlled remotely, laboratory contexts can be duplicated at far reduced costs as part of simulations, and there is also data computation, reduction, analysis and insight gained through problems and faults as experienced by the researchers.

The dichotomies between theory and practice need to be kept in check through instructional laboratory objectives: cognition (instrumentation, modelling, creativity, experimentation, data analysis, design, learning from own faults), psychomotor (practical skills, communication) and affective domain (safety, sensory awareness, ethical considerations, application). According to Feisel and Rosa (2006), exposure and appropriate tuition based on these laboratory objectives should lead to the effective engineer, if carried out successfully.

In school-based textbooks, engineering problems are seen as well-structured, manoeuvrable and to the point. On the other hand, work-based engineering problems are seen as complex, and multilayered, they have many solutions and are unpredictable, according to Jonassen and Lendel (2006). Therefore striking a balance between the two categories is important for nurturing young engineers.

Stagnation of engineering education means that services and goods are no longer of quality, and mediocrity is likely to be the result. Should one be surprised when their best engineering technology turns out ordinary, or rather leads to man-made disasters? Definitely this should be a major concern. It is not surprising that some are even talking about a new engineering agenda which advocates environmental awareness, sustaining and growth intended for the current millennium engineer. According to Von Blottnitz (2007), this millennium engineer curriculum needs to be informed by the Barcelona

Declaration of the 24th of October 2004, which calls for the complete overhauling of the university institution and its core activities as an educator of society. Among its core activities, the university has to radicalise its engineering curriculum, to move away from being too positivistic to being humane. It should be more flexible, holistic and equally accommodative of both the pure sciences and humanities. It should aim to produce the engineer who is more open-minded, critical, innovative and creative. This prospective engineer will adopt multidisciplinary approaches in his/her approach to work, will be culturally sensitive and will be able to relate his/her daily operations to the bigger picture as it unfolds, from the local to the diverse global level. His/her daily engineering activities should be environmentally friendly to the extent of helping conserve nature.

At international level, almost similar sentiments are raised in an article entitled “The research agenda for the new discipline of engineering education” (Jonassen & Lendel, 2006). EPICS projects are a classical example of embedding engineering practice in the human environment, freeing it from being too technocratic. Aspiring engineers serve their practicals in real community-based projects, learning how to work in teams and how to apply their technical know-how in real natural environments, they learn people skills of communicating and evaluating, and what is even more advantageous is that projects are not too costly to their local communities and are shaped according to the local community needs. More importantly, the process does not end there, as the diverse international interest is equally taken into consideration (Coyle & Hamilton, 2006: 1-10).

4.7.2 Strategies and policies needed to overcome shortcomings

The general picture of engineering in the South African context is marked by a dire shortage of professionally qualified engineers as result of the increased booming

economy. The increased economic activity has led to too much pressure upon limited rail, telecommunication, road and electricity infrastructure. Talk of the looming disaster about to happen due to the shortage of engineers is no longer empty as disasters are already happening; time and time again, one reads/hears of increased mining disasters (Primetime News @19h00. 2007); periodic power failures and traffic lights not working create chaos in traffic management, or even disasters in construction of buildings.

Blackouts have forced the national electricity supplier (Eskom) to form a partnership with the SABC whereby the national broadcaster serves as a warning monitor of Eskom's impending unpredictable power outages (SABC 3, News 2007). If consumption is threatening to exceed a certain level, this potential power outage is communicated to the consumers, who are asked to implement safety-valve measures by switching off certain appliances to reduce high consumption level in electricity. If this is already happening during the summer when consumption is known to be generally low, winter will probably be chaotic if a better, lasting solution is not found and applied in time.

Given the above sordid picture, all indications are that engineering education has most unfortunately been a neglected field, and now the price to pay is too expensive. To a large extent the problem appears to lie in the rampant economic boom of about 4% since 1994, which has not been paralleled by the production of skilled technologists qualified in Engineering (Hanrahan, 2006). The apparent neglect due to lack of planning (diminishing interest in Maths and Science over the years by learners, who regarded these subjects as too difficult to pass, and the corresponding desertion by professional educational engineers for more lucrative jobs in the corporate world due to poor educational salaries) has unfortunately led to more National Diploma technicians

assuming more senior responsibilities in areas that are far above their basic qualifications.

4.7.2.1 AsgiSA and Jipsa

AsgiSA is the government's response (in partnership with labour and business) to the said critical shortage of properly qualified engineers.

Jipsa (Joint Initiative on Priority Skills Acquisition) has also been added to fast-track skills production with the target set at 1 000 BEng qualifications in five years.
However, Jipsa would not be feasible without the special secondary programme for support. Some 500 schools are expected to produce an estimated 50 000 learners with sound qualifications in Maths, English and Science in three years. In the end, both AsgiSA and Jipsa are seen as the acknowledgement by all stakeholders that using underqualified or unskilled labour in engineering may lead to disaster. However, according to Hanharan (2006), this initiative is too small to have a reasonable impact when valued against construction projects estimated at more than R300 bil for the next three years.

Hopefully, schemes such as seed funding to all the programmes being increased from 1 200 to 2 400 and attempting to retain engineering staff will in the long run help to resuscitate engineering from the ashes and lead it to sound growth in the construction, telecommunication, railway and electricity sectors. It will thus emerge in the indispensable infrastructure that this country needs for the success of the FIFA soccer festivities to be hosted by South Africa, and also the booming knowledge economy, post 2010.

While Hanrahan (2006) appreciates the corrective measures planned in AsgiSA and Jipsa, he feels that they are crisis-driven; he recommends that as a growing economy, South Africa needs to adopt transitional engineering models that have been employed by successful economies.

4.7.2.2 Interactive engineering

While positive measures such as increased efforts to recruit learners for Science and Maths, an increase of scholarships in scientific careers, lowering the admission requirements (particularly for learners from disadvantaged schools) to science related fields, and also the increase of special foundation university courses in Science have to be applauded as some of the corrective measures to bolster figures for the Jipsa engineering programme, it is the qualitative meaningful teaching and learning strategies that will go a long way in delivering tangible lasting results. Therefore resources must not be spared in developing a highly interactive programme with the support of both online and DVC technologies; the programme must be holistic, captivating and, more importantly, learner-based. Such a course would be viable if it has been conducted through a number of DVC workshops, which allow learners to make their own input. To crown it all, it should be supported through the use of peers, tutors, counsellors and lecturers in blended learning. The optimal interaction of all the parties with the learner via the use of the available technologies (online and DVC) could help reduce the level of isolation the DE learner is prone to, and help motivate the learner to meet the prerequisites set by universities for their Engineering courses. What is of critical importance here is that the learners should be meaningfully involved in the flexible delivery by actively identifying the key skeletal concepts (given in the aims and objectives to be achieved) and building upon the basic concepts meaningful schemata (chunks and objects) by asking or responding to relevant questions. The resultant

analytical and problem-solving questions help increase meaningful learning. Logically, this occurs when learners are encouraged to demonstrate their learning or misconceptions through the submission of one or more assignments. To help the learners keep up with their term work, the term should be divided and paced according to a number of prescribed assignments. Prompt feedback needs to be provided by the tutors or lecturers. This would help bolster the learners' confidence that they are progressing (if the feedback is positive). In the case where serious flaws are identified, special online/DVC contact sessions should be used as corrective measures to bring the laggers (i.e. the slow learners) up to speed with the rest of the group.

4.8 Summary: In this chapter the researcher elaborates the research design and methods to employ in gathering the research data to answer the critical question – whether ICTs are underutilised or optimally used for flexible delivery in DE setting. Several reasons are advanced of why the integrative programme evaluation research design strategy is suitable to help tackle the task at hand. The inclusion of Engineering as basis of this research is not due to hype, rather is prompted by several incidents observed by the researcher in his immediate environment and also from socio-economic landscape. To align the research with current engineering education debates, and deliberations, the researcher had to rely upon some of the published work in engineering studies.

The next chapter covers the application of the research methods in collection of data about the samples. Following the analyses of the research data, the researcher now reports on the findings and results with references to the interview schedules, questionnaires, and group focus interviews.

CHAPTER 5 Research Application: Perceptions and Analyses - Delivery and Learning

5.1 Introduction and background

This chapter marks the pinnacle of what has been a challenging journey before tapering towards its conclusion. Its uniqueness lies in the combined use of both qualitative and quantitative approaches to unravel the issue of the use of ICTs, namely COOL/myUnisa and DVC, and other related studies.

To give a clearer view of the proceedings, a brief summary of chapter 4 is essential. It is an elaborate narration of the research design process followed and the methodology applied. A strategic innovative approach is needed that enables users to utilise ICTs effectively for flexible delivery. However, before deciding which strategy to apply, the question needs to be answered whether ICTs are actually underutilised or optimally utilised. The latter question helps the researcher to revisit the research design and methodology process; in elaborating upon the research and choice of methodology, the researcher advances reasons to justify the integrative approach or project evaluation. Another vital element of the study is justification for the chosen sample. The research design and methodology is rounded off through advancing essential techniques applied in ensuring the rigour, precision and adherence to both qualitative and quantitative approaches.

In chapter 5, the research design and methodological process are put into practice.

5.2 Project integrative evaluative approach

5.2.1 Monitoring, Inspection, Direct Observation: engineering activities that amounted to use of COOL/myUnisa and DVC

This aspect of the research design exposes the researcher to the concrete and tangible aspect of the phenomena – how much of engineering has been placed online, or how many learners are registered with COOL/myUnisa, or how many learners are registered with engineering? From the cursory glance these are supposed to be simple and straightforward questions. However, could be difficult to deduce when the researcher is presented with explanations bordering on moratorium due to the merger process.

From the word go it has been apparent that Engineering Department was one of the laggers as far as adoption of ICTs for DE flexible delivery is concerned. A mere visit to the website (through conducting monitoring and inspection) confirmed the said drawback. Furthermore, the Executive Director readily admitted in the earlier discussion that Engineering Department has a lot of ground work to cover in converting coursework to multimedia.

Following the said promise of initiating multimedia project by the dept., roughly the period of a year passed without anything concrete coming off the said discussion; summoning the courage, the researcher proposed the concept of creating an interactive multimedia project for online delivery via use of COOL/myUnisa to the acting Executive Director of Engineering at Unisa. Apart from using text and graphics, other aspects of multimedia such as audio and video were to be included as part of the project. Digital videoconferencing (DVC) would be used as a supplement to COOL/myUnisa, with both learner-lecturer interactions in what would emerge in fully blended delivery. This was in early 2001. The acting Executive Director appeared to share the same interest as his

predecessor; he readily gave the researcher permission to work closely with the Department on developing the proposed concept. As fate would have it, the idea of converting print-based coursework to interactive multimedia did not materialise (due to the merger process which became the centre of attraction then – as cited by the academics), except for the use of DVC which has since been adopted for the revision and oral examinations purposes.

Two Electrical and Civil Engineering lecturers showed interest and willingness in (out of eight) participation in the project. To be able to select learners' sample from registered Unisa learners, and those registered with COOL/myUnisa, one needed the official registration list. For strange reason, this was not an accessible item during the merger process, later it was intimated that the list of registered learners was placed under the moratorium. Initially, two lecturers had shown willingness to participate in the project. When the two willing lecturers were approached for ideas, approaches and materials to be converted to online, or DVC delivery, things changed. One dropped out due to citing pressure of work. The remaining lecturer (for electrical engineering) continued to participate.

Eventually, following relentless search and knocking on many doors, the list of engineering registered learners was supplied. Immediately it was used for pilot sampling in November 2003. Another pilot study was arranged with engineering staff; those studies were followed-up with a seminar conducted on the use of COOL/SOL and DVC workshops with staff and learners. The positive outcome of the seminar was use of the DVC by the keen lecturer (electrical engineering) to conduct revision with his classes before the semester examinations. The lecturer's and learners' experiences were captured via use of camera, and their interests and perceptions toward use of the ICTs

(with DVC in particular for educational delivery) via questionnaires. The positive off-spin of the said use has resulted in the quadruple booking of the DVC system either for revision or oral examination by the same department.

As implied in the preceding section, the COOL (now known as myUnisa) was found to be underutilised: only a skeletal structure of Engineering coursework was available on COOL, and a lot still needed to be done (as of the period 2001-2006). A subsequent visit to myUnisa as part of the auditing and monitoring process of the ICTs revealed the site to be still under construction (April 2007). Very scanty information was available and inactive sites were also found. No information was available on the rules, policies and administrative requirements of the Engineering courses available on the website as part of myUnisa. There was therefore no need to conduct other aspects of data collection such as monitoring and inspection (from myUnisa's virtual learning environment (VLE)..

5.2.2 Survey - data collection

The formative phase started with the selection of the appropriate sample, followed by the application of both probability and non-probability sampling which led to conducting personal interviews with (i) the learners (face-to-face, and one-to-one telephonically), (ii) academics (face-to-face), (iii) instructional designers and developers, and (iv) multimedia developers and producers. This part of the data collection exercise resulted in textual data and audio recordings. This process makes up the qualitative part of the formative phase.

The summative phase consisted of more combinations of both quantitative and qualitative approaches. Firstly, the sampling techniques (probability and non-probability) employed in the sample selection of learners, academics, instructional designers and

developers and multimedia developers were stringently adhered to. Data was collected through the self-administered structured questionnaires and focus group interviews were conducted with Engineering and other learners. Statistical analyses of data through SPSS and Excel gave both the statistical analyses and graphical statistical presentations of some of the key questions. The resulting similar findings obtained with the same sample or different samples as a means of indicating replication of similar findings where they occur thus amounts to threshold.

Getting the right sample, particularly of the learners, was a taxing challenge to the researcher. Non-probability sampling featured mainly in readily accessible samples such as academics and tutors, instructional designers and developers and multimedia developers. However, this was not as successful as far as learner sampling was concerned. For example, where personal interviews, self-administered questionnaires and focus group interviews were prearranged, low turnout forced the researcher to apply probability sampling techniques as in the case of accidental samples. These were used with self-administered structured questionnaires.

In the case of personal interviews, qualitative and quantitative approaches have been applied simultaneously, with transcripts of interview schedules (from semi-structured questionnaires) and audio-recordings converted into narrative verbal accounts. Each time statistical applications such as aggregations (means and percentages), summary and proportion are applied where the nature of the questionnaire allows the interpretation and analysis of the logic and meaning expected of the research report.

SPSS and Excel statistical techniques were applied to give the overall account of the self-administered questionnaires as part of the summative phase.

5.3 DE learners and their characteristics affecting sampling

DE learners are not compelled to be on campus daily, and they study at their own place, pace and time. This arrangement has far-reaching implications when it comes to sampling them for a given study. The critical question was which sampling technique (between probability and non-probability) would be accommodating of the unique situation of DE. From the word go it was crystal clear that the researcher would be forced to apply both aspects of sampling techniques interchangeably, for example using probability sampling when dealing with different groups of targeted samples such as learners, academics, designers, developers and producers of instructional materials and multimedia, and using non-probability sampling when looking at the unpredictable sampled group, such as the learners.

Some of the possible reasons that force learners to make special visits to the campus are library visits, contact sessions, or administrative visits to follow up on assignments, clarifying financial matters with administration, following up on study materials. It is a plus for studies of this nature when such visits coincide with the prearranged appointment made by the researcher with the learners. However, this was not always the case. Secondly, the research appointment was seen by some as playing second fiddle to matters relating to studies, which were their main priority.

5.4 Data collection, analyses and findings

The construct and key questions differed according to the sampled group's interests, but there were issues that spanned across both semi-structured and structured questionnaires. They consist of a mixture of biographical items, sex, age, ethnicity, professional background, studies, items relating to technology preferred, technology commonly used by the institution, strengths of the technology in teaching and learning,

weaknesses, changes that users may have liked to make, whether technology was being used for any teaching and learning, whether users would recommend it to any of their colleagues, whether there was any observable value associated with use of the technology, etc. Semi-structured questions were posed in an open-ended format, whereas structured questionnaire items were in a multiple format according to various measurement scales – nominal, ordinal, interval and ratio. Two or three question items elicited comment or discussion. The differences in focus were as follows:

- Learners were asked about the use of ICT skills in acquiring, communicating and delivery while engaged in the learning process.
- Academics were asked about the use of ICT support, interest in content and methodology of delivery.
- The focus for designers and other developers (language practitioners and quality assurers) was on the design and development of courses/modules for technology-based content: delivery techniques, learner interests and quality issues were involved.
- Multimedia developers were asked about support in the adoption and relevant use of the appropriate technology.

SPSS and Excel were employed in coding and analysing the variables; statistical measures were used, such as mean, median, frequencies, correlation, etc., tables and graphs (Fergusson & Takane, 1989; Sprinthal, 1990) were used in calculating relationships between main question outcomes, variables, validity of variables and extraneous variables, to mention but a few.

In tackling the main issues of optimal utilisation or underutilisation, the researcher used the main questionnaire items comprising general knowledge of ICTs, accessibility to

ICTs, their merits and demerits, uses, problems experienced and any suggestions of how to overcome the problems experienced. An interesting pattern emerged from the captured responses: generally, a high percentage of responses was obtained to the easy questions relating to general knowledge and accessibility, whereas the difficult questionnaire items relating to sharing of user experiences, descriptive accounts of problems experienced and how to solve them, were responded to by few, or else tended to elicit mixed reactions.

5.5 Face-to-face interviews

These interviews were conducted between 1 September 2001 and 31 March 2002. Personal interviews were held with learners (the instrument being a semi-structured questionnaire). The sample was selected through random sampling from a supplied list of 120 registered learners (see table 5.1) from a population of 380 Electrical Engineering learners. Of the systematic sampled group successful contact was established with 48 learners; 22 members promised that they would be on campus at the appointed time to attend to study related appointments besides the research appointment. In the end, only 9 (face-to-face interviews), 6 out of 14 (telephone interviews) honoured the appointment as promised. 64 members could not be contacted due to no responses, or changes in their contact details.

Personal interviews were held with professional staff (academics and support staff). Simple random sampling was employed, and as a result of the readily available population on campus (Florida), reasonable samples were obtained (see table 5.1) for the personal interviews and self-administered questionnaires.

5.5.1 Findings from and analysis of face-to-face interviews with learners

(ref. Annexure 1: Interview Schedule)

The sample of Engineering learners consisted of eight (53%) males, seven (47%) females, with at least 2% as gender shy (unspecified). Most (54%) were in the age group of 21-25 years old. Their cultural background could be described as diverse African.

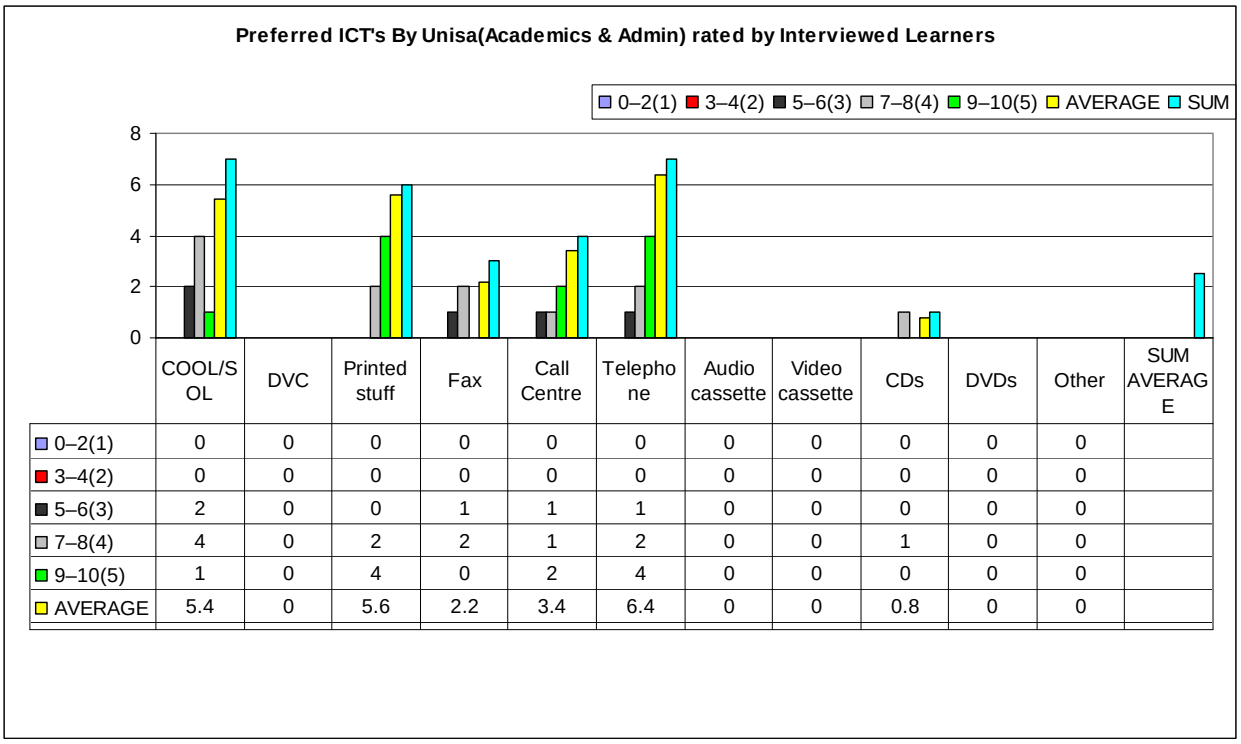
The simple coding of Learner One represented by L1, Learner Two by L2, etc. has been employed. All the responses collected from all the respondents have been grouped according to the main questions posed in the semi-structured interview, in order to compare the responses for overall logic and comprehensiveness of the topic at hand. At the same time, findings are identified and analysed following the questions posed.

SAMPLED GROUP	PLANNED SAMPLE SIZE	LEARNERS	ACADEMICS & TUTORS	DESIGNERS	DEVELOPERS
Personal interview, semi-structured questionnaires	48	9 + 6 (15/48 = 31%)	8 (80%)	5	4
Structured questionnaires via assistants	124	66 (53%)	7 (70%)	5	3
Structured questionnaires via Online	66	4 (6%)	n/a	n/a	n/a
Administered structured questionnaires during class attendance via DVC	90	28 (33%)	n/a	n/a	n/a
Focus group interviews	12 x 2	15 (63%)	n/a	n/a	n/a
Sample size		128 (40%)	10	5	4
Population size		320-420	20	10	12

Table 5.1 Sample sizes

Here follow the findings according to the transcripts of the **interviews with the learners:**

- **Preferred technology (or technologies) used by the new Unisa for courseware delivery and communication**



	COOL/SOL	DVC	Printed stuff	Fax	Call Centre	Telephone	Audio cassette	Video cassette	CDs	DVDs	Other	SUM AVERAGE
0–2(1)	0	0	0	0	0	0	0	0	0	0	0	
3–4(2)	0	0	0	0	0	0	0	0	0	0	0	
5–6(3)	2	0	0	1	1	1	0	0	0	0	0	
7–8(4)	4	0	2	2	1	2	0	0	1	0	0	
9–10(5)	1	0	4	0	2	4	0	0	0	0	0	
AVERAGE	5.4	0	5.6	2.2	3.4	6.4	0	0	0.8	0	0	

Figure 5.1 Preferred ICTs by Unisa (academics & tutors) rated by face-to-face interviewed learners

The majority (88%) of the sample perceived Unisa staff to prefer using the telephone, followed by COOL, then print material (handouts, tutorial materials, correspondence), for the delivery of learning (see figure 5.1 above). A total of 12,5% did not answer this question, perhaps due to a lack of knowledge and essential experience.

The rating suggests that despite Unisa's adoption of cutting-edge technologies, it could still be operating as a traditional correspondence institution. The picture painted by the following average scores: telephone 6.4 (as "more important"), printed stuff 5.6, COOL 5.4, call centre 3.4, fax 2.2, serves to confirm the Unisa's inclination to operate traditionally.

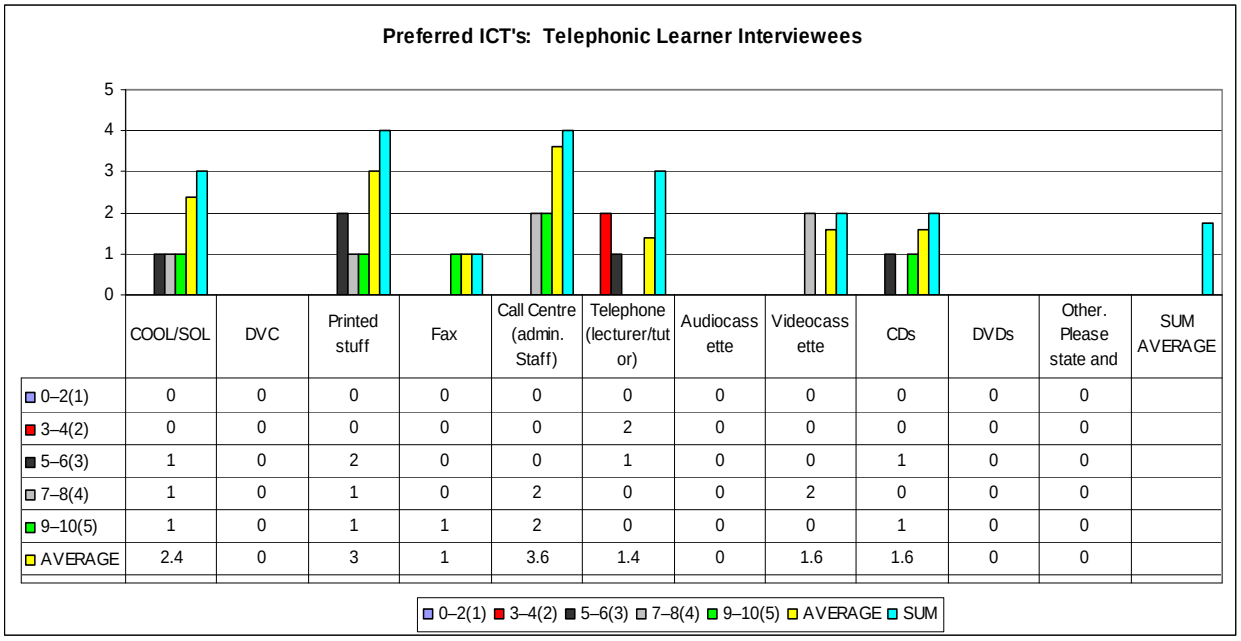
The low or even non-existent rating of the other multimedia tools is a major concern; it serves to emphasize the finding that Unisa could still be lagging behind as far as the adoption and optimal application of ICTs is concerned, thus falling far short of flexible

delivery. In this day and age, for CD to score 0.8, is not good enough as it is one of the key technologies readily available as part of multimedia. As if the preceding finding is not enough DVD, DVC, audio and video all rated 0 does exacerbate the bleak picture experienced thus far. Needless to say, this is unfathomable considering that the major concern here is for the teaching and learning methods of a scientific course such as Engineering. One wonders how the practical essence of the course is captured and relayed to the students without the use of the said technologies, especially when distance is one of the imposing barriers.

DVC and other technologies, particularly the multimedia, appear not to enjoy preference whatsoever by Unisa's academic and support staff (as per the learners' perceptions). From the preceding account, it seems like Unisa still has a long way to go in adopting and implementing the ICT-based models for flexible delivery and learning.

- **Technology preferred by learners**

The majority of the respondents (66%) gave the highest ratings in terms of their preferences to Call Centre (3.6), Printed Stuff (3), COOL (2.4) – clearly Call Centre and Printed Stuff regarded as the highly favourite with the learners confirms what was noted in Fig 5.1 as the majority of the respondents still in favour of the traditional mode; the next favourable rating went to CD & Videocassette (1.6) .followed closely by telephone (1.4), fax (1) – further affirmation of the preceding point; multimedia usage so far appears to be a neglected aspect DVD, DVC and Other (as e-mail) all notching (0) (see figure 5.2) below.



	COOL/SOL	DVC	Printed stuff	Fax	Call Centre (admin. Staff)	Telephone (lecturer/tutor)	Audiocassette	Videocassette	CDs	DVDs	Other. Please state and	SUM AVERAGE
0–2(1)	0	0	0	0	0	0	0	0	0	0	0	
3–4(2)	0	0	0	0	0	2	0	0	0	0	0	
5–6(3)	1	0	2	0	0	1	0	0	1	0	0	
7–8(4)	1	0	1	0	2	0	0	2	0	0	0	
9–10(5)	1	0	1	1	2	0	0	0	1	0	0	
AVERAGE	2.4	0	3	1	3.6	1.4	0	1.6	1.6	0	0	

Figure 5.2: Preferred ICTs by learners in face-to-face interview

There are both positive and negative correlations in ratings between the learners' and academics' preferences. Firstly, a positive correlation is denoted by virtually the same high rating obtained between, Printed stuff, Call Centre, and COOL by both the academics and learners. Unsurprisingly, almost negligible rating by both the academics and learners (1.6) of the multimedia technologies - video, CD should be noted as matter of concern. Further, the no rating of DVC, DVD & Other (e-mail) by the learners clearly shows that special efforts should be made by the institution in adopting appropriate ICTs for the teaching of Engineering.

- **Reasons for preference of ICTs**

The majority (75%) of learner respondents liked COOL as an ICT because of its easy access, allowing them to work at their own time, pace and place. It was also rated as good as an information resource, allowing easy downloads and enabling learners to get their exam results on time. Furthermore, it was considered user-friendly. A minority

(25%) did not answer this question, probably due to a lack of knowledge about the ICTs concerned.

Generally, the majority of learners interviewed appeared to find it easy to discuss COOL and other technologies, and had little to say about DVC, probably due to a lack of information about it and its use.

- **ICTs' weaknesses**

The majority (63%) concurred that COOL's weaknesses were accessing, uploading and connecting off-campus; also, it was very costly when it came to line rates. Lack of course content was a major problem, and the viable site was the FAQ, instead of fully-fledged educational content and intriguing presentations such as quizzes. All of these serve as factors leading to the underutilisation of COOL.

The failure to mention DVC could be attributed to a lack of knowledge about its existence, and therefore a clear sign of its underutilisation.

The minority (37%) who did not comment on COOL serves as a reminder that not all learners are familiar with it, and therefore promotional campaigns must be kept up.

- **ICTs used by learners and frequency**

The majority (63%) appeared to have vague views about what they used COOL for; however, the minority (27,5%) claimed to use it mainly as an administrative tool, to ask questions as a follow-up to printed handouts, to conduct course updates, for assignments, to keep track of and assess results, to check on exam dates as well as

changes in venues, for biographical information, and to a lesser extent as an academic tool for actual teaching (as in the case of online discussion) and learning.

There was a high variation in frequency of use (by at least 38% of respondents) ranging from once or twice a week, month, or even a year. This acts as a further indication of the minimal role COOL still plays in the studies of some of the learners. Once or twice a week to a month sounds reasonable, but once a year appears out of the question; a mere deduction tells one that such participants do not depend on this technology (myUnisa portal) for their learning.

The majority (62,5%) of non-responses suggests that some learners did not attempt to answer the question on their uses of the ICTs under discussion.

- **Wish list by learners of how ICTs should be used for teaching and learning (Question 5 learner f2f interviews)**

The majority (62,5%) of learner respondents expressed high priorities as accessibility and content. Their wishes were that the institution should devise a means of making COOL more accessible by engaging both government and Telkom in special negotiations for cheaper rates; that Unisa should establish its learning centres, that use of DVC or myUnisa should be considered after hours (probably cited with contact sessions in mind) to accommodate employed learners who might not get a chance to attend sessions during the day, that other technologies such as fax and video/audio cassettes should be used to increase accessibility of DVC and COOL; and that more examples for learners to work with should be loaded in COOL.

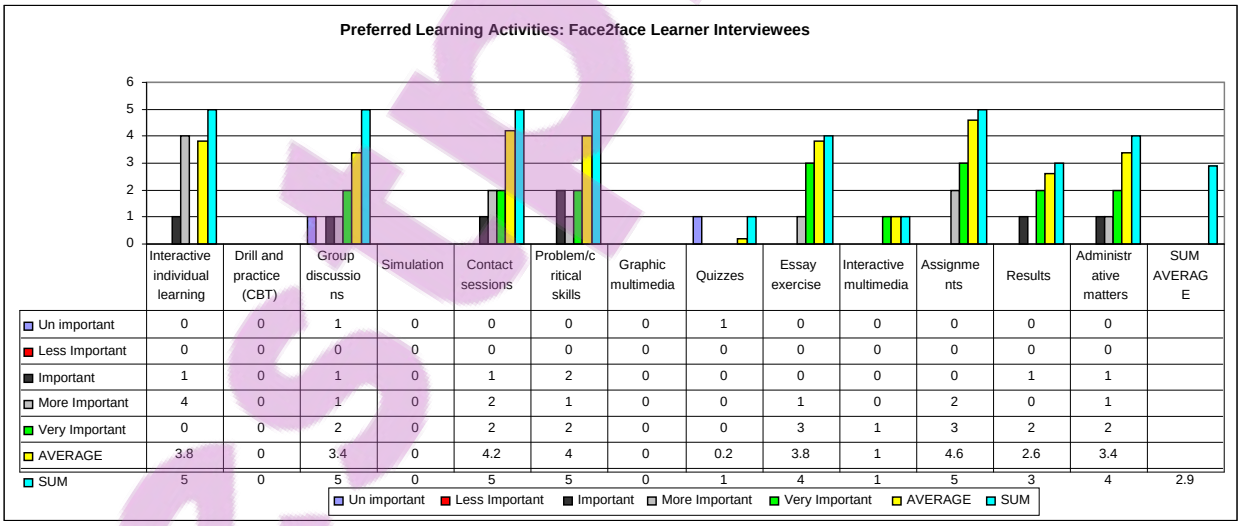
The substantial minority of 37,5% of non-responses suggest that there might be a reasonable number among the participants who might not be familiar with ICTs (COOL/myUnisa and DVC). This means that information campaigns need to be kept up

to help increase optimal utilisation. At the same time, all the identified distracters need to be corrected or dispelled as a priority.

- **Preferred learning activities or styles of delivery**

The majority (62,5%) (see figure 5.3 below) gave the highest mean scores to assignment (4.6 as “very important”), contact session (4.2), problem/critical skills (4), and essay (3.8). This is followed by slightly lower scores for interactive individual learning (3.8, group discussion (3.4), results (2.6).

With Engineering as the preferred field of study in this respect, one wonders how much can be achieved with use of essays as the presentation activity compared to other activities not cited here, such as those that received the lowest rating scores - quizzes (0.2), graphic multimedia (0) and simulation (0). However, the other activities (except essays) cited appear to be logical as presentation activities.



	Interactive individual learning	Drill and practice (CBT)	Group discussions	Simulation	Contact sessions	Problem/critical skills	Graphic multimedia	Quizzes	Essay exercise	Interactive multimedia	Assignments	Results	Administrative matters	SUM AVERAGE
Un important	0	0	1	0	0	0	0	1	0	0	0	0	0	
Less Important	0	0	0	0	0	0	0	0	0	0	0	0	0	
Important	1	0	1	0	1	2	0	0	0	0	0	1	1	
More Important	4	0	1	0	2	1	0	0	1	0	2	0	1	
Very Important	0	0	2	0	2	2	0	0	3	1	3	2	2	
AVERAGE	3.8	0	3.4	0	4.2	4	0	0.2	3.8	1	4.6	2.6	3.4	
SUM	5	0	5	0	5	5	0	1	4	1	5	3	4	2.9

Figure 5.3 Preferred learning activities by face-to-face interviewed learners

The ideal would be to have the interactive multimedia and simulation among the highly preferred activities, perhaps even before essays, as these activities would most likely help render the teaching of Engineering, which is a more practical subject, easier

(where applicable). It appears that the learners rated presentation activities that they are more familiar with as favourites, rather than those suited to the instructional setting of their scientific course. Again, as they were perhaps not well acquainted with the options given, a substantial number (37,5%) claimed to have no knowledge to answer.

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- **Rating DVC aspects**

A rating of 0 was given by all the participants (100%) as they claimed to have no knowledge of the technology.

- **Changes needed to be made to DVC**

Despite claiming not to have any knowledge of DVC, all respondents except one indicated that they would like to see changes made to DVC.

- **DVC problems and their solutions**

The minority (12,5%) of respondents indicated old technology faults, low bandwidth and unclear audio and picture as problems facing DVC. The suggested DVC solution was to update the technology.

Further illustration of the lack of relevant knowledge regarding the topic is the 37,5% of non-responses. The findings show that it is imperative that the importance of DVC to flexible delivery be strongly promoted to the Unisa community at large.

The majority (50%) tended to address the shortcomings associated with COOL instead of DVC. They listed these as the need for more quizzes and content, relevant information should be loaded on the system in good time for learners, empty pages on the website should be deleted and extramural activities should be included.

- **ICTs' contribution to flexible learning**

Half the respondents (50%) felt that ICT contributed to flexible learning.

- **ICTs' contribution to learners' learning**

More than half of the participants (85,2%) felt that ICTs' contribution was high. Three non-responses (38%) suggest there is a substantial amount of uncertainty among the participants regarding ICTs' role.

- **Frequency of use of ICTs**

The lack of daily use of COOL suggests a lower inclination to use ICTs by the learners. The highest incidence of use varied between weekly (3) to monthly (1). Again, two non-responses (33%) suggest uncertainty among the participants concerning use.

- **Use of activities by the learners of ICTs**

The most common activities cited by at least 50% of the sample included conducting library searches, checking exam timetables and exam results, having online group discussions and exchanging information with lecturers. However, given the COOL

experience with Electrical Engineering, these responses appear over exaggerated. Hence further cross-checking and correlation are needed to establish the validity and credibility of the point being made here. The other 50% did not give their responses to the question – probably due to reluctance or a lack of knowledge regarding the technology.

- **Causes of "no contribution"**

Lack of access and ageing DVC as reasons given for no contribution compare generally to the weaknesses cited for ICTs or COOL (see page 107). Again, a sizable number of the group (67%) opted to give no responses. Further probing revealed lack of knowledge as the main reason for this.

- **Orientation or training in use of ICTs**

The majority (83%) of learner respondents felt that orientation was necessary.

- **Promotion campaign of ICTs**

The majority (83%) indicated that a COOL (myUnisa) information campaign through study guides, handouts, contact or information sessions was effective. To a lesser extent (17%), word-of-mouth was also said to help promote COOL (myUnisa). However, the same could not be said about the promotion of DVC, as the majority of the respondents did not know about it.

- **Highly recommendable ICTs**

MyUnisa (COOL) certainly received thumbs up from the majority of learners (75%) as the technology to be recommended, whereas no recommendation was made for DVC.

- **Merits of ICTs**

The main advantages of COOL were stated as allowing learners to communicate with their peers and lecturers, wherever they were, thereby saving them money and time. Again, DVC appeared to be overlooked by the respondents for use.

- **How to improve the programme**

Half (50%) indicated that they would like to see the following changes made: COOL (myUnisa) functionality, include multimedia content, interactivity, lecturer participation, information dissemination about the Virtual Learning Environment and its promotional campaigns, and add extramural activities. Some members (25%) appeared satisfied with the current status, whereas others (another 25%) gave no responses.

- **Underutilisation of the available ICTs by Unisa community and how to overcome this demise**

According to the majority (63%), ICTs lie idle and unused due to lack of information about their existence by the potential users. Inclusion of the computer lab could also help raise awareness and use. The custodians should continue raising awareness and should include DVC. Furthermore, it is advisable to allow user input through research and encourage lecturer participation in group discussions. Both myUnisa (COOL) and DVC are good information resources and can help to eliminate social isolation suffered by DE learners.

- **Acceptance by learners of possible changes to improve ICTs**

There was unanimous support by the majority (75%) that they would like to try out the improved version of the ICTs (myUnisa and DVC).

- **ICTs as significant resources to studies, career growth and future**

The majority (75%) of learner respondents felt that ICTs were significant resources. Since life is technologically oriented, the use of ICTs should help bridge the digital divide, and should also make communication between the learner and the institution easier. ICTs should also help render studies easier. However, email and fax also serve as vital backups to myUnisa (COOL).

- **Flexibility of Unisa's status**

The overwhelming majority (83%) agreed that Unisa was flexible based on COOL's relevancy, accessibility, reliability and confidentiality. Individual scores differed slightly between inflexibility and flexibility in terms of place and time. This implies that the designers and developers of COOL/myUnisa will need to devote special effort to the latter aspects during the revamp process. DVC's role was seen as non-existent (0%) according to the interviewees. As with other questions involving DVC, the non-rating could be ascribed to the fact that DVC was not a well-known technology to the majority of the interviewees.

See figure 5.4 below.

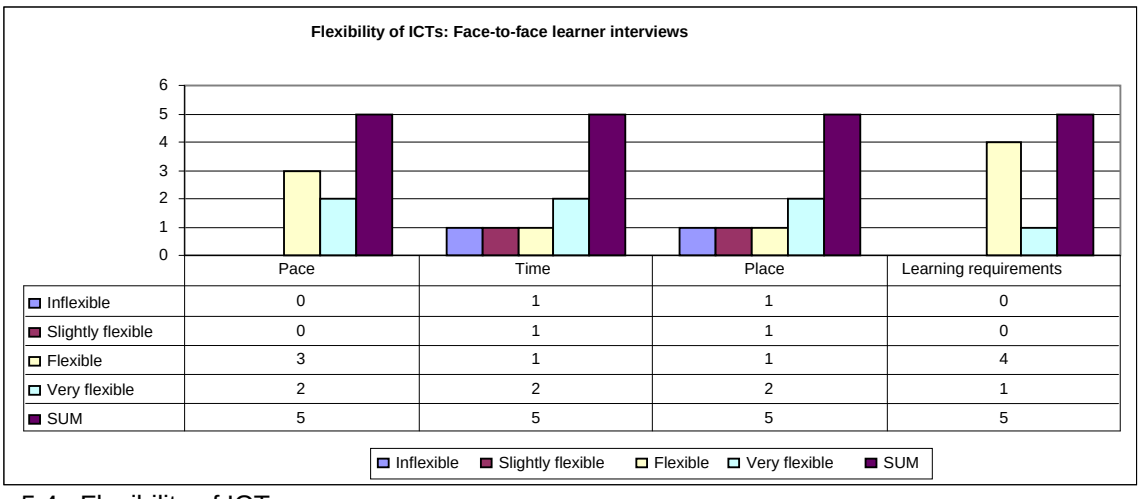


Figure 5.4: Flexibility of ICTs

5.5.2 Findings from and analysis of learners' telephone interviews

- **Preferred ICTs used by Unisa for courseware delivery**

Telephone learner interviewees' rating of the preferred ICTs appear to correlate positively with the face to face interviewees' ratings except for two, namely, COOL (2.4) and telephone (1.4) as "less important" and "unimportant" respectively (see page). Another difference lies in the fact that with the telephone learner interviewees there are no recorded non-respondents. Could this difference be ascribable to reflection of responses given under relaxed atmosphere associated with use of the telephone, as opposed to face-to-face? Does rating of telephone as "unimportant" by the respondent not sound too ironic as telephone serves as the medium enabling even the interview in question?

- **Presentation activities preferred by learners**

The activities rated the highest were administrative matters (3), assignment (3), results (3) and essay exercise (2). Contact session, graphic multimedia, and interactive individual learning were all rated 1, and drill and practice, group discussion, simulation, problem skill, quizzes and interactive multimedia were rated 0. DVC was not rated at all, reason unknown.

The overall results here are comparable to those obtained in the face-to-face learner interviews.

- **Technical presentation by DVC**

According to the mean scores, the highly rated were audiovisual graphics (4.75), use of buttons (4), screen design (4), picture (3.5), subject relevancy (3.25) as "more

important"; screen appeal (3), colour (3), as "important"; subject importance (2.25), presenter (2), participants (1.5), as "less important', Human Computer Interface (1), as "unimportant". While the various elements of the DVC may differ in degree of importance (as according to the preceding interviewees' rating), they should all be seen as equally important at any given time, depending on the nature of the presentation or conference.

Respondents do not cease to amaze in that earlier, a similar question asked about rating of DVC elements in the face-to-face interview was left unanswered as the interviewees claimed not to know the DVC technology. However, this question did not prove problematic to the telephonic interviewees. In fact it received 100% response. Could the variation again be attributable to the setting, say face to face as opposed to the telephone one – meaning that one could be capable of more insightful returns; or could it be interviewer's way of asking questions, or just purely co-incidental? Further probing could be necessary to unravel the cause of this irregularity.

- **Changes to DVC aspects**

All the respondents said that they would like to see changes.

The overall results here are comparable to those obtained in the face-to-face learner interview.

- **ICTs' contribution to learning**

The majority (60%) claimed that ICTs (COOL) did contribute to their learning monthly, by anything between 20 and 100%, with the majority (65%) rating it between 50 and 80%. Again, DVC was not rated, and the reason for this could be a lack of knowledge.

The overall results here are comparable to those obtained in the face-to-face learner interviews.

- **Recommendation of ICTs (COOL)**

Except for one telephone interviewee (L14), the rest (83%) said that they would recommend COOL/SOL for use by others.

The overall results here are comparable to those obtained in the face-to-face learner interviews. The majority (83%) agreed that COOL was user-friendly and flexible in terms of pace, time and place. They felt that learning requirements were implement able and that ICTs contributed to learning.

- **Flexibility of COOL and DVC**

The minority rated COOL/SOL equally as flexible in terms of the essentials of pace, time, place and learning requirements. The majority (67%) gave no response.

5.5.3 Summary of face-to-face and telephone interviews

On one hand, learners felt that Unisa staff still preferred to use mainly the telephone, Call Centre, print material and COOL. Unisa appears to be operating like the old traditional correspondence institution in which multimedia ICTs such as DVC, DVDs, CDs and audio and video cassettes are hardly used.

Negatives of ICTs were inaccessibility, lack of content, low lecturer interaction, PIN code problems and the slow uploading process, all of which lead to a high chance of underutilisation. DVC hardly received any form of promotion. The majority (62,5%) of the learner respondents tended to prefer well-known presentation activities despite their

incompatibility and ineffectiveness in the presentation of Engineering. Hence essays were rated highly, while simulation and interactive multimedia were not. Once again, underutilisation of ICTs appears to be prevalent.

On the other hand, judging by their preference for the ICTs, the learners appear keenly interested in the wide variety of ICTs – including both COOL/myUnisa and other multimedia products. If the institution were to implement its ICT strategy in line with the learners' preference for various formats in ICTs, there would most probably be optimal utilisation of ICTs. Other ICT positives that need to be capitalised upon are keeping up an efficient promotional strategy in the form of handouts, websites, information sessions, word-of-mouth and Unisa learning centres. To improve matters, COOL's (myUnisa's) idleness could be eliminated through an increase in promotional campaigns, interactivity and multimedia content. User input could be allowed through research.

Aspects that were rated low or that elicited mixed responses were how and when COOL is used. Uses such as library searches, checking exam timetables and exam results, communicating with lecturer or peer group were recorded. Some respondents felt that DVC weaknesses were old technology, low bandwidth and poor connection. Therefore the solution could be to upgrade the technology.

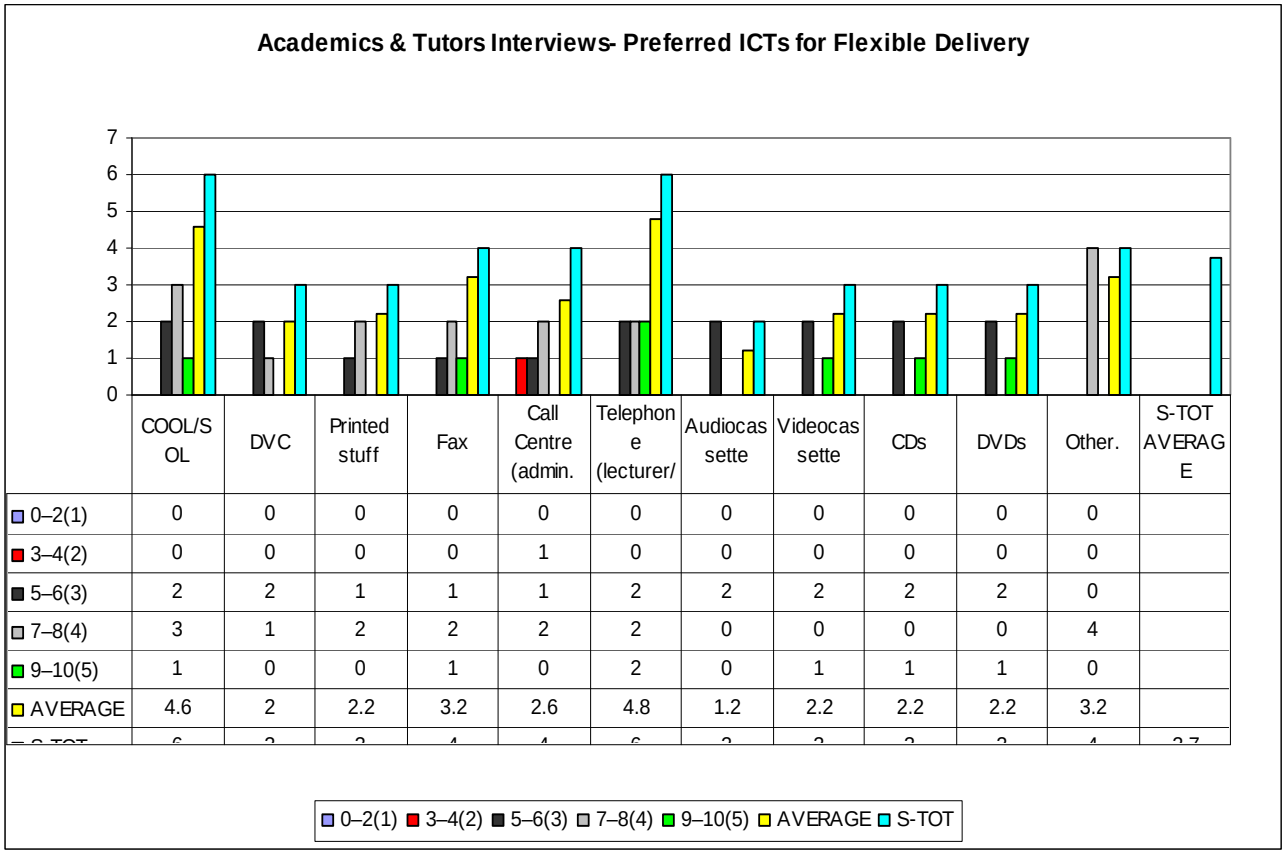
The majority (82,5%) of face-to-face interviewees felt that COOL was doing well in flexible delivery in terms of accessibility, relevancy and confidentiality. However, only 32,5% interviewed by telephone agreed with this. This contrast in findings may be because face-to-face respondents felt under duress caused by the presence of the interviewer and telephone interviewees may have felt freer to express themselves.

Another difference in the results obtained between the face-to-face and telephone interviews appears in answer to the question on the DVC presentation activities. The telephone sample gave the highest rating to administration and assignment, and the lowest as drill and practice, whereas the face-to-face group did not respond. To attribute this difference to the influence of the interviewer would most probably not be far from the truth. However, as the two groups were exposed to the same interviewer, perhaps the cause of the difference could be out of the bounds, i.e. beyond reasonable conjecture.

5.6 Findings from and analysis of interviews with academics and tutors

The sample of Engineering academics consisted of six lecturers and three tutors. The majority (56%) were male and 44% were female, with the same ratio represented in black and white respondents, respectively. Some 11% were between the ages of 26 and 30 years, 44% between 36 and 40 years, and 44% between 41 and 45 years. Below are the findings according to the transcripts of the interviews with the interviewees:

- **Technology preferred for flexible delivery**



	COOL/SOL	DVC	Printed stuff	Fax	Call Centre (admin.	Telephone (lecturer/	Audiocassette	Videocassette	CDs	DVDs	Other.	S-TOT AVERAGE
0–2(1)	0	0	0	0	0	0	0	0	0	0	0	
3–4(2)	0	0	0	0	1	0	0	0	0	0	0	
5–6(3)	2	2	1	1	1	2	2	2	2	2	0	
7–8(4)	3	1	2	2	2	2	0	0	0	0	4	
9–10(5)	1	0	0	1	0	2	0	1	1	1	0	
AVERAGE	4.6	2	2.2	3.2	2.6	4.8	1.2	2.2	2.2	2.2	3.2	

Figure 5.5 Academics & tutors' preferred ICTs

The overwhelming majority (88.9%) responded. At first glance, it seems too ironic for the academics to rate the telephone highly at 4.8. However, based on the evidence of the reality they contend with, the telephone happens to be one of the most convenient tools for some of their learners (to communicate with their lecturers). This begs the question: How does one teach a complex and practical subject such as Engineering over the telephone? In assessing respondents' responses, one gets a sense that the telephone is rated highly for administrative related matters, e.g. setting appointments and attending to individual study problems, rather than for elaborative academic matters, for which the fax appears to be more popular. Rated 4.6, COOL/SOL comes second for its accessibility. This assertion would go a long way if academics' use of COOL was seriously exploited for flexible delivery and learning, rather than as a measure of preference (see fig. 5.5 above). Fax, email are tied at 3.2 with the Call Centre closely behind them with mean score 2.6: they are valued by the respondents in

communicating, sending and receiving feedback from their learners. Surprisingly, print material (handouts or tutorial letters), at 2.2 points, is rated among the “less important” by the respondents (except for one), as the institution seems to thrive on churning out print material. Does this mean that the respondents issue print material just to meet the targets set rather than doing what they believe should enhance their teaching activity? The low preference for other multimedia formats (DVC, CDs, and DVDs, video cassette) within range scores of 2-2.2 by the respondents confirms that the use of these technological formats remains untapped, particularly in the instruction of Engineering.

A minority (11,1%) did not respond probably due to lack of knowledge.

- **Academics’ reasons for preference of ICTs**

The majority (88,8%) felt that COOL, email, telephone, the Call Centre and faxes played a critical part in their flexible delivery activities, such as communicating, making appointments with learners or tutors, or even acting as a medium for problem solving. In addition, COOL was also seen as an academic and administrative resource. Some academic respondents (37,5%) felt that DVC was important in real-time interaction. Others (22,2%) saw the fax as playing an important role when it came to feedback on tasks and helping to overcome the shortcomings of the telephone, especially when dealing with Engineering content. Videos and CDs are excellent in the enhancement of teaching difficult concepts.

Printing is still seen as important for the purpose of developing tutorial letters. Audio cassettes received the lowest recorded score – probably because the audio medium on its own appears to have a limited role to play in the teaching of scientific subjects such as Engineering.

- **Technology variation according to use**

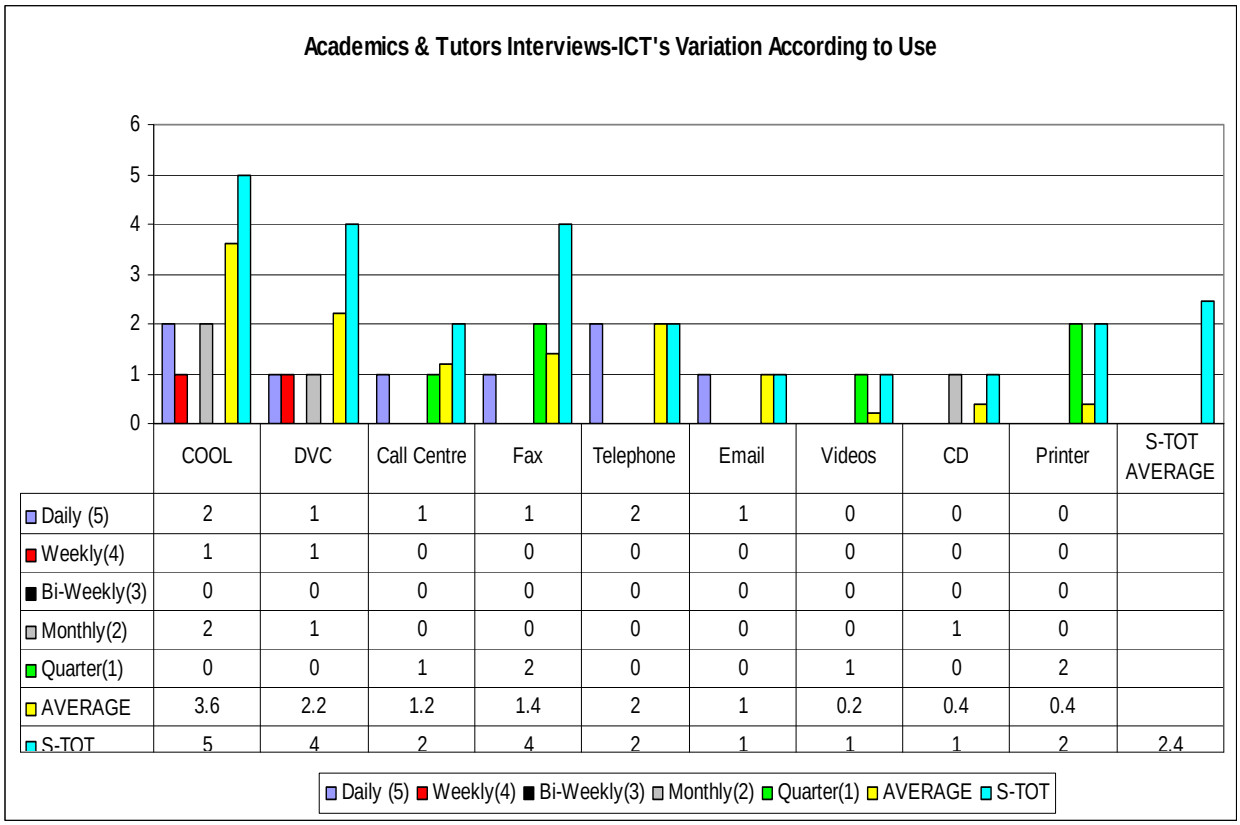


Figure 5.6 Academics and tutors ICTs' variation according to use

The majority (55,6%) responded to this question. COOL/SOL appears highly utilised from daily to monthly with mean score of 3.6; it is closely followed by DVC at 2.2, mainly by the tutors, then telephone 2, fax 1.4, Call Centre 1.2. Print material at 0.4 appears to have been deliberately underrated as printing predominates in courseware supplies. This cautions against reading too much into these figures, as they may be a wish list rather than a reflection of reality. The lowest rating was obtained for CDs 0.4 and video cassettes 0.2. On one hand, as in other instances, this highlights how audiovisual multimedia is still being undervalued; on the other hand the low rating given to email compared to COOL highlights the side-effects of the two technologies having been separated, and not complementing each other (see fig.5.6 above).

A substantial number (44,4%) of respondents did not respond – this may be a sign of doubt or indecision due to lack of essential use experience in ICTs.

- **Performance roles of technology**

Highly rated was COOL/SOL for communication (8), followed by its ability to send or receive (7), and to handle content (7) and then software (6). On the other hand, DVC's communication and sending or receiving capacities were each rated at 4, which do not appear to be high enough. This is perhaps due to fewer raters as it is still an unknown technology to many, including the academics. Another probable explanation for the low score could also lie in the weaknesses of the old DVC: the low bandwidth caused unclear picture and sound.

- **Rating technological strategy**

The respondents appeared to be divided and uncertain in rating the technological strategy between good - "as long as it can be updated", not good – "as not all the learners can be reached". However, a substantial number (55%) rated it as moderate (5) to good (8), while 45% did not give any response. The above ratings are limited to the technology setup, and other aspects such as flexible delivery and learning which hinges on the provision of quality education, competitive edge and globalisation, better performance and removal of distance as a barrier have been overlooked. This misconception could also be related to the fact that a substantial number (45%) did not answer, except to give "don't know" or "pass on" responses.

- **Weaknesses in integration process of ICTs**

There were mixed reactions to the integration process of technology – a minority (22%) saw COOL as good for its resources and user-friendliness. However, the majority (78%) felt that the reason for the underutilisation of COOL and DVC was due to the way the ICTs had been implemented, marketing was poor and lack of management participation was also a major deterrent. COOL's weaknesses included no full information on

assignment records, academic assignment data statistics lacking (no records of individual assignment and their credits), no assignment arrived through the system as no system accepted assignments online, assignment sent via email had to be printed and submitted via print. COOL's insufficient content and minimal or no lecturer interaction were seen as the worst of the problems.

Although DVC's positives were seen as real-time communication and interaction, these were overshadowed by the old and outdated technology which tended to discourage potential users, according to 33% of the sample.

- **Strengths of ICTs**

The majority (55,6%) felt that COOL was highly accessible, good for keeping students' academic records, excellent at allowing students to work at their own pace, time and place and an easy-to-use communication tool. DVC was regarded as an enabler of real-time communication and seen as saving time and money where it was well-resourced and appropriately utilised. A substantial number (45%) did not appear to know the strengths associated with the ICTs – a serious concern that needs to be addressed.

- **Strategy**

Mixed reactions were elicited about strategy. Some (33%) would have liked to keep COOL the same (unchanged), such as storage of content, students' academic records, tutorials and contact details. Others, roughly 33%, would have liked to see an improvement in implementation of strategy, policy and promotion campaigns.

- **Changes to COOL**

The majority (66,7%) said that they would like to see changes to COOL so that it was more accessible, the booklist design and uploading/downloading time needed to be improved, communication capacity with learners (questions, assignments and tutorials) needed to be increased, and confusing subject codes changed. They said that they would like telephone and cellular phone fields to be compulsory for possible use of SMSs. Promotion campaigns appeared to be good, but ICT use was still lacking, so the campaigns were failing in some way and needed to be revised. Lecturer participation in group discussions was to be encouraged. The changes to DVC suggested by academic respondents were upgrade both hardware and software and make sure that the system is fully functional and then enforce user-friendly policies in DVC to discourage too much travelling by the staff. A minority (33,3%) did not respond, probably due to unfamiliarity with this aspect of the discussion.

- **Innovations**

The responses to this issue were mixed, with the majority (66,7%) proposing innovative changes, such as add an interactive mathematics quiz with answers (with accessibility to all the learners), add Electrical Engineering tutorial letters, link courses (subjects) and get Engineering courses online (in the interactive mode), encourage learners to register and participate meaningfully in online learning. Other innovations proposed were that all the regional sites should be supplied with Internet-linked computers, and user-friendly COOL, the use of both DVC and COOL should be increased through the use of SMSs as an announcement of future planned sessions, tutorial letters needed to be placed on COOL and the project management approach should be used in the integration process of technology to ensure proper participation of all the key stakeholders. A minority (33,3%) did not respond, probably due to lack of ideas. In most cases, innovation occurs when advocates deal with the matter concerned from time to time; practice

allows them to try various solutions under varying circumstances. It is under such trying times that often being innovative will come easily to those who stick it out.

- **Possible causes of ICT underutilisation**

In the case of COOL, strong views were raised by the majority (66,7%). Causes of underutilisation were listed as high cost, lack of accessibility due to students' failure to register with COOL, lack of information and knowledge among potential users due to poor promotion, delays among some academic departments in going online, and even a lack of proper consultation between key stakeholders (academics, administrators, instructional designers and media developers).

In the case of DVC, underutilisation was seen as due to a lack of promotion and proper maintenance. Some 33,3% did not respond, probably due to a lack of knowledge or ideas.

Support for Engineering going online

The majority (75%) of academics interviewed would have liked to see Engineering courses online. If the majority of the academics converted their courses to online, this would most probably encourage many Engineering learners to register with COOL/myUnisa as their course materials would be available online. The minority of 25% of interviewees made up the dissenting voice.

- **Courses available online or presented via technology**

The majority (60%) claimed to have their courses presented via technology, but there are some doubts about this. Some 40% gave mixed reactions, varying from "not knowing" to a definite "no". A mere peek at the Engineering site on myUnisa earlier this year seemed to confirm doubts that little or nothing is happening online as it revealed lifeless sites. From this, the programme group in question, like many others in its position, has a lot of work to do if its intention is to adopt the ICTs for flexible delivery.

This picture is further complicated by the substantial number (44,4%) who did not give any response, probably due to indecision or lack of knowledge.

- **Intention to convert course materials to ICT-based models by academics**

Content availability is one of the critical prerequisites for the success of ICT models (COOL/myUnisa or DVC). The majority (55%) of academics interviewed claimed that plans were afoot to load some courses/modules online; at the same time 20% of the very same group seemed unsure. Furthermore, the tutors (33%) were not sure, as the decision to place courses/modules online is the prerogative of the academics. This topsy-turvy state of affairs needs to be clarified soon by the Engineering Department and its leadership to help ground it strongly.

- **Reasons for failure to convert courses to online presentation**

The minority group (33,3%) advanced reasons that students were not accessible online due to their lack of technology, their departments lacked HR and time resources and that it was the lecturer's prerogative to ensure that their courses were converted to online. To a large extent these reasons are credible, but the question is: How long should one wait for all the students to register with myUnisa before starting to convert material? While waiting for registration by those who lag behind, what happens to those already registered? This amounts to the cliché that "two wrongs don't make a right". Insufficient resources were also listed as a reason. However, humankind has succeeded in overcoming many obstacles because of its resilience to rise above insurmountable obstacles. In a nutshell, avoiding going online may be the worst route to follow in this time and era. Therefore more serious thinking and planning should be done along the lines of adopting ICTs for flexible delivery as a realistic solution.

- **Self-evaluation by academics of use of ICTs**

The lecturers interviewed saw themselves and management as highly positively inclined to the use of ICTs, with lecturers scoring 6, administrative staff 5, learners 6 and

academic administrative support 5. Lecturers (academics and tutors) appear more positively inclined to the use of the ICTs, and probably what seems to be complacency on their part when it comes to the adoption and integration of ICTs for teaching and learning may not actually be the case; rather, it could be something that needs to be addressed carefully by the powers that be. The drawback does not appear to be lack of capacity on their part.

- **Academics' perception of own capability using ICTs for flexible delivery**

Some 33,3% saw themselves as capable of high flexibility, 44,4% as moderately capable of flexible delivery, and only 11,1% as low in capacity. Another 11,1% did not respond.

- **Academics' perception of own capability at helping learners**

Academics were equally divided between highly and moderately capable. A reasonable number (33,3%) considered themselves as highly capable, another 33,3% as moderately capable and a paltry 11,1% as low in capacity. Of all the respondents, 22,2% did not respond. If this finding is anything to go by, then Unisa appears to be well-resourced in ICT human resources, but the question is how to fully exploit this to benefit Unisa's clients and partners.

- **Academics' perception about learners' capability to learn through ICTs**

The majority of academics interviewed (55,6%) saw the learners as moderately capable of learning through ICTs (COOL in particular), while others were divided between the low and high point of scale (22,2% each). It is not surprising that some of the respondents (22,2%) simply assumed that learners would have a low capability to learn through DVC, probably as the latter is seen as unfamiliar technology. However, a paltry 11,1% felt that learners' capability was moderate to learn through DVC.

An overwhelming majority of 66,7% did not respond. This kind of reaction may on one hand be read as being non-committal; on the other hand, it may be read as confirmation that academics know very little about their learners due to little interaction taking between the two parties. This lack of knowledge should serve as motivation for the use of ICTs in DE institutions to help break and overcome the distance which acts as the barrier.

- **Promising situation while converting to ICTs**

All of the respondents (100%) painted a positive picture regarding future developments if adoption were successful. Getting feedback from students with accessibility, more learners registering and going online, a possible increase in the pass rate, possible achievement of intended targets by the key participants – all these positive indicators should lead to progress and success (increased throughput), and the possibility of an institution outperforming its competitors. At the same time, these indicators taken collectively act as a further plus to the academics as positively inclined to the use of ICTs.

- **The way forward**

A large number of interviewees (78%) agreed that both COOL and DVC needed improvement. With lecturers contributing more academic content, there is a need to increase marketing campaigns to learners and other users about the role of COOL/myUnisa and DVC and their capacities. All users of COOL/myUnisa and DVC need to be exposed to training (if they need it); the correct implementation strategy supported by correct policies should be introduced. In the case of DVC, technology needs to be upgraded and the bandwidth size increased.

- **How to remedy underutilisation**

Less than half the group (44%) advanced the following as effective remedial measures: Increase the budget allocated for the use of technology, uproot maladministration, inform all the stakeholders of the necessary changes to revitalise the use of technology in time, introduce newsletters or brochures (via online or print) to update users on the latest planned changes in the use of technology, avoid making empty promises which merely make users lose faith in the use of technology, inform all role players including learners about the changes to be made (in both DVC and COOL/myUnisa). The use of ICTs should be fully practised and not just on paper. More than half the group (56%) could not suggest any corrective measures for underutilisation, probably due to a lack of essential experience in the use of ICTs.

- **Integrating technology with resource allocation and accountability as prime factors**

Some respondents appeared not to know how to tackle this question. Others seemed to agree that ICTs were enablers, and would therefore result in less paper and more convenience in teaching and learning where they were relevantly and appropriately applied. More importantly, there was fair comprehension (by at least 45% of respondents) of the principle that resource allocation needs to be supported by accountability to ensure full utilisation as the catalyst for the full integration of ICTs, and this is encouraging. Again, 33% of the interviewees did not attempt an answer.

- **Unisa's suitability to flexible or fully blended learning status**

According to the majority (55%) of the sample, Unisa is not suited for flexible or fully blended learning. The results serve as confirmation of the actual lack of use of technology for flexible delivery and learning. Lack of students' accessibility due to their

failure to register on the COOL/myUnisa system exacerbates the results. Unisa as a whole needs to work harder to attain fully flexible or blended learning status. This calls for more communication among key role players and management should also make an input by using relevant and appropriate research to instill the spirit of use of ICTs for educational gain among staff and learners alike. Lack of knowledge was still a factor in this respect as 33% of the sample did not give any intelligible suggestion when requested to do so during the interview.

- **Academics' expectations following attainment of flexible delivery status**

The majority of interviewees (88,9%) agreed that the application of ICTs was likely to help adopting schools turn the corner in achieving their targeted goals of expediency and more convenience as ICTs' full impact is felt by learners, lecturers and administrative supportive staff. In the quest to overcome the barrier of distance and achieve qualitative educational gains through quicker communication, smooth delivery and response (through ICT-based systems), the returns are likely to be increased improvement in results, inevitably leading to the elevation of Unisa as a better performing tertiary institution in DE.

- **Role change when using ICT-based system**

The majority (87,5%) of academics agreed that their role should be more facilitative, and that the role of students should be more active/participative. It appears that the academics fairly comprehended the change in their role that would need to be introduced in line with the use of ICTs.

The minority (12,5%) claiming that their role would not change serves as a caution that both academics and learners may require guidance on how to handle their respective new roles. Some 37,8% were in favour of a role change with regard to DVC. This is

indicative of the fact that role clarification will need to be taken seriously when it comes to live interactions between presenters and learners during DVC sessions to ensure success.

- **Ideal design process**

Many of the respondents (48%) felt that focus should be given to both the technical aspect (interactivity) and end product (conversion from document materials to electronic multimedia format). Other serious considerations listed include compatibility of subject and medium, a pilot approach for relevancy and multimedia, an instructional design approach with involvement of instructional designers and input of stakeholders (subject matter experts or lecturers, ICT producers, learner interests and expectations in a team approach).

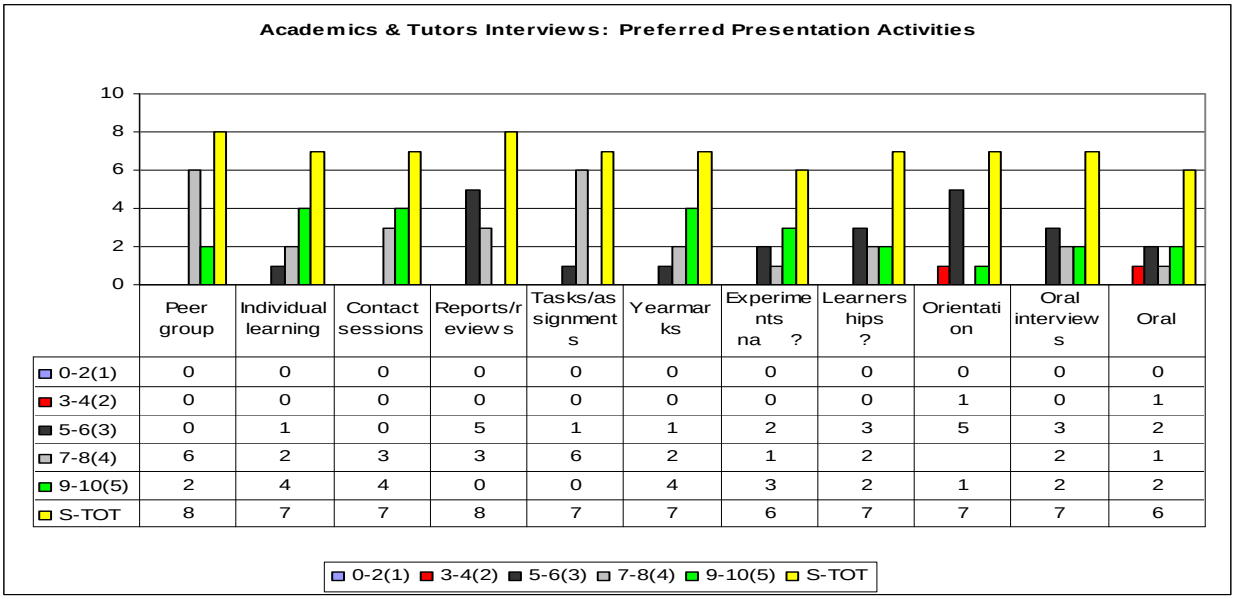
The fair representation of 33% of those who answered “not sure” is a persistent reminder that ICTs are still unfamiliar territory to some participants. Therefore one needs to tread carefully and never take matters for granted at any given point in time during the design process.

- **How to ensure inclusiveness and shared interests during integration**

Some of the respondents gave what sounds like useful and insightful comments, e.g. “give them models of how to do it, they might end up trying and giving up if they don’t succeed”. However, the majority (63%) felt that the use of the instructional design model, complemented by aspects of project management, should serve as the basis upon which the innovative strategy should be built to ensure that all the relevant stakeholders make their input into ICT models being developed. The minority (38%) appeared not to have the faintest idea about this issue. This serves as a reminder that

ICT models must be treated with caution, especially if the trainees do not claim to have an instructional design background.

- **Preferred presentation activities by academics –**



	Peer group	Individual learning	Contact sessions	Reports/reviews	Tasks/assignments	Yearmarks	Experiments na ?	Learnerships ?	Orientation	Oral interviews	Oral
0-2(1)	0	0	0	0	0	0	0	0	0	0	0
3-4(2)	0	0	0	0	0	0	0	0	1	0	1
5-6(3)	0	1	0	5	1	1	2	3	5	3	2
7-8(4)	6	2	3	3	6	2	1	2		2	1
9-10(5)	2	4	4	0	0	4	3	2	1	2	2
S-TOT	8	7	7	8	7	7	6	7	7	7	6

Fig 5.7 Academics and tutors interviews: Presentation activities

Highly rated by majority (88,9%) are the peer group discussion (6.8), followed by contact sessions (6.4), individual learning (6.2), yearmarks (6.2), learnerships (5.4) and oral interviews (5.4), and then experiments (5). The lowest rating was for orientation (4.4).

If the form of technology based on the presentation activities as advanced were to be deduced, it would be better to settle for ICTs (myUnisa and DVC) as they appear to be better able to cater for the choices as indicated.

- **Most valued approach in application of instructional design strategy**

At face value it appears that the majority (71%) were in favour of group work, or a team approach which should serve as the norm during the instructional design process as

mooted here. However, the faint voice (28%) that preferred the individual approach serves as a reminder that the matter of a group approach versus an individual approach must be handled with the necessary caution by all groups concerned.

Summary of interviews with academics and tutors

According to the academics and tutors, their most preferred ICTs as COOL/myUnisa and DVC have not yet been adopted for use due to the following obstacles: the majority of their learners do not have access, and they (academics) do not have the time, necessary ICT skills, support help and other resources to enable them to convert to ICTs. Others among them, particularly the tutors, felt that it was the prerogative of the academics to make the necessary change. Other points listed as causing the failure of integrating the ICTs were poor promotional campaigns undertaken, especially regarding DVC, lack of necessary training, costly technology and poorly applied strategy in adopting technology. These reasons were also advanced for underutilisation of the ICTs. In the same vein, the academics felt that they were positively inclined to the ICTs as they felt their use contributed to growth and the elimination of the digital divide. Furthermore, they felt they had the necessary skills and capacity to impart knowledge of the ICTs to their learners. In the same breath, a substantial number of the academics appeared to doubt the ability of their learners to use ICTs for learning. This doubt could be related to the little interaction occurring between learners and academics due to DE as a barrier, the failure to adopt available ICTs for this purpose and the belief by the majority of the academics that few of their learners enjoyed using ICTs as recommended by the institution. Mixed feelings were highlighted by the unconvincing responses to conversion of courses to online. Although reasonable input was given on how to overcome underutilisation, and even suggestions for innovation were made, the majority appeared to be lost.

The clear finding is that the majority of the academics saw Unisa as still falling short of being flexible in its delivery.

5.7 Findings from and analysis of interviews with instructional designers and developers

The sample group of instructional designers and developers consisted of two males and four females. Four were black and two were white. Two were from the 26-30 year age group, three from the 31-35 year age group and one from the 41 to 45 year age group. The total years of work experience was 29 years, with an average of 5,8 years per person. However, none of these respondents had any actual experience in developing online material.

- **Required special experience and qualification for instructional designers and developers**

The required qualification for an instructional designer is an educational degree (BAEd), experience and a working knowledge of software programs, e.g. Quark, Freehand, Photoshop, scanning, web design and development (Java and HTML programming), and graphic design background is recommended; quality assurance, language practitioner skills such as proofreading, translation and editing make up some of the other prerequisites.

- **Other important qualifications**

These relate to developers and producers of online materials and include the abilities and skills of electronic origination and graphic design (in support of instructional designers). They also need to have the ability and skill to use programs such as MSOffice and MSWord, and knowledge of text layout, quality assurance and OBE, as well as have a good command of English.

- **Conditions at work**

All the respondents in this sample (100%) were unanimous about enjoying work in the instructional design setting.

- **Strengths of ICTs**

The group appeared to speak with one voice, and highly praised the benefits of the ICTs, such as providing easy access to teaching and learning, acting as an immediate feedback platform, and as a good substitute for lecturers and textbooks (COOL and DVC). Other positives included the use of the right language, user-friendly nature of the system, a well-secured site for personal use through the use of PINs when logging in, interactiveness offered by DVC and the possibility of ICTs helping one to be up-to-date technologically.

- **Willingness to recommend ICTs to others**

All the respondents (100%) indicated their willingness to recommend ICTs to others.

- **Interesting aspects of the instructional designers' and developers' work in developing ICT-based materials**

Although the discussion sounded varied and as if it were coming from different angles by the instructional designers and developers, the researcher sensed that their work is interesting and colourful. Several interviewees (80%) conceded that every project had its specific requirements. Less accessibility and less computer literacy have their own challenges on one hand, and on the other hand, there is the question of the great variety in courses that instructional designers and developers have to contend with from time to time. The question of language is also critical as it has to be pitched at the right level for the learner. In the end, the work of the instructional designers and developers

entails designing, checking for content precision and relevancy, reading and checking for quality and precision in delivery of content to the intended target group.

The minority (20%) appeared lost for words, perhaps in keeping with their claim of non-use of online and other ICTs.

- **Established drawbacks**

Although responses were highly varied by the majority (80%), the cited drawbacks are some of the frequently repeated ones which may lessen myUnisa's (COOL's) appeal if overlooked: slow access, no tutorial letters, the costly rates in connecting, login problems and monotonous screen design with less appeal. Again, a minority of 20% refrained from answering.

- **Eliminate ICT drawbacks**

Again the same majority (80%) felt that the following could be the solution: fix the server (slowness in opening) of the network, create a Unisa dedicated Internet café as part of the learning centres, lecturers should send in regular tutorial letters, the overall design and use of colours need to be revisited, some of the technicalities could be best handled by ICT multimedia programmers.

- **Interactive aspect of ICTs**

This rated high as "Very important" at a score of 3, followed by the administrative function at 2; ICTs as a teaching tool was rated 0 under the "Very important" option and only considered fairly important as a teaching tool with a score of 2. This rating carries a very important message that teaching as the lowly placed aspect of myUnisa needs to be re-energised. In fact, more serious attention needs to be devoted to the other two aspects, namely administration and interactivity. Undervaluing teaching is as good as

missing the significance of the use of ICTs for teaching and learning, and the said oversight could further be seen as the reason why the learners appear reluctant to register with myUnisa.

- **Rating of presentation activities**

Peer interactions were considered “Very important” with a score of 5, followed by HCI with 3, and communication was rated 0 under the “Very important” scale category. This low rating of communication could be due to the fact that the respondents did not feel this aspect was up to scratch. Respondents from other groups in this research complained of limited communication between learners and lecturer-learners. It is for this reason that the communication aspect should be revisited and be revamped in line with the instructional design.

DVC was not considered, perhaps due to a lack of knowledge or doubt by the respondents. To bring DVC up to par with myUnisa, more promotional campaigns as well as demonstrations need to be conducted.

- **How to improve COOL**

The views raised by the minority (33%) were that the information via COOL should be made readily available to the learners and the presence of the lecturing staff, where their presence is desired, should be increased. The few ideas and contributions made by the minority speak volumes regarding the underutilisation of ICTs as the instructional designers and developers do not develop a feel for ICTs.

The rest (67%) did not give any response, due to a lack of performance which most likely leads to a lack of knowledge.

- **Why online technology (myUnisa/COOL) is important**

The strong views raised by the minority (33%) were that attractive screen designs of the site helped boost the image of the institution, and thus increase its prestige. Online connection was regarded as more suitable to DE learners as they can access it at their own time, place and pace. Again, the majority (67%) gave no response.

- **Users' attitudes towards ICTs**

Respondents saw the learners' attitudes towards COOL as highly positive with a score of 2, and gave the academic support staff and the lecturers a score of 1. Administrators and senior management were seen by the respondents as highly negative towards ICTs. There were no responses relating to DVC.

- **How to dispel negative attitudes**

This question was attempted by only 40% of the sample and they proposed increasing campaigns (to reluctant users such as management) about the positives of using ICTs, such as use of online student profile data for decision-making. Success stories of some of the users of ICTs could also be shared.

The majority (60%) cited lack of knowledge when it came to advancing suggestions of how to dispel negative attitudes. It is only with experience that respondents are able to give intelligent answers in instances such as this. It appeared that those who lacked the necessary experience were often lost for words when it came to higher order questions that required experience, insight and critical analysis about the area concerned.

- **Description of current use of ICTs**

A total of 40% of these respondents saw ICTs as moderately used and 40% as optimally used. The average score of 40% between moderate and optimal use may be seen as relatively good. However, this does not apply when it comes to this group's own

admission and showing; reasonable description of its ICT use status should be rated between underutilisation and moderate. 20% did not give responses.

- **Suggestions to achieve optimal use in the face of underutilisation**

The response given by the minority (20%) of the respondents was that the best tactic would be to encourage senior management staff to use DVC to address staff (in remote areas) instead of using transport, to save time and money. The point mooted here is to raise awareness of cost-effectiveness, dependability and relevancy of DVC use for flexible delivery purposes. The majority (80%) did not respond to this question.

- **Factors responsible for optimal use**

Of the interviewees, 40% listed using the best cutting-edge technologies, being served by well-trained and committed ITC staff, and instructional designers and developers and other multimedia specialists as factors responsible for optimal use of ICTs. Again, the majority (60%) of respondents refrained from giving a response, most probably due to a lack of information.

- **Wish list for ICT changes**

Responses were more concerned with appearance and technicality, with 40% wishing to retain COOL the same way as in myUnisa, and another 40% opting for retaining the same firewall and software for logging onto the Internet. One would have expected the wish list to be more along the lines of subject matter level, content relevancy, methodology of presentation, interactive multimedia, etc. The minority (20%) did not give a response, probably due to a lack of information.

- **Aspects that should change**

The majority (80%) of interviewees cited a change in attitudes by lecturers, same-day response to learners' queries by lecturers, all learners having accessibility with Pentium 4 processing power, and changing the design of myUnisa (formerly COOL) as it was too straightforward. The minority of 20% did not respond.

- **New innovations**

The views of the majority (80%) were more general than those expected of the instructional designers and developers. Their suggestions for innovations were the appeal for lecturers to be present in their offices when they were needed, staff to be armed with the latest models in PC hardware/software, e.g. Pentium 4, and a change in name from COOL to a more innovative one.

- **Old/new stakeholders**

The overwhelming majority (80%) suggested that new/old stakeholders were students, lecturers, the IT dept, different programme groups, Telkom, vendors, management, staff and the Minister of Education. A total of 20% did not answer this question.

Support for the statement "A bright future lies ahead for our learners with access to correct use of ICTs for their educational delivery."

The majority (66%) indicated their support for the statement by commenting on the prospect of a promising bright future through increased accessibility to ICTs, increased relevant usage of ICTs by learners, resulting in enhanced computer literacy, increased interaction between learners, and use of research which should help verify what works and what does not work. A total of 34% did not answer this question.

Summary of interviews with instructional designers and developers

The common shortcoming shared by the instructional designers and developers, despite their long experience in the field of instructional design, was that the majority appeared to lack experience in working with online technologies (COOL/myUnisa) and DVC. They appeared to enjoy working in the instructional design and multimedia environment but the opportunity has not cropped up yet for the development of the said ICT materials.

These respondents felt the ICTs have a valuable contribution to make in terms of teaching and learning, but there are also drawbacks, such as the technology not being up to scratch, costly technology, insufficient promotion of ICTs, lack of content and participation by academics, and few students who are properly registered which leads to underutilisation of ICTs. They felt that some positive action such as a well designed myUnisa, a well-planned promotion campaign of ICTs and meaningful participation by the lecturers may turn the tables for the better.

5.8 Findings from and analysis of interviews with multimedia developers

The sample of multimedia developers consisted of two males and one female and two members were black and one white. One respondent each fell into the age groups of 26-30 years, 36-40 years and 41-45 years.

- **Qualifications and experience needed**

Although each interviewee gave their own background qualification (web, system programming and multimedia authoring tools) as a prerequisite for their qualifications, all of them (100%) emphasised the importance of work experience rather than formal qualifications when it comes to the development and production of ICTs. The significant formal qualifications were cited as a diploma in IT, plus programming – system design and development, and use of application software, e.g. Adobe, Photoshop, Flash and

Macromedia. Other skills cited include the use of authorware, i.e. colour, shape and artistic background, knowledge and experience of web design (particularly graphic design), multimedia and their products, and networking skills.

- **Appreciation of work in multimedia environment**

Complete consensus (100%) was reached when it came to establishing whether the interviewees enjoyed working in the multimedia environment.

- **Preference for online (ICT) technology by interviewees**

The majority (66%) agreed that the 24-hour availability of COOL provided learners with choice and convenience, it saved time, provided an alternative resource to lectures and handouts, made learning easy through use of animations, graphics, video clips, and prompts in content presentation. In addition, a minority (33%) felt that the new Unisa had opted to use more of the old Unisa's SOL system rather than COOL for the following reasons: it is easy to change and update, it is interactive and informative, and it offers the students the opportunity to see their financial (administrative) and performance (academic) records.

- **The best choice**

All (100%) were non-committal as to which was best between COOL and SOL, but all were willing to recommend myUnisa to others.

- **Best aspects of multimedia regarding designing**

The majority (100%) considered website development, presentation software (Java) and using project teams as fascinating aspects of multimedia development. The fascinating aspects of multimedia were seen as responsibility for enhancing the quality of work

presented through them, and thus adding special value in making the main concepts stand out where they had been adequately exploited for this purpose. To achieve such a feat (enhancement and enabling) in instructional design and development requires teamwork and coordination of various stakeholders (instructional designers and developers, subject experts, including multimedia producers) to make a contribution to product development. Eventually the qualitative multimedia product on the table can then be used by learners to render difficult concepts or subjects easy, and could even be used by lecturers to enhance teaching during their contact sessions.

- **Possible drawbacks**

The following drawbacks were cited by the individuals within the group: learning is not necessarily made easy through the use of graphics, animation and videos, many details are left out and there is no link between modules or uploaded material to create a sense of continuity. Other weaknesses included technophobia, failure to market ICTs, lack of training and use of PIN codes/passwords. These drawbacks and weaknesses scare users away when they do not get what they expected to find at the right time. A lack of knowledge about DVC or myUnisa causes learners to miss out on opportunities that might have been stepping stones in their search for knowledge. Simply ‘dumping’ scanty educational materials, full of gaps, online does not make sense in multimedia (i.e. without proper instructional design and development) and does not make teaching and learning easy for the learners or the academics. The result is that using ICTs may be seen as a futile exercise, and simply amounts to an abuse of ICTs.

- **Use of ICTs for flexible delivery**

The majority (75%) rated myUnisa as being predominantly utilised for administrative functions, less than 50% said it was used for academic functions, and 33% for

interactive purposes. The implication of myUnisa being used more for administrative than academic functions boils down to flexible delivery being unattainable. This status probably stems from a lack of content and lecturer participation online and few registered learners with myUnisa.

- **Group discussions**

MyUnisa was highly rated in terms of HCI with 13 points, followed by communication (academic or administrative aspect) at 12, and lowest was peer/lecturer interactions at 11. No responses were given in respect of DVC; the reason is probably because it is regarded as unknown technology.

- **How to improve group discussions**

Although group discussion is generally accepted as important, according to the respondents, there are no such discussions among the online materials available. Lecturers need to initiate this learning activity by placing interesting materials online on myUnisa. The resultant initiative (of placing group discussion materials online) could lead to improved communication between lecturers and learners, peer interactions and probably improved performance by learners with access. This would lead to increased awareness about the existence and value of the ICTs.

- **Value of group discussions**

The majority (66,7%) saw group discussions as carrying a greater value compared to textbooks in that they allow learners to have greater appreciation of content, and may also help learners gain better insight into the main concepts and objects of the course/modules of the learning materials.

- **Positives of ICTs**

All the respondents (100%) felt that the distance barrier of sending or delivering academic materials through the post was overcome through ICTs, i.e. transfer or delivery of information was now easier, and there was also more accessibility to the virtual campus (myUnisa), communication was rendered easy and there was accurate management of information (database). Overall they felt that the institution was now more competitive in its business dealings.

From the preceding account, it is clear that through the application of myUnisa and other ICTs, the institution has a good chance of changing for the better in its dealings with the community and most likely with its partners and competitors.

- **Negatives of ICTs**

Using outdated technology makes access difficult. Inappropriate use of technology means that not much is achieved as users do not know the true value of different types of multimedia technology. For example, use of Flash may add more value and simplify more complex concepts through graphics and animations that may not be achieved through PowerPoint. Hence a team approach is such a vital strategy when it comes to the design and development of multimedia products. It is often a mammoth task for an individual to be able to keep up with new changes occurring in this field. Multimedia infrastructure may not be easy to implement due to a host of possible hurdles, such as incompatibility due to different software packages or their versions, licence rights to clear or even costs to meet.

- **Attitudes of the users**

The multimedia developers regarded the academic support group as more positive with a score of 4, followed by administrators and senior management, and learners with a score of 3 each. Lecturers, at a score of -1, were perceived as negative towards ICT

usage by some interviewees (67%). The minority (33%) did not respond. Further study is needed as to why groups perceive themselves as more positive than others toward the use of ICTs, and why they presume the next available group to be more negative. The answer relating to DVC was left blank by all the respondents.

- **Recommended solution**

The majority (67%) said that the solution to changing attitudes would be to uproot negativity through more communication and reassurance to the lecturers that technology will not replace them. The message should be conveyed that correct application of technology will help in boosting the positive results in performance by their learners.

- **Evaluating utilisation**

The use of ICTs is seen by the majority (67%) as underutilised and by the minority (33%) as moderate. Underutilisation of this magnitude is probably due to the cited problems such as insufficient content, lack of participation online by the academics and failure by the learners to register in large numbers with myUnisa. On reflection these problems appear to have many cause-effect relationships.

- **How to overcome underutilisation**

The recommended solution by the majority (67%) was given as being proactive as opposed to reactive, conducting more research and conducting educational training workshops with the users. The minority (33%) did not respond.

- **How to cope with change**

The given majority's (67%) suggestions were to keep the same people as they understand how to utilise technology. In addition, the best of both COOL and SOL should be kept. The minority (33%) did not respond.

- **Reason for change**

The responses by the majority (67%) were about making changes to essential HR and technology resources, keep more resourceful staff that has the know-how of how technology works, and identify and keep the best of both COOL and SOL and use it to develop a more superior system. The minority (33%) refrained from answering, probably due to a lack of sufficient experience.

- **Innovations the group would make**

The majority (67%) preferred technologically related innovations, viz. introduction of the latest software packages such as Flash, new third-generation multimedia software packages, and use of a more multimedia approach (with animations) to revitalise teaching and learning experiences. The minority (33%) refrained from answering.

- **Stakeholders to play a role**

All the interviewees (100%) seemed to agree that learners, lecturers, designers and developers, senior management and ICT could do with some form of training and orientation in how to use ICTs, and also a firm grounding on what role they needed to play. If the academics, for instance, are not aware that when they use ICTs they should also play more of a facilitative role, then they will not gain the best out of the effort of using the technology, and this may even negatively affect the way they use ICTs. In the same vein, the learners could be unfamiliar with the more participative role they are expected to play during the blended learning. Senior management is supposed to show

the way and encourage the adoption and use of ICTs for flexible delivery, but how will they fulfill the role if they hardly know anything about it? Last but not least, the ICT Directorate should to a great extent know how to steer the ship.

- **How to improve use of ICTs**

All the interviewees (100%) recommended marketing and promotion campaigns of ICTs and other technologies, e.g. CDs and audiovisual cassettes, as backups to distributing study materials.

- **Future use of ICTs**

All the respondents in this group (100%) voted for statement #1 "**Get rid of the outdated aspects of current technology while introducing new hardware and software;**
Acquire the right and relevant resources (human and hardware) at the right time." which implies their support for the success associated with the correct use of ICTs as the right solution to overcoming low pass rates in the DE context.

5.8.1 Summary of interview findings with multimedia developers

The majority concurred that ICTs are valuable tools in communication, as storage means and exchanges. They are also important when it comes to flexible delivery and learning. Fascinating aspects of multimedia are in programming and software development (as quality enhancement). However, ICTs are also fraught with drawbacks which lead to its underutilisation: wrong outdated technology, wrongly applied ICTs due to lack of knowledge and costly resources (time, HR, incompatibility in technologies). Academically there is insufficient content and pedagogic such as group discussions are not well applied. Mainly, ICTs are being used for administrative functions.

In assessing the current status and the issue of whether Unisa is flexible or not, the majority of respondents (67%) felt that Unisa was not, as the ICTs are used mainly for

administrative rather than academic services, there is little lecturer participation and few students have registered with myUnisa.

ICT-based models coupled with innovations would lead to optimal utilisation. The majority saw the solution as acquiring new technology (hardware/software), applying it correctly for teaching/learning, ensuring that participation was encouraged according to the right procedure and roles, using the right marketing strategy with the support of the right policies, using research and being proactive.

5.9 Self-administered structured questionnaires (SASQ)

The period for this part of the process covered September 2004 to March 2005. The researcher used the Engineering registration list for the selection of the required sample. As the list was outdated (dated February 2002), and more than 75% irrelevant, the researcher made attempts to acquire a new one, but without much success. For some reason, there appeared to be a moratorium on list updates of registered learners due to the merger process at the time. The researcher resorted to accidental and volunteer sampling of all the Engineering learners who happened to be on campus during the said period. The registration block, library and popular learner sites such as auditoriums and lecture halls were chosen as places where students would be found, and questionnaire administrators (librarians, administrative staff and research assistants) were to issue out questionnaires to learner volunteers and collect them after completion. Special instruction to follow – questionnaires were to be filled by the engineering learners as a priority. Depending on the number, time availability and willingness of the respondents, the volunteer assistants were able to quickly browse through the completed questionnaires and point out the items omitted or left blank to the

respondents and where the respondents were willing to oblige by further providing the required information, this was done.

The researcher needed a sample size of 140 of the 340 Electrical Engineering learner population for this aspect of the study. To liaise with the respondents as sample members, the researcher required the assistance of two administrators in Student Support and the library, that is, in addition to the research assistant. Where the administrators had to wait for the learners to fill in the questionnaires, a 100% return rate (42 questionnaires) was obtained. Where the questionnaires were given out to learners with guidelines to fill the questionnaires in on their own and mail them back later, the return rate was disappointing. Roughly 38 questionnaires were issued and not returned. Of the 60 questionnaires sent via mail to the sampled learners, only 22 (37%) were returned, with 12 of the said 22 being returned after dispatch of the reminders. In the end, 140 questionnaires were issued and 66 (19.4%) returned (see table 5.1, page 8).

Last but not least, a further 30 online questionnaires were sent via GroupWise. Only 4 (0.02%) were returned, again after the reminders had been sent out.

5.9.1 Findings from and analysis of learners' SASQ

The sample (66) was dominated by males at 74%. Females were 24%, with at least 2% as gender shy (unspecified). Most of this group (52%) fell into the age group of 21-25 years old. Their cultural background could be described as diverse African. Economically, they could be characterised as city dwellers (80%) and unemployed (52%), as opposed to 39% employed. A reasonable number of the group (23%) had already settled into definite engineering career lines.

- **ICTs possessed by learners**

A basic elementary knowledge of computers is important if the DE learner intends reaping optimal use of connectivity. In terms of what learners possess as ICTs, particularly a description of their PC setup, there were mixed reactions. For example, some of the answers were not clear, e.g. the majority of the respondents (28%) claimed to be **Hightower users**, followed by **laptop** (12%) and **desktop** (8%) users. One wonders what the no response of 38% means in this instance, particularly with reference to the subsequent question items left blank. The implication here could either be no response because of a lack of knowledge as to what was required by the question, or no response because the respondent did not feel like answering, or simply skipped it. This unclear state of affairs could possibly be explained by reading the answers provided for other questions.

In response to the question on making a choice about the processor type, a meagre 6% and 26% specified their Pentium types as Pentium 1 and 2, and 3 and 4, respectively. An overwhelming 94% and 61% did not respond at all. Again, this reaction raises the question of whether the respondents did not understand what was required, or simply refrained from answering, but access is ruled out as a possibility through the responses obtained to the questions to follow.

Responses to memory specification were not encouraging either. For the description pertaining to the memory status of learners' computers, 14% showed that their PC's memory measured in gigahertz and 6% in megabytes (RAM); again an overwhelming majority (88% and 94%, respectively) did not give responses to the memory question

items. Other questions with similar non-responses relate to the classification about the Internet and multimedia capabilities, the type of browser, modem, printer and monitor.

The sample appeared to take more interest in the question item about the operational system type: 58% described their system as Windows 2000 and the rest (42%) as Windows XP. For the first time the latter response eliminates doubts about the learners' accessibility to PCs.

- **Exposure to DVC**

In response to the question on exposure to DVC, the majority of the sample indicated no exposure or contact with the DVC technology. A meagre 2% indicated exposure to DVC types Aethra, Polycom and Picturetel. In line with the recorded non-exposure, the highest non-responses of 97% and 98%, respectively, were recorded to question items about DVC. Further highlights of no contact with the DVC technology were recorded in other question items relating to speed of transmission, bandwidth and DVC peripherals, such as the document camera, which recorded the highest range (97% to 100%) of non-responses. The picture highlights the underutilisation of the DVC technology.

- **Access to ICTs**

In answer to how they access PC technology, the majority of the sample (27%) saw themselves as home PC users, 17% use community resource centres, followed by 15% at work, 15% at learning resource centres and the lowest rating (8%) was given to family or friend. A total of 18% did not respond. These figures suggest that 27% have at least reasonable access daily, whereas the majority (55%) has conditional access, probably dependent upon renting, goodwill or favours. In a nutshell conditional exposure rather than full access to ICTs can also act as a deterrent to users. Needless to say, the

question of accessibility should always be treated with sensitivity when dealing with delivery of teaching and learning in a DE setting. In the same vein, conditional exposure to PCs (renting or borrowing) could result in users not getting acquainted with the type of the technology they use, especially if they do not know how to access such information. When it comes to upgrades, downloads and even connectivity, knowledge of system information is crucial to get the best performance out of the PC. To a certain extent the same rule applies to DVC, especially when dealing with compatibility.

One of the critical factors to the success of the survival of the distance learner is participation in the virtual campus (with connectivity to the Internet via dial-up modem or broadband). A total of 39% claimed that they had received an explanation of the existence of the virtual campus (COOL/SOL or myUnisa), 38% of the sample claimed to be Internet linked and 18% claimed to be participating meaningfully in the virtual campus. The positive sign of growth in the numbers of students registered on myUnisa is shown by willingness to participate at 17%. However, the 21% who did not like to participate in the virtual campus raises concern. Some learners did maintain that they could not withstand long hours of exposure to reading on the PC screen. However, in a VLE setting control of reading could be preplanned to ensure that interaction is maintained through various formats rather than through mere reading. However, further research is needed to ascertain what could be possible explanations for the negative type of behaviour or reaction toward VLE.

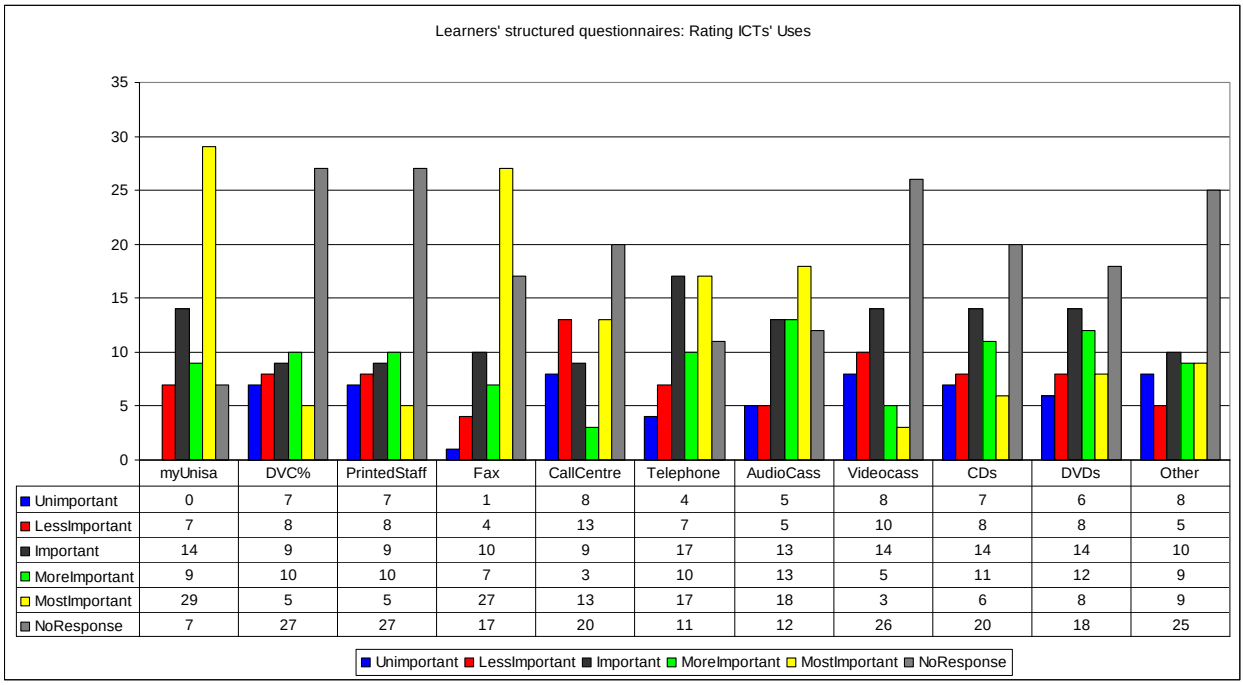
- **MyUnisa/COOL registration**

A matter of major concern should be the paltry 8% registered with myUnisa, and the overwhelming majority of 82% providing no response. It should be borne in mind that registration is the main formal way of participating in Unisa's virtual campus (myUnisa).

This is further borne out by the sample's experience of using COOL - a mere 20% is not good enough. The said statistics paint a sad picture as far as utilisation of VLE for flexible delivery of Engineering is concerned. Much more effort is need to show the significant role that could be achieved through myUnisa by the potential users.

- **Efficiency rating of ICTs**

The students appear to attach a lot of faith to the importance of technology that serves their interests well, and ICTs are no exception to this observation. MyUnisa appears to be the most favourite at 47.4% and rated "Most important", followed by fax at 47%. For an unexpected change DVC (earlier reported as unknown) was now rated equally with print material (as the dominant media) at 23% ("Most important") per item. As observed in the interviews, for natural science subjects, the low rating of the multimedia tools does not bode well: DVD rating at 32.4%, CD at 27.8%, video cassettes at 23% . Other forms of ICTs, i.e. audio cassette (39.2%), telephone (38.8%), Call Centre (27.6%), were fairly appreciated by some members of the sample, even though they would seem to serve more of an administrative purpose rather than as academic tools, particularly the Call Centre and telephone (see fig 5.9 below).



	myUnisa	DVC%	PrintedStaff	Fax	CallCentre	Telephone	AudioCass	Videocass	CDs	DVDs	Other
Unimportant	0	7	7	1	8	4	5	8	7	6	8
LessImportant	7	8	8	4	13	7	5	10	8	8	5
Important	14	9	9	10	9	17	13	14	14	14	10
MoreImportant	9	10	10	7	3	10	13	5	11	12	9
MostImportant	29	5	5	27	13	17	18	3	6	8	9
NoResponse	7	27	27	17	20	11	12	26	20	18	25

Figure 5.9 SASQ ICTs' efficiency rating by learners

Considering ICT use for delivery, myUnisa (72%) dwarfed the use of DVC (15%) when the sample's mean scores are taken. This is confirmed by the comparison of the learners' responses to questions regarding their functional knowledge of myUnisa (52%), as opposed to DVC (22%) (see figure 5.9 above).

- **Reason for preferences of ICTs**

Is there any specific reason why users prefer particular ICTs? There was a split vote in response: some members indicated that they liked COOL/myUnisa because it allowed them to study at their own place and time (59%), others because it enabled group discussion (41%) and others for the cost reduction (39%). Some preferred live contact sessions (53%), but the 92% who were not sure negated the support shown for COOL/myUnisa in this respect. Although few showed support for DVC, it was consistent support: first for cost reduction (21%), then group interaction (24%) and last but not

least, preference for face-to-face via DVC (26%). As a result DVC appears to have the edge over COOL/myUnisa in this regard.

- **Problems with myUnisa/COOL**

ICT related problems scare users away. Problems associated with myUnisa (COOL/SOL) are lack of sufficient academic information (41%), not easy access off-campus (32%) and mainly FAQs (27%). Even though the users appear sceptical (39% indicated not sure), it can be inferred that problem areas hampering progress are that group studies are intimidating (11%), problematic connection (12%) and poor audio (6%). Therefore it is advisable that immediate remedial action be implemented to solve these problems.

- **Wish lists of learners**

A wish list is one of the positive signs that indicate attitudes of users towards technology. Responses to this question confirmed that respondents wished to see (i) adaptation and adoption of technologies accessible to the majority of learners (48%), (ii) use of ICTs appropriately and relevantly (36%), and (iii) marketing and training of users in the correct use of ICTs where there is a need (44%). Above all, ticking the option “All of the above” (30%) appears to serve as confirmation of the preceding options that they are in tandem and serve to add up to a working solution.

- **Presentation activities and style**

The critical ingredients to good presentation are content and methodological input. According to the respondents, they valued highly use of the following activities with COOL/myUnisa: assignment (52%), results (50%), drill and practice (48%), contact session (47%) and simulation (46%). These were followed by problem solving skills

(33%), interactivity (29%), essays (26%) and group discussion (24%). Low rated activities were graphics (23%), quizzes (21%) and administrative matters (17%), that is, if the sum to values given to the scale aspects “Extensive” and “Very extensive” are taken into account.

When the same approach is applied in considering use of DVC, highly rated activities appeared to be group discussion (24%), results (23%), problem solving (22%) and assignment (21%). These were followed by graphics (17%), contact session (16%) and interactivity (16%), and low-rated activities were essays (14%), drill and practice (13%) and simulation (12%). When application of the presentation style is considered, the order of preference given above for both COOL/myUnisa and DVC might require adjustment according to their strengths.

- **Contribution of ICTs to learning**

The majority (61%) asserted that COOL/myUnisa did contribute to their learning. Only 11% of the same sample confirmed DVC’s contribution, while at the same time an overwhelming majority (85%) decided to abstain from responding, thus raising questions about ICTs’ popularity, particularly DVC. The respondents classified COOL’s/myUnisa’s contribution as significant at 34%, but that of DVC as insignificant (5%).

- **Recommend ICTs to colleagues**

Naturally, people tell others (friends and families) of products and services that please them. The overwhelming majority (83%) of the sample said that they would recommend myUnisa (COOL), whereas only a handful (26%) would do the same with DVC.

When questioned about reasons behind the reluctance to recommend the ICTs for use to others, initially the sample was divided. However, the division soon disappeared as the sample's responses became more coherent and unanimous. Lack of technology was cited by only 8% as a reason, as was insufficient technology awareness campaigns. Lack of training by the users was rated by 39%. The fair majority (41%) gave the answer as "All of the above", implying that the combined effect of the above reasons could be seen as the main deterrent.

- **Overall importance of ICTs to learners**

Undoubtedly, the sample was divided in response to the question on the overall importance of the ICTs to the learners. Some respondents did seem to underrate some of the advanced choice items, e.g. 68% left the choice of learning through ICTs unmarked, and 59% left the choice of ICTs enhancing studies unmarked. The latter measure of responses seems to correlate to the 44% who marked "None of the above" and thus emphasise the lack of importance. However, a reasonable number of participants (48%) marked "Future preparation for the digital world" and they felt that the importance of ICTs cannot be overlooked for the critical role they play.

5.9.2 Summary of self-administered questionnaires to learners

Access is a problem and leads to knowing little about the technology used. The great majority of respondents showed little knowledge of the basics about their PCs and they did not have full access, but rather enjoyed conditional exposure though renting or borrowing PCs. The same also applies to knowledge of DVC, where only 2% claimed knowledge of it.

Participation in myUnisa still remains a question mark, with 18% claiming participation. However, the number of fully registered participants of the 39% of Internet users is very low at 8%. A cause for concern is the 21% who did not favour VLEs.

There are substantial doubts about the value of ICTs to flexible delivery and even possible reluctance to recommend ICTs to others due to a lack of technology, training and ineffective promotional campaigns.

Despite the questions arising, learners who participated in this research claimed myUnisa to be the most favourite ICT (44%), followed by the fax, telephone, audio/video cassette, Call Centre, DVC, print material and CDs. The value of ICTs is appreciated by the majority, but their weaknesses and how to overcome them are also highlighted. Presentation methods and content could be seen as their strengths in flexible delivery. To a large extent the role of DVC was acknowledged as the questionnaire unfolded, even though its role appears to be second to COOL/myUnisa, with a substantial number not answering.

5.10 Findings from and analysis of questionnaires administered to academics and tutors

This group of professionals makes up the core of what is happening in Engineering as a field of study: the delivery of content and methods, motivation, the impact upon the natural and cultural environment by the engineers, evaluation and throughput. Participants in the sample were made up of the age group of 26-30 years, diverse South African ethnic backgrounds (Zulu, 42%, Afrikaans, 21%, Setswana, 21%) and predominantly males at 84%, as opposed to 16% females. Engineering academics constituted 68% of the sample, and others 32%.

- **Number of registered students**

To the question of how many students were registered for the courses according to the lecturers, responses suggested a great variability of lecturer to learner ratios from as little as 0<50: 5%, 51<100: 37%, to as high as 251 plus.

- **Assistance**

There is evidence of assistance in the form of tutor allocation per course, varying between 0% (no tutor) to as high as 11% (two tutors) for a course. The number of learners registered per course helps to determine the number of tutors allocated.

- **Using ICTs for delivery**

The majority (68%) of the sample said that they were not using ICTs for delivery. A further substantial number (32%) of the sample did not answer. This revelation about Engineering academics with reference to myUnisa speaks volumes as their non-participation could be contributing a great deal to underutilisation as far as delivery is concerned.

- **DVC presentation of courses/modules**

The overwhelming majority (84%) said that they did not use DVC presentation of courses/modules and 16% did not answer. As in the case of myUnisa, the non-participation of Engineering academics in DVC programmes contributes a great deal to its underutilisation and in the long run to the failure of qualitative delivery to the learners.

- **ICT skills possessed**

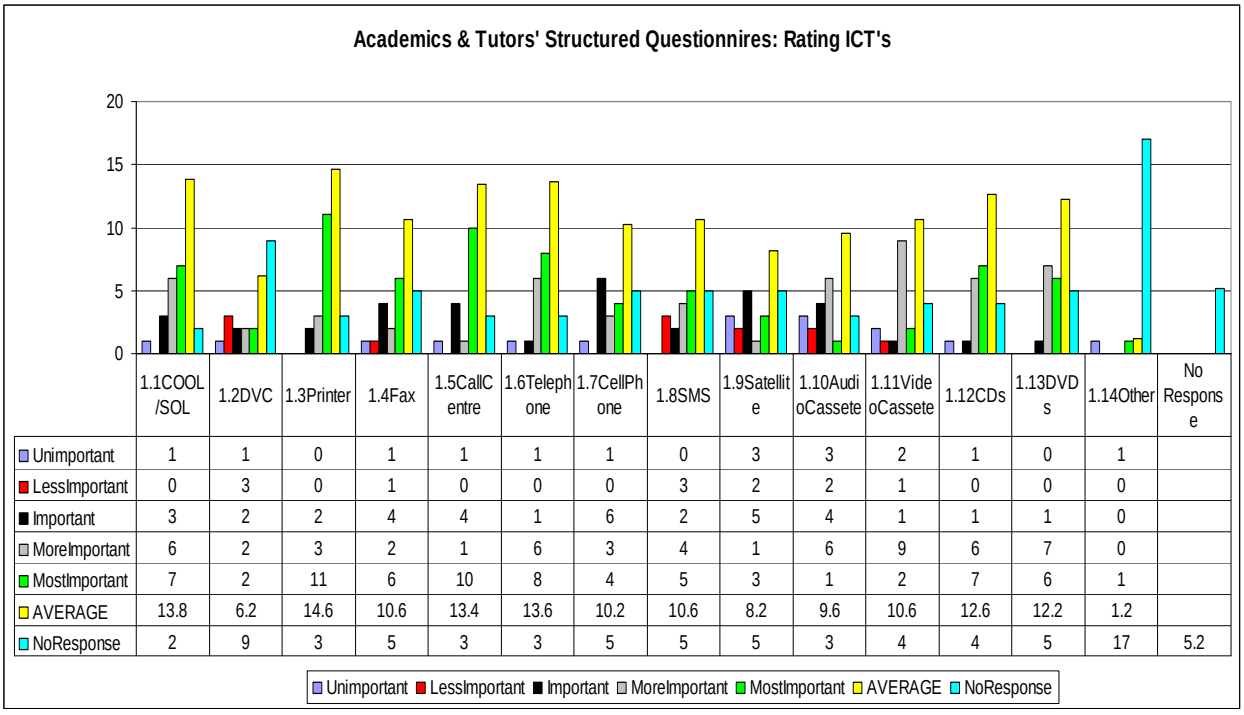
The majority (89%) indicated that they were well conversant with the use of email, fairly conversant (47%) with the use of two-way video (DVC) and discussion boards (37%),

and less than average (26%) with both mailing lists and chats. They were well-acquainted with Internet resources such as searching (89%) and locating new information using menus (58%). In other words, the majority of the respondents claimed above-average ability and skills in the use of ICTs. Now if the hard reality has to be faced, the implication is that failure by the academics to deploy their essential skills in use of the ICTs of myUnisa and DVC for flexible delivery in a way serves the purpose of promoting the digital divide as all the necessary basics appear to be readily available.

- **Preferred ICTs for flexible delivery**

The preferred ICTs for flexible delivery contrasts with what the learners perceived to be the case (page 12 fig. 5.1). Largely rating of the ICTs was done by the majority (78%) with minority (21%) refraining.

The recorded responses were as follow:



	1.1COOL/SOL	1.2DVC	1.3Printer	1.4Fax	1.5CallCentre	1.6Telephone	1.7CellPhone	1.8SMS	1.9Satellite	1.10AudioCassete	1.11VideoCassete	1.12CDs	1.13DVDs	1.14Other	No Response
Unimportant	1	1	0	1	1	1	1	0	3	3	2	1	0	1	
LessImportant	0	3	0	1	0	0	0	3	2	2	1	0	0	0	
Important	3	2	2	4	4	1	6	2	5	4	1	1	1	0	
MoreImportant	6	2	3	2	1	6	3	4	1	6	9	6	7	0	
MostImportant	7	2	11	6	10	8	4	5	3	1	2	7	6	1	
AVERAGE	13.8	6.2	14.6	10.6	13.4	13.6	10.2	10.6	8.2	9.6	10.6	12.6	12.2	1.2	
NoResponse	2	9	3	5	3	3	5	5	5	3	4	4	5	17	5.2

Figure 5.9 Academics & tutors SASQ rating ICTS

Considered “Most important” were CDs (87%), DVDs (82%), print material (58%) and the Call Centre (53%). Ordinarily “More important” could be seen as telephone (42%), myUnisa (37%) and fax (32%). The implication here is that these technologies are seen in a good light by the academics, as they would also be exposed to high use in flexible delivery. However, as seen with the previous cases, what is highly preferred now may not enjoy high preference when it comes to actual usage, myUnisa being the case in point. Less rated among the “Most important” were SMSs (26%), cellphones (21%), satellite (16%) and DVC (11%). Chances are that the affected ICTs will most likely feature among the least utilised by the academics, with DVC being the least used (fig 5.8).

- **Reasons for preference**

The reasons for preference show the underlying motive to use ICTs. Only 21% stated the reason as accessibility; a vast 79% did not give their choices, even though the questionnaire teemed with probable examples that could be refined as potential answers. From the respondents’ lack of response, a number of implications can be drawn, one being that the majority may have been indifferent, and that their inclination was not to use ICTs for delivery. Another could be the side effect associated with a lack of the necessary experience.

- **Frequency of use**

Variability in terms of how often the ICTs are used, if clearly established, should give one the idea of whether the technology is well-used or just window-dressing. Daily usage was rated at 53%, weekly usage at 26%, bi-weekly usage at 11% and annual usage at 11% which should be seen to be relatable to optimal usage of the ICTs,

however tends to differ with the reality painted thus far (lack of content, use of ICTs for administrative purpose, and little content online).

- **Special consideration of myUnisa and DVC for flexible delivery**

Highly rated as “Most important” for the role of flexible delivery was myUnisa (32%), followed by conducting contact sessions via myUnisa (21%), using DVC interactively (21%) and using DVC for feedback (16%). DVC being rated as “Less important” by so many (53%) for contact sessions and also the high percentage of no responses is not surprising as DVC is still perceived as an unknown technology at Unisa.

- **Reasons for using ICTs**

A reason for using ICTs that was rated highly by the majority was provision of quality education (53%), followed by improving communication capacity (47%) and enabling learners to achieve excellent exams results (42%). However, the point of removing distance as a barrier, which went unrated, was overlooked (with 79% who did not answer). This means that participants missed one of the critical roles played by the ICTs. The preceding statistics reveal mixed reactions – the respondents appeared not to have the necessary confidence in the roles to be fulfilled by the use of ICTs, but the lack of the necessary confidence appeared to be exacerbated by overlooking distance as a barrier and through the high number of non-responses. Lastly, lack of enthusiasm in this respect could also be related to a lack of knowledge due to underutilisation.

- **ICTs’ benefits**

When asked about the benefits of ICT, the only option rated highly was live interactions through DVC (63%). This shows confidence by the majority in this particular functional aspect of ICTs. In fact the scale is tipped positively by the fact that both the options

“myUnisa tailor-made for Unisa learner needs” and “encouraging students to surf net” (53% each) are denotative of the said benefits likely to appreciate to ICT users. Further positivity is also highlighted through the fair rating as “important” of the option “enabling students to access their biographical information” (63%). In the end the positive perception overrides the negative one.

- **Weaknesses**

No clear-cut answers were given about the weaknesses of ICTs, but highly rated were lack of ICTs and no access (42%), non-use of ICTs by academic departments and problems associated with logging in from home (21%). The overwhelming majority were opposed to the suggested weaknesses. This requires further probing as to what could be the seen as weaknesses by the respondents.

- **Wish list of changes**

One change that respondents wanted to be made was an improvement in teaching and learning (53%). However, the rest of the options were rejected due to insufficient support for “content, look and feel” (26%) and “booklist design” (21%). The implication of their rejection is that there appears to be more variability between the latter groups’ members, which also tends to be more characterised by independence in thought.

- **New ICT ideas**

If well-supported the suggestions for new ICT ideas would probably go a long way in re-energising the mooted models. Again, one highly rated option (63%) was “load interactive modules”. Other options with less support were “uploading relevant content” (42%), “include study letters and tutorials” and “eliminate big online files that may slow down accessing the website” (both at 37%).

- **Reasons for the non-use of ICTs by the academics**

The lack of an advertising campaign was identified as one of the main drawbacks by the majority of the respondents (74%). Despite their logic and reasonableness, the other options “cost and inaccessibility” (47%) and “failure to register with myUnisa by the students” (47%) appeared to be less considered.

- **Description of own capabilities in respect of myUnisa and DVC for flexible delivery**

The majority (63%) felt that they had moderate capacity to use ICTs for flexible delivery. This would be a plus to utilisation of ICTs for flexible delivery.

- **Helping learners develop capability**

A substantial number (53%) of respondents felt that they had moderate capability. This would be a plus to optimal utilisation of resources.

- **Learners’ capability of using myUnisa**

The majority of academics (68%) did not believe learners had moderate capability of using ICTs. This could be explained by the little interaction the academics have with their learners.

- **Learners’ capability of using DVC**

A substantial number (53%) of academics felt that learners’ capability for the use of DVC was low.

- **Ideal ICT use**

The majority (74%) supported registering the majority of learners with myUnisa. However, other options “Improvement of exams performance” (32%) and “get learner feedback” (26%) received less support. This may imply that the academics do not believe that using ICTs would have a major impact such as improving exams results. Alternatively, the use of multiple-choice questions does not appear to suit all the respondents; in all the previous cases the first option appeared to enjoy the highest priority in allocation of marks than later options. Indeed, this appeared to be the trend throughout.

- **Way forward**

The options “train users” (63%) and “update online materials” (53%) were well supported, whereas “increase general awareness campaign” (42%) and “purchase latest ICTs” (32%) received less support.

- **Flexibility or inflexibility of Unisa**

Most respondents felt that Unisa was flexible.

- **Future plan to convert to ICTs**

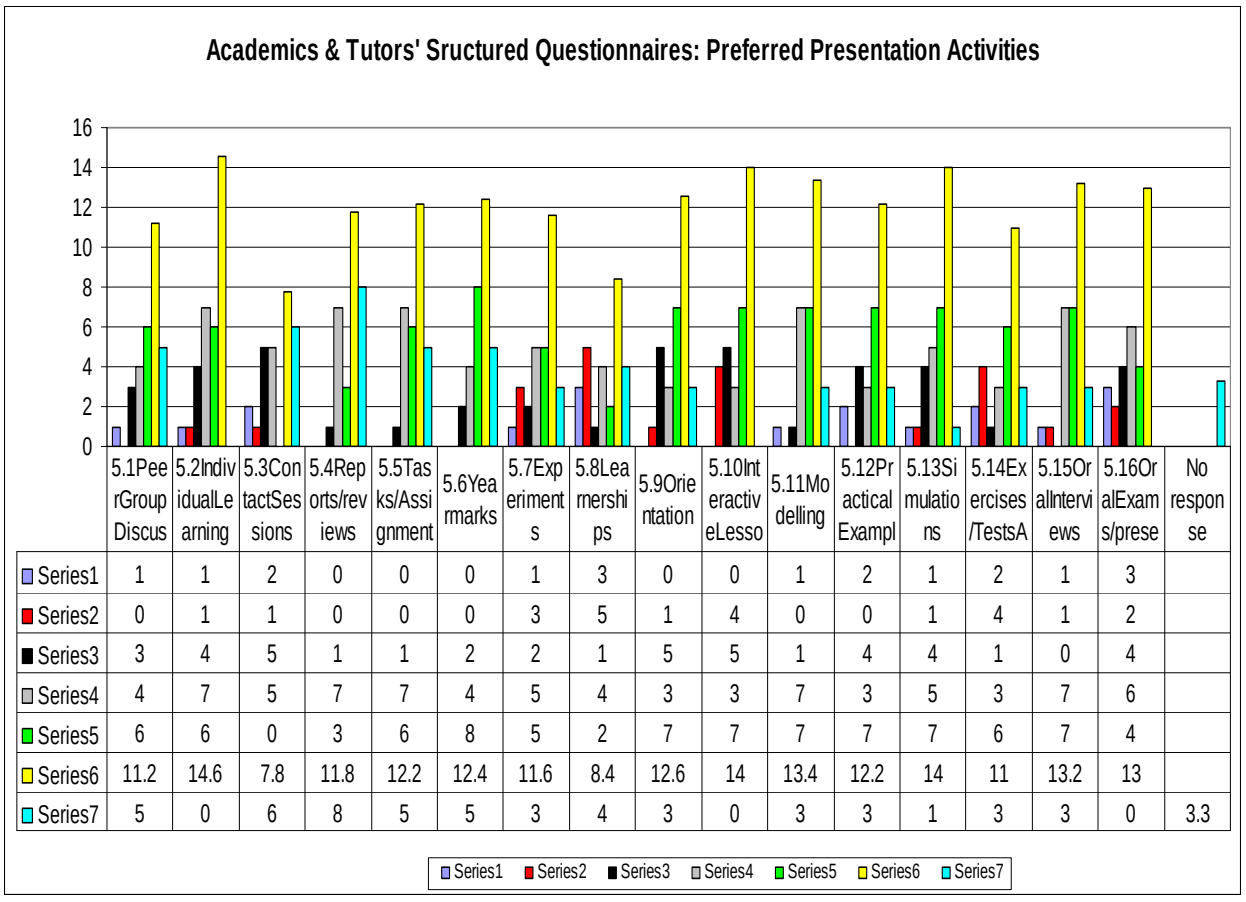
The overwhelming majority (84%) gave their support to converting to ICT-based models.

- **Change in role**

When it comes to the main online users, there is a need to change roles and engage learners as active role players and this was supported by 53% of the respondents. On the other hand, minor support (11%) was for the lecturers to play a facilitative role.

- **Preferred activities conducted through ICTs for flexible delivery**

The respondents appeared to be less enthusiastic about this question as evidenced by the noticeable non-responses (about 33%) who did not answer. The following were considered to be “Most important” in descending order: individual learning (14.2), simulation (14) interactive lesson (14), modelling (13.4), and oral interviews (13.2); middle rating go to examinations (13) yearmark (12.4), tasks/assignment (12.4), and peer group discussion (11.2).



	5.1PeerGroup Discus	5.2IndividualLearning	5.3ContactSessions	5.4Reports/reviews	5.5Tasks/Assignment	5.6Yearmarks	5.7Experiments	5.8Learnerships	5.9Orientation	5.10InteractiveLesso	5.11Modelling	5.12Practical Exampl	5.13Simulations	5.14Exercises/TestsA	5.15OralInterviews	5.16OralExams/prese	No response
Series1	1	1	2	0	0	0	1	3	0	0	1	2	1	2	1	3	
Series2	0	1	1	0	0	0	3	5	1	4	0	0	1	4	1	2	
Series3	3	4	5	1	1	2	2	1	5	5	1	4	4	1	0	4	
Series4	4	7	5	7	7	4	5	4	3	3	7	3	5	3	7	6	
Series5	6	6	0	3	6	8	5	2	7	7	7	7	7	6	7	4	
Series6	11.2	14.6	7.8	11.8	12.2	12.4	11.6	8.4	12.6	14	13.4	12.2	14	11	13.2	13	
Series7	5	0	6	8	5	5	3	4	3	0	3	3	1	3	3	0	3.3

Figure 5.10 SASQ Academics and tutors’ Presentation activities

Others that one thought would feature highly in rating are experiment (11.6) and contact session (7.8), considering the nature of the course (Engineering) as the basis, but it was not to be.

As Engineering academics, the respondents appeared very keen to collaborate with various experts such as technology advisors (79%), subjects specialists (74%),

language practitioners (74%) and instructional designers (47%), and even participate in group work (68%). Cause for concern is that a substantial number of the academics were not sure (63%), and worse, even marked “None of the above” (53%), thus giving the impression of being haunted by doubt and mixed feelings regarding the question.

Academics’ confidence in learners’ ability to live, earn a living and work in the 21st century in terms of the academics’ assessment of the use of ICTs for flexible delivery varied from very confident (63%) to not very confident (74%).

5.10.1 Summary of findings of self-administered structured questionnaires to academics and tutors

Based on the evidence gathered, none of the academics indicated any participation in the use of the ICTs (myUnisa and DVC). The findings are mainly characterised by what appears to be a pendulum swing. Doubts and uncertainty appear plentiful and whereas reasons for use of ICTs, preferred ICTs, using ICTs for flexible delivery, variation according to use, development of ICT-based materials, preferred presentation activities through ICTs for flexible delivery and the lack of advertising campaign were confirmed as critical in some of the settings in this very study, they are now clouded in uncertainty through the substantial number of either non-responses or responses of not sure.

However, there are some findings that were not clouded by uncertainty. According to the majority of academics, using myUnisa and DVC for flexible delivery is still far from achieving its prescribed targets. Therefore Unisa cannot be seen as flexible and the role of both learners (to participate actively) and lecturers (to facilitate) needs to change.

5.11 Findings from and analysis of questionnaires administered to instructional designers and developers

The main role of instructional designers and developers is to customize content and the methods for delivery and learning based on learner aptitudes, growth and interests. This group consisted of 63% females and 38% males. The majority (88%) of the respondents were in the 40 plus age group. The racial composition was mainly white Afrikaans (63%) and English (38%).

- **Perception of role to play**

The majority (63%) concurred that their main roles were advisory, consultative and evaluative of course materials in relation to learners. However, this role becomes more defined and realistic with the designers' active participation in the actual work process. As is the case with many other professions, less active participation renders the designers dubious and sceptical of their place and role.

- **Perception of strength of ICTs' flexibility in delivery and learning**

The majority (50%) of the sample perceived the strength of ICTs as being interaction by learners, academics and administrators via ICTs over the use of information and enhancement of both the learners' and academics' roles. The support shown here is due to the fact that the essential qualities associated with the use of the ICTs, namely interaction and enhancement, are not readily available in any trump card instructional setting, but in those that have been well-designed and produced. However, the majority (63%) indicated that they were not sure in their interviews. In a nutshell, what can be drawn here from the finding is that there are more elements of doubts and uncertainty prevailing among the designers and developers regarding their role in the use of ICTs.

- **Interesting aspects of developing online (myUnisa) materials**

Participants said that ensuring that content, methodologies and technology were used in the right proportion in flexible delivery (63%) was an interesting aspect. The doubts and uncertainty referred to earlier on are now highlighted through the high number (88%) of unmarked responses to the option of liaising and consulting with different stakeholders in the development of individual projects (in online or DVC). A factor responsible for the noted doubts and uncertainty could be that the designers appear to work more in the production of print-based materials as opposed to ICTs.

- **Perception of weaknesses of ICTs**

This was one of the poorly attempted questions. Only a lack of access by the learners was identified by 50% of the sample from the given choices; other credible sources of weaknesses such as resistance by the users to adopt the technology and lack of ownership of technology were not perceived as such; hence they remained unmarked by the majority (75%), again as evidence of doubts or lack of interest. Experience has shown that often complex ICT-based relationships become easy and discernible with interaction, use and discussion about the impact on the cultural and natural environment. It is perhaps in this light that the higher order options such as those mentioned above would not be identifiable as weaknesses in an implementation strategy to instructional design experts who hardly ever have a chance to plan, argue and discuss the use and deployment of ICTs for educational delivery.

- **Perception regarding current use of ICTs**

A reasonable majority (63%) concurred that the ICTs remain underutilised (see figure 5.10 below). The extent of the negative perception is further corroborated by two

separate majority 'No' votes (75%) to both fully optimal and moderately optimal utilisation.

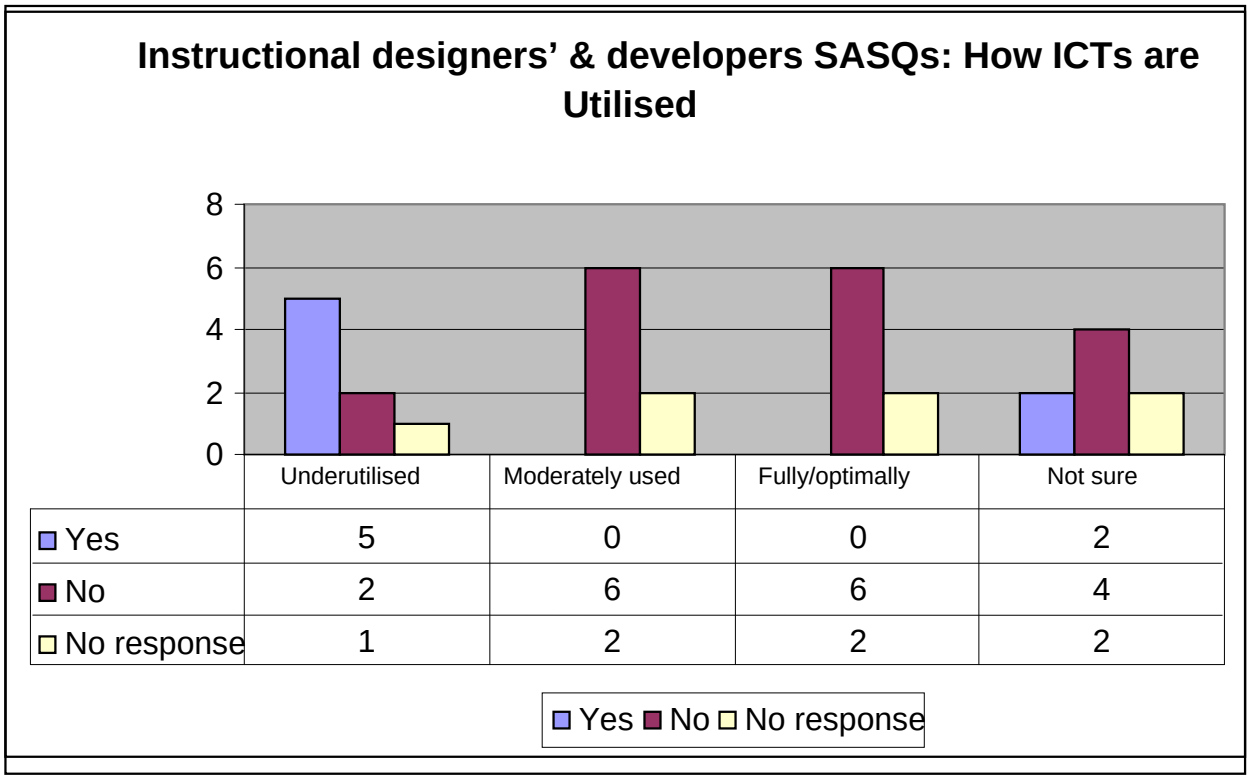


Figure 5.10 Instructional designers & developers SASQ – how ICTs are used

- **Measures to correct underutilisation**

The designers did not think that they could help make the much needed change. However, the following were suggested by 38% of the respondents: positive campaign, positive incentives for the learners to use technology, encourage cooperation between lecturers and media developers to work together to produce ICT-based materials (see figure 5.11 below). These suggestions are hard to hear against the backdrop of uncertainty created by the majority (63%) from the unmarked and no response categories. Apart from seminars/workshop discussions as one way of enlightening the staff about the use of new technology, there is also the question of how often strategy and adoption measures are shared through communication. If hardly any such

discussion takes place, obviously questions on such matters would be dismissed as difficult by the affected party.

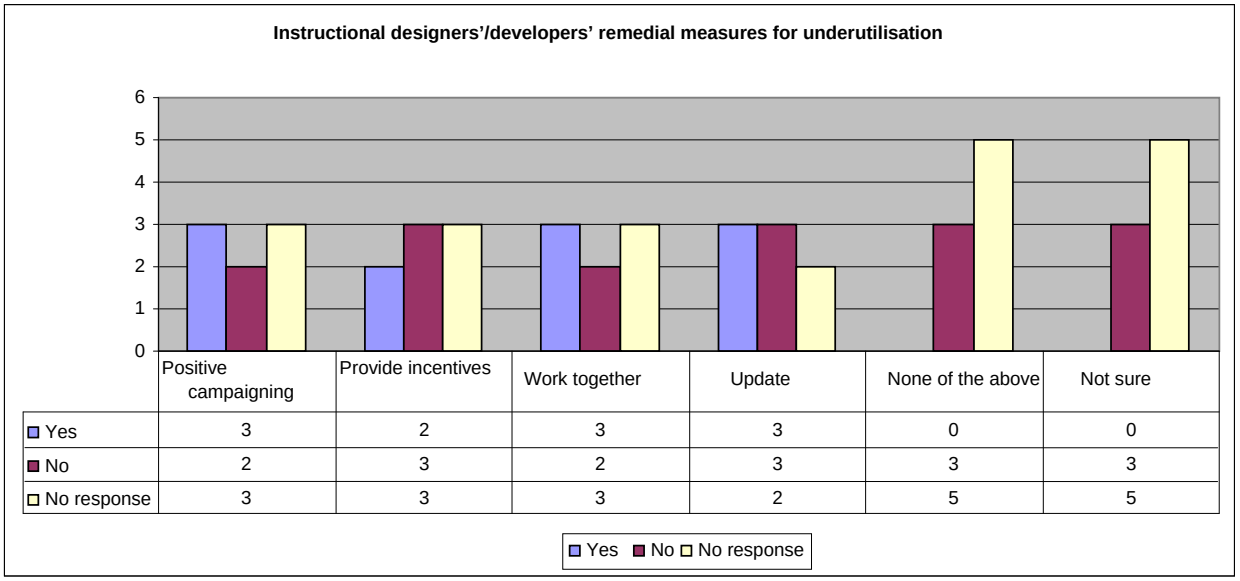


Figure 5.11 Instructional designers: remedial measures to underutilisation

- **Factors leading to optimisation**

This was one of the poorly attempted questions, as the majority (88%) refrained from expressing their feelings. Only the minority (13%) identified viable options as "best and relevant use of online and DVC technologies", "dedicated learners and their lecturers communicate via ICTs" and "less dependence on paper-based hand-outs".

- **Room for changes**

The majority (88%) did not mark their options. Only a minority (13%) would have liked to retain COOL and DVC in the same (original designs).

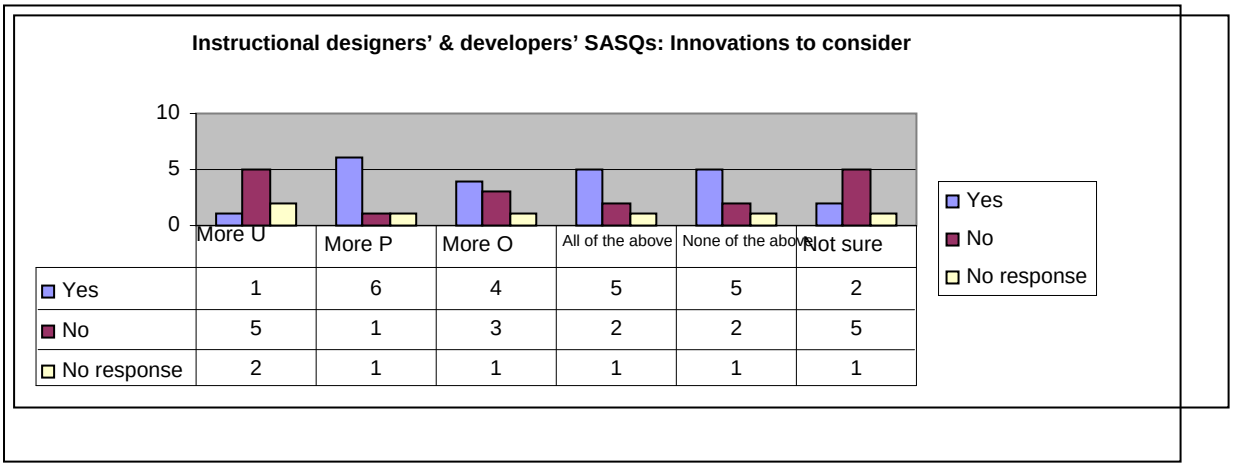
- **Changes to be made**

An encouraging picture was given by the majority (63%), who indicated that they would change COOL and DVC, and make more effective use of ICTs to reduce the high failure

rate and that they would like to see more immediate response from the lecturers to their learners' questions.

- **Suggested innovations**

These comprised more participation online of lecturers and tutors when users require their inputs (75% of respondents), more use of interactive multimedia for teaching and learning and more online exercises requiring participation by the peer group learners, lecturers and tutors (63% of respondents). However, the promising brighter prospects were somewhat negated by the 63% who opted for "None of the above" (see figure 5.12 below).



	More U	More P	More O	All of the above	None of the above	Not sure
Yes	1	6	4	5	5	2
No	5	1	3	2	2	5
No response	2	1	1	1	1	1

Figure 5.12 Instructional designers' SASQs: innovations to consider

- **Stakeholders to play more meaningful role**

This question was fairly attempted. The majority of respondents (75%) concurred that learners should be active choosers and recipients of content, media developers should be allowed to play a more critical role (63%), academics should make sure of content and that methodologies were up to date (50%) and administrators should make sure that all learner records were up to date (50%). These responses demonstrated the understanding of the respondents in this respect, which is in line with one of the basic

requirements of the design and development of ICT-based materials, namely that it should be the result of a team approach by different experts, rather than an individual effort.

- **Suggestions to help improve use of ICTs**

There was consensus and eagerness to see an improvement in COOL (63% of respondents) and DVC (25% of respondents) as they play a pivotal role in the institutional ICT strategy. Cause for concern is the majority (75%) who did not mark their response or made no suggestions. The magnitude of the problem can be understood especially if it is related to the fact that these are multiple-choice questions, whose options as answers were developed from the probable answers from the interviews. The respondents in the self-administered structured questionnaires had a number of options to choose from as correct answers. From the decoded behaviours, the researcher surmises that the participants in the interviews appeared to be more knowledgeable than the respondents to questionnaires. Alternatively, the interviewees might have appeared to pay more attention whereas the respondents to questionnaires responded without a full commitment to anonymity.

- **Future use of ICTs for flexible delivery**

A positive view was taken by the majority. Some 88% felt that access alone without appropriate and relevant implementation would not render successful results, 77% felt that the lack of correct implementation of an ICT strategy would worsen the digital divide and 51% were of the opinion that a bright future lay ahead for learners with access to and correct use of ICTs. However, this positive view appears to have been tarnished by the substantial number of 50% who opted for “None of the above”, thus highlighting the presence of doubts and uncertainty. From the preceding findings it appears that doubts

and uncertainty tended to characterise respondents selected from samples with little exposure to use of ICTs – something that may result in disillusionment if not handled with care.

5.11.1 Summary of findings from self-administered structured questionnaires to instructional designers and developers

The findings appeared to be in a positive direction, but then suddenly veer towards the negative.

While on one hand, a reasonable majority of interviewees felt that the role of instructional designers and developers in the application of ICTs was unique and significant, on the other, the overwhelming majority of questionnaire respondents refrained from answering or opted for the “Not sure” option regarding the very same question. Another example of this split vote is a substantial number who felt that the strength of ICTs for flexible delivery lay in their interaction and enhancement qualities, but the majority opted for the “Not sure” option or simply did not answer. The mixed but balanced type of reaction for and against one particular aspect is identifiable through a number of other findings, such as how to introduce change through ICTs, ICTs’ weaknesses, ICTs’ benefits, how to achieve optimisation, or how to innovate. Possible reasons for the said doubts and uncertainty could be a lack of productive engagement by the participants (instructional designers and developers in this instance) in the design and development of ICT-based materials.

In the end, one clear finding is that all the ICT-based models (COOL/myUnisa and DVC) are currently being underutilised.

5.12 Findings from and analysis of questionnaires administered to multimedia producers and developers

Media producers and developers are the vital link and do play integrative role between the technology, content (instructional designers and developers and subject matter experts) and users.

This was the smallest sampled group consisting of three people, with two males and one female. The sample mainly fell into the age categories of 41-45 years (67%) and 46 plus years (33%) and represented the typical South African diverse racial groups of Asian (33%), Afrikaans (33%) and Northern Sotho (33%).

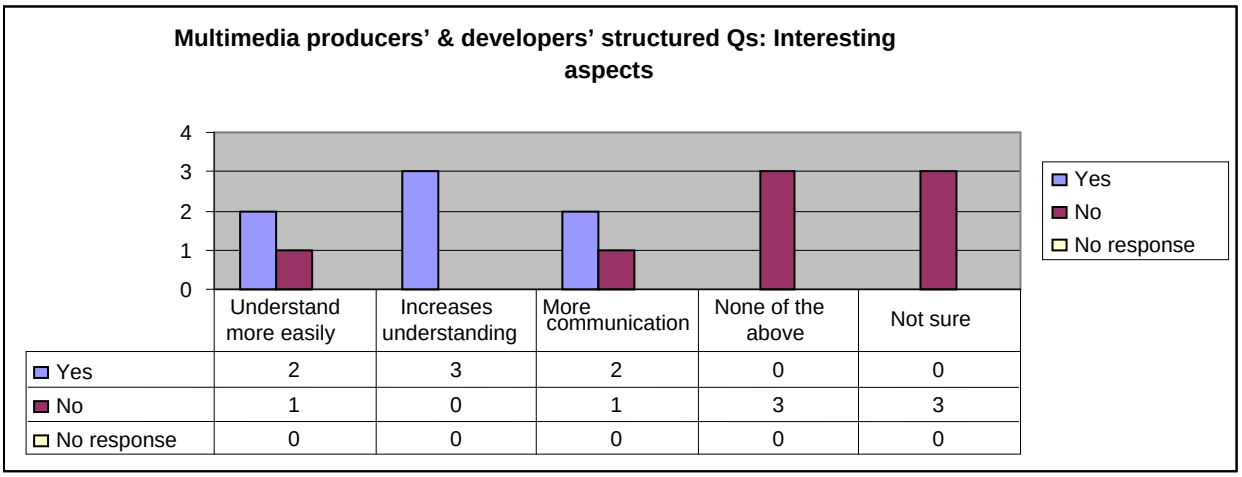
Students' participation in online or DVC distance learning opportunities was seen by the whole sample group (100%) as somewhat proactive. Most of these respondents were multimedia developers (67%), followed by web designers (33%). To qualify as a media developer, he/she had to have a command of knowledge of multimedia and products (100%), use of different application software (100%), programming experience (100%) and web experience (100%).

- **ICTs' strengths in flexible delivery**

All the respondents (100%) regarded offering students a chance to see their records and learning made easy as COOL's strengths. Some 33% felt that ICTs also offered learners 24-hour access. DVC's strengths were also unanimously agreed upon as being a real-time contact session, learning made easy probably through live interaction and also that it saves time and reduces cost by eliminating travelling and accommodation costs.

- **Interesting aspects of website designing and development**

All the respondents (100%) rated the interesting aspects as ICTs allowing presentation of difficult concepts in an easier way. Some 67% felt that if web-based application software of difficult concepts was done correctly it should allow users to understand information in an easier way and the same percentage felt that relevant application of graphics and symbols should make communication effective. (See figure 5.13 below)



	Understand more easily	Increases understanding	More communication	None of the above	Not sure
Yes	2	3	2	0	0
No	1	0	1	3	3
No response	0	0	0	0	0

Figure 5.13 Multimedia producers & developers SASQ's interesting aspects

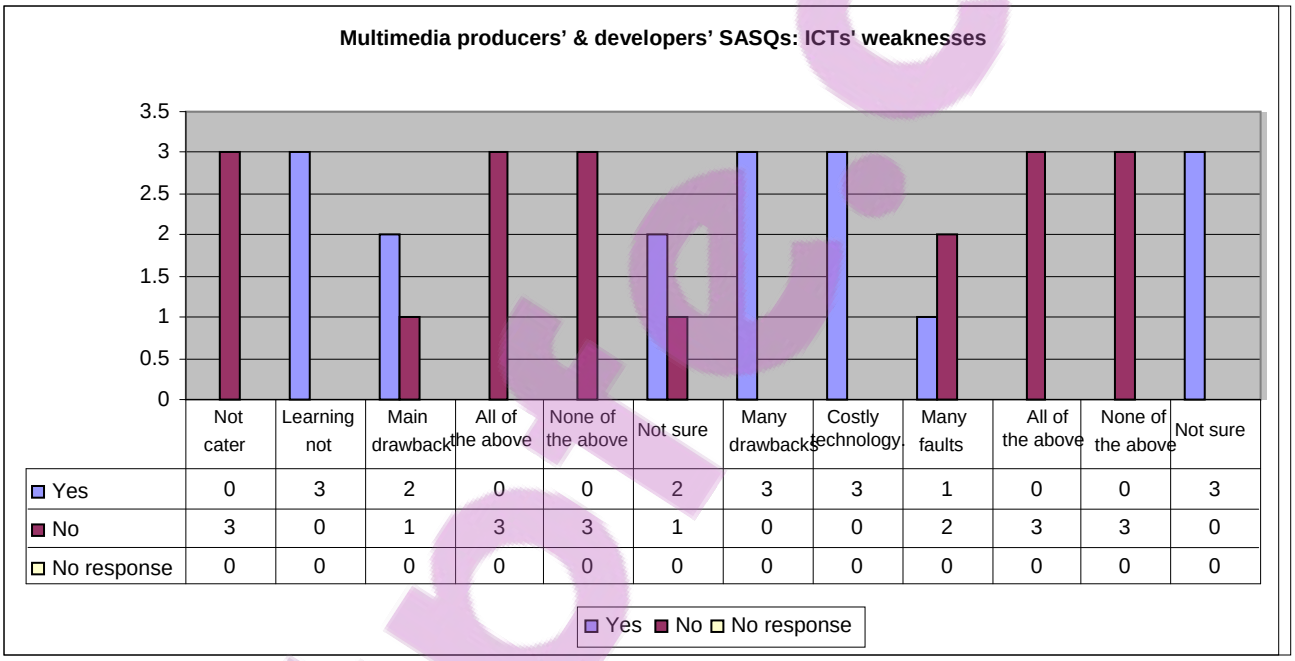
- **Weaknesses of myUnisa**

All respondents (100%) saw these as learning is not necessarily made easy, lack of training and marketing (67%) and failure to cater for students' holistic needs (67%).

It is been intimated elsewhere in this report that the design and development of the online and multimedia materials require productive engagement of project teams. Often where the team process has been compromised, the weaknesses are likely to be found in abundance in the form of content, methods and presentation which may not fulfill the expectations of the beneficiaries.

- **DVC's weaknesses**

These were given as lack of training and marketing (100%), costly technology (100%) and outdated hardware and software which tend to have many faults (33%). These require immediate remedial measures. Problems are not just confined to DVC, however, as they are also encountered in printing and fax at one point or another. However, DVC has not yet established itself as fax and printing have done. Long overdue problems associated with its instructional ventures often force the users to become disillusioned against its use for educational gain.



	Not cater	Learning not	Main drawback	All of the above	None of the above	Not sure	Many drawbacks	Costly technology	Many faults	All of the above	None of the above	Not sure
Yes	0	3	2	0	0	2	3	3	1	0	0	3
No	3	0	1	3	3	1	0	0	2	3	3	0
No response	0	0	0	0	0	0	0	0	0	0	0	0

Figure 5.14 Multimedia developers' SASQ ICTs' weaknesses

- **Current uses of ICTs**

A substantial number of the sample rated the current uses of ICTs for flexible delivery as administrative (67%) with a measurement scale of "More important", teaching purposes (67%) with a measurement scale of "Important" and interactive (67%) with a measurement scale of "Less important". In other words, consensus was reached with regard to proper and relevant use of ICTs. (See figure 5.13 below.)

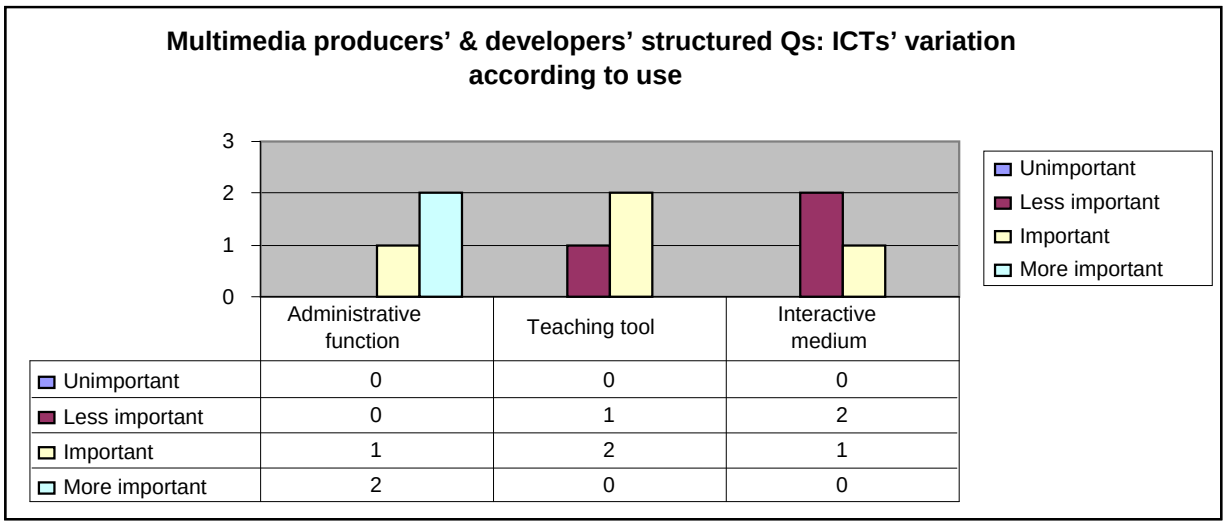


Figure 5.15 Multimedia producers SASQ variation according to use

On closer inspection the point appears to have been misconstrued here. The rating given to group discussion relating to COOL/myUnisa and communication with learners over teaching tool was "Important" by 67% of the respondents. Common sense dictates that myUnisa and DVC should serve educational delivery purposes as the main brief in line with the institutional business. However, in reality as shown by the finding, it would appear that the said ICTs serve more of an administrative rather than an academic function.

- **Current use of technology**

The description of the current use of technology ranged from virtually insignificant to moderate, that is, it varied between underutilisation (33%) and moderate (67%). This serves as an indication that things are far from what Unisa would like to see in its flexible delivery strategy (which is optimal utilisation of its ICT resources).

- **How to optimise use of ICTs**

There was unanimous consensus by all respondents that there was a need for more communication about use of ICTs for delivery, more research, a need to educate

stakeholders about the importance of ICTs in education and to implore users to be proactive (67%).

- **Changes to be made**

Again, there was unanimous agreement by all respondents (100%) about changes to be made, which were advocated as acquiring the right and relevant resources in good time, electing to use the best of both COOL and SOL, and eliminating the weaker aspects of administrative and academic functions before further use.

- **Innovations to be made**

These were also consensual among all the group members (100%). Innovations suggested were getting rid of outdated material, doing trial runs on new content with relevant stakeholders and applying more of the multimedia approach.

- **Does the application of ICTs facilitate and enhance flexible delivery?**

A total of 67% said no and the rest (33%) said yes. The high negative response sounds and a warning to Unisa that the road ahead to make inroads into flexible delivery through ICTs is still uphill and steep. However, all is not lost, as with the right approach and viable strategy, flexible delivery could still be achieved on time.

5.12.1 Summary of findings from self-administered questionnaires to multimedia producers and developers

The answers given appear to be straight and to the point, unlike responses by other groups. Could this be the influence of experience gained from having worked with the same ICTs for some time?

The majority agreed on roles of multimedia designers, ICTs' strengths (COOL/myUnisa and DVC) in flexible delivery, interesting aspects, and ICTs' weaknesses and even how to remedy them.

Overall, multimedia developers felt that ICTs were still underutilised and flexible delivery was still out of reach. However, what is important is that the overall goal could still be attained by applying remedial action and innovations.

5.13 Focus group interviews 1

5.13.1 Data collection

To make up for the flaws associated with volunteer sampling, this methodology was used as a measure of possible corrections and verification of results obtained earlier through the interviews and self-administered structured questionnaires. Email, telephone and audio recorders were used, followed by SMS in arranging and confirming appointments for the group sessions. Sampled members promised to turn up but, as in the case of interviews and self-administered studies, the turnout for scheduled sessions continued to be a huge disappointment, as many sampled members withdrew at the last minute, some with apologies, some not. However, the interview took place with the interviewees who showed up. Mthatha, East London, Nelspruit and Durban had a turnout of 0%. Florida, Middleburg, Bloemfontein, Port Elizabeth and Pretoria recorded fair turnouts (2-6%). Interestingly the highest turnout was recorded in Polokwane and Kimberley.

5.13.2 Findings from and analysis of focus group interview with learners from group 1

Eight out of a possible 22 interviewees arrived, six from Kimberley, one from Middleburg and one from Port Elizabeth. The potential interviewees from Florida and Nelspruit did not arrive.
Half of the interviewees (50%) were males and 50% females in the age groups of 21-25 years (3.04), 26-30 years (3.04) and 16-20 years (2). The registration periods represented covered 2006 (3.04), 2005 (3.04), 2004 (1.04) and 2003 (1.04). Interviewees were from diverse South African language backgrounds, i.e. Setswana (3.04), Venda (1.04), Zulu (1.04), Xhosa (1.04) and Afrikaans (1.04). Their economic activity status was positive, with the majority (63%) claiming to be employed, 50% full-time.

- **Job compared to course work**

This was done to establish whether there was any positive relationship between the learners' studies and their current career line. A negative relationship seemed to predominate, with 60% disagreeing that there was any relationship between their job and course content, and 40% disagreeing that there was any relationship between their job and the practical sessions. Half (50%) of the respondents claimed that they stood to benefit from their studies by way of promotion, 33% would benefit from the practicals and a mere 17% by the content. There was also an air of indecision among the group confirmed by 38% (3) who chose "Less agree" regarding promotion and 38% who chose "Neutral" to practicals.

- **Attendance of practical sessions**

This was confirmed by 50% of the interviewees, who claimed using prearranged sessions.

- **ICTs possessed by learners**

Hardware/software varied according to desktop at 75%, Hightower at 25% and laptop at 25%

No participants used a Pentium processor 1 and 2 and Pentium processors 3 and 4 were rated at 17%. The majority (76%) opted for unsure.

The popular application system appeared to be Windows 2000/XP at 63%, followed by Windows 95/8 at 6% (a thing which indicated lack of understanding of what Pentium meant).

A few participants (38%) indicated the modem speed they used for connectivity as either 28.8 kbps, 56kbps, or 1Mbps, while the majority (92%) opted for unsure.

Multimedia appeared to fare quite well with Media Player being rated 33,3%, followed by CD at 39% and DVD at 28%, while the majority (61%) settled for the “Not sure” option.

The majority (75%) still saw DVC as an unknown entity, claiming first-time experience, with only a minority (25%) claiming second-time experience.

- **Access to ICTs**

Accessibility varied from 45% through the Unisa study centre, 18% at home, 18% at work, 9% at an Internet café and 9% other, while 1% gave no response. Little background knowledge about the PCs and their system knowledge are not surprising as the users might be experiencing accessibility problems.

- **MyUnisa/COOL registration**

Registration on myUnisa/COOL serves as a prerequisite for Unisa students to use the site. The current registration was confirmed at 75% by the group. The majority of the registered users may not necessarily use it on a daily basis, depending on accessibility and the question of content availability, and so on, particularly when considering answers to the question on COOL/myUnisa experience.

- **MyUnisa/COOL experience**

An average of 57% was substantially lower than those registered on the system (recorded at 75%). This serves as an indication that a lot that still needs to be done in developing myUnisa, particularly in accommodating some of the courses in Engineering and also promoting the portal. Though reported to be unknown earlier, DVC experience was recorded above average at 75%.

Use of the combination of DVC and COOL/myUnisa for flexible delivery was given a high rating by all the interviewees (100%). However, when evaluated separately myUnisa and DVC came off second best, with each scoring 25% votes.

- **Efficiency rating of ICTs**

According to popular vote, the following was ranked “Most important” from highest to lowest: MyUnisa at 17%, DVC at 14%, print material at 14%, Call Centre at 14% and DVD at 11% (see page 103, figure 5.20).

The following were ranked as “More important”: 29% fax, 29% CD, 14% Call Centre, 14% DVD and 14% other (as in “email”).

Last but not least, ranked “Important” was fax at 21%, video cassette at 20%, telephone at 16% and audio cassette also at 16%.

Ranked “Unimportant” were telephone (50%) and video cassette (50%), which contradicts the popular voting noted earlier.

- **Frequency of ICT use**

MyUnisa was rated by all interviewees (100%) as often and by 33% as average. DVC was rated by 67% as average and by all (100%) as rarely. This high percentage given to the average and rare use of DVC indicates that improvements need to be made to DVC, which may help increase its usage.

- **Reasons for preference for ICTs myUnisa and DVC**

The reasons for using myUnisa and DVC were mainly getting information at their own place and time (57%), 43% claimed that online group discussion enhanced learning, 60% saw DVC as reducing travelling time and cost and 40% deemed group interactions as important. A total of 38% claimed to use myUnisa for checking exams and changes in dates and 25% saw it as playing a critical role when used to ask questions as follow-up.

- **Problems with myUnisa**

Some 38% said that not enough academic information was the main problem, and 25% felt that access was not easy off-campus. A total of 38% were not sure.

- **Problems with DVC**

Some of the respondents (60%) claimed that sometimes connection was problematic. Another 40% saw team effort as the needed solution to some of the problems.

- **Any recommended solution**

These did not appear easy to come up with; in fact the majority (60%) claimed not to be sure. Some 40% claimed that the given choice items, e.g. establishment of cheaper rates for educational institutions and establishing local Unisa cybernets, were inappropriate.

- **Presentation activities and style**

When assessing myUnisa, extensive use was made of results (18%), quizzes (18%), problem solving (18%), practical (12%), interactive (12%) and assignment (12%). “More” use was made of administration and simulation (50%). The use group (35%), interactive multimedia (35%) of essays (33%), as “quite important”. However, administration (22%), and simulation (11%), was rated as “less important”.

When assessing DVC, extensive use was made of interactive (12%), group (35%), practical (33%) and simulation (19%), followed by a rating of “quite” for administration (75%) and assignment at 25%.

- **ICTs’ contribution to learning**

MyUnisa was rated at 50% contribution and 47% valued contribution.

DVC’s contribution was rated at 50% and valued contribution at 50%, respectively

- **Recommend ICTs to colleagues**

Half (50%) felt strongly that they would recommend both ICTs to their colleagues. The reasons provided as motivation were that use of ICTs help in eliminating the main barriers facing DE learners associated with place, pace and time. Some 38% saw ICTs as making communication easy with others and 25% claimed that they could learn wherever they were through ICTs. All interviewees (100%) saw ICTs as suitable for teaching and learning purposes.

5.13.3 Summary of focus group interview 1

Learner users appear to be dominated by desktop users, with Windows 2000 as the main application, connecting via Unisa learning centres. Other important connection points appear to be home and work. Responses were marred by the high rates of non-responses regarding other aspects of PC knowledge. A substantial number claimed to notice a positive relationship between their job and studies (content), and their job and the practical. In the same vein, there is a corollary regarding the same point, implying that Engineering is drawing some of its learners who are already established in other fields.

A combination of DVC and myUnisa is favoured for flexible delivery, but when used individually, both myUnisa and DVC are rated second to their combined use. Mixed reactions were experienced as far as efficiency rating of ICTs is concerned: myUnisa, DVC and the Call Centre appear to be high. However, cumulatively rated high are fax, CD and print material. Common preferences, reasons and recommendations of how to overcome problems were noted by few. However, the high percentage of “Not sure” responses could be related to problems associated with underutilisation.

5.13.4 Findings from and analysis of focus group interview with learners from group 2

Seven out of a possible ten learners were interviewed. Their composition was very typical in character to the Unisa group. Males constituted 63% and females 38% of a group of eight people. Most were in the age group of 21-25 years (50%), others were fairly distributed between the age groups of 26-30 years (12,5%), 31-35 years (12,5%), 36-40 years (12,5%) and 16-20 years (12,5%). There was a fair representation of registration periods from 2005 (38%), 2004 (25%), 2006 (12%) and 2003 (12,5%). Diverse language groups represented were Northern Sotho (57%), Setswana (14%), Venda (14%) and Ghanaian Ewe (14%). Most were unemployed (57%) and 43% were employed full-time.

- **Job compared to course work**

The minority claimed that there was a positive relationship. Some 25% agreed to a positive relationship with content, 25% with facilities, 25% with practical and 25% with promotion. The majority felt that there was a negative relationship and 33% disagreed in terms of content, 33% in terms of practical and 33% in terms of promotion.

- **Attendance of practical sessions**

The majority (86%) claimed attendance of prearranged practical sessions, while the minority (14%) was not sure.

- **ICT(s) possessed by learners**

The minority (21%) claimed possession of both laptop and desktop, but the majority (79%) refrained from giving any response.

The common processors used appear to be Pentium 3 and 4 (43%), Windows 2000/XP (43%), followed by Pentium 1 and 2 (6%) and Windows 95/8 (6%).

The most common modem speeds identified by some of the users (11%) were 28.8kbps, 56kbps and 1MG, while 2% were unsure. The main concern is the highest percentage (87%) shown by the non-responses/not sure responses.

Multimedia aspects were rated as follows: Media Player 9%, CD 14% and DVD 14%. DVC was rated by 75% as unknown, with first-time experience, and the minority of 25% claiming second-time experience.

- **Access to ICTs**

Learners access ICTs through home (35%), work (18%), Internet café (18%), Unisa study centre (12%), family/friend (12%) and the library (6%). The majority of 86% had registered on myUnisa and 14% had not.

- **MyUnisa experience**

A total of 43% described their myUnisa experience as advanced, 29% as above average and 14% as average. A low percentage described their DVC experience as advanced (29%), 14% as above and 57% as average.

Use of the combination of DVC and COOL/myUnisa for flexible delivery was rated highly at 86%, as opposed to either myUnisa (14%) or DVC on its own.

- **Efficiency rating of ICTs**

Ranked “Most important” were DVC at 22%, Call Centre at 13%, telephone at 13%, CD at 9%, DVD at 9%, email at 9% and myUnisa at 9%. Ranked “More important” were email (24%), video cassette (24%), myUnisa (18%), print materials (18%) and the Call Centre (18%). “Important” was the ranking given by 25% to print materials, 15% to fax, audio cassette, DVD and CD, and 10% to telephone (see page 111, figure 5.21).

Audio cassette (60%), fax (20%) and video cassette (20%) were rated as “Unimportant”, which contradicts the popular voting (see above).

- **Frequency of ICT use**

All interviewees (100%) said that they used myUnisa often and 75% said average. Some 25% said that they used DVC on an average basis and 75% said rarely. Those who used myUnisa often said that it was easy and accessible and they could use it any time. Those who used DVC rarely gave the reasons as inaccessibility and new technology.

- **Reasons for preference for ICTs myUnisa and DVC**

Of the respondents, 54% gave their reason for preferring myUnisa as getting information at their own place and time and 31% felt that online group discussion enhanced learning. The reasons for using DVC were that it reduces travelling time and cost (42%) and that it was useful for group interactions (33%).

- **Problems with myUnisa**

Half the interviewees (50%) said that there was not enough academic information, 36% said that there were only FAQs, no quizzes, and 14% indicated that access was not easy off-campus.

- **Problems with DVC**

More than half (67%) indicated that a team effort was needed and 33% were not sure.

- **Any recommended solution**

Establishing cheaper rates for educational institutions was selected by 50% of the respondents, 40% selected establishing Unisa cybernets (portal as myUnisa) and 10% said that DVC was fine after working hours and weekends.

- **Presentation activities and style**

When assessing myUnisa, extensive use was made of interactive (13%), results (13%), problem skills (12%) and quizzes (12%). “More” use was made of group and simulation, each at 27%, quizzes (18%), followed by practical, interactive and assignment all at 12%. Practicals (57%) and essays (43%) were rated as “quite”. When assessing DVC, extensive use was made of interactive and group, both at 16%, and practical and problem skills, both at 14%. This was followed by a rating of “quite” for assignment (40%), results (20%) and essays (20%).

- **ICTs’ contribution to learning**

MyUnisa was rated as capable of 70% contribution to flexible delivery, and 72% valued contribution. DVC’s contribution was rated at 30%, and valued contribution at 60%.

- **Recommend ICTs to colleagues**

Half of the interviewees said that they would recommend myUnisa and half would recommend DVC. Some 38% said that ICTs made communication easy with others, 38% said that they could learn wherever they were and 25% said that technology-based studies were easy to pass. All respondents said that ICTs were needed for teaching and learning.

5.13.5 Summary of focus group interview 2

The majority of the focus group interviewees were desktop and laptop users, and appeared to prefer Windows 2000/XP and Pentium 3 and 4. The majority of users depended on home for their Internet connectivity, followed by work, university learning centres and Internet cafés. There was a negative relationship between studies and job situation, meaning that Engineering appears to draw some of its learners from fields other than Engineering. The same comparison applies to job and practicals – only a minority appears to fit the category where studies, job and practicals correlated positively. One should therefore expect the affected latter learners to have their current career prospects to be enhanced through the qualifications they obtain in Engineering. Another great amount of indecision is noticeable through quite a number of the participants who opted for “Not sure” despite explanations provided by the interviewer in prompting them for answers. For example, interviewees tended to provide scanty information regarding their PC setup in terms of both hardware and software. This tendency is baffling in that here users portray themselves as home users, meaning that they should be more familiar with their PC setup as opposed to conditional exposure as in the case of university learning centre users. Most importantly, a reasonable majority helped identify ICTs as efficient, and to give an indication of frequency of use, strengths and weaknesses and how to overcome the weaknesses. Choosing a combination of myUnisa and DVC for Unisa flexible delivery was also included. However, the high rate of “not sure” answers raises doubts as to the viability of some of the findings, e.g. the lack of knowledge of the learners’ own PC background and setup is cause for major concern.

5.14 Comparative study between interviews, self-administered structured questionnaires and focus group interviews 1 and 2

5.14.1 Learner to learner

Gender: Both learner focus group interviews 1 and 2 appear similar, but group 2 and the self-administered questionnaire group compare favourably with the Unisa norm of 63:38 and 74:24 male to female representation, respectively; whereas group 1 is an exception, with a ratio of 50:50 male to female.

Age: All the groups appear the same, with a slight variation occurring in group 1 with no representation in the age categories of 31-35 and 36-40 years.

Registration: The self-administered questionnaire group is more similar to Group 2. Both these groups have the edge over group 1 with one more registration occurring in 2001.

Language: Groups had the same racial representation, with the self-administered questionnaire group 1 being dominated by Setswana and Northern Sotho, which belong to the same family of South African Sotho ethnic languages. A lost window of opportunity is establishing how much language use is a distracting factor or catalyst in the use of ICTs for flexible delivery? This could be pursued in other studies.

Employment status: Groups were dissimilar in that both the self-administered questionnaire group, group 1 and group 2 had more unemployed (55%) than employed (32%), whereas group 1 enjoyed equal representation of both part- and full-time workers. Practical experience makes up significant portion in field such as Engineering, to help the learners come to grips with essential subject matter; so lack of ample employment opportunities pose a challenge to DE practitioners (teachers) to exploit viable means such as ICTs to reach and engage their learners productively.

Job compared to studies: The questionnaire group and focus groups appear more similar than different in character. This assertion is borne out by the calculated average of 23% of focus group 1 of the self-administered questionnaire group compared to the 33% calculated for focus groups 2. Superficial differences were found and can be seen in figures 5.16 and 5.17 below.

Attend practical engineering: Very similar responses were obtained, with both samples' main choice being arranged practical sessions.

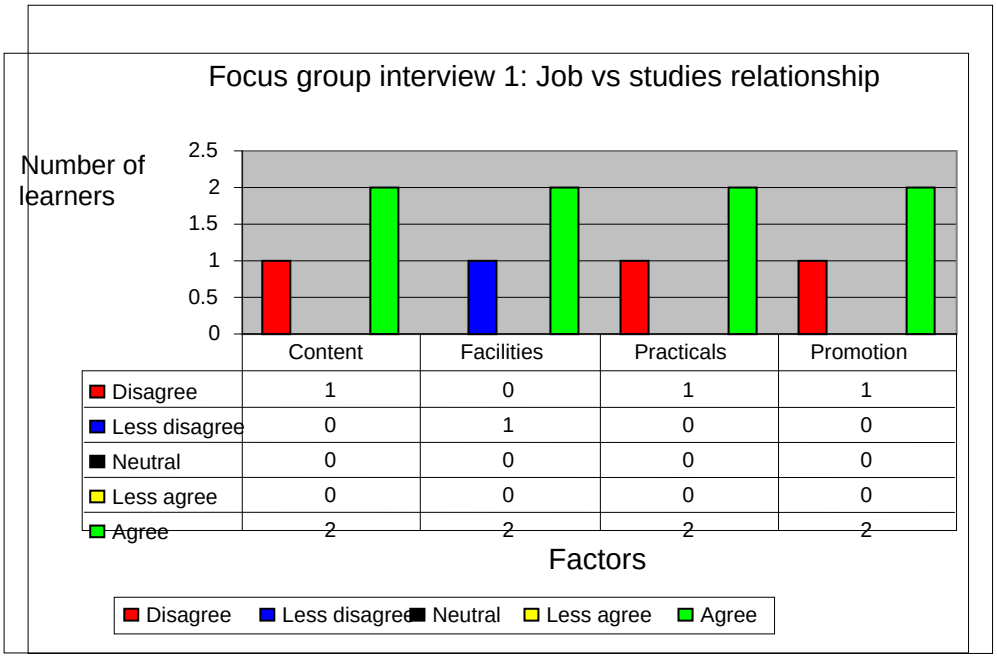


Figure 5.16 Focus group interviews 1: job compared to studies

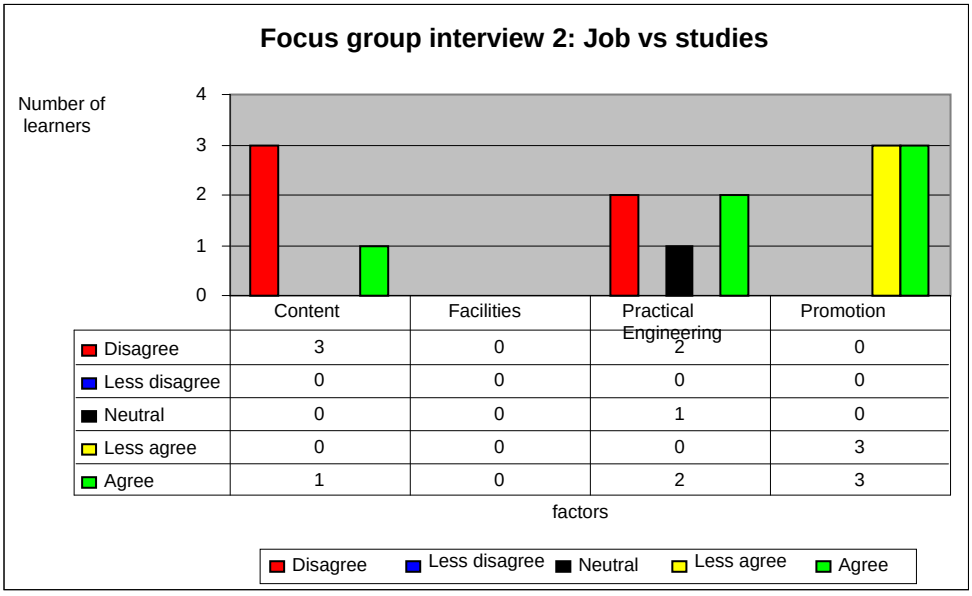


Figure 5.17 Focus group interviews 2: job/studies relationship

Setup and connectivity: Similar responses were applicable to all the groups, e.g. Pentium 2 and 3, CD and DVC. The differences are slight, e.g. Hightower, Media Player and laptop. The recorded "no responses" by particularly the self-administered questionnaire group correspond to the "no responses" by groups 1 and 2. There is a strong likelihood that the respondents did not know the answer to the questionnaire item.

Accessibility: Similar responses were obtained, with both the self-administered questionnaire group and group 2 claiming more accessibility from home, work, learning resource centres and Internet cafés. Group 1 tended to rely more on Unisa study centres (see figures 5.18 and 5.19 below).

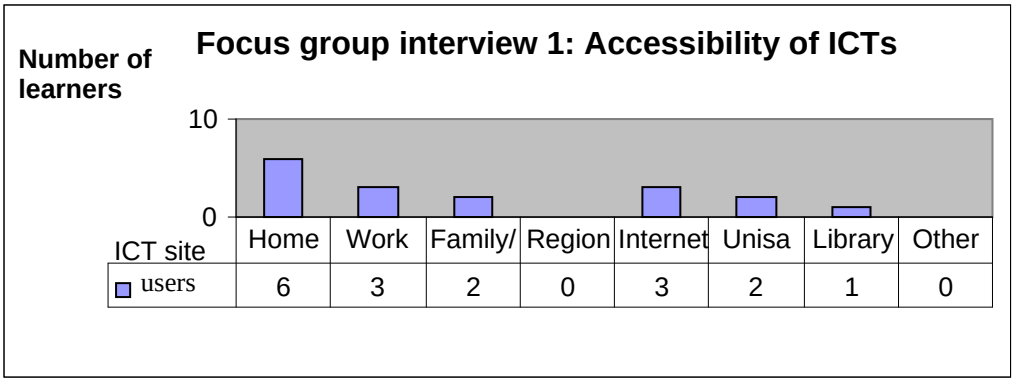


Figure 5.18 Focus group interviews 1: accessibility to ICTs

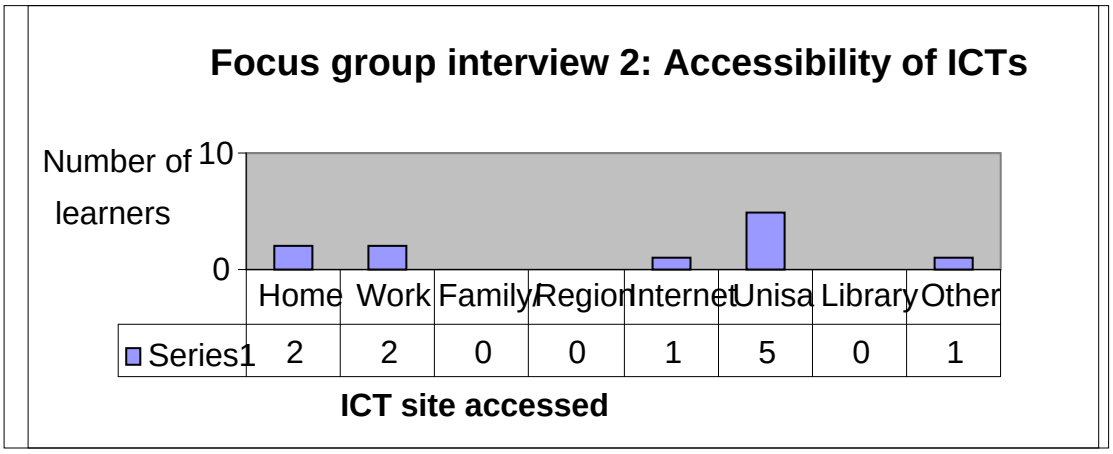


Fig 5.19 Focus group interviews 2: accessibility to ICTs

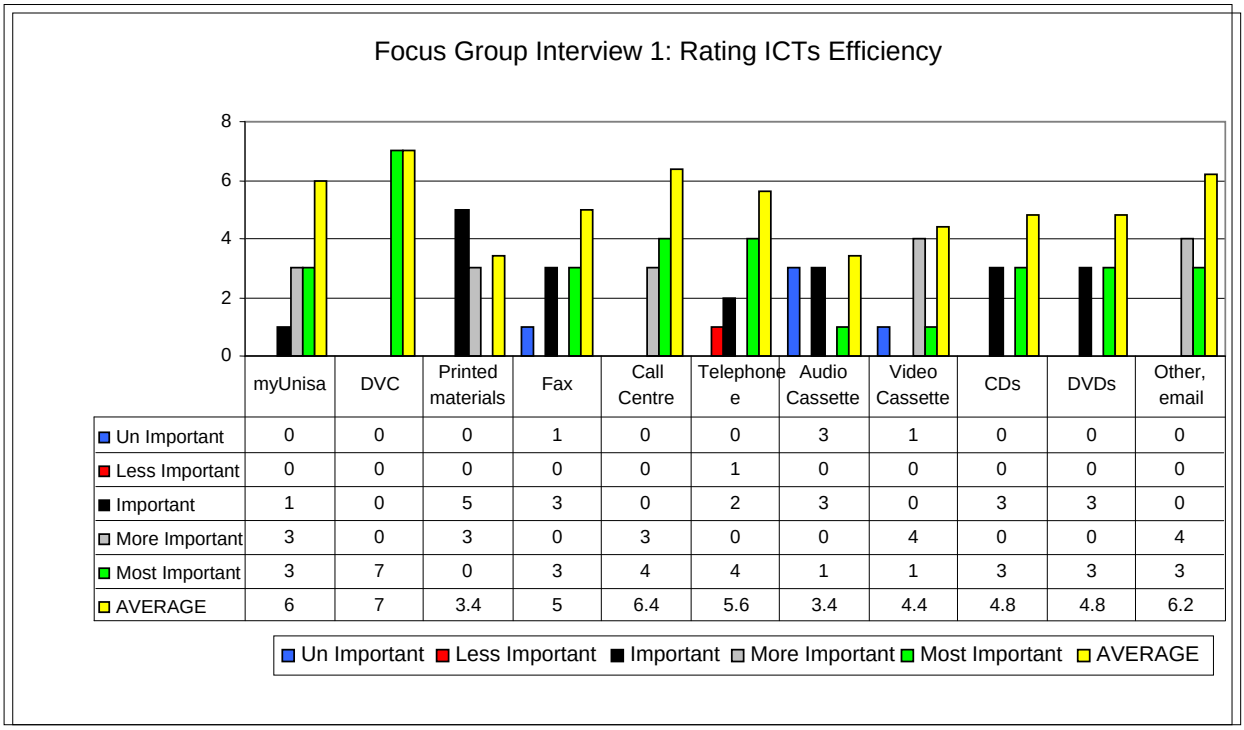
The implication of reliance upon external use of ICTs means accessibility is till a major problem to the majority of the learners.

myUnisa registration: While both focus groups 1 and 2 compare favourably in terms of myUnisa registration at 74% and 86%, respectively, the same cannot be said of the self-administered questionnaire group at 8%.

Online and DVC experience: Similar corresponding responses were obtained, with all the groups claiming more of myUnisa experience than DVC experience.

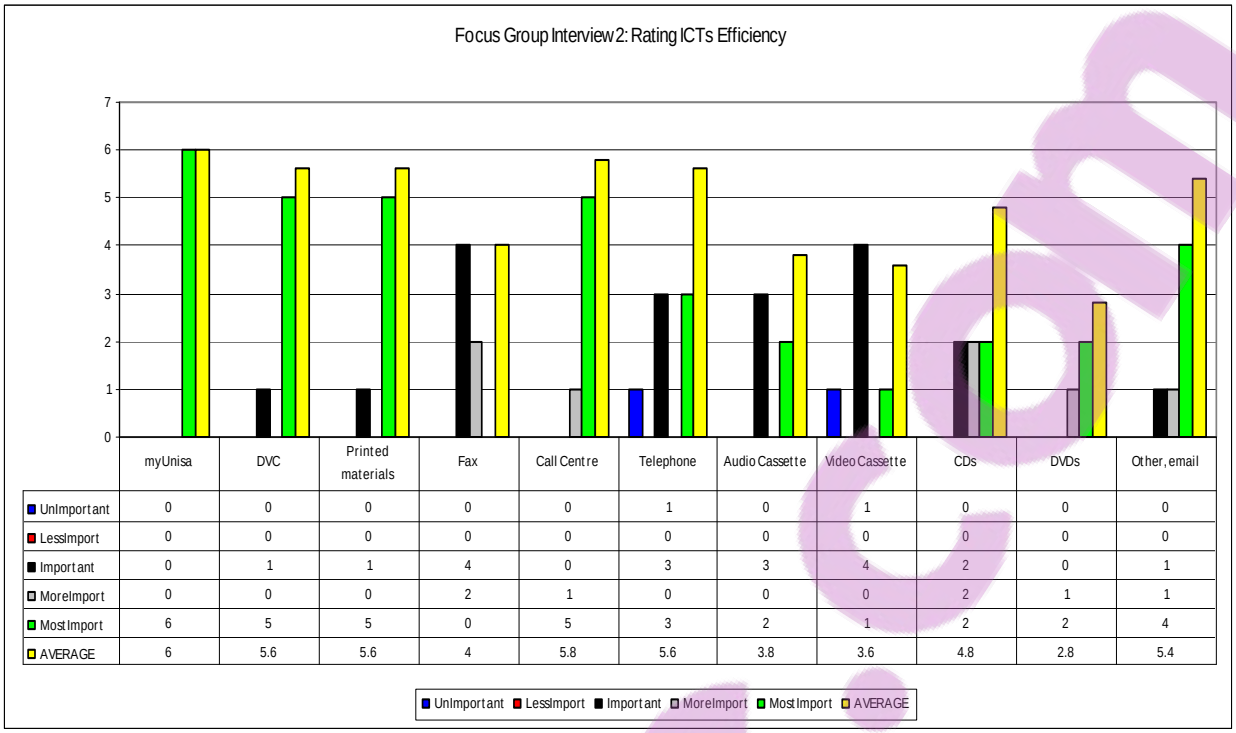
Own choice ICT: Similar choices were made by both sample groups for a combination of the use of myUnisa and DVC for flexible delivery.

Rating of ICT technologies according to their efficiencies by the learners (simple correlation of figures 5.20, 5.21 and 5.22): Although a bit complex in nature, the figures appear to have more in common than in differences, e.g. video cassette is identifiable as the least or unimportant among the three figures; among the highly valued are DVC with mean score of 7, (due to unfair advantage, alluded to, see page), followed by Call Centre 6.4, other email 6.2, myUnisa 6 and telephone 5.6 (figure 5.20); whereas in figure 5.21 myUnisa at 6 is closely followed by Call centre 5.8, DVC 5.6, print material 5.6, and telephone 5.6. Further correlation is obtained in figure 5.22 (SASQ's learners) with myUnisa 47.4% as the highest, followed closely by fax 47%, telephone 38.8%; the negative correlation occurs in the instance where both DVC 23%, and print material 23% are rated very low as compared to focus group interviews 1 & 2 results.



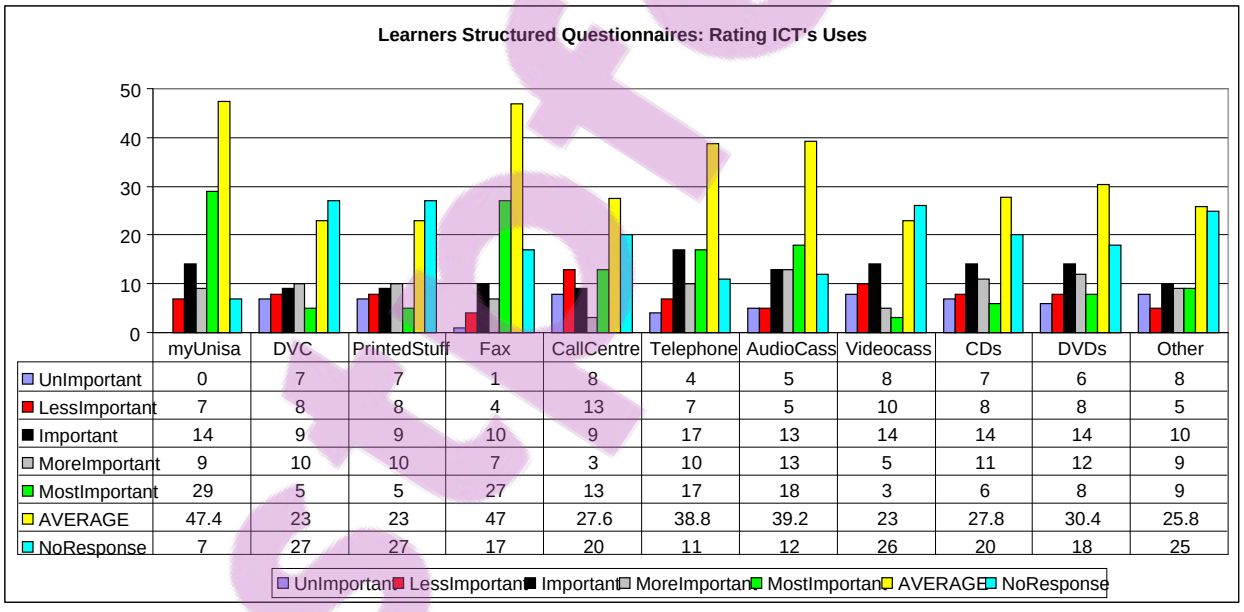
	myUnisa	DVC	Printed materials	Fax	Call Centre	Telephone	Audio Cassette	Video Cassette	CDs	DVDs	Other, email
Un Important	0	0	0	1	0	0	3	1	0	0	0
Less Important	0	0	0	0	0	1	0	0	0	0	0
Important	1	0	5	3	0	2	3	0	3	3	0
More Important	3	0	3	0	3	0	0	4	0	0	4
Most Important	3	7	0	3	4	4	1	1	3	3	3
AVERAGE	6	7	3.4	5	6.4	5.6	3.4	4.4	4.8	4.8	6.2

Figure 5.20 Focus group interviews 1 rating ICTs efficiency



	myUnisa	DVC	Printed materials	Fax	Call Centre	Telephone	Audio Cassette	Video Cassette	CDs	DVDs	Other, email
UnImportant	0	0	0	0	0	1	0	1	0	0	0
LessImport	0	0	0	0	0	0	0	0	0	0	0
Important	0	1	1	4	0	3	3	4	2	0	1
MoreImport	0	0	0	2	1	0	0	0	2	1	1
MostImport	6	5	5	0	5	3	2	1	2	2	4
AVERAGE	6	5.6	5.6	4	5.8	5.6	3.8	3.6	4.8	2.8	5.4

Figure 5.21 Focus group interviews 2 ICTs efficiency rating



	myUnisa	DVC	PrintedStuff	Fax	CallCentre	Telephone	AudioCass	Videocass	CDs	DVDs	Other
UnImportant	0	7	7	1	8	4	5	8	7	6	8
LessImportant	7	8	8	4	13	7	5	10	8	8	5
Important	14	9	9	10	9	17	13	14	14	14	10
MoreImportant	9	10	10	7	3	10	13	5	11	12	9
MostImportant	29	5	5	27	13	17	18	3	6	8	9
AVERAGE	47.4	23	23	47	27.6	38.8	39.2	23	27.8	30.4	25.8
NoResponse	7	27	27	17	20	11	12	26	20	18	25

Figure 5.22 SASQ rating ICTs efficiency by learners

ICTs use: Similar corresponding responses were found in all three samples, confirming the rare use of DVC and frequent use of myUnisa. Frequent use of myUnisa consisted mainly of administrative activities such as exams, yearmarks and results rather than the academic content. These results do correlate with personal interview results whereby the participants indicated rare use of myUnisa (mainly monthly to quarterly logins) for

flexible delivery. At the same time correlated with the academics confirmation of lack of the engineering content online. On the other hand rare use of DVC, is seen as a result of unfamiliar, inaccessible technology. Again, there is a positive correlation with personal interview results.

Reasons for preference for myUnisa: Similar choices were made by the majority of all the samples for getting information at their own place and time, seeing online group discussion as enhancing learning, to mention but a few.

Reasons for preference for DVC: The same responses were noted with the majority of all groups including some of the telephone learners, opting for DVC being good in group interaction, and reducing travelling and time wastage. At the same time, the responses contradicted the face-to-face interview results which hardly acknowledged any contribution of DVC (however, the interviewee's role has been alluded as possible factor for the noted variation).

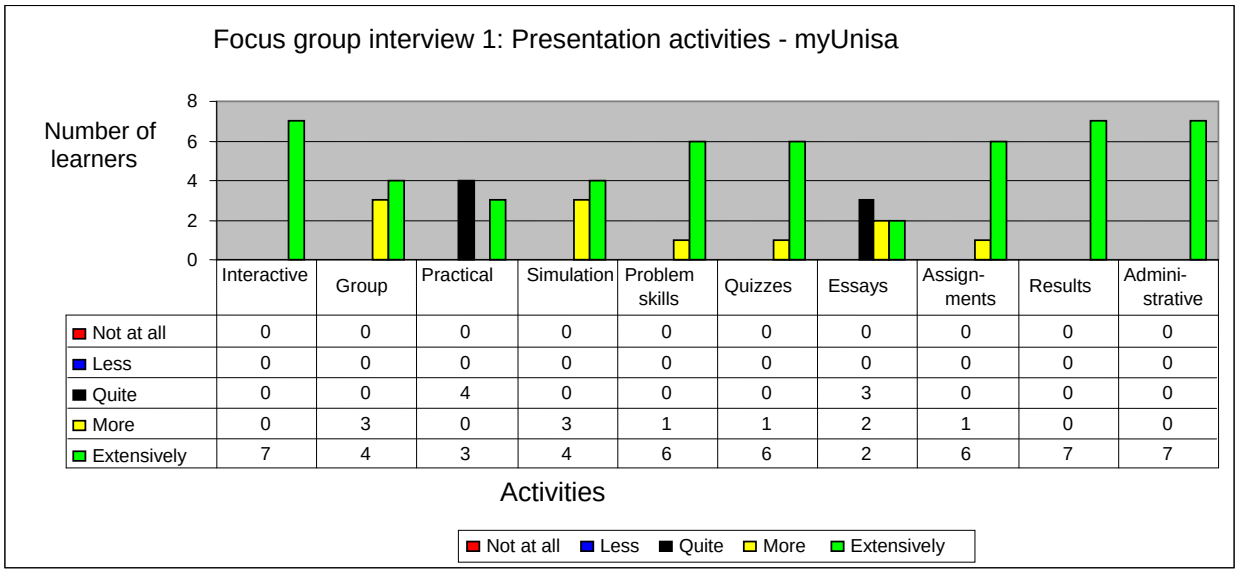
Problems with myUnisa: Similar responses were given by all three groups, namely as insufficient academic information, mainly FAQs, no quizzes and difficulty in connecting off-campus. There is 100% correlation with the personal interview findings.

Problems with DVC: Very similar responses, cited as poor promotion campaign of the technology and technical problems that some time tended to characterize the connection.

In both instances of problems with ICTs (COOL/myUnisa and DVC), there is a consistent presence of doubt (shown by some members' choice of "Not sure" or "No response"), which could be inferred as a lack of thorough knowledge regarding the said ICTs, particularly the latest developments.

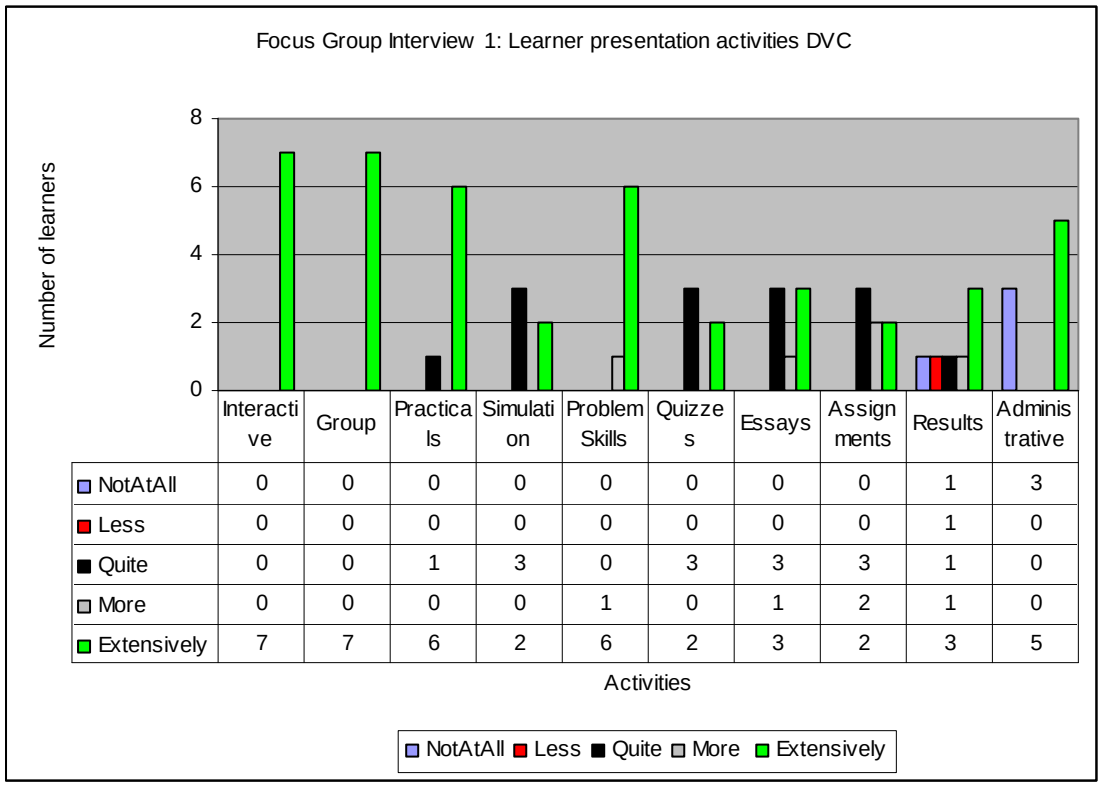
Any recommended solutions: There are positive correlations in the responses given by the self-administered questionnaire group, namely adoption and adaptation of technologies accessible to the majority of learners, use of ICTs appropriately and relevantly, marketing and training of users in correct use of ICTs where there is a need, to focus group 2's indications of cheaper rates and more use of Unisa's own cybernet. These findings correlate more positively with the personal interview findings under the learners' wish list, or how to improve the programme. However, the majority of focus group 1's choice of the options "None of the above" and "Not sure" render it as a group characterised by doubt.

Rating presentation activities: Generally, focus group 1 appears more varied in their responses than group 2. However, both groups seem to agree that most presentation activities on COOL/myUnisa rate highly between quite a lot and extensively. The highest rated presentation activities were problem skills, results and interactivity (see figures 5.23 and 5.24 below). This high degree of correlation is further demonstrated through the highest rating of interactivity, group discussion, practical and problem skills regarding the use of DVC. Closer inspection of the cited activities, namely, group discussion, practical engineering, and problem skills raises questions regarding their rating (as "quite a lot" to "extensive") as under the personal interviews, both learners and academics alluded to the lack of content online, and myUnisa being used mainly for administrative support functions.



	Interactive	Group	Practical	Simulation	Problem skills	Quizzes	Essays	Assign-ments	Results	Admini-strative
Not at all	0	0	0	0	0	0	0	0	0	0
Less	0	0	0	0	0	0	0	0	0	0
Quite	0	0	4	0	0	0	3	0	0	0
More	0	3	0	3	1	1	2	1	0	0
Extensively	7	4	3	4	6	6	2	6	7	7

Figure 5.23 Focus group interview 1 Presentation activities: myUnisa



	Interactive	Group	Practicals	Simulation	Problem Skills	Quizzes	Essays	Assignments	Results	Administrative
NotAtAll	0	0	0	0	0	0	0	0	1	3
Less	0	0	0	0	0	0	0	0	1	0
Quite	0	0	1	3	0	3	3	3	1	0
More	0	0	0	0	1	0	1	2	1	0
Extensively	7	7	6	2	6	2	3	2	3	5

Figure 5.24 Focus group interview 1 : Presentation activities through DVC

ICTs' contribution to flexible delivery: All agreed that ICTs do, through myUnisa, contribute more than DVC in the ratio 61:11 for the self-administered questionnaire group, and 59,5:55 for focus groups 1 and 2, respectively. In the case of the personal interviews, there was a split vote with 50% voting yes and 50% no. However, in terms of

the degree of contribution, the majority agreed that ICTs' contribution was substantial (85,2%).

Recommend ICTs to colleagues: All the three groups, including the personal interviews, agreed that they would recommend ICTs to colleagues.

Reasons for making recommendation: Almost the same responses were received, i.e. making communication easy, allowing flexible pace, place and time, and rendering studies easy.

Need for ICTs: Both samples agreed that ICTs were important to learners in DE settings.

Conclusion

The results obtained under the various study conditions (self-administered questionnaires, focus group interviews 1 and 2 and personal interviews) serve as sufficient evidence that the threshold point has been attained (that is in terms of obtaining similar findings in conducting studies with various samples identified for this study) was reached. Simply put, this implies that similar results are likely to recur or be replicated with samples of the identified population when exposed to similar study conditions.

5.14.2 Academics to learners

Underutilisation of the ICTs (myUnisa) was highlighted by the vast majority (68% + 32%) of the academics (self-administered questionnaires). This correlates positively

with non-registration confirmation on myUnisa by an overwhelming majority of learners (82%) in response to the self-administered questionnaire.

Reasons for preferences for ICTs by academics and learners: A paltry 21% of academics gave the reason for preferences as accessibility, while an overwhelming majority (79%) abstained. This state of affairs correlates positively with 63% of academics who opted for “Not sure”. The learners were divided regarding this question, but the slight majority (53%) preferred live contact sessions. The overwhelming majority (92%) of “Not sure” by the learners serves as further indication of doubt that might be emanating from underutilisation.

Overall ICT benefits to learners and academics: Again there was a divided vote by the learners. Some respondents to the self-administered questionnaire did seem not to notice some of the advanced choice items, or even underrated them, namely “learning through ICTs” was left unmarked by 68% and “ICTs enhance my studies” was left unmarked by 59%. However, the latter measure of responses seems to correlate to “None of the above” marked by 44% of learner respondents and thus emphasizes either doubt, lack of knowledge or even negative perceptions towards the importance of ICTs by some learners. The options such as “removing distance as barrier through use of ICTs”, “both myUnisa and DVC are tailor-made for Unisa learner needs” and “improving communication capacity through ICTs” were overlooked by a range of 53% - 79% academics who did not answer the multiple-question that merely required tick/mark next to is considered the right/correct option.

Success associated with successful converting to ICTs by the academics: All of the respondents (100%) painted a positive picture regarding future developments if

adoption and integration of ICTs were successful: more learners registering and going online, increased interactivity and feedback from students with accessibility, a possible increase in the pass rate, and possible achievement of intended targets by the key participants. This reaction correlates positively with learners' wish list **(by 63% majority)** of how ICTs should be used for teaching and learning: they expressed their high priorities as accessibility and content; that their wishes were that the institution should devise a means of making COOL/myUnisa more accessible by engaging both government and Telkom in special negotiations for cheaper rates; that Unisa should establish its learning centres, that use of DVC should be considered after hours.

The way forward: A large number of academic interviewees (78%) agreed that both COOL and DVC needed improvement. With lecturers contributing more academic content, there is a need to increase marketing campaigns to learners and other users about the role of COOL/myUnisa and DVC and their capacities. This strategic stance correlates with the majority learners' (83%) standpoint that COOL (myUnisa) & DVC information campaign through study guides, handouts, contact or information sessions, or word-of-mouth would be effective in selling viable ICT models.

5.14.3 Instructional designers and developers to academics

Self-perception of role to play: The majority (63%) concurred that their main roles were advisory, consultative and evaluative while helping to develop course materials intended for learners. However, this role becomes more defined and realistic with the designers' active participation in the process of developing required materials while working closely with the academics. Less active participation renders the designers dubious and sceptical of their place and role, which could possibly explain the loss of 37% to "non-responses" or the "not sure" option. The preceding doubts compares

favourably with the combined academics and tutors' doubts (53%) when it comes to preparation of converting the coarseware (electrical engineering) for online delivery.

Perception of benefits associated with use of ICTs: On one hand, flexibility in delivery and learning, interaction by learners, academics and administrators via ICTs over the use of information and enhancement of both the learners' and academics' roles were affirmed by 50% of the sample. On the other hand, the recorded majority of 63% were not sure – the latter response indicates that there is more of the element of doubt and uncertainty prevailing among the designers and developers regarding their role in the use of ICTs; hence their stance of sitting on the fence. The same point correlates to the point of the academics failing to choose ICTs as important role-player in removing the distance barrier by at least 79%, who instead opted for "no response".

Factors leading to optimisation in use of ICTs: The great majority of designers and developers (88%) opted for not making a choice and for no response categories; only the minority of 13% identified what they considered their best options as "best and relevant use of online and DVC technologies" and "dedicated learners and their lecturers communicate via ICTs". The noted indecision by the developers and designers correlates to the academics' dilemma when faced with use of DVC for the presentation of modules. The overwhelming majority (88%) of "no-responses" is probably due to a lack of knowledge about the use of technology for flexible delivery and learning.

Measures that might help in optimal utilisation of ICTs: Both instructional designers (63%) and academics (74%) concurred that content and presentation methods should be used in the right proportion in flexible delivery, different stakeholders should be consulted in the development of individual projects, positive promotional campaigns should be used that might help to promote both DVC and myUnisa, and that may also help encourage the majority of learners to register with myUnisa.

5.14.4 Multimedia developers and producers to learners

ICTs' benefits in flexible delivery (myUnisa): They offer students a chance to see their records (100%), learning is made easy (100%) and they also offer learners 24-hour access (33%).

DVC's strengths: Real-time contact sessions are possible (100%), it is learning made easy (100%), it saves time and reduces cost (100%). This correlates with half (50%) of the learners' account of liking ICTs for allowing them to study at their own place and time, for enabling group discussion and reducing costs.

Elimination of known weaknesses is a positive step to optimal utilisation of ICTs: All multimedia developers (100%) felt that learning was not necessarily made easy, and that the drawbacks were lack of training and marketing, and the failure to cater for students' holistic needs. Arguing along the same lines, a substantial number of learners (41%) advocated the provision of adequate qualitative academic content, and updating of technology that would allow easy access off-campus.

5.15 Summary

This chapter entails the actual application of the research design, process and methodology. It presented the collection and analyses of the data pertaining to the study in question. It opened with how the samples were chosen, the application of both probability and non-probability approaches which led to conducting personal interviews with the learners (face-to-face, and later, one-to-one by telephone). Similar personal interviews were conducted face-to-face with samples randomly selected from academics, instructional designers and developers and multimedia developers and producers. Data comprising short note-taking and audio recording was captured by

completion of the semi-structured questionnaires. This process, which is more qualitative, made up the formative phase.

The summative phase consisted more of a combination of both quantitative and qualitative approaches. Very similar sample selection approaches were employed in the selection of learners, academics, instructional designers and developers and multimedia developers. To avoid possible bias, it was established in the preselection interview that all the participants were not familiar with the DVC medium and would be participating for the first time through the medium. While their interview experience would be critical for the study, it would serve the purpose of increasing publicity and serving as a yardstick of the reactions of those exposed to the medium. At the time of the focus group interviews phase, three-quarters of the study had been completed. Another notable irregularity that occurred during the interviews was that some members excused themselves during the interviews to attend to other pressing matters they had planned for the day.

The data was analysed through SPSS and Excel to give both the statistical analyses and graphical statistical presentations of some of the key questions. Similarities and differences in findings following data analyses, act as confirmation of the viability of ICTs in delivery and learning if appropriately and relevantly utilised; the fact that flexible delivery was not yet a reality with Unisa mainly due to the underutilisation of the available ICTs. Possible solutions to some of these problems were that content should be delivered through well-thought out constructive approaches, both the academic and administrative staff should use models to address learner needs appropriately; at the same time, it is advisable that ICT models be reviewed from time to time with learner

and other stakeholders input; above all, ICT resources, strategy, policy, research and innovation should be used and applied relevantly.

In closing, the inconsistencies and irregularities established, such as few knowing the real reasons behind the failure of ICTs for teaching and learning, and the strengths and weaknesses of ICTs, lack of experience in working with ICT models, and the doubts and indecisions experienced with most participants, were highlighted and elaborated upon as obstacles that could be overcome; within the same vein, benefits, positives accruing from the use of the models, positive attitudes as opposed to pessimism shown by the participants, eagerness and willingness were highlighted according to different settings with different samples; above all it has been shown through use of different techniques that the threshold has been achieved in terms of replicated similar findings recurring in a number of different settings with samples taken from Engineering. Last but not least, merging process seemed to affect some aspects of the study, particularly, during the monitoring and inspection phase.

In chapter 6, the researcher deals mainly with the conclusions reached, based on the analyses of the results. At the same time the researcher advances recommendations of how to correct or solve the identified problems.

CHAPTER 6 Findings, Conclusions and Recommendations

6.1 Introduction: a brief recap of a challenging and intriguing journey.

Chapter 1 consists of the introduction, purpose, rationale, research design and methods, sampling techniques, limitations and expected outputs of the whole study.

In chapter 2 the researcher attempts to capture the main arguments, deliberations, pedagogical aspects, models and theories that serve as the crux of this study gathered from the literature review, seminar and conference in a bid to paint the picture of what the essentials are of ICT-based instructional studies.

Chapter 3 highlights the shortcomings and ills associated with the SA educational system. The rationale is given of why ICT's role is being touted as the best solution to help address the said ills, especially in DE setting. To contextualize the reality, a picture is given of the performance of the ICT models – COOL/myUnisa and DVC at Unisa, their successes as well as shortfalls. In addition, comparative analyses of ICT models nationwide and globally is made.

In chapter 4 the researcher elaborates on the research design and methods to be used in collecting data for this specific study. Further, the researcher justifies why he chose Engineering Science rather than any other field as the context for this study.

Chapter 5 consists of the analyses of the data collected from the interview schedules, questionnaires, and focus group interviews. The qualitative/quantitative report comprises the findings and the discussion highlighting the observed differences; there are also what appear to be doubts and indecisions among some participants, agreements and even similarities in findings.

In chapter 6 the researcher deals mainly with the conclusions reached, based on the analyses (using SPSS and Microsoft Excel tools) of the results, and advances recommendations of how to correct or solve the identified problems. Last but not least, it

highlights the areas identified as requiring further research as they are not adequately covered in this research study due to its scope, time and financial constraints.

In delving deeper into this chapter, the immediate question that comes to mind is: Has the target goal of the journey been achieved or not?

Based on the key findings of the study namely, that there is little or no content available on some of myUnisa courses or modules inspected, few learners that have registered online, and lack of meaningful participation by some of the academics, underutilisation of ICT models (myUnisa and DVC) appear to be the main feature. Further verification in this respect can be sensed through:

6.2 Summary of main findings

Below is a summary of the main findings of the research on which this thesis is based:

6.2.1 The response to the **main research question:** Does the application of ICTs (COOL and DVC) facilitate and enhance flexible learning at Unisa, particularly in line with teaching and learning, as intended? With reference to flexible delivery as it relates to aspect of Engineering, this study established that minimal use is made of ICTs for academic delivery and therefore plays minimal role facilitating and enhancing learning at Unisa.

With respect to **the sub-problems**, the applicable findings appear to highlight the preceding painted picture to a greater or lesser degree:

6.2.2 Are the technologies correctly applied for teaching and learning?

Based on the evidence of research findings (particularly with learner –i.e. complaints associated with lack of content and rare lecturer participation online, academic and tutor interviewees -the majority not ready to have content online at the time, it has been

established that a measure of appropriateness and relevancy in technology application is rather skewed particularly in favour of using the ICT models mainly for administrative support rather than for the purposes of teaching and learning.

6.2.3 Are the ICTs' implementation and development strategies in line with their flexible design strategy?

While few respondents regard myUnisa as fully flexible, the overwhelming majority see the use of both myUnisa and DVC as still falling short of flexible delivery, with DVC behind by a rather wider margin. Some of the other causes have been cited as a failure to conduct sufficient promotional campaigns which are a prerequisite to implementation phase, expensive technology that is still inaccessible to the majority of the learners, a lack of willingness by professional staff to use technology due to insufficient resources, and failure by senior management to show the way.

6.2.4 Do the instructional design and technological applications meet the needs and expectations of their users, particularly learners and lecturers? As matters stand, the study suggests that users' expectations through rating the perceptions and attitudes particularly those of the academics and tutors, instructional designers, learners and multimedia developers, are far from being met as not all critical parts of the models are in place yet regarding the Engineering and other Departments. With reference to the findings relatable to essential skills and capacity in use of ICTs, the academics have no relevant experience of selecting, and availing relevant course materials for online development; further, lack of meaningful participation in the instructional design process. At the same time, the study has established that the IDs have no essential experience of developing ICT-based materials (for both online and DVC). The situation seems to be exacerbated by complaints raised by some learners as: difficulty in

connecting off-campus, lack of exposure to promotional campaigns, and lack of proper guidance and training in use of ICTs particularly DVC.

6.2.5 What are the characteristics of successful ICT models which render them to be referred to as effective tools of teaching and learning in a distance education context?

According to the majority of users' perception (with reference to interviews, self-administered questionnaires and focus group interviews) ideal characteristics of ICTs model are: it must be flexible by providing for in line with the essential needs of DE learner that is, at own place, pace and time; it must accommodate both asynchronous (all times) and synchronous (at times), it must also be user-friendly. Essentially, the critical points as advanced correlate with basic requirements for flexible delivery under literature review see p 49. Further, there must be sufficient back-up support, say, in terms of the real-time support it could take the form of eliminating unforeseen glitches, that is, back-up in line with real-time technology. If say DVC connection fails, teleconferencing could be used as back-up with some aspects of the presentation if proper back-up was planned beforehand. It is very important that the majority of participants be accessible and well-acquainted with the technology to be applied.

Revamping of flexible delivery as suggested by the interviewees and respondents (learners, academics, IDs & multimedia producers) could be done through simultaneous use of technological models myUnisa, DVC and the live lecturer in mixes or blends (chpt2, pp17-28). Vital aspects of flexible delivery that could be fully exploited through such blending approach include process high -, learning designs such as Learning Management System – as inclusive in myUnisa. Full capacity of DVC – as interactive and amenable to broadband could be exploited in seamlessly integrating both online (myUnisa), live lecturer with lesson props, near and remote participants into

a dynamic audiovisual, graphical and textual presentation that could also be recorded for asynchronous use later, thus affirming what is elaborated upon in literature review as product (flexible learning) of interacting components, p49.

One cannot afford to ignore use of the relevant instructional methods in ICT-based models for there is strong feeling among the respondents that the instructional methods need to be central to the presentation, delivery and evaluation of the academic content, e.g. constructivism - could be structured and presented through co-operative education (see literature review p57) whereby a joint workplace projects between institution of learning (Unisa) with either private or government entity serve to provide learnership or practical training to learners; alternatively, through collaborative learning – whereby critical diverse real-life experiences could serve as spice to formal instructional curriculum.

Individual uniqueness of learners as implied through the preceding responses could be made up for in flexible delivery through the instructional strategy that prides itself of built-in artificial intelligence with tendency to adapt according to variable capacities of learners. In instances whereby real-life experiences appear to be predominant (as in collaborative learning), use of hypermedia could be the answer – i.e. ill-structured knowledge domains which cannot be explained according to linear structured protocol as they require scaffolding provided through hypermedia. Use of hypermedia could be re-energised though use of intrigue, suspense and punchy story-line as in the case of movies – to capture and engage the attention of the learners – infotainment promises to be a hit particularly if exploited appropriately.

To round off this aspect of the discussion, one cannot help but allude to the sense of what appears to be lack of full comprehension, or ignorance, and even lack of knowledge, values, mission and purposes associated with use of the current models – COOL/myUnisa and DVC. Packaging and presenting model as neat whole should not fall short of treatment afforded typical marketing of valuable product (refer dynamic application of ICTs, chapter 2, pp55-65); how would model application serve the purpose if its users do not know what it stands for? Further, if its value is inferred incorrectly, how would it be fully integrated into the planned educational system? Strangely, these are some of the basic questions that seem to reveal flaws associated with the underutilisation of DVC and myUnisa.

It is imperative therefore that the potential beneficent be well acquainted with its essentials such as its uniqueness, simplicity in application; what value is to be added through its application; what are its underlying philosophies and paradigms (advantages associated with convergence of technologies through digital platform, knowledge society interests, and affording individual learners the opportunity to excel within global environment for those scarce resources if uncompromised success is the goal being pondered. Other critical values include equity in access, and efficiency needed as part of competitive global society.

Last but not least, to ensure dynamic application of the model means that the process is carried through the given phases as pre-initiation, implementation cycle, and scalability phases; rather than applying these phases through straightjacket approach, the adopters need to phase the process in flexibly, by continuously checking for what works or does not work according to the given environmental dynamics.

As it is often the case, things may not necessarily go according to plan; therefore check and balances to help correct the impeding obstacles lie in revisit to the 4es (environment, effectiveness, ease of use, and engaging the technology) as espoused in p89

Eventually when full implementation cycle is achieved, the implementers need to work at institutionalization (developing sense of harmony/ownership between model, users, implementers and policy developers; all in all there is a chance that the whole process from start to finish could easily extend over 6-8yrs (depending on scale of the project).

6.2.6 Does the application of COOL and DVC models help to address the shortcomings associated with the distance education context, such as insufficient optimisation in learning, lack of face-to-face contact, high drop-out and failure rates?

Based on the findings from the interviews, structured questionnaires, and focus group interviews (learners, academics, instructional designers and multimedia developers), full impact of the benefits associated with the use of myUnisa and DVC for flexible delivery have not yet been felt due to haphazard or compromised implementation strategies applied so far; above all, the situation appears to be made worse by the main forms of correspondence (printing and sending of courseware via ordinary mail or courier service) and traditional way of teaching and leaning which appear to still play dominant role in DE setting. However, by the same token, from the rating of the users' perspectives, there is a strong indication that the current and potential users have strong belief and faith in possible growth and progress that could be achieved through proper implementation of the ICTs for flexible delivery, thus leading to elimination of distance as barrier, attainment of optimal flexible delivery, and possible decline in dropout, and increased thoroughput. Some of the desired potentials associated with the

proper implementation strategies, have been cited by some of the researchers under the literature review as just-in-time response, enhancement, convenience and qualitative teaching through use of myUnisa and DVC, and increased interactivity and retention rates.

6.3 Conclusion and their recommendations. Based on the literature review and findings established from personal interviews, SASQ and focus group interviews, the following conclusions and recommendations are raised:

6.3.1 Conclusion 1. The significant role played by ICTs in distance education for flexible delivery has been established in this research. However, in instances where the ICT models have been deployed and little progress is observed, such results are not fulfilling to the affected role-players. Based on the evidence of this study, the main drawbacks leading to underutilisation appear to be lack of content, use of ICTs mainly for administrative support rather than academic, lack of ICT skills and capacity, lack of application of relevant policies, to mention but few. In such instances as observed at Unisa and elsewhere, ICTs have become white elephants and instead of minimising the side-effects of distance as a barrier to flexible delivery, they end up being window-dressers to the real problems.

Recommendation 1

Drastic measures should be implemented to remedy the underutilisation of ICTs. If applied correctly and at the right time, these measures are most likely to act as an incentive to optimal utilisation of ICTs. The corrective measures according to learners, academics, IDs interviews' findings are as follow:

- Provide sufficient academic content with relevant instructional activities to encourage online interaction between learners and their peer group or tutors. Captivating and engaging strategies should be employed together with multimedia interactive approaches to help whet learners' appetites to the course modules offered. Other formats such as questions-and-answers and quizzes could be handy when applied as a means of engaging the learners for the search for relevant information and essential interactive activities.

- Provide relevant administrative activities relating to academic support; at any given point in time it is important that the learners know what rules to observe to ensure that their progress of study is smooth. It is frustrating for the learners to discover belatedly that they cannot proceed with a certain module because they owe certain prerequisite credits. Rules pertaining to submission of assignments, tutorials, practicals and contact sessions need to be readily available to learners at all times. Tools such as the FAQ need to be updated from time to time as it can serve the purpose of explaining some of the rules or policies not easy to apply. Normally it is in the application of policies that complications often emerge due to misunderstandings.

- Apply orientation and training in the proper use of the ICTs by the users. In other words, the use of ICTs should be fully practised, not just contained on paper. Generally professionals tend to be oversensitive and apprehensive in areas where they doubt their skills and know-how. Therefore, it is critically important to provide orientation and requisite training in areas where the need exists in both online and DVC technologies. Where applicable, similar training initiatives should

be extended to the learners to ensure that they are fully capacitated to benefit from the use of both online and DVC technologies.

- Introduce group forum platforms as a basis for encouraging group collaboration by stakeholders departmentally, or interdepartmentally or even institutionally. Sharing of experiences in terms of growth or problems help to pave the way and build confidence for the new recruits.

6.3.2 Conclusion 2: From the literature review, one of the major handicaps leading to failure in application of ICTs for educational delivery is the overemphasis of the technology as the end-in-itself, rather than tool to help deliver content for teaching and learning purposes. To add salt to injury, at other times, exaggerated claims (empty promises) have been made about the technology' successes in delivery. Often such exaggerated claims end up leading to the disillusionment of the users such as the academics and learners to new ventures in use of technology for educational delivery.

Recommendation 2: Flexible delivery should be seen as the equivalent to customisation where the customer's choice (in terms of place, pace and time as suggested in literature review, see p79) is the prime determinant of product delivery. However, for effective educational delivery, flexible delivery should transcend this and the utmost caution needs to be exercised to ensure that it is not compromised when it comes to effective teaching and learning as the desired outcomes. In this study, the use of myUnisa will go a long way in meeting the stipulations associated with flexible delivery. The same also goes for the use of DVC – as long as the pedagogical underpinnings such as constructivism and those associated with it are observed and

adhered to. The superior returns in annihilating distance as barrier are mooted as the possible result in the simultaneous application of both models with the lecturer as the facilitator in, say, contact sessions through blended learning as a strategy, p50-52.

New innovations with use of technology –as suggested by multimedia developers- staff need to be armed with the latest models in PC hardware; introduction of the latest software packages such as flash, new 3rd generation multimedia software packages, and to use more multimedia approach (with animations) to revitalise teaching and learning experiences should give the necessary boost in presentation format. Changing name from COOL to a more innovative one such as myUnisa may also serve as an additional booster to positive image; however, as according to perceptions by the users (namely learners and academics) the main popularity factor will remain content – with teaching and learning as the main outcomes.

Improve use of ICTs (myUnisa and DVC) through use of marketing and promotional campaigns that are supported through realistic strategies and demonstrable outcomes. It is also vitally important to use other technologies e.g. CD, and DVD as backups to distributing study materials.

Group discussion has not yet been put to fruitful use in DE setting, according to the multimedia interviewees. Lecturers need to place interesting materials online in myUnisa. The resultant initiative (of placing group discussion materials online) could lead to improved communication between lecturers and learners, peer interactions as in learner-to-learner and probably improved performance by learners with access and thus lead to increased awareness about the existence and value of the ICTs. It would allow potential users to have greater appreciation of content, and may also help learners get better insight about the main concepts and objects of the course or modules of the learning materials.

Pedagogical underpinnings are highly recommended to serve as the basis of the ICT-based instructional model of the programmes of flexible delivery; the questions of relevancy and appropriateness in meeting the curriculum standards determined by SAQA for given courses should never be compromised when ICT-based instructional models are developed.

6.3.3 Conclusion 3: Haphazard application of ICTs, lack of model focus and strategy cause failure and ultimate underutilisation of the ICTs, thus drop-out and low throughput tend to continue unabated despite what appears to be concerted efforts in use of ICTs by some, that is, according to interviewees and respondents (academics, IDs, and multimedia developers). The preceding picture correlates with the points raised earlier under literature review that identify high content shovelware and lack of learner-centredness as some of the causes associated with inappropriate use of ICTs (pp53, 57, 123-127, 131).

Recommendation 3

According to literature review proven strategic models should be adopted as a basis for the application of new strategic ICT models such as myUnisa and DVC, in the form of blended learning. In proven strategic models critical questions relating to effectiveness, testability, trialability, complexity and guidelines for direction should be highlighted. To crown it all, the aspiring advocates of such models have a better picture of the targeted goals and product of their visionary project outcomes.

Application of dynamic innovative models is critical in instances where little progress has been achieved with the use of ICTs for educational delivery; the prerequisites are

establishing whether the use and implementation of the ICTs is based on some form of model, establishing the level at which implementation has progressed according to the model, and the shortfall of the implementation according to the parameters in the model. Where the use of distinct models has been strictly followed with support of documentary evidence, it will probably be easy to determine failures and successes associated with the implementation of the ICT model and even how to innovate them. However, where the picture is vague about any form of model used, logic dictates that any form of adopted strategy used (piecemeal or haphazard) should be reduced to some form of comprehensible model. Basically what this means is that when working within the confines of the given model, it becomes easier for the advocates to determine what does or does not work. Consequently, the level of innovation will most probably vary according to trials aimed at making the model plan work and resulting frustrations from failures encountered. In short, it is not surprising that part of the innovations hinges on insight, part from transplanting with understanding other researchers' ideas and modifying them to the local context and in other part still emerges from researchers' creativity and thorough practice with existing models.

Institutionalisation of the models is critical. Vital ingredients to institutionalisation are ownership of the models that must be taken up by the users, and change in culture and mindset might be crucial as such change might entail new way of doing things.

6.3.4 Conclusion 4: Based on the findings, it seems as if there is no clear policy governing ICTs at Unisa. Unclear policy is the downfall of many new projects, ICTs not exception. User-friendly policies in support of the implementation of the ICT innovative model must be applied. It is common knowledge that policy made and left to decorate files never bites and as a result no change will be achieved through such policies.

Worst, is that co-existence of the models such as ICTs- versus print-based may be counterproductive and costly to sustain in the long run – due to sending ambiguous messages to users that result in underutilisation of ICTs..

Recommendation 4: The successful use and implementation programme of ICTs depends on applied policies, with clear guidelines and set deadlines. If the institutional drive is to see less dependence upon printing by the users, then the institution has to set robust online programmes in place and set target dates aimed at reducing such dependency after determining the learners' readiness to cope with the new approach. Allowing online co-existing with printing, as it is the case with current practice, does not augur well for the planned change. In the same vein, equal allocation of budgets for travel and DVC use is also contradictory and self-defeating. Again, it is imperative to ensure that the current DVC system has sufficient capacity and operates optimally in service rendering to deliver the necessary support to both academic and administrative support. All the necessary stakeholders must be familiar with technology use and its benefits. When all the preconditions are met, then reducing travel budgets as a form of encouraging technology use can be implemented.

6.3.5 Conclusion 5: It seems as if the investment in setting up the ICT at Unisa was not coupled with and equal investment in the promotion of ICTs at Unisa. The investment in acquiring and setting up the ICTs is wasted if it is not matched with an equal and relevant investment in their promotion. It is common knowledge that fine craft and merchandise are not hidden in closets after their produce, especially if they are meant for the market, rather, they are displayed in highly visible spots with much fanfare (if the budget allows it). In a nutshell, the failure to promote or market the ICT models is as

good as defeating the whole purpose aimed at change and growth – thus adding to the woe, as lack of optimal utilisation of ICTs.

Recommendation 5: Promote new models and their related ICTs, is advocated by all the interviewees and respondents (learners, academics and tutors, IDs and multimedia developers); such promotion must be backed up by realistic execution of the projects lined up for the use of the technology; what this means particularly for DVC technology, is that the practical use of the system must match the promotion of the technology because unforeseen faults and unreliable line connection could tarnish the image of what is seen as the cutting-edge technology.

Newsletters or brochures (online as part of a paperless society) can be introduced to keep users informed of the latest news about uses, changes, successes and problems encountered and how to overcome them. These will help to sell the idea of using ICTs, by reporting on the successes achieved, or even celebrating them. To render the promotional idea sustainable, ideally their successes should be followed up with viable training programmes offered to the newly recruited participants, p59, 131.

At the same time, it must be borne in mind and re-emphasized that empty promises are seen as one of the major loopholes to the application of ICTs. The implication is that more must be done in terms of delivery of promises made, for in many instances users appear to lose faith in the use of technology due to false promises. Empty promises manifest themselves in the form of lack of capacity and essential project's resources following the launch; it is critically important that such shortsightedness be eliminated in time (see p57-58, 131).

6.3.6 Conclusion 6. Based on many of the responses and findings, it seems as if there is a problem of people sticking to old habits because of a fear to explore the new (ICTs), and that is one of the reasons why there is such an under-utilization of ICTs at Unisa. Old habits are said to be hard to die; some of the reasons cited as obstacles to adopting new change in the form the ICTs did not appear to carry much weight, for example, “I have no time”, also citing -the inaccessible learners, and expensive technology as the obstacle – that is in the face of overwhelming contradictory evidence (question of lack of time could also imply poor time management or lack of prioritization; costly technology – has not been eliminated by the centralization of costs to ICTs directorate). Old habits that compel their adherents to endure the old lifestyle blindly despite overwhelming evidence that the new approach carries hope of overcoming the known obstacles (high drop-out and poor academic results), are a drag and should be disposed at the earliest possible time.

Recommendation 6: To dispel the said underutilisation, there is need for bringing about change of mindset, cultural norms, and way of seeing life within the institution of tertiary education. From mere glance the cultural norm of “individualism, academic freedom and independence”, do not appear favourable to the adoption of ICTs. Are there possible conflicts of interests inherent in mooting the adoption and application of ICTs within an institution that has been preaching and practising academic independence and freedom with the new approach – using ICTs for teaching and learning? Generally, the universities thrive on a culture of academic freedom and independence (diversities) – where any form of uniformity in execution of plans (curriculum teaching) could be viewed with suspicion and disdain. The researcher wonders whether this stance could not be one of the underlying motives for some of the ills associated with a lack of interest in the use of ICTs for educational delivery in higher

education. However, as indicated earlier, the advocacy for the use of ICTs is not for the blind adoption, rather to consider the relevancy and appropriateness in application according to disciplinary differences, p128.

Merit awards based on effective use of models for instructional delivery should also be considered for possible use as incentives to keen pioneers and users. Some time planting a seed and nurturing it to good growth can be a costly process; the same analogy in the form of extending merit awards may be effective in bringing about desired change in mindset and culture.

6.4 Further studies

When all the measures are in place for flexible delivery, it is important to determine the correlation between positive flexible delivery intervention strategies undertaken and cost- effectiveness. The question of when to conduct such research may not be easy but one could always be guided by the indicators -firstly, by the lecturers increasing meaningful, instructionally designed materials for myUnisa and DVC, secondly, sufficient evidence of promotional campaigns of the ICTs, thirdly, more learners registering and going online and their meaningful participation in group discussion and interactive multimedia, compared to possible outcomes such as improved learner throughput, increasing learner retention and concomitant decreasing drop-out rates.

It would be interesting to establish what sort of results could be attained with residential learners when almost similar instructional models are implemented and evaluated. Use of ICTs in the case of the residential campus has been associated with the negative impact by some who argued that the students tend to stay away from attending contact

classes when exposed to dual delivery of both face-to-face and ICTs based. As matter of interest, another perspective could be revealed through analyzing what socio-economic factors such as gender, age and environmental effects could bear on studies of this nature?

Originally, the intention was to follow two main streams viz. experimental and survey in gathering data. However, due to constraints associated with the merger process, which in a way appear to act as a feed to endless excuses provided by the key participants, time and financial constraints, the researcher decided to cancel the experimental stream and to continue with the survey stream. The idea was aimed at unravelling the mystery behind what was suspected underutilisation and to build a model that could be readily used to correct the ills caused by underutilisation. During the post merger, it would be interesting to see how both streams would perform, particularly the experimental one. Would users choose the experimental approach as opposed to the survey methods in settings of this nature – or would the results reflect the same outcomes, with say negligible difference? For now, it remains to be seen how this hypothesis would take shape.

Issue of language – as the main vehicle for communication; if the right language is not applied, then the recipient of the message are likely to miss its gist; language is one of the factors that need to be re-evaluated in flexible delivery including even when such instruction is carried through use of ICTs.

From time immemorial, in South African educational context, the role of the mother tongue has been confined to a subservient position, especially in secondary and tertiary education. Lately, with the transformation process and ongoing research locally and

internationally, the call for the mother tongue to occupy a more central place in teaching and learning of important subjects, including the sciences, is becoming louder and louder by the day. Obviously such a call to deviate from what has been seen as the norm and convention is a culture shock to the conformists and advocates of the current status quo, who forget that English is the second or third language to the majority in the African setting. Could this subservient role of the mother tongue be a factor to the scarcity of content from an African perspective when international comparisons are drawn in terms of research? Seen in terms of the preceding logic, language could also be a distracting factor when coming to the interrogation of the question of digital divide. The implication is that the majority of Africans appear to be denied services and critical information due to communication being in the language not well-understood by their majority. Thus, it is vitally important that the ongoing research and debates mushrooming around this topic be followed with keen interest to ensure that Engineering does not lose out when changes have to be considered.

Old habits, cultural norm, academic freedom & independence are critically important when dealing with the changes to be made to bring about the effectiveness in qualitative learning. One would need to conduct the survey to see to what extend the old traits and habits are a factor when it comes to adopting change in the form of utilising ICTs for educational delivery and learning?

Applying corrective measures to redress mainly the underutilisation of strategic models, e.g. myUnisa, DVC and others, would entail a revisit of strategy, policy, implementation and evaluative measures of use. It is encouraging to observe some positive signs of ICT developments within Unisa. New revitalisation drives are being undertaken with the Institute for Curriculum Learning and Development and lecturers regarding the post-

harmonisation process of myUnisa; there is already talk of myUnisa2. One wonders to what extent some of the critical issues raised in the preceding discussion (lack of the following items: content, pedagogical underpinnings, policies, model focus, appropriate use of technology, promotional campaigns) as causes of the underutilisation are currently addressed here; within the same breadth, positive drive needs to be undertaken with the DVC system.

6.5 Concluding remarks

The preceding research effort should be seen as a tip of an iceberg as the picture of what one is dealing with here is much more complex. Worse, it (the picture) keeps on changing with the increasing demand by the public and interested stakeholders upon engineering curricula. However, what appears to be the overriding messages by the majority of the participants in this research should not be taken lightly: that technology should be applied appropriately and relevantly to make flexible delivery a reality in DE context; that greater gains and returns in the form of dispelling the wrong perceptions of seeing Engineering as the most difficult course to DE learner coupled with improved retention and throughput rates are likely to be made through innovative use of ICT models; most importantly, the participants are of the opinion that it requires co-operation, concerted and consistent efforts by the academics, researchers, instructional designers and developers, multimedia developers, policy-makers and learners to make optimal use of the available ICTs for flexible delivery and learning.

While the concept of dynamic application of ICTs for flexible delivery may sound daunting and far-fetched, the opposite is imponderable given the enormity of challenges to overcome by the new age university such as Unisa. Critics are hard to please when it

comes to production of skills, how to deal with digital divide; blames such as catering for the elite few, irrelevancy and mediocrity in knowledge production are bandied about when it comes to evaluation of the contribution made by Higher Education. While the main strife remain upping performance characterised by brilliance, it is highly probable that part of such a solution may lie in unchartered territory through use of innovative models. It is also advisable that resources should not be spared in bolstering such projects aimed at addressing critical needs of the learners.

At the same time, implementation of dynamic ICTs models should be seen as part of a long-term investment – there are likely not to be overnight successes as lasting solution require greater effort and time to render feasible results. What adopters and advocates of ICTs should bear in mind is that they are part of the bigger dream, paving way for a new revolution called knowledge and digital economy and helping to prepare their learners for the globalisation era. That in itself is a huge responsibility, demanding a lot of guts, patience, empathy, sweat and compassion to see the process through.

In the final analysis, it is hoped that this research will serve as impetus for raising interest and awareness about need for further research in better utilisation of ICTs for educational development; also, as eye-opener to the aspirants embarking in use of ICT-based models for educational delivery (say in Engineering, and other related courses) in DE setting; to the advocates or even pioneers grappling with ICT models - pondering how to overcome obstacles to the application of their own ICT-based instructional models; above all, to be stepping stone in addressing the problems associated with poverty, for part of the end–results of quality education is raising standard of living, not just at Unisa, but the rest of SA, Africa and globally.

Summary of Chapter 6 – key findings are advanced as answers to main research question and its sub-problems; followed by the discussion of the main conclusions, and their recommendations, and then rounded off with possible areas as ground for further studies.

7.0 BIBLIOGRAPHY

Abbott, C. 2001. *ICT: Changing education.* London: Routledge Falmer.

Alana, E.C. 2002. The information age. *e-Primers for the information economy, society and polity.* Available on the Internet at: www.eprimers.org/infoage/index.asp (accessed 14/03/2004).

Alexander, S. & Boud, D. 2001. Learners still learn from experience when online. Stephenson, J. (ed.) 2001. *Teaching and learning online: Pedagogies for new technologies.* London: Kogan Page.

Anderson, A. 1997. A guide to Multimedia Learning in the next Millennium: How's Multimedia evolving? In *Training and Development.* August.

Apartheid legacy haunts SA, 2006, *Mail & Guardian Online,* 15 November, From: http://www.mg.co.za/articlePage.aspx?articleid=289951&area=/breaking_news/breaking_news_national/ accessed 05022007.

Arch, 1997.A Guide to Multimedia Learning in the Next Millennium; Multimedia Learning. *Training & Development*. August.

Ary, D., Jacobs, L.C. & Razavieh, A. 1990. *Introduction to research in education.* Chicago: Holt Rinehart and Winston. Inc: Fort Worth. (Pp 3-115; 168-352; 406-453).

Askov, E.N., Johnston, J., et. al., 2003. *Expanding access to Adult Literacy with Online Distance Education.* NSCALL: Cambridge. (Pp 1-73). Available @ http://ncsall.gse.harvard.edu.

Babbie, E. & Mouton, J. 2001. *The practice of social research*. Cape Town:

Oxford University Press.

Badat, S. 2002. SA's universities and technikons will get R8bil from government this year. Are taxpayers getting value for their money? *Sunday Times,* 3 February: 19.

Barr, R. B. & Tagg, J. 1995. From Teaching to Learning: A New Paradigm for Undergraduate Education Change, November/December pp13-24.

Bates, A. W. 1993. Educational Aspects of the Telecommunications Revolution, pp1-10. Davies, G. & Samways, B. (eds) 1993. *Teleteaching*. Proceedings of the IFIP TC3 Third Teleteaching Conference. North Holland: Elsevier Science Publisher B.V.

Bates (Tony) A.W. 1997. The Impact of Technological Change on Open and Distance Learning. In *Distance Education.* Vol 18, No 1: 93-108.

Bennett, J. 2002. SA is still short of skills. *Sunday Times Business Times: Careers*, 20 January: 3 Also available @ http://www.sundaytimes.co.za/careers.htm.

Bivens, H.L. 1998. *Distance Learning Future: Creating New Learning Environment And Develop New Pedagogical Skills.* Miamisburg: NCR World Services Organization.

Boddy, G. 1997 Tertiary Educators' Perceptions of and Attitudes Toward Emerging Educational Technologies. In *Higher Education Research & Development,* Vol 16, No 3, pp343-356.

Borsook, T. K. & Higginbotham-Wheat, N. 1991. Interactivity. What it is and what it can do for computer-based instruction. In *Educational Technology,* 31 (10), 11-17.

Bottorff, J. L. 1993. *Issues in Qualitative Research Methods Using Videotaped Recordings.* California Sage: Thousand Oaks. (Pp 245-258).

Bradley, S. A. 1997. Guide to Multimedia Learning in the Next Millennium: How can media be used Effectively for training? *Training & Development*. Vol 51, August: 43.

Bransford in Dick, W. 1991 An Instructional Designer's View of Constructivism in *Educational Technology.* May: 42.

Bristow, R. 2004 (as reporter) Beyond Email: Wikis, Blogs and Other Strange Beasts. Strategies for Collaborative Working and Learning in the 21st Century. Weetwood Hall, University of Leeds, 22 November 2004. *Ariadne, 42 (42)* January.

British Association for Open Learning: Flexible Learning. 2000. *Open Learning Today*. January.

Brown, C. & Czernewicz, L. 2005. Disciplinary differences in the use of educational technology in Emerge 2006 conference abstracts and programme. University of Cape Town: Emerge2006.

Buckley, J. 1997. A Guide to Multimedia Learning in the Next Millennium: B.T systems -How's Technology changing training? *Training & Development*. Vol 51, August: 40.

Bullard, D. 2001. Why the .Com Bubble Had To Burst? *The Money Standard*. Issue 9, May/June.

Bullen, M. 1998. Participating and critical thinking in Online University Distance Education, ICAAP. From http://cade.icaap.org/vol 13.2/bullen.html.

accessed 10/03/2004.

Chute, a Chief Learning Strategist. 1998 Cincinnati: Lucent Technologies Center for Excellent In Distance Learning (internet)

Ciolek, M 1998 Today's WWW, tomorrow's MMM: the spectra of Multimedia Mediocrity. *Educom Review* May/June, Vol 32 pp1-5

Clarke, A. & Dawson, R. 1999. *Evaluation research: An introduction to principles, methods and practice.* London: Sage. (Pp 1-92)

Cloete, L. 2001. *The education and training of cataloguers: A training resource programme*. Doctoral thesis, University of Pretoria.

Cohen, S. 1997. A guide to multimedia in the next millennium. *Training and Development*, Vol 51, August:33

Collis, B. & Moonen, J. 2001. *Flexible Learning in a Digital World: Experiences and Expectations.* London: Kogan Page Ltd. (Pp4-5; 45-51; 53-54)

Combrinck, L. 2003 Closing the Chapter of an Unwritten Book. *Sowetan* Perspectives 28 November: 27

COOL 2003 [online]. From: http://www.cool.tsa.ac.za, accessed 15 May 2003.

Coomey, M. & Stephenson, J. 2001. Online learning: It is all about dialogue, involvement, support and control in Stephenson, J. (ed.) *Teaching and*

learning online: Pedagogies for new technologies. London: Kogan Page.

Coyle, J Hamilton L. E, et.al. 2006 {2005 Bernard M. Gordon Lecture Award} Integrating Engineering Education and Community Service: Themes for the Future Engineering Education. *Journal of Engineering Education.* Jan 2006(1); 95. http://www.cree.uct.ac.za (accessed 14 Feb. 2007).

Cox, R. 1997. A Guide to Multimedia Learning in the Next Millennium: Macromedia. *Training & Development.* Vol 51, August: 38-40

Cronje', J. C. 1997. Education for technology, technology for education, in Van Harnelen, T. . *Guidelines for technology-enhanced education at the University of Pretoria,* Vol 1, ITI Working Paper, No. ITI-97-9, June, Institute for Technological Innovation.

Cunningham in Dick, W. 1991 An Instructional Designer's View of Constructivism in Educational Technology. May: 141-145.

Davies, A. J. 1980. Research as an Inactional Situation: Objectivity in the Interview. *International Journal Nursing Studies*. April Vol 17 pp215-220.

Davies G. and Samways B. (eds) 1993. Stanford University: Experience in Distance Education. '' in Davies G. and Samways B, (eds) 1993. *Teleteaching.* Elsevier Science Publisher B.V.: North Holland.

Deacon, A. & Winsculley 2005. Learning from the Rhetoric of the Academics in Emerge 2006 conference abstracts and programme. University of Cape Town: Emerge2006

Dekkers, J. & Andrews, T., 2001. A meta-analysis of flexible delivery in selected Australian tertiary institutions: How flexible is flexible delivery? Richardson L. and Lidstone J. (eds.), *Flexible Learning for a Flexible Society*, pp172-182. Proceedings of ASET-HERDSA 2000 Conference, Toowoomba, Qld, 2-5 July 2000. ASET and HERDSA. From: http://www.aset.org.au/confs/aset-herdsa2000/procs/ dekkers.html, accessed 30 April, 2001.

Dietrich, C. 1997. A Guide to Multimedia Learning in the Next Millennium….Multimedia industry is headed for greater growth. *Training & Development*. Vol 51, August: 44

DiPaolo, A. 1993. Stanford University: Experience in Distance Education, pp23-26. in Davies G. and Samways B, (eds) 1993. *Teleteaching.* North Holland: Elsevier Science Publisher B.V.

Dolhon, J. P. 1998. Peering into Virtual Space Camera Shot Selection in the VideoConference Class. Report Distance Education. June, Vol 2, No 6: 3-6

Donnely 1998, in Abbott, C. 2001. *ICT: Changing education.* London: Routledge Falmer. (P11)

Duby, A. 1985. *Self-Formative Evaluation Of Instructional Materials With Reference To Games And Television.* Pretoria: Unisa (Doctoral Thesis).

DVD today, 1999, March. From: http://emediapro.net, accessed 21/12/2002.

Executive Summary: An Integrated Flexible System for Higher Education in South Africa, 1998 pp1-21. From http://www.tsa.ac.za: projectsflexlearn/flprac.htm accessed 23/03/2002.

Fagoonee, I. 2001. *E-Learning in a small island state: The case of Mauritius in International Conference on Engineering Education*, August 6-10. Oslo, Norway. Pp8B4-5 to 8B4-9.

Feisel L. D. & Rosa, A. J. 2006. The Role of Laboratory in Undergraduate Engineering Education. in *Journal of Engineering Education.* January 2005, pp121-128. From http://www.cree.uct.ac.za accessed 10/02/2007.

Fergusson, G. A & Takane, Y. 1989. Statistical Analysis in Psychology and Education. 6th edition. New York: McGraw-Hill Inc. (pp 3-212).

Fletcher, J. D. 2003. Does this Stuff Work? A Review of Technology Used to Teach. *TechKnowLogia.* January – March: 1-7 From: http://www.TechKnowLogia.org accessed 01/04/2005.

Flinck, R., 1980. On defining distance education. In Keegan, D. J. 1978. *Distance Education,* 1(1): 4.

Foich-Lyon, E. & Trost, J. F. 1981. Conducting Focus Group Sessions. *Studies in Family Planning.* December. Vol 12 No 12 pp443-448.

Forsythe, R. 2002 WebCT at Manchester Metropolitan University (MMU): Progress and Possibilities. MMU: *Learning and Teaching in Action*, 1(2), Summer.

Glesne, C. & Peshkin, A. 1992. *Becoming Qualitative Researchers An Introduction.* Universities Illinois & Vermont: Longman. (pp63-94)

Goldberg, M. W & Salari, $ 1997 World Wide Web – Course tool: An environment for building WWW-based courses. In Computer Networks and ISDN Systems. Vol 28, Issues 7-11, May: 1219-1231. Proceedings of the Fifth International WWW Conference 6-10 May 1996.

Gooler, D. & Stegman, C. 1995. *A Scenario of Education in Cyber City*, pp1-12, Northern Illinois University: College of Education. From: http://wwwhbg.psu.edu/bsed/intro/docs/cyber/index.html accessed 23/9/97

Greyling, F. & Pete, M. 2000. Making the Gears Work – a Dual Perspective on the Management and Implementation of e-Learning at South African Technikons Pretoria & Natal. RAU's 3rd Annual Conference on WWW Applications. Sept. 5-7th

Guba & Lincoln in Clarke, A. & Dawson, R. 1999. *Evaluation research: An introduction to principles, methods and practice.* London: Sage. (p 57)

Haddid, D. W. & Draxler, A (eds.) 2002. Technologies for Education: Potential, parameters and prospects, prepared for UNESCO by Knowledge Enterprise Incorporated for Educational Development.

Hanraharan, H. 2006. Engineering Education. Fragile state, new growth projects,

But where to in the long term? *FEE Magazine, vol 10, Issue 1, Oct 2006* http://www.cree.uct.ac.za accessed Feb. 14, 2007.

Hathaway, R.S. 1995. Assumptions underlying quantitative and qualitative research: Implications for institutional research. *Research in Higher Education*, 36(5). Pp535-555

Heinich, R., Molenda, M. & Russell, J.D. 1989. *Instructional media and the new technologies of instruction*. New York: Macmillian.

Hernes, G. 2003. Emerging trends in ICT and challenges to educational planning in technologies. *Technologies for Education*. Also available at http://www.eprimers.org/ict/page38.asp.

Heydenrych, J. 2002, The Implementation of Online Learning Community. A Report to the Tuition Committee of Unisa (IOP377-J Human Capacity Development. Pretoria: COLE of Bureau of Learning Development. Pretoria: Unisa. pp1-55.

Hills in Abbott, C. 2001. *ICT: Changing education.* London: Routledge Falmer.

Holmberg, B 1990 Theory and Practice of Distance Education, 2nd Edition, In Keegan, D.(ed.) *Routledge Studies in Distance Education.* London: Routledge. Pp18-26

Hope & Hope 1997 digital wave economies. From: https://www.infosci-online.com/downloads/excerpts/Wickramas2398Ch1.pdf accessed 140207

Hodgson, B. 1993. Key terms and issues in open and distance learning. *Open and Distance Learning Series*. London: Kogan Page.

http://umweb3.unisa.ac.za/myunisa/data/subjects/Electrical_Engineering.pdf 1st - 4th year, accessed 06/02/2007.

http://umweb3.unisa.ac.za/myunisa/data/subjects/Electrical_Engineering%20Practice.pdf electric engineering practice (site not available, accessed 06/02/2007.

http://www.UNISA.ac.za, 2003

http://www.unisa.ac.za/cmsys/staff/contents/enotice2007/january/docs/GettingStartedmyUnisa26_jan_07.pdf.

Huffman, A. 1997 A Guide to Multimedia Learning in the Next Millennium: Are CD-ROM's Dying Out? *Training & Development*. Vol 51, August: 44.

Hughes, J.A. 1990. *The philosophy of social research*. London: Longman.

Huysamen, G. K. 1998. *Descriptive Statistics for the Social and Behavioural Sciences,* 3rd Revised Edition. Pretoria: J.L. Van Schalk Academic.

Hyde A. 1997. A Guide to Multimedia Learning in the Next Millennium: How will Technology Change the Face of Multimedia Training? *Training & Development*. Vol 51. August: 44.

Illiteracy Threat to democracy. 2002. *City Press.* 03 February.

Information Society And Development (ISAD) 2002. in *City Press* 03/02/.

Interactive into the future, DVC, *Business Press*, 01/08/99 vol. 11 issue 37, p21 item No 1483011.

Integrated Technology Centre (ITC) Advisory Committee. 1998. Minutes. Roodepoort: Technikon SA.

Integrated Technology Centre (ITC) Compiled Database on use of COOL by theTechnikon SA's learners, 2001. From: http://www.cool.tsa.ac.za/feedback.htm accessed 10 February, 2002

ITC Report 2001. Technikon SA: Roodepoort.

ITC Strategy Report,1998 Technikon SA: Roodepoort.

Jackson, R. H. 2001. Web based library Learning Resources. From: http://www.knowledgeability.biz/weblearning.html, accessed 22/04/007.

James, J. 2001. Evaluating website usability and usefulness: An ergonomic focus. Paper delivered at RAU's WWW Applications Conference (3rd: 2001: Rhodes University).

Johnson, D. 1994. *Research Methods in Educational Management*. University of Leicester. London: Longman.

Jonassen, D., Strobel, J., Lee, C. B. 2006. Everyday Problem Solving in Engineering; Lessons for Engineering Educators. *Journal of Engineering Educators.* April 2006; 95 (2).

Jones, G.R. 1998. Cyberschools: An education renaissance [online].in Jones G. R. *Digital Century.* From: http://www.cyberschools.com.

Kaplan, H. 1998. Integrative multimedia and the World Wide Web: A new paradigm for university teaching and learning. *Educom Review*, 9 January: 1-4 http://www.educom.edu/web/pubs/reviewArticles/32148.html, accessed 09/01/98.

Keegan, D. J. 1980. On defining distance education.in *Distance Education*, (1): 4.

Kelly heads for JSE, 2007. *Classic FM/BusinessDay,* 29 January. From: http://transcripts.businessday.co.za/cgi-bin/transcripts/tshowtranscript.pl? 1170111057 accessed 10022007.

Khan, A.W., 2000. Application of ICTs in ODL: A reality check. *Distance Education – An Open Question*. Programme and abstracts of UniSA(Adelaide) & ICDE Conference, University of South Australia, Adelaide.

Kilpert, O. (compiler) 2001. The University of South Africa (Unisa) in *Open and Distance Educational Materials Case Study #16 PGDDE1-3/102/2001-2002.*

Unisa Faculty of Education: Pretoria. Pp115-120.

Kvale, S. 1983. The Qualitative Research Interview: A Phenominological and a Hermeneutical Mode of Understanding. *Journal of Phenomilogical Psychology.* No 14 pp171-196.

Lallana, E.C. (2002). The information age. *e-Primers for the information economy, society and polity.* From: http://www.eprimers.org/infoage/index.asp (accessed 14/03/2004).

Laurillard 2004 Evaluation of Effectiveness of WebCT in F2F context. Gloucestershire University.

Lazenby, K. 1998. Constructivism and the creation of virtual campuses in higher education. Mini dissertation, University of Pretoria.

Levinson, P. 1999. *Digital McLuhan: A guide to the information millennium.* London: Routledge.

Lewis, M. 2000. Focus Group Interviews in Qualitative Research: A Review of the Literature , Action Research E-Reports, 2. From: http://www.fhs.usyd.edu.au/arow/arer/002.htm. (accessed 12/01/07).

Lockwood, F. 2003. Flexible Learning Within MMU: Working Smarter Not Harder. *Learning & Teaching in Action Manchester Metropilitan University*. Vol 2, Issue 2 Summer. MMU: Learning & Teaching Unit Publ. pp4-7.

Madisa B P (compiler) 2001 Extracts from Electrical Engineering Syllabus and Curriculum. Technikon SA: Florida.

Mayes, T. 2001. Learning technology and learning relationships. In Stephenson, J. (ed.) 2001. *Teaching and learning online: Pedagogies for new technologies.* London: Kogan Page.

Mbeki, T. 2002. Bridging the digital divide: ICT infrastructure for poverty alleviation. *City Press*, 3 February.

Mbeki, T. 2002. ICT Prevents New Form Of Slavery. *City Press* 3/02/.

Merriam, S.B. 1998. *Qualitative Research and Case Study Applications in Education.* San Francisco: Josses- Bass Publishers.

Micro Finance Skills Project (MFSP) as SETA Project. 2002 *City Press* 03 February.

Misek, M. 1999. Mission Possible: The Migration Plan. http://www.emediapro.net (wrting/storing/distribution/retrieval – DVD & CD) Knowlegde does not Diminish.

Mizell, A.P. 1997. SAXophone: Enhancing the Global Village Via Compressed Video. *Report Distance Education*. July, Vol 1, No. 3 pp 3-4.

Mngxtiama A. 2002. Globalisation is not the only road. *City Press.* 3/02/.

Morgan, D. L. 1988. Focus Groups as Qualitative Research. Newbury Park: A Sage University Paper: pp5-85.

Morgan, D.L. 1996 Sociology, Social research, Methods, Focus groups, in *Annual Review of Sociology*. Palo Alto. Vol. 22 pp 129-152, URL: http://proquest.umi.com/pqdweb?did=10128817&Fmt=3&clientId=18133&RQT=309&VName=PQD accessed Sept 2006.

Morrison, D. 2004. Case Study 2 - Weblogs: Niche or Nucleus? University of Bath. Weetwood Hall, University of Leeds on 22 November. *Ariadne,* Issue 42, January. Also available http://www.ariadne.ac.uk/issue42/beyond-email-rpt/intro.html.

Motshekga, A. 2007. MEC for Education on 2006 Grade 12 Exams Results. From **http://www.gautengonline.gov.za** dd 28/12/2006 Gauteng Prov Government Portal, accessed 07/02/2007.

Naidu, S. 2003. Trends in Faculty Use and Perceptions of E-Learning; Possible Causes. *Learning and Teaching @ Manchester Metropolitan University* Vol 2 Issue 3 Autumn: 27-33.

New Unisa Update. Edition One, 2003. Pretoria: Unisa. November: 1-4.

Nian-Shing Chen, N. S, Craig Zimitat, C. (2004) Differences in the

Quality of Learning Outcomes in a Face2Face Blended Versus Wholly Online Courses. Atkinson R., McBeath, C. et.al. (eds). *Beyond the Comfort Zone: Proceedings of the 21st ASCILITE Conference* (pp175-179). Perth, 5-8 December. Also available @http://www.ascilite.org.au/conferences/perth04/procs/chen.html.

Nunan, T 2000. Rethinking the Ways in which Teaching and Learning are supported: the Flexible Learning Centre at the University Of South Australia. *Journal of Higher Education Policy and Management.* May2000, Vol. 22 Issue 1, p85-98.

Odendaal, A. 2001. The development of interactive online learning for distance education: A South African case study. Paper delivered at RAU's WWW Applications Conference 3rd: 2001: Rhodes University.

Oliver, R. 2005. Using Blended Learning Approaches to Enhance Teaching and Learning Outcomes in High Education. Edith Cowan University (Austria) http://elrond.scam.ecu.edu.au/olivier/2005/iaup2.pdf , accessed 30/04/007.

Open Source Software. 2003. Sunday Times Business Times 21/12/.

Osava, M. 2003. Degrees must have expiry date. *Sowetan,* 28 November: 19.

Phaahla, P. (2002) The New Higher Education? Learning and Teaching in a Knowledge Society with the Emphasis on Online Environments, paper delivered at Aston University: Birmingham.

Patton, Cook, & Reichart. (1979) in Clarke, A. & Dawson, R. 1999. *Evaluation research: An introduction to principles, methods and practice.* London: Sage. (p62).

Pearce, H.2006 Increasing Throughput in the Engineering Programmes at the University of Cape Town in *FEE Magazine* vol 10, Issue 1, October. From: http://www.cree.uct.ac.za accessed Feb. 2007.

Perkins in Dick, W. 1991 An Instructional Designer's View of Constructivism in Educational Technology. May.

Pityane, B. 2006. Principal's Statement to (Unisa) Senate. Pretoria: Unisa.

Pityane, B. 2004. Unisa online – Towards the African University Barney. From: http://staff.unisa.za/towardstheafricanuniversity Barney.htm accessed 20/10/2004.

eTV 2007. Primetime News @19h00. 23/06.

Popkewitz, T. S.1984 *Paradigm and Ideology in Educational Research: The Social Functions of the Intellectual.* East Sussex: The Falmer Press.

Rakow, J. 1997. Adult education Computer & Network Multimedia Training. *Training*: March, v34 n3 p61-65.

Reed, J. & Woodruff, M. 1995. Using compressed video for distance learning: An introduction to using videoconferencing technology for teaching. San Diego State University in the *Distance Educator Newsletter*, Fall.

Reference Method for Unisa, 2004 Unisa: Florida/Roodepoort).

Reich, 1997 in Jones, G.R. 1998. Cyberschools: An education renaissance [online]. Jones G. R. *Digital Century.* From: http://www.cyberschools.com.

Robson, J. 1996. Some Pedagogical Implications of using Technology in Distance Education. ACT Australia: Australian Catholic University.

Rossie & Freeman in Babbie, E. & Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press (pp 335-336).

Robson, J. 2000. Evaluating Online teaching. *Open Learning*, Vol. 15 (2).

Rumble, G. 1989. On Defining Distance Education. *The American Journal of Distance Education.* Vol. 3 No. 2 pp31-43.

Saba F. 2000 With Friends Like These…. *Report Distance Education.* June 15, Vol. 4 (6). June 15: 1-4

SA failing its pupils, says trade union. 2006. *Mail & Guardian Online,* 28 December. From: http://www.mg.co.za/articlePage.aspx?articleid=294629&area=/breaking_news/breaking_news_national/ accessed, 05022007.

SABC 3, 2007.News @ 6am 10/09/.

Sadtu: Support needed for underperforming schools, 2007 *Mail & Guardian Online. 06 January*. From: http://www.mg.co.za/articlePage.aspx?articleid=295064&area= /breaking_news/ breaking_news__national/_dd 0601007 accessed 05/02/007.

Sandercock G.R.H. 2001. Learners' performance and evaluation of attitudes towards WebCT in the delivery of Applied Sports Science. Univ of North London.

Scott, D. & Usher, R. *Researching Education: Data, Methods and Theory in educational Inquiry*. Cassell: London.

Scriven in Clarke, A. & Dawson, R. 1999. *Evaluation research: An introduction to principles, methods and practice.* London: Sage. (Pp 1-92).

Sekgwelea, S. M. 2004 Dynamic Innovative Approach to the application of ICTs for flexible delivery learning within DE Institutions (preliminary findings) From:http://emerge2004.net/profile/abstract.php?resid=30 accessed 01/09/2004,

Sekgwelea, S.M. 1999. Digital videoconferencing (DVC) as supplementary delivery tool at Unisa. *OLASA Research Publications.* 1999.pp1-18. Paper delivered at conference organised by Nadeosa. University of Pretoria.

Shabajee, P. 2004. Talk 1 Emerging Collaborative Environments, Case Study 1 The Perspective from the Research User'. Weetwood Hall, University of Leeds on 22 November 2004.In *Ariadne Issue 42*, January. Also available at http://www.ariadne.ac.uk/issue42/beyond-email-rpt/intro.html

Shelly, G.B., Cashman, T.J. & Vermaat, M.E. c2001. *Discovering computers 2002: Concepts for a digital world.* Boston: Course Technology.

Shilowa, M., 2006. Media Address on 2006 Exams Results. From: **http://www.gautengonline.gov.za** dated 28/12/2006 Gauteng Prov Gov Portal, accessed 07/02/2007

Simmonds T.1995 Using blended learning approaches to enhance teaching and learning outcomes in higher education, p1-10. From: http://www.google.com/search?q=cache:qDl9_Mlgg98J:elrond.scam.ecu.edu.au/oliver/2005/iaup2.pdf accessed Dec 2007

Snook, A. 2000. Just -in-Time Open Learning. *Open Learning Today*, January: 36-38

SOL Symposium accessed 3/10/03 http://www.SOL.unisa.ac.za

Sotho, N. 1998. *A Model For the Mobilization of The Advanced Psychiatric Nurse as a Resource Person.* Rau (Doctoral Thesis).

Sowaga, D. 2002. SA Universities Need to Get Realistic. *City Press*, 20 January:

Spiro in Dick, W. 1991 An Instructional Designer's View of Constructivism in Educational Technology. May:

Sprinthal, R.C. 1990 Basic Statistical Analysis. New Jersey: Prentice Hall Inc. pp 1-308.

Stephenson, J. (ed.) 2001. *Teaching and learning online: Pedagogies for new Technologies.* London: Kogan Page.

Taylor & Francis.(2007) *DE new paradigm.* From: http://taylorandfrancis.metapress.com/media/af8altn68p5uqhb07j2q/contributions/j_/3/_3/8/j338n681mu246517.pdf .

Technikon SA policies and procedures for postgraduate studies, 2002. Research Development Office. Florida: Technikon SA.

The Research Agenda for New Discipline Engineering Education. 2006. *Journal Engineering Education*, Oct 2006, 95, 4 *ProQuest Education Journal:* 259

The Report of the September Commission on the Future of the Unions to the Congress of South African Trade Unions, August 1997. http://www.Chapter 7 New workers, new members organising new sectors & layers of workers accessed 06/02/007.

The third International Mathematics and Science study of Grade 8, 2007 in *Mail & Guardian,* 27/12.

Tiffin, J. & Rajasingham, L. 1995. *In search of the virtual class: Education in an information society.* London: Routledge.

Tinio, V.L. 2002. ICTs In education. *e-Primers for the information economy, society and polity*. From: www.eprimers.org/ict/index.asp accessed 23/05/2003.

Thijs, et al in Lallana, E.C. (2002). The information age. *e-Primers for the information economy, society and polity.* From: http://www.eprimers.org/infoage/index.asp (accessed 14/03/2004).

Top Brands. 2003. *Sunday Times Business Times 5/10/*.

Unisa homepage, 2004 accessed 30/06/06

UNISA (University of South Africa), 2003. *Sunday Times* 21 December: 22.

University of Idaho. 1996. *Interactive videoconferencing in distance education*. In Wills B., *Distance Education-Strategies and tools and Distance Education: Practical Guide #10*. University of Idaho: College of Engineering.

U.S. Department of Labor, 1999, Futurework—*Trends and Challenges for Work in the 21st Century (Engauge, 21st century skills, 2001 by NCREL).* From:

http://www.ncrel.org/indepth digital age economy.htm accessed 21/10/2002.

Van Buren-Schele, C. 2001. Challenges facing developing countries in the design and delivery of online courses. Paper delivered at RAU's WWW Applications Conference (3rd: 2001).

Van Koller, J. F. 2001. Outlines of Institute of Staff Development (ISD) formal modules. (From: I/SHARE/Unisa/Technikon_teaching/Outlines, accessed 21/10/2002.

Van Koller, J. F. 1997. Alternative Measurement Instruments for the Evaluation of Learner Achievement in Business Management at the Technikon Southern Africa. Pretoria: University of South Africa (Doctoral Thesis).

Van Wyk, E. 2000. Using the Web to train Web Professionals. Pretoria Technikon. RAU's 3rd Annual Conference on WWW Application. Sept. 5-7th.

Von Blottnitz, H. 2007 Educating Engineers in Sustainable Development: Mastering new jargon or serious transformation. *FEE Magazine, vol. 10, Issue 1, Oct 2006.* From http://www.cree.uct.ac.za accessed 10/02/2007.

Von Glaserfield, E. 1995. A constructivist approach to teaching. In Steffe, L.P. & Gale, J. (eds.) 1995. *Constructivism in education*. New Jersey: Lawrence Erlbaum Associates.

Walker, M. 2000. Learning How To Learn In A Technology Course: A Case

Study. *Open Learning*, Vol. 15 (2) The Open University, London.

Walford, G. (1998). *Doing Research about Education*. London.: Falmer Press.

Watson, J. & Hill, A. 1984. *A dictionary of communication and media studies.* London: Edward Arnold.

Webster, D, 2004. Conceptualising the student-tutor relationship: Adventures in *Marxist and Realist analysis, Learning and Teaching in Action*. Dept of Interdisciplinary Studies, Chesire, MMU. Vol. 3, (3) Winter – 2004. MMU.

Welman, J.C. & Basson, P.A. 1995. *Research Methodology -The Interrelation-ship Between Job Satisfaction and Academic Achievement of Distance Education Students,* pp234-271.

Welman, J.C. & Kruger, S.J. 2002. *Research methodology*. Cape Town: Oxford University Press.

Willis, B. 1997. Interactive videoconferencing in distance education. In *Distance Education at a Glance, Guide #10.* Also available @ http://www.uidaho.edu/eo/dist10.html.

Wimmer, R.D. & Dominick, J.R. 1994. *Mass media research: An introduction*. Belmont: Wadsworth.

Yates, S. 2006. RAT Online the Wheel Spanner: An Online Self-Defence Course.

Also available: http://www.emerge2006.net/abstracts accessed 10/07/2006.

Yetton, 1997 in Collis, B. & Moonen, J. 2001. *Flexible Learning in a Digital World: Experiences and Expectations.* London: Kogan Page Ltd. (Pp4-5; 45-51; 53-54).

Yonker, M. 1997. A Guide to Multimedia Learning in the Next Millennium: InFocus- Intranet versus Internet. *Training & Development.* Vol 51, August: 43.

Ziegler, R. 1997 A Guide to Multimedia Learning in the Next Millennium: How's Multimedia Evolving? Andersen Consulting Co.in *Training & Development*. Vol 51, August: 36.

8.0 GLOSSARY continues from chapter. 1, par 1.9 pp20-21

Multimedia: With teaching and learning as the context, multimedia is any application that integrates text with any of the following: sound, picture, graphic, video, virtual reality or other media elements (Shelly et al., 2002). Furthermore, it could be seen as the product of technology to render teaching multisensory (Cohen, 1997; Andersen, 1997; Rakow, 1997). Its didactic qualities are that it can easily engage learners, by allowing them to take risks, that is, if properly programmed. Learners/trainees ultimately learn by doing, seeing and hearing. More importantly, they learn at their own time, wherever and whenever they choose (Arch, 1997, Bradley, 1997, Chute, 1998, Cox, 1997).

Convergence of technologies: This is made possible by the digital platform programme. All the media, i.e. audio, video, CD, online, telephony and TV, are now conversant and complement one another as multimedia products (Hodgson, 1993; Huffman, 1997). The digital videoconferencing system is a typical convergent technology as it can be used with various digital technologies at the same time in presentations, e.g. data projector, document camera, laptop, DVD, whiteboard, by the live presenter (Dolhon, 1998; Business Press, 01081999).

Information society: Information is becoming the central and significant commodity through the development and application of computers and their associated electronic systems. As a result, there are new emerging aspects of national and international life, such as class relationships, government, economics and diplomacy, which are based upon functions of information transfer. Indeed, we are at the point where information and wealth are practically seen as one and the same thing. Information is also power which crosses both national and international boundaries with ease, depending on the sophistication and resources the country/state has at its disposal. This implies that the inhabitants of states with poor information infrastructure are most likely to be disadvantaged when dealing with matters relating to global affairs. Hence the talk about the digital divide. Information is also a social and cultural resource, raising questions such as privacy, access, commercial privilege and public interest (Watson & Hill, 1984:87).

Furthermore, the main problem with the information society is the proliferation of information. Unfortunately, too readily available information does not simply translate into a learned society. Rather, the opposite applies. Therefore it is critical that advanced educational systems be developed that help learners develop skills

of selectivity, relevancy and appropriateness when it comes to application of higher order cognitive skills (Alana, 2002).

Digital: Signals that have only two states, on and off; digital describes computers because they are electronic devices powered by electricity which also has two states: on or off (Shelly et al., 2002).

Digitisation: A process whereby print, sound, graphics and video can be converted into a digital code, i.e. series of 1's and 0's. Advantages: In storage formats, e.g. CDs and DVDs, the digitised information can be scanned and accessed with speed and accuracy not possible in analogue formats. Also the transmission of digitised information is less cumbersome than that of analogue. Digitisation has led to the convergence of media formats, thus emerging in superior media formats such as the Internet (Heinich et al., 1989:394-5) and its related Web-based technologies, e.g. portals, Virtual Learning Environment, weblog, wiki, podcast.

Information technology (IT): Microelectronics, computing + telecommunications = IT. Its formal definition is "the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications" (Watson & Hill, 1984: 87).

Information communication technology (ICT) or information telecommunications: This is seen by some (Glen, 1998) as a medium to deliver an alternative schooling. ICT comprise digital technologies, e.g. audio, radio, video, TV, DVD, electronic print, computer, teleconferencing, videoconferencing, computer conferencing, cable TV, satellite, cellphone and Internet. It is the conceptualisation of the living room as

the classroom and implies delivering education to people, instead of people to education, regardless of where that “living room” is located anywhere in the world (Glen, 1998:45).

Online learning: “Here transmission models of teaching are replaced. Learner control of navigation, resource use, and interaction become central issues. An online learning environment also encompasses the administration of courses and subjects (registry functions); accessing of resources (commercial textbooks suppliers, links of libraries, internet service providers); interactions with the delivery of courses and subjects (virtual tutorial groups, broadcast, one-to-one communications between students and between student and teacher); and accessing student support (learning support about and through the online environment). The use of these services is controlled and managed by the student, in relation to her or his particular learning needs” (Nunan, 2000:17; Bradley, 1997; Bivens, 1998; Bar & Tagg, 1995).

Instructional technology: “A complex integrated process involving people, procedures, process, ideas, devices and organisation, for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems in situations in which learning is purposive and controlled” (Heinich et al., 1989).

Interactivity: In flexible delivery this relates to immediacy of response, non-sequential access of information, adaptability of what is said, how it is said and feedback to personalise. Options for the receiver input are bi-directional communication that is exchanging positions between speaker/listener; allowing grain-size as the length of

presentation before input is required, however, excessively long grain-size stifles interaction (Borsook & Higginbotham-Wheat, 1991)

Videoconferencing: Two-way audio-video interactive telephony. It comprises use of ISDN, computer technology (codec = compression/decompression), a TV monitor, microphone, digital telephone, camera and speakers. The camera and microphone take in more information than the "pipe" or “bandwidth” can handle, so the video and audio information must be processed by a piece of equipment called the codec before it can be transmitted. Incoming signals are decoded by the codec before they are sent to the monitor and speakers. All this processing results in compromised features of picture and sound quality, especially if the bandwidth is as low as 128kbps. The compromised video is called video "ghosting" or "image softness" due to rapid information flow (Reed & Woodruff, 1995).

Point-to-point videoconferencing: Achieved when interactive videoconferencing is used to connect two locations.

Codec: Described as the core of interactive videoconferencing. Codec stands for compression/decompression. This is the electronic device that transmits compressed data (images/text/sound) and receives (decompresses) the video signals that the recipients will see on their DVC sets. Simply put, codec functions like an extremely sophisticated modem. A modem takes digital data and transmits it over regular phone lines. The codec takes analogue signals, compresses and digitises them, and transmits the signals over digital phone lines (Woodruff and Mosby, 1996 in Willis, 1997).

Point-multipoint conferencing: Some systems are also capable of simultaneously connecting more than two sites through the use of a multipoint control unit, or MCU. Multipoint conferencing can be effective although the scheduling, technical and logistical dimensions of MCU conferences can be imposing (Willis, 1997).

Multipoint conferencing: The bridge facility (MCU) allows simultaneous inter-connection of various sites at the same time. Some bridges allow simultaneous interlinking of up to 12 sites or even more. Furthermore, they allow a number of continuous presences of the connected site, while others can be seen through voice activation (that is when one of the participants talk while their site is connected.

Real time through DVC: Live two-way communication through interactive videoconferencing.

Bandwidth: The data pipe for the transmission or reception of data such as audio/video/text, graphics measured in kilobytes per second (kbps), e.g. 64kbps, 128kbps, 256kbps or 384kbps. At lower ends, such as 128kbps, video/audio quality is not at its best as at 384kbps. The highly recommended bandwidth rate is 384kbps for the standard transmission of instructional materials, with the lecturer as the driver.

8.1 Achronyms & Abbreviations

CBI Computer Based Instruction
COOL Coperative Online Learning
DVC Digital Videoconferencing
eTV Free-to-Air TV station based in South Africa
HTML Hypertext Markup Language
ICT Information Communication Technology (ies)
IRC Internet Relay Chat

ISD Institute of Staff Development
ISDN Integrated Digital Service Network
ITC Integrated Technology Centre
LMS Learning Management System
NQF National Qualification Framework
ODL Open Distance Learning
OBE Outcome Based Education
OSS Open Source Software
PDA Personal Digital Assistant
SABC South African Broadcasting Corporation, classified as public broadcaster
SASQ Self Administered Structured Questionnaire
SMS Short Message Service
SOL Student Online Learning
VLE Virtual Learning Environment

ANNEXURES

I. INTERVIEW SCHEDULE (Face-to-Face & Telephone) with Learners

Formative: DVC/COOL/SOL

Concept: This questionnaire recognises that you as a student have probably been exposed to different forms of ICT in varying degrees.

The main objectives of this questionnaire are two-pronged:

- First and foremost, it is part of the requirements for the fulfilment of the researcher's DTech degree.
- Second, it is intended to improve the effectiveness of the New Unisa's ICT models: COOL (former TSA online), SOL (former Unisa online) and DVC (former TSA's digital videoconferencing) as part of a flexible learning strategy.

These objectives can only be achieved if you give your honest response to the questions on the various forms of ICT (COOL/SOL and DVC) and give your opinion on how they can be improved to render a higher quality service to their users in future.
After completion of this study, the researcher will make the results available at the New Unisa during the course of 2005.
All ethical considerations, such as confidentiality, privacy and respect for the individual rights as they relate to you as the participant, will be observed by the researcher at all times.

1.1 What is the preferred technology (or technologies) used by the New Unisa for your courseware delivery and communication?

(**Rate 0 to 10 by ticking the appropriate column.)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
COOL/SOL					
DVC					
Printer – printed materials/handouts/ books					
Fax					
Call Centre (admin. staff)					
Telephone (lecturer/tutor)					
Audiocassette					
Videocassette					
CDs					
DVDs					
Other. Please state and rate accordingly.					

1.2 Which technology do you prefer?

(**Rate 0 to 10 by ticking the appropriate column.)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
COOL/SOL					
DVC					
Printer – printed materials/handouts/ books					
Fax					
Call Centre (admin. staff)					
Telephone (lecturer/tutor)					
Audiocassette					
Videocassette					
CDs					
DVDs					
Other. Please state _____ and rate accordingly.					

2. What do you like about the ICT-based projects COOL/SOL and DVC? Discuss each in turn:

   COOL/SOL

   _____
   _____
   _____
   _____

   DVC

   _____
   _____
   _____
   _____

3. What are their weaknesses, if any, with regard to the way they are used for flexible learning? Discuss each in turn:

   COOL/SOL

   _____
   _____
   _____
   _____

   DVC

   _____
   _____
   _____
   _____

4. What are your current uses of the two technologies?

   COOL/SOL

   _____
   _____
   _____
   _____

   DVC

   _____
   _____
   _____
   _____

5. How would you like to see the ICT-based technologies used for learning?

   _____
   _____
   _____
   _____

6. What would attract you to the use of COOL/SOL and DVC?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.)

	COOL/SOL					**DVC**				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
Interactive individual learning										
Drill and practice (CBT)										
Group discussions										
Simulation (CBT)										
Contact sessions										

Problem/critical skills										
Graphic multimedia										
Quizzes										
Essay exercise										
Interactive multimedia										
Assignments										
Results										
Administrative matters										

7. Rate the technical set-up/presentation: DVC

(Rate 0 to 10 by ticking the appropriate column.)

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
Picture					
Presenter					
Participants					
Subject relevancy					
Subject importance					
Screen design					
Screen appeal					
Human–computer interface					
Colour					
Use of buttons					
Audiovisual graphics					

8. Would you like to see any changes in the aspects mentioned?

Yes ☐
No ☐

Please elaborate:

_____
_____
_____
_____

Any suggestion(s)?

_____
_____
_____
_____

9. Does ICT-based learning contribute to your learning or not?

COOL/SOL

Yes ☐
No ☐

DVC

Yes ☐
No ☐

9.1 If YES, what percentage (%) compared to other resources? %_____

Say whether weekly or monthly.

Weekly ☐
Monthly ☐

9.2 List the courses/activities/tasks for which you use the technology in your studies.

_____
_____
_____
_____

9.3 If NO, what could be seen as the cause of such failure?

COOL/SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

10. Is there any need for learners to be given orientation/training on how to use technology (COOL/SOL/DVC) for learning?

Yes	☐
No	☐

11. How did you learn of the ICT-based technologies?

COOL/SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

12. Would you recommend COOL/SOL and DVC to any of your colleagues?

COOL/SOL		
	Yes	☐
	No	☐
DVC		
	Yes	☐
	No	☐

12.1 If YES, why?

COOL/SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

12.2 If NO, why not?

COOL/SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

13. What is your perception or experience of how the programme(s) should function?

COOL/SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

14. General comments regarding the use or lack of use of technology by the New Unisa community (learners, lecturers, tutors, administrators):

_____
_____
_____
_____

15. If the necessary changes could be made timeously to improve the ICTs (COOL/SOL and DVC), would you be interested in using these technologies for your studies in future?

Yes ☐
No ☐

16. Is use of ICTs important for your studies, career growth and future? Discuss.

_____
_____
_____
_____

17. In terms of the use of ICTs for flexible learning, out of 100%, how much would you credit the New Unisa as flexible? Give reason(s).

COOL/SOL: _____%
REASON(S):

_____
_____
_____
_____

DVC: _____%
REASON(S):

_____
_____
_____
_____

18. How flexible is it according to the essentials mentioned in this table?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.)

	COOL/SOL				**DVC**			
	Inflexible	**Slightly flexible**	**Flexible**	**Very flexible**	**Inflexible**	**Slightly flexible**	**Flexible**	**Very flexible**
Pace								
Time								
Place								
Learning require-ments								

THANK YOU SO MUCH FOR YOUR PARTICIPATION!!!

II. Academics & Tutors INTERVIEW SCHEDULE

C. Lecturers/tutors/academic tutor managers

Concept: This questionnaire recognises that you as lecturer/academic manger/tutor have probably been exposed to different forms of ICT in varying degrees.

The main objectives of this questionnaire are two-pronged:

- First and foremost, it is part of the requirements for the fulfilment of the researcher's DTech degree.
- Second, it is intended to improve the effectiveness of the New Unisa's ICT models: COOL (former TSA online), SOL (former Unisa online) and DVC (former TSA's digital videoconferencing*)* as part of a flexible learning strategy.

These objectives can only be achieved if you give your honest response to the questions on the various forms of ICT (COOL/SOL and DVC) and give your opinion on how they can be improved to render a higher quality service to their users in future.
After completion of this study, the researcher will make the results available at the new Unisa. All ethical considerations, such as confidentiality, privacy and respect for the individual rights as they relate to you as the participant, will be observed by the researcher at all times.

1. Background:

   1.1 Gender _____
   1.2 Age _____
   1.3 Lecturing/tutoring experience (in distance education) _____
   1.4 Ethnicity/race _____? **(NB These questions are optional.)**

2. Which technology do you prefer for flexible delivery?

   (**Rate 0 to 10 by ticking the appropriate column.)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
COOL/SOL					
DVC					
Printer – printed materials/handouts/ books					
Fax					
Call Centre (admin. staff)					
Telephone (lecturer/tutor)					
Audiocassette					
Videocassette					
CDs					
DVDs					
Other. Please state _____ and rate accordingly.					

   2.1 Please state the reason(s) for your choice.

   _____
   _____
   _____
   _____
   _____

   2.2 How often do you use the technology that you mentioned in 2.1?

   _____
   _____

_____
_____
_____

3. How would you rate COOL/SOL and DVC for the following roles?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.)

	COOL/SOL					DVC				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
Communicating with learners interactively										
Sending/receiving/ giving feedback to and from learners/staff										
Software tool (COOL/SOL) and its capacity										
The content available on the COOL/SOL site										
Bandwidth size										
Clear picture/audio										

4. How do you rate the overall technological strategy (flexible delivery/learning) in terms of your needs?

   4.1 Any weaknesses/positives ascribed to the integration process of the technology (COOL/SOL and DVC):

   _____
   _____
   _____
   _____
   _____

   4.2 Any strengths identified:

   _____
   _____
   _____
   _____
   _____

   4.3 Any problems:

   _____
   _____
   _____
   _____
   _____

5. If it were your decision to introduce changes about the technology:

   5.1 what would you keep the same and why?

   _____
   _____
   _____
   _____
   _____

   5.2 what would you change and why?

_____
_____
_____
_____
_____

5.3 what innovations would you like to see implemented?

_____
_____
_____
_____
_____

6. In the case where the technology was never used, what are the main reasons for it not being used?

_____
_____
_____
_____
_____

7. Does your programme group have any subject/courses loaded/conducted via the technology?

Yes ☐
No ☐

7.1 If YES, how many? _____

7.2 If NO, why not?

_____
_____
_____
_____
_____

8. How would you describe support for technological use within your programme group by:

(Tick the appropriate box.)

	Very positive	**Positive**	**Indifferent**	**Negative**	**Very negative**
Administrators/management					
Support admin.					
Lecturers/academic managers/ tutors					
Learners					

9. How would you describe your COOL/SOL and DVC capability for flexible delivery?

Low ☐
Moderate ☐
High ☐

10. How would you describe your capability of helping learners learn ICTs?

Low ☐
Moderate ☐

High ☐

11. How would you describe your learners' capability to learn through COOL and DVC?

COOL
- Low ☐
- Moderate ☐
- High ☐

DVC
- Low ☐
- Moderate ☐
- High ☐

12. In the case of the use of COOL/SOL and DVC, what would you describe as a promising situation? Discuss.

_____
_____
_____
_____
_____

12.1 What should be the way forward? Discuss.

_____
_____
_____
_____
_____

12.2 In the case of a **grim picture in the use of ICTs**, what needs to be done to improve the situation?

_____
_____
_____
_____
_____

12.3 How do you perceive the New Unisa's drive for the integration of technology for educational use? Discuss in terms of resource allocation and accountability.

_____
_____
_____
_____
_____

13. Is the description 'flexible institution through use of ICTs for education delivery or learning' suitable for the New Unisa?

COOL
- Yes ☐
- No ☐

SOL
- Yes ☐
- No ☐

DVC
- Yes ☐

No ☐

13.1 If NO, what needs to be done for the New Unisa to attain flexible status? Discuss.

_____
_____
_____
_____
_____

13.2 Any plans to have course/modules converted to technology delivery in future?

_____
_____
_____
_____
_____

13.3 What are your expectations with regard to changing to flexible delivery through COOL/SOL and DVC?

_____
_____
_____
_____
_____

14. Is role change required for the lecturer/tutor and learners when using ICT- based technologies?

COOL
Yes ☐
No ☐
SOL
Yes ☐
No ☐
DVC
Yes ☐
No ☐

Please give reason(s) for your choice:

_____
_____
_____
_____
_____

15. What is the ideal process (individual/instructional design model) that need to be followed for changing subject presentation/delivery into technological delivery mode?

_____
_____
_____
_____
_____

16. What should be done to ensure that the process of integration of ICTs for educational delivery is characterised by inclusiveness and shared interests by main stakeholders? Discuss.

_____

_____
_____
_____
_____

17. Which of the following activities would you like to see feature on COOL/SOL and DVC?

(**Rate 0 to 10 by ticking the appropriate column.)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
Peer group discussion					
Individual learning					
Contact sessions					
Reports/reviews					
Tasks/assignments					
Yearmarks					
Experiments					
Learnerships					
Orientation					
Oral interviews					
Oral exams/presentations					

18. In the development of technology-based instructional materials, I prefer the following:

Working with instructional designers	
Working in the company of subject specialists	
Working with language practitioners	
Working with technology advisors	
Working on my own, because it allows me better concentration	
Group work	
Working in a team with instructional designers, subject advisors and technology advisors	

THANK YOU SO MUCH FOR YOUR PARTICIPATION !!!

III. Instructional Designers and Developers

Face-to-Face INTERVIEW QUESTIONNAIRE

Concept: This questionnaire recognises that you as system programmer/web developer/graphic designer/DVC facilitator have probably been exposed to different forms of ICT in varying degrees.

The main objectives of this questionnaire are two-pronged:

- First and foremost, it is part of the requirements for the fulfilment of the researcher's DTech degree.
- Second, it is intended to improve the effectiveness of the New Unisa's ICT models: COOL (former TSA online), SOL (former Unisa online) and DVC (former TSA's digital videoconferencing) as part of a flexible learning strategy.

These objectives can only be achieved if you give your honest response to the questions on the various forms of ICT (COOL/SOL and DVC) and give your opinion on how they can be improved to render a higher quality service to their users in future.
After completion of this study, the researcher will make the results available at the New Unisa during the course of 2008.
All ethical considerations, such as confidentiality, privacy and respect for the individual rights as they relate to you as the participant, will be observed by the researcher at all times.

1. Background:

   1.1 Race:

Black	☐
White	☐
Indian	☐
Coloured	☐
Other	☐

   1.2 Gender _____

   1.3 Age _____

2. Experience:

   2.1 How long have you been working in multimedia (COOL) environment?
   _____

   2.2 Qualifications/experience needed to fulfil this role _____

   2.3 What other qualifications are required to develop a fully-fledged COOL/TSA online/Interactive multimedia/DVC _____

   2.4 Do you enjoy working in the multimedia environment?

Yes	☐
No	☐

   2.5 If NO, please state the reason:
   _____
   _____
   _____
   _____

3. What would you say are the strengths of COOL, SOL and DVC?

   COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

3.1 Based on these strengths, would you be willing to recommend any of the abovementioned technologies to others in distance education?

Yes ☐
No ☐

3.2 Mention fascinating/interesting aspects of the job of developing, hosting, designing or facilitating the site/conference.

_____
_____
_____
_____

4. What would you say are the drawbacks/weaknesses of COOL, SOL and DVC?

COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

4.1 How would you eliminate them?

_____
_____
_____
_____

5. How would you rate the use of technology by TSA for flexible delivery?

(Rate by ticking the appropriate column.)

	0<25%	**26%,50%**	**51%<75%**	**76%<100%**
Administrative function				
Teaching tool				
Interactive medium				

6. How important do you rate current group discussions with regard to the use of the ICTs?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.)

	COOL/SOL					DVC				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
Peer Interactions and intervention by lecturers.										
Communication with learners over administrative/academic matters.										
Human–computer Interface issues: screen appearance, font size, colour, sequence of ideas, etc. DVC accessories: data projector, doc camera, clarity of picture and voice										

6.1 If not important, what can be done to improve the situation?

_____
_____
_____
_____

6.2 If very important, briefly explain why you rate it very important.

_____
_____
_____
_____

7. What would you describe as positives brought about by the use of technology at TSA? Discuss.

_____
_____
_____
_____

7.1 What would you describe as negatives, lowering effectiveness of technology?

_____
_____
_____
_____

7.2 Describe some of the attitudes of the users of COOL, SOL and DVC.

(Tick the column that best describes your answer.)

	COOL			DVC		
	Positive	**In-between**	**Negative**	**Positive**	**In-between**	**Negative**
Administrators — senior management						
Admin. Support						
Learners						
Lecturers						

7.3 If negative, what should be done to change them?

_____
_____
_____
_____

8. How would you describe the present use of the technology?

Under-utilised	
Moderate	
Optimum	

8.1 If under-utilisation/moderate, what should be done to bring the use to optimum?

_____
_____
_____
_____

8.2 If optimum, what are factors that you would credit as responsible for successes achieved?

_____
_____
_____
_____

9. If it were your decision to introduce changes about the technology:

9.1 what would you keep the same?

_____
_____
_____
_____

9.2 what would you change?

_____
_____
_____
_____

9.3 what new innovations would you like to see introduced?

_____
_____
_____
_____

9.4 what old/new stakeholder(s) would you like to see playing a meaningful role in making effective use of technology at the New Unisa?

_____
_____
_____
_____

10. Any other suggestion to help improve the use of technology?

COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____
DVC
_____
_____
_____
_____

11. Your opinion regarding the future use of the technology for flexible delivery. Choose one statement below and comment.

"A bright future lies ahead for our learners with correct use of ICTs for their educational delivery." ☐

"The lack of correct implementation of an ICT strategy for educational delivery will worsen the problems associated with the digital divide for our learners." ☐

COMMENTS:_____
_____
_____
_____

THANK YOU SO MUCH FOR YOUR PARTICIPATION !!!

1V. Multimedia Developers and Producers

Face-to-Face INTERVIEW QUESTIONNAIRE

B. System programmers/web developers/graphic designers/videoconferencing facilitators

Concept: This questionnaire recognises that you as system programmer/web developer/graphic designer/DVC facilitator have probably been exposed to different forms of ICT in varying degrees.

The main objectives of this questionnaire are two-pronged:

- First and foremost, it is part of the requirements for the fulfilment of the researcher's DTech degree.
- Second, it is intended to improve the effectiveness of the New Unisa's ICT models: COOL (former TSA online), SOL (former Unisa online) and DVC (former TSA's digital videoconferencing) as part of a flexible learning strategy.

These objectives can only be achieved if you give your honest response to the questions on the various forms of ICT (COOL/SOL and DVC) and give your opinion on how they can be improved to render a higher quality service to their users in future.
After completion of this study, the researcher will make the results available at the New Unisa during the course of 2005.
All ethical considerations, such as confidentiality, privacy and respect for the individual rights as they relate to you as the participant, will be observed by the researcher at all times.

1. Background:

   1.1 Race:

Black	☐
White	☐
Indian	☐
Coloured	☐
Other	☐

   1.2 Gender _____

   1.3 Age _____

2. Experience:

   2.1 How long have you been working in multimedia (COOL) environment?
   _____

   2.2 Qualifications/experience needed to fulfil this role _____

   2.3 What other qualifications are required to develop a fully-fledged COOL/TSA online/Interactive multimedia/DVC _____

   2.4 Do you enjoy working in the multimedia environment?

Yes	☐
No	☐

   2.5 If NO, please state the reason:
   _____
   _____
   _____
   _____

3. What would you say are the strengths of COOL, SOL and DVC?

COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

3.1 Based on these strengths, would you be willing to recommend any of the abovementioned technologies to others in distance education?

Yes ☐
No ☐

3.2 Mention fascinating/interesting aspects of the job of developing, hosting, designing or facilitating the site/conference.

_____
_____
_____
_____

4. What would you say are the drawbacks/weaknesses of COOL, SOL and DVC?

COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____

DVC

_____
_____
_____
_____

4.1 How would you eliminate them?

_____
_____
_____
_____

5. How would you rate the use of technology by TSA for flexible delivery?

(Rate by ticking the appropriate column.)

	0<25%	**26%,50%**	**51%<75%**	**76%<100%**
Administrative function				
Teaching tool				
Interactive medium				

6. How important do you rate current group discussions with regard to the use of the ICTs?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.)

	COOL/SOL					**DVC**				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
Peer Interactions and intervention by lecturers.										
Communication with learners over administrative/academic matters.										
Human–computer Interface issues: screen appearance, font size, colour, sequence of ideas, etc. DVC accessories: data projector, doc camera, clarity of picture and voice										

6.1 If not important, what can be done to improve the situation?

_____
_____
_____
_____

6.2 If very important, briefly explain why you rate it very important.

_____
_____
_____
_____

7. What would you describe as positives brought about by the use of technology at TSA? Discuss.

_____
_____
_____
_____

7.1 What would you describe as negatives, lowering effectiveness of technology?

_____
_____
_____
_____

7.2 Describe some of the attitudes of the users of COOL, SOL and DVC.

(Tick the column that best describes your answer.)

	COOL			**DVC**		
	Positive	**In-between**	**Negative**	**Positive**	**In-between**	**Negative**
Administrators — senior management						
Admin. support						
Learners						
Lecturers						

7.3 If negative, what should be done to change them?

_____
_____
_____
_____

8. How would you describe the present use of the technology?

Under-utilised	☐
Moderate	☐
Optimum	☐

8.1 If under-utilisation/moderate, what should be done to bring the use to optimum?

_____
_____
_____
_____

8.2 If optimum, what are factors that you would credit as responsible for successes achieved?

_____
_____
_____
_____

9. If it were your decision to introduce changes about the technology:

9.1 what would you keep the same?

_____
_____
_____
_____

9.2 what would you change?

_____
_____
_____
_____

9.3 what new innovations would you like to see introduced?

_____
_____
_____
_____

9.4 what old/new stakeholder(s) would you like to see playing a meaningful role in making effective use of technology at the New Unisa?

_____
_____
_____
_____

10. Any other suggestion to help improve the use of technology?

COOL

_____
_____
_____
_____

SOL

_____
_____
_____
_____
DVC
_____
_____
_____
_____

11. Your opinion regarding the future use of the technology for flexible delivery. Choose one statement below and comment.

"A bright future lies ahead for our learners with correct use of ICTs for their educational delivery." ☐

"The lack of correct implementation of an ICT strategy for educational delivery will worsen the problems associated with the digital divide for our learners." ☐

COMMENTS:

_____
_____
_____

THANK YOU SO MUCH FOR YOUR PARTICIPATION !!!

V. Self-Administered Questionnaires (SASQ)

Focus Group Interviews with learners

Dear ALUMNUS OR LEARNER

1. You have been nominated to participate in the Focus Interview Study conducted via the VideoConferencing system about general use of ICTs for teaching and learning.

2. Kindly do note that this study comply with all the necessary guidelines and ethical considerations stipulated for studies of its nature e.g. observance of confidentiality, refraining by the researcher to use the supplied information for malicious or bodily harm purposes.

3. Your acceptance and intention to attend the planned focus interview study (planned for the 11 to 14 Sept 2006, for the duration of 1hour session, at any one of the following venues - Gauteng, Nelspruit, Middleburg, Durban, PE, East London, Umtata, Bloemfontein, Kimberly) will help to:
3.1 shape/change use of the ICTs for the educational delivery,
3.2 expose you to other forms of teaching and learning (new experience),
3.3 help to enrich or broaden educational research about use of ICTs in education, particularly Engineering or related fields

4. What do I stand to gain through my participation (you may ask): you will most likely stand to gain the following?
4.1 experience and information of what's entailed in qualitative research study, e.g. group focus interview
4.2 special experience and knowledge of the use of the cutting-edge technology, namely Digital Videoconferencing or DVC system for teaching and learning. Would this help to make your studies easier during this digital era? Participation in this study should help you to judge wisely.
4.3 help development in ICT research for academic and practical experience purposes
4.4 most likely to be rewarded through special invitation to the public release of the results pertaining to this study, and also possible invitation to seminars that may be organized as follow-up to the said study.
4.5 Last but not least, the questions and concerns that may arise during this study should be directed to the researcher Mr. Sello Sekgwelea (011)4713136, cel. 0829029734, fax (011) 4713803 email: ssekgwel@unisa.ac.za

Many thanks in anticipation

Yours faithfully,

For Dr J Van Koller
Research Supervisor

SELF-ADMINISTERED STRUCTURED QUESTIONNAIRES (SASQ for LEARNERS)

Information And Communication Technologies (ICTs) For Teaching and Learning

Dear ALUMNUS OR LEARNER

You have been nominated to participate in the Focus Interview Study conducted via the VideoConferencing system about general use of ICTs for teaching and learning. Your acceptance of this nomination will go a long in helping to:
i, shape/change use of the ICTs for the educational delivery,
ii expose you to other forms of teaching and learning (new experience),
iii help to enrich or broaden educational research about use of ICTs in education, particularly Electrical Engineering or related fields

Guidelines & Rules for DVC recorded interview led by the interviewer
Set Date and time: The study is planned to last for 1.5hours, as part of focus group interview conducted via DVC. This implies that all the participants agree to meet at selected place, at the appointed time and to participate in the scheduled interview to be recorded.

i. Anonymous, group based. Answers consensual or varied, however groups afforded opportunity to caucus/discuss suitable options or answers (reflective of group's feelings or interests).

ii It is recommended that all the questions be answered.

ii. Be assured that confidentiality will be maintained since your name does not appear anywhere in the questionnaire.

iv. Participation in the interview implies that you agree to the following conditions:

a. that your participation in this research is voluntary;

b. that the information supplied by yourself will not be used in any way to cause bodily or emotional harm or pain;

c. that the researcher(s) and their possible future publisher(s) have your permission to make the information public if such need may arise.

iv. During the interview, the researcher or his assistant will facilitate and mark the interview] schedule according to the group's responses in the appropriate boxes ("X" or "√" box).

v. Some questionnaire items, require ONE mark per item, whereas others allow several marks (X or |/)of options per question.

In the case of the Questionnaire items that require comments or elaborate answers, more time will be allowed to permit elicitation of answers or comments that might be true reflection of the groups' feelings

Positive results to accumulate to participants:

i. experience and knowledge of what's entailed in qualitative research study –group focus interview
ii. special experience and knowledge of use of the cutting technology DVC for teaching and learning
iii. help in boosting research development for academic and practical experience
iv. receive special invite for the release of the results, and possible seminars that may be organized as follow-up to the study

The overall results of the study intended to be publicized during the academic year 2008. The participants will be notified of the reports release date and even be invited to possible seminar(s) to be conducted.

vi. Enquiries or queries should be directed to Sello Sekgwelea, Unisa, Florida Campus, Tel. (011)4713136.

SECTION A: Background information

1. What is your gender? -

1	Male
2	Female

2. What is your age? -

16-20 years	1
21-25 years	2
26-30 years	3
31-35 years	4
36-40 years	5
Older than 40 years	6

3. In which year did you register for the diploma/degree at Unisa? -

2005	1
2004	2
2003	3
2002	4
2001	5
In/Before 2000	6

5. What is your home language?

6. Do you have a job at the moment? If 'No', please move directly to question A9.-

Yes	1
No	2

7. How would you classify your job?

Full-	1	time
Part-	2	time

8. Is your job related to what you are studying in terms of: **mark once in each row where applicable** -

	Disagree				Agree
content (study materials)?	1	2	3	4	5
facilities (laboratory, computer)?	1	2	3	4	5
practicals (serving articles)?	1	2	3	4	5
promotion (diploma/degree)?	1	2	3	4	5

If you marked 'Agree' on the points relating to facilities and practicals under question 8 above, skip the next question.

9. Where do you go for the study requirements for facilities and practicals? **Mark applicable options**.-

9.1 I attend special practical session(s) arranged by my	1	lecturers
9.2 Practicals and facilities are not prerequisite for my	2	coursework
9.3 Work-based practicals meet the requirements	3	
9.5 None	5	
9.6 Not sure	6	

SECTION B: Accessibility/Connectivity/Skills -

Which description matches the computer (PC) & digital videoconferencing (DVC) unit you use for learning? **Please mark all the description that match your hard/software (of PC) or DVC unit(s) you use for your studies.**

1.0 Hardware (PC):	**Mark Corresponding Number**	2.0	**DVC**	**Mark corresponding number**
1.1 Laptop	1	2.1	Tandberg/	1
1.2 Desktop	2			
1.3 Tower	3			
1.4 Pentium 1 & 2	4			
1.5 Pentium 3 & 4	5			
1.8 Windows 95/98	8			
1.9 Windows2000 or XP	9			
1.12 Media Player	12			
1.14 28.8 or 56kbps Internet connection speed	14	2.2	Picturetell	2
1.18 CD	18			
1.19 DVD	19	2.4	Aethra vega	3

2.3 I get access to computer/videoconferencing at **(Mark where applicable)**: -

	Computer	Videoconferencing (DVC)
2.3.1 HOME	1	1
2.3.2 WORK	2	2
2.3.4 FAMILY/ FRIEND	4	4
2.3.5 REGIONAL OFFICE	5	5
2.3.6 INTERNET CAFÉ	6	6
2.3.7 UNISA STUDY CENTRE	7	7
2.3.8 LIBRARY	8	8
2.3.9 Other (please specify)	9	9

4. Are you registered with myUnisa? - YES | | NO | |

5. My experience in using online & DVC materials can be described as… **Choose one.**

Description	COOL/SOL	DVC
5.1.1 Limited	1	1
5.1.2 Below Average	2	2
5.1.3 Average	3	3
5.1.4 Above Average	4	4
5.1.5 Advanced	5	5

6. If you were to choose between my Unisa, or DVC, or my Unisa and DVC combination, what would you choose? Discuss ……..

SECTION C: General use of ICTs for flexible learning

1. Rate the efficiency rate of technology used for the delivery of your courseware by **marking the appropriate column, once per item..** -

Scale **(0–2 = Unimportant; 3–4 = Less Important; 5–6 = Important; 7–8 = More Important; 9–10 = Most Important)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
1.1 COOL/SOL	1	2	3	4	5
1.2 DVC	1	2	3	4	5
1.3 Printer – printed materials/handouts/ books	1	2	3	4	5
1.4 Fax	1	2	3	4	5
1.5 Call Centre (admin. staff)	1	2	3	4	5
1.6 Telephone (lecturer/tutor)	1	2	3	4	5
1.7 Audio cassette	1	2	3	4	5
1.8 Video cassette	1	2	3	4	5
1.9 CDs	1	2	3	4	5
1.10 DVDs	1	2	3	4	5
1.11 Other: _____ (Rate accordingly)	1	2	3	4	5

2. Describe how often do any of the following technologies used for delivery of your courseware.

Technology	Rarely	Below average	Average	Above average	Often
COOL/SOL	1	2	3	4	5
DVC	1	2	3	4	5

2.1 If you chose "often", state the reason……..
2.2 If you chose "rarely", state the reason. ……..

5. What do you like about the ICT-based projects COOL/SOL and DVC? Which -statement(s) represent(s) your feelings? **Choose all applicable options.**

5.1 COOL/SOL

5.1.1 like getting information at my own time and place.	1
5.1.2 I like online group discussions for they enhance learning	2
5.1.5 I prefer more of live contact session with lecturers than ICT-based modules.	5
5.1.7 None of the above	7
5.1.8 Not sure	8

5.2 DVC -

5.2.1 I like using this type of technology for group interactions.	1
5.2.3 It helps to reduce traveling, time and costs.	3
5.2.6 None of the above	6
5.2.7 Not sure	7

6. What are your current uses of these technologies (COOL/SOL & DVC)? **Mark all applicable options.-**

6.1 COOL/SOL plays important role in

1

6.1.1 Exam dates and changes in venues	2
6.1.2 Asking the questions as follow-up to hand-outs	3
6.1.3 Keeping up online discussion with peers & lecturers	6
6.1.6 None of the above.	7
6.1.7 Not sure	

6.2 DVC's role is important in

6.2.1 Covering problem areas with the guidance of lecturer/tutor in DVC session	1
6.2.2 Preparation for examination session	2
6.2.5 None of the above.	5
6.2.6 Not sure	6

7. What are the problems, if any, with regard to the way COOL/SOL, DVC and other technologies are used for flexible learning? -

7.1 COOL/SOL

7.1.1 Not enough academic information	1
7.1.2 Access not easy off-campus	2
7.1.3 Only FAQs – no academic quiz	3
7.1.5 None of the above.	5
7.1.6 Not sure	6

7.2 DVC

7.2.1 Group studies via DVC are intimidating	1
7.2.2 Team effort is needed for the success of DVC session	2
7.2.3 Sometimes connection is problematic	3
7.2.6 None of the above.	6
7.2.7 Not sure	7

9. How would you like to see ICTs used for your course delivery? **Mark all applicable options.**

9.1 Government and Telkom need to establish cheaper rates for educational institutions.	1
9.2 Establish Unisa local cybernet branches.	2
9.3 DVC is fine after hours and over weekends as DE learners work during the week.	3
9.5 None of the above.	5
9.6 Not sure	6

10. How much would you like to see technology being used according to the following activities for the delivery of your courses? **Mark once per each activity (that is, twice per line, according to Online & DVC) -**

(0 = not at all; 5-6 = quite a lot; 9-10 = very extensively)

ACTIVITIES	**COOL/SOL**					**DVC**				
	0–2	**3-4**	**5-6**	**7-8**	**9-10**	**0-2**	**3–4**	**5–6**	**7–8**	**9–10**
10.1 Interactive individual learning	1	2	3	4	5	1	2	3	4	5
10.2 Practicals	1	2	3	4	5	1	2	3	4	5
10.3 Group discussions	1	2	3	4	5	1	2	3	4	5
10.4 Simulation (CBT)	1	2	3	4	5	1	2	3	4	5
10.5 Problem/critical skills	1	2	3	4	5	1	2	3	4	5
10.6 Quizzes	1	2	3	4	5	1	2	3	4	5
10.7 Essay exercise	1	2	3	4	5	1	2	3	4	5

10.8 Assignments	1	2	3	4	5	1	2	3	4	5
10.9 Results	1	2	3	4	5	1	2	3	4	5
10.10 Administrative matters	1	2	3	4	5	1	2	3	4	5

11. Does ICT-based learning contribute to your learning or not? -

COOL/SOL		DVC	
Yes	1	Yes	1
No	0	No	0

12. If you answered "YES", estimate the percentage (%) it contributes compared to other resources. _____% (for both COOL/SOL & DVC)

13. Would you recommend COOL/SOL and DVC to any of your colleagues? **Choose one answer for each technology.-**

COOL/SOL		DVC	
Yes	1	Yes	1
No	0	No	0

14. If YES, why?

14.1.0 I recommend COOL/SOL & DVC because: **mark all options that are applicable** -

14.1.1 it makes communication easier with others.	1
14.1.2 you can learn wherever you are.	2
14.1.3 technology-based studies are easy to pass.	3
14.1.6 None of the above.	6
14.1.7 Not sure	7

14.2 If NO, why not?

14.2.1 There is a general lack of use of COOL/SOL & DVC by the educational community because: (**Please tick options below that reflect your views**) -

14.2.1 there is lack of community awareness campaigns for using technology	1
14.2.2 Use of COOL/SOL & DVC causes digital divide as many learners do not have access to the right technology	2
14.2.3 ICT users must be familiar with the technology so that they can achieve optimal results.	3
14.2.5 None of the above.	5
14.2.6 Not sure.	6

15. As the 21 century DE learner, is there need for use of ICTs for teaching and learning? Please give your general feelings ……

Thank you so much for your time and participation!!

VII. SASQ -Academics and Tutors

Guidelines & Rules

i. Please answer all the questions.

ii. Be assured that confidentiality will be maintained since your name does not appear anywhere on the questionnaire.

iii. Filling-in this questionnaire implies that you agree to the following conditions:

a. that your participation in this research is voluntary;

b. that the information supplied by yourself will not be used in any way to cause bodily or emotional harm or pain;

c. that the researcher has your permission to make the information public if such need arise.

iv. Please draw an "X" or even a tick " √" in the appropriate box.

v. Some questionnaire items, require ONE tick per item, whereas others allow several ticking of options per question.

vi. Enquiries or queries should be directed to Sello Sekgwelea, ICT, Unisa Florida Campus, Room E326. Tel. (011)4713136.

SECTION A: Background information

1. What is your gender? **Choose one answer per question.**

1.1	Male	1
1.2	Female	2

2. What is your age?

2.1	≤30 years	1
2.2	31-35 years	2
2.3	36-40 years	3
2.4	41-45 years	4
2.5	46-50 years	5
2.6	51-55 years	6
2.7	≤56 years	7

3. What is your home language?

1
2
3
4
5
6
7
8
9
10

11
12

3.1 English
3.2 Afrikaans
3.3 Setswana
3.4 Sepedi
3.5 Sesotho
3.6 isiZulu
3.7 isiNdebele
3.8 Tshivenda
3.9 Xitsonga
3.10 isiXhosa
3.11 siSwati
3.12 Other (please specify)
.....

4. What is your area of specialisation as a lecturer in Engineering? **Choose (Plse fill in your specialized field under Other if your area of specialization is not Engineering).**
4.1 Chemical Eng.__; 4.2 Civil Eng.__; 4.3 Electrical Eng __; 4.4 Electronic __;
4.5 Mechanical __; 4.6 Mining __
Other ……..

5. How many students are registered for your course(s)?

5.1 0-50__ ; 5.2 51-100__; 5.3 101-150__; 5.4 151-200__; 5.5 201-250__; 5.6 251>__

6. How many tutors are assigned to the course (s) you teach (where applicable)?
_____

7. How many online courses do you teach? _____

8. Is there any aspect of the course(s) delivered through DVC? **Choose one.**
8.1 YES_1__ 8.2 NO_2_

9. I have the skills and knowledge to use the following forms of electronic communication. **Tick all that apply:**

9.1 Email	1
9.2 Chat	2
9.3 Mailing lists	3
9.4 Two-way video	4
9.5 Newsgroups	5
9.6 Discussion boards	6
9.7 None of the above.	7

10. How proficient are you at Internet searching? **Mark all that apply.**

10.1 I don't know how to search for resources on the World Wide Web.	1
10.2 I can browse the World Wide Web but have limited strategies for locating new resources.	2
10.3 I can use search engines to construct simple keyword and menu-driven searches. I can usually locate information but not always efficiently.	3
10.4 I can quickly and efficiently locate information on the Web using a variety of strategies.	4
10.5 I can quickly and efficiently locate information on the Web using a variety of strategies, and often serve as a resource to others.	5

SECTION B: General use of technology

1. Which technology(ies) do you prefer for flexible delivery? **Choose and rate accordingly.**

Scale **0-2: Unimportant; 5-6 Important; 9-10 Most Important**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
1.1 COOL/SOL	1	2	3	4	5
1.2 DVC	1	2	3	4	5
1.3 Printer – printed materials/handouts/ Books	1	2	3	4	5
1.4 Fax	1	2	3	4	5
1.5 Call Centre	1	2	3	4	5
1.6 Telephone	1	2	3	4	5
1.7 Cellular phone	1	2	3	4	5
1.8 SMS-ing	1	2	3	4	5
1.9 Satellite	1	2	3	4	5
1.10 Audio cassette	1	2	3	4	5
1.11 Video cassette	1	2	3	4	5
1.12 CDs	1	2	3	4	5
1.13 DVDs	1	2	3	4	5
1.14 Other: _____ (Rate accordingly)	1	2	3	4	5

2.1 Please state the reason(s) for your preferences.

_____
_____

2.2 How often do you use the technology(ies) that you mentioned in 2.1? **Choose one.**
2.2.1 daily__; 2.2.2 weekly__; 2.2.3 bi-monthly__; 2.2.4 quarterly__; 2.2.5 annually__

3. How would you rate COOL /SOL and DVC for the following roles? **Choose two per row.**

(0-2 = Unimportant; 5-6 = Important; 9-10 = Most Important)

	COOL/SOL					**DVC**				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
3.1Communicating with learners interactively	1	2	3	4	5	1	2	3	4	5
3.2 Sending/receiving/ giving feedback to and from learners/staff	1	2	3	4	5	1	2	3	4	5
3.3 Presentation tool and its capacity	1	2	3	4	5	1	2	3	4	5
3.4 Conducting contact sessions and revision	1	2	3	4	5	1	2	3	4	5

4. What are the significant aims/objectives of using technology

for teaching and learning (flexible delivery/learning) in terms of learner needs? **Choose statement(s) that agree with your feelings.**

4.1 Provision of quality education
4.2 Improve learner's communication capacity and skills
4.3 Excellent medium for revision and examinations
4.4 Remove distance as barrier
4.5 None of the above.
4.6 Not sure

1
2
3
4
5
6

5. What are the strengths/benefits associated with the ICTs?

5.1 COOL/SOL is excellent; it is especially designed for the needs of Unisa students.
5.2 All the learners enjoy the live interactions, demonstrations and explanations through DVC.
5.3 COOL/SOL encourages students to use/surf the Internet.
5.4 As an administrative tool, it enables students to access their biographical information and records.
5.5 None of the above.
5.6 Not sure

1
2
3
4
5
6

6. What are the weaknesses/disadvantages of the ICTs? **Choose most applicable options.**

6.1 Logging in from home can sometimes be problematic.
6.2 Lack of computers & DVC means no access.
6.3 Unisa's ICT system is well-advertised
6.4 My academic department is reluctant to use the technology because of the cost involved.
6.5 None of the above.
6.6 Not sure

1
2
3
4
5
6

7. If it were your decision to introduce changes in the ICT technology, what would you change?

7.1 I would improve the teaching and the communication aspects of COOL/SOL to render it a more reliable source of knowledge.
7.2 The content arrangement, look and feel of the website are fine but do need revamping.
7.3 Change booklist or design to reflect exactly what is available online
7.4 Different experts need to co-operate for the project to be successful.
7.5 None of the above
7.6 Not sure

1
2
3
4
5
6

8. Which new ideas would you like to see implemented in the new ICT-based system?

1
2
3
4

8.1 Interactive modules loaded, e.g. practice exercises/problems with solutions	5
8.2 Inclusion of study letters and tutorials	6
8.3 Delete big files/folders that slow down online site	
8.4 More uploading of relevant interactive content	
8.5 None of the above	
8.6 Not sure	

9. In the case where the technology has never been used, what are the possible main reasons for not using it?

9.1 The inaccessibility of the students to the technological site and high costs;	
9.2 Most of the students did not register with COOL/SOL	
9.3 COOL/SOL & DVC strategies not well advertised to Unisa community	
9.4 None of the above.	
9.5 Not sure	

10. How would you describe your COOL/SOL and DVC capability in terms of knowledge and application for flexible delivery? **Choose one answer per question.**

10.1 Low	1
10.2 Moderate	2
10.3 High	3

11. How would you describe your capability of helping learners to learn about ICTs?

11.1 Low	1
11.2 Moderate	2
11.3 High	3

12. How would you describe your learners' capability (in terms of access, use of ICTs, affordability) to learn through COOL and DVC?

12.1 COOL/SOL		
12.1.1	Low	1
12.1.2	Moderate	2
12.1.3	High	3
12.2 DVC		
12.2.1	Low	1
12.2.2	Moderate	2
12.2.3	High	3

13. In the case of the use of COOL/SOL and DVC, what would you describe as an ideal situation? **Choose applicable items.**

13.1 Getting feedback from my students who have access to ICTs	1
13.2 Getting more students to register for COOL/SOL and seeing them use it for learning	2
13.3 Improved exam performance when the students use the ICT tools	3
13.4 None of the above.	4
13.5 Not sure	5

SECTION C

1. What should be the way forward? **Choose statement(s) that agree with your views.**

1.1 Update online materials from time to time.	1
1.2 Conduct more general awareness campaigns among whole Unisa community about the use of ICTs.	2
1.3 Students, lecturers and administrative staff should get training on how to use ICTs.	3
1.4 Raise money to buy more ICTs (software/hardware).	4
1.5 None of the above.	5
1.6 Not sure	6
	6

2.0 Is the description 'flexible institution through use of ICTs for education delivery or learning' suitable for the new Unisa? **Choose one answer per each technology.**

2.1. COOL		
2.1.1	Yes	1
2.1.2	No	0
2.2.1 SOL		
2.2.2	Yes	1
2.2.3	No	0
2.2.3 DVC		
2.2.3.1	Yes	1
2.2.3.2	No	0

3. Do you have any plans to have your courses/modules converted to technology delivery in future (if not yet done)?
   3.1 Yes__ or 3.2 No __

4. Is a role change required of the lecturer/tutor and learner when using ICT-based technologies? How do you see their different roles? **Give one answer per item.**

	YES	NO
4.1.1 I see the lecturer/tutor acting more as a facilitator than as a source of knowledge.	1	0
4.2 I see learners adopting more active role in the search for knowledge.	1	0

5. Which of the following activities would you like to see feature on COOL/SOL and DVC? **Rate according to how strongly you feel they should be featured, but once per activity.**

	Unimportant			Important	Most Important
Activities	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
5.1 Peer group discussion	1	2	3	4	5
5.2 Individual learning	1	2	3	4	5
5.3 Contact sessions	1	2	3	4	5
5.4 Reports/reviews	1	2	3	4	5
5.5 Tasks/assignments	1	2	3	4	5
5.6 Yearmarks	1	2	3	4	5
5.7 Experiments	1	2	3	4	5
5.8 Learnerships	1	2	3	4	5
5.9 Orientation	1	2	3	4	5
5.10 Interactive lessons	1	2	3	4	5
5.11 Modelling	1	2	3	4	5
5.12 Practical examples	1	2	3	4	5

5.13 Simulations	1	2	3	4	5
5.14 Exercises/Tests and model answers	1	2	3	4	5
5.15 Oral interviews	1	2	3	4	5
5.16 Oral exams/presentations	1	2	3	4	5

6. In the development of technology-based instructional materials, I prefer the following: **Mark all the applicable options**

6.1 Working with instructional designers	1
6.2 Working in the company of subject specialists	2
6.3 Working with language practitioners	3
6.4 Working with technology advisors	4
6.5 Working on my own, because it allows me better concentration	5
6.6 Group work	6
6.7 None of the above	7
6.8 Not sure	8

7. Based solely on strong performance in your institution's assessments of use of ICTs for flexible delivery, how

confident would you be that a student would be prepared to live, learn and work in the 21st century? **Choose one**

7.1 Not very confident	1
7.2 Slightly confident	2
7.3 Fairly confident	3
7.4 Moderately confident	4
7.5 Very confident	5

8. What types of content are available on your institutional network or intranet? T**ick/mark all options that are applicable.**

8.1 Our institution does not have a network or intranet.	1
8.2 Library collections	2
8.3 Periodical (magazine) databases	3
8.4 Other curriculum-related databases	4
8.5 Distance learning content	5
8.6 Online lessons supporting the curriculum	6
8.8 None of the above.	8
8.9 Not sure	9

THANK YOU VERY MUCH FOR YOUR TIME AND PARTICIPATION!!

VII. SASQ Designers and Developers of Content (Academic Support)

Guidelines & Rules

i. Please answer all the questions.
ii. Be assured that confidentiality will be maintained since your name does not appear anywhere on the questionnaire.
iii. Filling-in this questionnaire implies that you agree to the following conditions:
   a. that your participation in this research is voluntary;
   b. that the information supplied by yourself will not be used in any way to cause bodily or emotional harm or pain;
   c. that the researcher(s) has your permission to make the information public if such need may arise.
iv. Please draw an "X" or even a tick " /" in the appropriate box.
v. Some questionnaire items require ONE mark per item, whereas others allow several marks per question.
vi. Enquiries or queries should be directed to Sello Sekgwelea, ICT, Unisa Florida Campus, Room E326. Tel. (011)4713136.

SECTION A: Background information

Please mark one option per question.

1. What is your gender?

1.1	Male	1
1.2	Female	2

2. What is your age?

2.1	<30 years	1
2.2	31-35 years	2
2.3	36-40 years	3
2.4	41-45years	4
2.5	46-50 years	5
2.6	51-55years	6
2.7	>56years	7

3. What is your home language?

1
2
3
4
5
6
7
8
9
10
11

12

3.1 English
3.2 Afrikaans
3.3 Setswana
3.4 Sepedi
3.5 Sesotho
3.6 isiZulu
3.7 isiNdebele
3.8 Tshivenda
3.9 Xitsonga
3.10 IsiXhosa
3.11 SiSwati
3.12 Other (please specify)
.....

5. What is the role to be fulfilled by the instructional designer in developing multimedia-based course(s)? **Choose all applicable options.**

5.1 Mainly an advisorial and guidance role in design and development of courses	1
5.2 Act as consultant to the role-players developing educational media	2
5.3 Evaluate ICT-based programmes for their effectiveness in teaching and learning	3
5.5 None of the above.	5
5.6 Not sure	6

6. What would you say are the strengths of COOL/SOL and DVC? **Choose**

6.1 Flexibility in delivery and learning	1
6.2 Learners, academics and administrators interact freely over the use of information, with ICTs as the vehicle (in communication)	2
6.3 Learner's role of active participation in search of qualitative learning and the academic's role of facilitation are enhanced	3
6.4 It gives users choice in terms of medium of communication	4
6.6 None of the above	6
6.7 Not sure	7

7. What are some interesting aspects of designing and developing the web site (as in COOL/SOL)? **Choose:**

7.1 Use of project approach forces one to meet clients from different background	1
7.2 Liaising and consulting with different stakeholders in development of individual project is easy	2
7.3 Ensuring that content, methodologies and technology used in the right proportion in flexible delivery is quite challenging	3
7.5 None of the above	5
7.6 Not sure	6

8. What would you say are the drawbacks/weaknesses of COOL, SOL and DVC?

1
2

8.1 Weak ineffective promotion campaigns	3
Lack of ownership of technology by users	4
8.3 Very expensive technology, e.g. DVC	5
8.4 Resistance by the users to adopt use of technology	6
8.5 Lack of access by the learners	7
8.6 None of the above.	
8.7 Not sure	

B1.0 How would you describe the present use of the technology? **Choose one.**

1.1 Under-utilised	1
1.2 Moderately used	2
1.3 Fully or optimally utilised	3
1.4 Not sure	4

B2.0 If underutilised or moderately used, what should be done to ensure optimal use?
Mark all applicable options.

2.1 Positive campaign for the use of technology to all stakeholders	1
2.2 Encourage and provide incentives for the learners to use technology	2
2.3 Encourage lecturers and ICT media developers to work together in producing materials for ICTs	3
2.4 Update all the technology-based courseware	4
2.5 None of the above.	5
2.6 Not sure	6

B3.0 If optimally used, what are the factors that you would credit as being responsible for the successes achieved?

3.1 Best and relevant use of online and DVC technologies	1
3.2 Dedicated learners and their lecturers communicate via ICTs	2
3.3 There is less dependence on paper-based hand-outs	3
3.4 All of the above.	4
3.5 None of the above.	5
3.6 Not sure	6

4.0 If it were your decision to introduce changes relating to the current technology, What would you keep the same?

4.1 I would keep SOL/COOL and DVC the same.	1
4.2 I would keep only COOL the same.	2
4.3 I would keep only DVC the same.	3
4.4 I would keep only SOL the same.	4
4.6 None of the above.	6
4.7 Not sure	7

5.. If it were your decision to introduce changes relating to the technology, what would you change?

5.1 I would change SOL/COOL and DVC 1
5.2 I would like to see immediate feedback from the lecturers (same-day response) 2
5.3 I would like to see more interaction between students and their peers, as well as 3
5.4 More effective use of ICTs would probably help to reduce high failure rate.
5.6 None of the above. 4
5.7 Not sure 6
7

B6. Which old/new stakeholder(s) would you like to see playing a more meaningful role in making effective use of technology at the new Unisa?

6.1 All the academics should make sure that content and methodologies are up to date and relevant. 1
6.2 Administrative staff should ensure that learners' academic and administrative records are up to date. 2
6.3 Learners must be active choosers and recipients of content through technology. 3
6.4 Naturally media developers should be allowed to play more critical role 4
6.5 All of the above. 5
6.6 None of the above. 6
6.7 Not sure 7

B7.0 Do you have any other suggestions to help improve the use of technology?
7.1 COOL/SOL: ……..
7.2 DVC: …….

B8.0 Which old/new stakeholder(s) would you like to see playing a more meaningful role in making effective use of technology at the new Unisa?

8.1 All the academics should make sure that content and methodologies are up to date and relevant. 1
8.2 Administrative staff should ensure that learners' academic and administrative records are up to date. 2
8.3 Learners must be active choosers and recipients of content through technology. 3
8.4 Naturally media developers should be allowed to play more critical role 4
8.5 All of the above. 5
8.6 None of the above. 6
8.7 Not sure 7

B9.0 Do you have any other suggestions to help improve the use of technology?
9.1 COOL/SOL: ……..
9.2 DVC: …….

C1.0 What innovations would you like to see introduced? **Mark all applicable options.**

1.1 More use of interactive multimedia for teaching and learning 1
1.2 More participation of lecturers/tutors online when users require their input/help 2
1.3 More online exercises encouraging exchanges of ideas between the learner peer group and their lecturers 3
1.4 All of the above. 4
1.5 None of the above. 5
1.6 Not sure 6

C2.0 What is your opinion regarding the future use of technology for flexible delivery? **Mark all applicable statements below.**

2.1 "A bright future lies ahead for our learners with access to correct use of ICTs for their educational delivery."	1
2.2 "The lack of correct implementation of an ICT strategy for educational delivery will worsen the problems associated with the digital divide for The learners."	2
2.3 " Access alone without appropriate and relevant implementation strategy will not render successful results."	3
2.4 All of the above.	4
2.5 None of the above.	5
2.6 Not sure	6

Thank you so much for your Support and Participation!

IX. SASQ Multimedia Developers & Co-ordinators

Guidelines & Rules

i. Please answer all the questions.

ii. Be assured that confidentiality will be maintained since your name does not appear anywhere on the questionnaire.

iii. Filling-in this questionnaire implies that you agree to the following conditions:

a. that your participation in this research is voluntary;

b. that the information supplied by yourself will not be used in any way to cause bodily or emotional harm or pain;

c. that the researcher(s) and their publisher(s) have your permission to make the information public if such need may arise.

iv. Please draw an "X" or even a tick "√" in the appropriate box.

v. Some questionnaire items, require ONE tick per item, whereas others allow several ticking of options per question.

vi. Enquiries or queries should be directed to Sello Sekgwelea, ICT, Unisa Florida Campus, Room E326. Tel. (011)4713136.

SECTION A: Background information

Please CHOOSE/MARK one option per question.

1. What is your gender?

1.1	Male	1
1.2	Female	2

2. What is your age?

2.1	≤30 years	1
2.2	31-35 years	2
2.3	36-40 years	3
2.4	41-45 years	4
2.5	46-50 years	5
2.6	51-55 years	6
2.7	≥56years	7

3. What is your home language?

3.1	English	1
3.2	Afrikaans	2
3.3	Setswana	3
3.4	Sepedi	4
3.5	Sesotho	5
3.6	isiZulu	6
3.7	isiNdebele	7
3.8	Tshivenda	8
3.9	Xitsonga	9
3.10	IsiXhosa	10
3.11	SiSwati	11
3.12	Other	12

(please specify) .....

SECTION B: Online, network and DVC infrastructure and support

1. **Do students participate in online or DVC distance learning opportunities in your institution? CHOOSE ONE.**

1.1 We do not have proper technology support system.	1
1.2 It is not proactive.	2
1.3 Somewhat proactive	3
1.4 Extremely proactive	4

2. If your institution network/DVC/satellite broadcasts fail (**please underline whichever is applicable**), how long does it typically take to restore services?

2.1 Never fails	1
2.2 Minutes	2
2.3 Hours	3
2.4 Days	4
2.5 Unpredictable	5

3.0 How adequate is technical support for your institution's video service, including videoconferencing, digital video satellite and broadcast services? **Choose one**

3.1 We have no video support	1
3.2 We are poorly supported.	2
3.3 Support is fair.	3
3.4 We are well supported.	4
3.5 Support is exemplary.	5

1
2
3
4
5

4. How adequate is software support in your institution, including workstation software installation, configuration, upkeep, user training, help desk and troubleshooting?

4.1 We have no software support.

4.2 We are poorly supported

4.3 Support is fair.

4.4 Support is excellent.

4.5 Support is more advanced.

5. In terms of use of technologies for flexible delivery, how does your institution compare to its competitors? How adequate are your online and DVC support services in your institution?

	COOL/SOL	DVC
5.1 We have no proper technology.	1	1
5.2 We are poorly supported.	2	2
5.3 Support is fair.	3	3
5.4 We are well supported.	4	4
5.5 Support is exemplary.	5	5

8.0 **Choose role(s)** that you currently play/perform as ICT media specialist.

- ***Software Application***

8.1 Web designer	1
8.2 Multimedia programmer	2
8.3 DIT	3
8.4 DVC Facilitator	4
8.5 Other ……..(specify)	5
8.6 Not sure.	6

9. What role does a fully qualified media developer fulfill? **Choose applicable options**

1
2
3
4
5

6

9.1 Knowledge and understanding of multimedia and their products
9.2 Use of different application software such as flash, Adobe, Photoshop
9.3 Programming experience (system & design methodology)
9.4 Web experience, networking skills & graphic design
9.5 None of the above.
9.6 Not sure

10. What would you say are the strengths of COOL, SOL and DVC in flexible delivery? **Choose applicable options**

10.1 The strengths of COOL/SOL are:
10.1.1 It offers students the opportunity to see their financial (admin) and performance (academic) records . 1
10.1.2 It provides learners with choice of access through 24-hrs availability. 2
10.1.3 It provides an alternative resource to lecturers and hand-outs. 3
10.1.4 Learning is made easy through use of animations, graphics, video clips and prompts in content presentation. 4
10.1.5 None of the above. 5
10.1.6 Not sure 6

10.2 The strengths of DVC are:
10.2.1 Helps to provide real-time contact session 1
10.2.2 It makes learning easy 2
10.2.3 Life, real-time and interactive sessions are interesting 3
10.2.4 It cuts down costs related to transport; thus saves time 4
10.2.5 None of the above. 5
10.2.6 Not sure 6

11. What are some interesting aspects of designing, developing, and hosting the website? **Choose applicable options**

11.1 Website development application is an interesting activity that allows the user to understand information more easily if done correctly. 1
11.2 Proper and relevant use of the ICTs increases students' understanding of difficult concepts. 2
11.3 Appropriate use of graphics, motion pictures and symbols make communication much more effective. 3
11.4 None of the above. 4
11.5 Not sure 5

12. What are some of the weaknesses emanating from the wrong use of COOL, SOL and DVC? **Choose applicable options**

12.1 COOL or SOL:

12.1.1 It does not cater for the students' holistic needs. ***1***
12.1.2 Learning is not necessarily made easier through use of graphics, animation, video clips. 2
12.1.3 Lack of training and marketing are the main drawbacks. ***3***
12.1.4 None of the above. ***4***
12.1.5 Not sure ***5***

12.2. DVC: **Choose applicable options**

1
2
3
4
5

12.2.1 Lack of capacity is the main drawback.
12.2.2 It is a costly technology to implement and sustain.
12.2.3 Old and outdated units tend to have many faults.
12.2.4 None of the above.
12.2.5 Not sure

13. How would you rate the current use of technology by Unisa for flexible delivery?
Rate by ticking the appropriate column.

	Un-Important	Less Important	Important	More mportant
Current Uses	**0<25%**	**26%<50%**	**51%<75%**	**76%<100%**
13.1 Administrative function	1	2	3	4
13.2 Teaching tool	1	2	3	4
13.3 Interactive medium With sufficient content	1	2	3	4

14.0 What would you regard as the proper and relevant use of technology in line with flexible delivery?

	Unimportant	Less Important	Important	More Important
Relevant Uses	**0<25%**	**26%,50%**	**51%<75%**	**76%<100%**
14.0.1 Administrative function	1	2	3	4
14.0.2 Teaching tool	1	2	3	4
14.0.3 Interactive medium with sufficient content	1	2	3	4

15.0 How important do you rate current group discussions with regard to the use of the ICTs? **Rate by ticking the appropriate column.**

(0-2 =Unimportant; 5-6 = Less Important ; 7-8 = Important; 9-10 = More important

	COOL/SOL					DVC				
	0–2	**3–4**	**5–6**	**7–8**	**9–10**	**0–2**	**3–4**	**5–6**	**7–8**	**9–10**
15.1.1 Peer interactions and intervention by lecturers	1	2	3	4	5	1	2	3	4	5
15.1.2 Communication with learners over administrative /academic matters	1	2	3	4	5	1	2	3	4	5
15.1.3 Real-time communication;	1	2	3	4	5	1	2	3	4	5
15.1.4 Socialisati-on medium	1	2	3	4	5	1	2	3	4	5
15.1.5 Immediate Feedback	1	2	3	4	5	1	2	3	4	5

17. How would you describe the present use of the technology at Unisa? **Choose one**

17.1 Underutilised [1]

17.2 Moderately used	2
17.3 Optimally used	3
17.4 Not sure	4

18. If underutilised/moderately used, what should be done to ensure optimal use? **Choose applicable options.**

18.1 There is a need for more communication about use of ICTs for education.	1
18.2 More research need to be conducted and shared by learners, users and academics.	2
18.3 ICT users must be proactive and create their own projects while using other people's creations (products) as a basis to improve use of the technology.	3
18.4 Educate different stakeholders about the important role of technology in education.	
18.5 None of the above.	4
18.6 Not sure	5
	6

19. If it were your decision to introduce changes in the use of technology, what would you change? **Choose applicable options.**

19.1 Acquire the right and relevant resources (human and hardware) at the right time	1
19.2 Use the best of both COOL & SOL when the time comes to develop a superior system.	2
19.3 Both academic and administrative aspects of the online technology require redress of the weaknesses before further use.	3
19.4 None of the above.	4
19.5 Not sure	5

20. What innovations would you like to see introduced? **Choose applicable options.**

20.1 Get rid of the outdated aspects of current technology while introducing new hardware and software.	1
20.2 New content and approaches need to be tried and tested with relevant stakeholder groups before full-scale implementation.	2
20.3 Use more of a multimedia approach.	3
20.4 None of the above.	4
20.5 Not sure	5

21 In your opinion, do the application of ICTs (COOL/SOL and DVC) facilitate and enhance flexible learning as planned by Unisa? **Choose one**

21.1 YES	1
21.2 NO	0

THANK YOU SO MUCH FOR YOUR TIME AND PARTICIPATION!

X. **FOCUS GROUP INTERVIEWS 1 & 2 with LEARNERS**

STRUCTURED QUESTIONNAIRE – Information And Communication Technologies (ICTs) For Teaching and Learning

ALUMNUS OR STUDENT

Concept: Teaching and learning in distance education (DE) continue to undergo major changes due to the need for excellence. Apart from printed lectures and textbooks, DE is also delivered through many forms of Information Communication Technologies (ICTs), for example, web-based (e.g. COOL or SOL, lately, myUnisa) and digital videoconferencing (DVC), radio, Interactive TV, to mention but a few. When the different forms of technology are computer-based, the approach is known as multimedia, for example, compact disc (CD) containing written information, sound and video materials.

Sometimes these forms of technology are used independently, e.g. audio/videocassettes, CDs, COOL or DVC, resulting in a mixed approach or blended learning when integrated with a live, interactive presentation. It looks like the more global communities venture into the digital period, the more teaching and learning in DE will be unthinkable without use of ICTs.

As recipients and beneficiaries of learning, the learners do frequently become exposed to different forms of technology. As such the learners do develop a sense of appreciation for the use of the ICTs in education. It is for this reason that you as a learner are requested to help plan for appropriate and relevant usage of ICTs for teaching and learning, by providing information to the question items as stipulated in this questionnaire.

Guidelines & Rules

i. Please answer all the questions.

ii. Be assured that confidentiality will be maintained since your name does not appear anywhere on the questionnaire.

iii. Filling-in this questionnaire implies that you agree to the following conditions:

a. that your participation in this research is voluntary;

b. that the information supplied by yourself will not be used in any way to cause bodily or emotional harm or pain;

c. that the researcher(s) and their publisher(s) have your permission to make the information public if such need may arise.

iv. Please draw an "X" or even a tick "√" in the appropriate box.

v. Some questionnaire items, require ONE mark per item, whereas others allow several marks of options per question.

vi. Enquiries or queries should be directed to Sello Sekgwelea, ICT, Unisa, Florida Campus, Room E326. Tel. (011)4713136.

SECTION A: Background information

1. What is your gender?

1	Male
2	Female

2. What is your age?

16-20 years	1
21-25 years	2
26-30 years	3
31-35 years	4
36-40 years	5
Older than 40 years	6

3. In which year did you register for the diploma/degree at Unisa?

2005	1
2004	2
2003	3
2002	4
2001	5
In/Before 2000	6

4. Where do you live? Place a cross (+)/tick (√) where applicable

4.1 In a city ___, e.g. Durban, Cape Town, Johannesburg
4.2 In a town ____, e.g. Welkom, Brits, Ladysmith
4.3 In a rural area ___, e.g. sparsely populated; mainly farming community

5. What is your home language?

English	1
Afrikaans	2
Setswana	3
Sepedi	4
Sesotho	5
isiZulu	6
isiNdebele	7
Tshivenda	8
Xitsonga	9
isiXhosa	10
siSwati	11
Other (please specify)	12

6. Do you have a job at the moment? If 'No', please move directly to question A9.

	Yes
No	1
	0

7. How would you classify your job?

Full-	1	time
Part-	2	time

8. Is your job related to what you are studying in terms of: **mark once in each row where applicable**

	Disagree				Agree
content (study materials)?	1	2	3	4	5
facilities (laboratory, computer)?	1	2	3	4	5
practicals (serving articles)?	1	2	3	4	5
promotion (diploma/degree)?	1	2	3	4	5

If you marked 'Agree' on the points relating to facilities and practicals under question 8 above, skip the next question.

9. Where do you go for the study requirements for facilities and practicals? **Mark applicable options**.

1
2
3
5

9.1 I attend special practical session(s) arranged by my [6] lecturers
9.2 Practicals and facilities are not prerequisite for my coursework
9.3 Work-based practicals meet the requirements
9.5 None
9.6 Not sure

10. Do you envisage writing exams at the end of the year?

[1] Yes
[0] No

11. What is your study area?

12. In what year (level) of study are you?

SECTION B: Accessibility/Connectivity/Skills

Which description matches the computer (PC) & digital videoconfencing (DVC) unit you use for learning? **Please mark all the description that match your hard/software (of PC) or DVC unit(s) you use for your studies.**

1.0 Hardware (PC):	**Mark Corresponding Number**	2.0	**DVC**	**Mark corresponding number**
1.1 Laptop	1	2.1	Aethra vega	1
1.2 Desktop	2			
1.3 Tower	3			
1.4 Pentium 1 & 2	4			
1.5 Pentium 3 & 4	5			
1.8 Windows 95/98	8			
1.9 Windows2000 or XP	9			
1.12 Media Player	12			
1.14 28.8 or 56kbps Internet connection speed	14	2.2	Picturetell	2
1.18 CD	18			
1.19 DVD	19	2.4	Polycom	4
1.20 Printer (with colour option)	20	2.9	Bandwidth 128kps	9
1.21 Printer (without colour)	21	2.10	Bandwidth 384kbps	10
1.22 Monitor (Black & White)	22	2.11	Documentary camera	11
1.23 Monitor (Colour)	23			
1.24 Other: …… Please describe	24	2.13	Other: …… Please describe	13

2.3 I get access to computer/videoconferencing at **(Mark where applicable)**:

	Computer	Videoconferencing (DVC)
2.3.1 HOME	1	1
2.3.2 WORK	2	2
2.3.4 FAMILY/ FRIEND	4	4
2.3.5 REGIONAL OFFICE	5	5
2.3.6 INTERNET CAFÉ	6	6
2.3.7 UNISA STUDY CENTRE	7	7
2.3.8 LIBRARY	8	8
2.3.9 Other (please specify)	9	9

3. Internet plus COOL/SOL & DVC connectivity: **mark where applicable.**

	YES/NO	
3.1 THE COMPUTER I HAVE ACCESS TO IS INTERNET-LINKED.		
3.2 THE FEATURES OF THE VIRTUAL CAMPUS WERE EXPLAINED TO ME (involving COOL/SOL & DVC).		
3.3 I PARTICIPATE IN THE VIRTUAL CAMPUS USING BOTH COOL/SOL & DVC.		
3.4 I WOULD LIKE TO PARTICIPATE IN THE VIRTUAL CAMPUS using both COOL/SOL & DVC.		

4. Are you registered with COOL/SOL? | YES | | NO | |

5. My experience in using online & DVC materials can be described as… **Choose one.**

Description	COOL/SOL	DVC
5.1.1 Limited	1	1
5.1.2 Below Average	2	2
5.1.3 Average	3	3
5.1.4 Above Average	4	4
5.1.5 Advanced	5	5

6. Where is your nearest digital videoconferencing (DVC) site? **Choose one**

6.1 Pretoria___, 6.2 Florida___, 6.3 Cape Town__, 6.4 Durban__, 6.5 Newcastle__, 6.6 Pietermaritzburg__, 6.7 Nelspruit__, 6.8 Middlesburg__, 6.9 Pietersburg__, 6.10 Giyani__, 6.11 Mafikeng__, 6.12 Bloemfontein__, 6.13 Kimberley__, 6.14 Port Elizabeth__, 6.15 East London__ 6.16 Umtata ___ , Other(please mention it if left out)……...

6.17 I have attended some of my lectures via | YES | 1 | NO | 2 | DVC.

7. I have the skills and knowledge to use the following forms of electronic communication (tick applicable options):

7.1 Email	1
7.2 Chat	2
7.3 Mailing lists	3
7.4 Digital videoconferencing (DVC)	4
7.5 Newsgroups	5
7.6 Discussion boards	6

8. How proficient are you at Internet searching?

8.1 I don't know how to search for resources on the World Wide Web.	1
8.3 I can use search engines to construct simple keyword and menu-driven searches. I can usually locate information but not always efficiently.	3
8.4 I can quickly and efficiently locate information on the Web using a variety of strategies.	4

SECTION C: General use of ICTs for flexible learning

1. Rate the technology used for the delivery of your courseware by **marking the appropriate column, once per item..**

Scale **(0–2 = Unimportant; 3–4 = Less Important; 5–6 = Important; 7–8 = More Important; 9–10 = Most Important)**

	0–2	**3–4**	**5–6**	**7–8**	**9–10**
1.1 COOL/SOL	1	2	3	4	5
1.2 DVC	1	2	3	4	5
1.3 Printer – printed materials/handouts/ books	1	2	3	4	5
1.4 Fax	1	2	3	4	5
1.5 Call Centre (admin. staff)	1	2	3	4	5
1.6 Telephone (lecturer/tutor)	1	2	3	4	5
1.7 Audio cassette	1	2	3	4	5
1.8 Video cassette	1	2	3	4	5
1.9 CDs	1	2	3	4	5
1.10 DVDs	1	2	3	4	5
1.11 Other: _____ (Rate accordingly)	1	2	3	4	5

2. Describe how often do any of the following technologies used for delivery of your courseware.

Technology	Rarely	Below average	Average	Above average	Often
COOL/SOL	1	2	3	4	5
DVC	1	2	3	4	5

2.1 If you chose “often”, state the reason.……..
2.2 If you chose “rarely”, state the reason. ……..

5. What do you like about the ICT-based projects COOL/SOL and DVC? Which statement(s) represent(s) your feelings? **Choose all applicable options.**

5.1 COOL/SOL

5.1.1 like getting information at my own time and place.	1
5.1.2 I like online group discussions for they enhance learning	2
5.1.3 I prefer more of live contact session with lecturers than ICT-based modules.	3
5.1.4 None of the above	4
5.1.5 Not sure	5

5.2 DVC

5.2.1 I like using this type of technology for group interactions.	1
5.2.2 It helps to reduce traveling, time and costs.	2
5.2.3 None of the above	3
5.2.4 Not sure	4

6. What are your current uses of these technologies (COOL/SOL & DVC)? **Mark all applicable options.**

6.1 COOL/SOL plays important role in

6.1.1 Exam dates and changes in venues	1
6.1.2 Asking the questions as follow-up to hand-outs	2
6.1.3 Keeping up online discussion with peers & lecturers	3

6.1.4 None of the above.
6.1.5 Not sure

6.2 DVC's role is important in

6.2.1 Covering problem areas with the guidance of lecturer/tutor in DVC session [1]
6.2.2 Preparation for examination session [2]
6.2.3 None of the above. [3]
6.2.4 Not sure [4]

7. What are the problems, if any, with regard to the way COOL/SOL, DVC and other technologies are used for flexible learning?

7.1 COOL/SOL
7.1.1 Not enough academic information [1]
7.1.2 Access not easy off-campus [2]
7.1.3 Only FAQs – no academic quiz [3]
7.1.4 None of the above. [4]
7.1.5 Not sure [5]

7.2 DVC
7.2.1 Group studies via DVC are intimidating [1]
7.2.2 Team effort is needed for the success of DVC session [2]
7.2.3 Sometimes connection is problematic [3]
7.2.4 None of the above. [4]
7.2.5 Not sure [5]

9. How would you like to see ICTs used for your course delivery? **Mark all applicable options.**

9.1 Government and Telkom need to establish cheaper rates for educational institutions. [1]
9.2 Establish Unisa local cybernet branches. [2]
9.3 DVC is fine after hours and over weekends as DE learners work during the week. [3]
9.4 None of the above. [4]
9.5 Not sure [5]

10. How much would you like to see technology being used according to the following activities for the delivery of courses? **Mark once per each activity (that is, twice per line, according to Online & DVC)**

(0 = not at all; 5-6 = quite a lot; 9-10 = very extensively)

ACTIVITIES	**COOL/SOL**					**DVC**				
	0–2	**3-4**	**5-6**	**7-8**	**9-10**	**0-2**	**3–4**	**5–6**	**7–8**	**9–10**
10.1 Interactive individual learning	1	2	3	4	5	1	2	3	4	5
10.2 Drill and practice	1	2	3	4	5	1	2	3	4	5
10.3 Group discussions	1	2	3	4	5	1	2	3	4	5
10.4 Simulation (CBT)	1	2	3	4	5	1	2	3	4	5
10.5 Contact sessions	1	2	3	4	5	1	2	3	4	5
10.6 Problem/critical Skills	1	2	3	4	5	1	2	3	4	5
10.7 Graphic multimedia	1	2	3	4	5	1	2	3	4	5
10.8 Quizzes	1	2	3	4	5	1	2	3	4	5
10.9 Essay exercise	1	2	3	4	5	1	2	3	4	5
10.10 Interactive	1	2	3	4	5	1	2	3	4	5

multimedia										
10.11 Assignments	1	2	3	4	5	1	2	3	4	5
10.12 Results	1	2	3	4	5	1	2	3	4	5
10.13 Administrative matters	1	2	3	4	5	1	2	3	4	5

11.What's your view of the newly adopted myUnisa (COOL , SOL) & DVC system? Have the use of these new tools help to boost Unisa's effort in reaching its communities? Choose One: YES NO

11.1 Does the use of My New Unisa (COOL or SOL) & DVC contribute to your learning or not?

COOL/SOL		DVC	
Yes	1	Yes	1
No	0	No	0

12. If you answered "YES", estimate the percentage (%) it contributes compared to other resources _____% (for both COOL/SOL & DVC)

13. Would you recommend My New Unisa (COOL/SOL) and DVC to any of your colleagues? **Choose one answer for each technology.**

COOL/SOL		DVC	
Yes	1	Yes	1
No	0	No	0

14. If YES, why?

14.1.0 I recommend COOL/SOL & DVC because: **mark all options that are applicable**

14.1.1 it makes communication easier with others.	1
14.1.2 you can learn wherever you are.	2
14.1.3 technology-based studies are easy to pass.	3
14.1.4 None of the above.	4
14.1.5 Not sure	5

14.2 If NO, why not?

14.2.1 There is a general lack of use of COOL/SOL & DVC by the educational community because: (**Please tick options below that reflect your views**)

14.2.1 there is lack of community awareness campaigns for using technology	1
14.2.2 Use of COOL/SOL & DVC causes digital divide as many learners do not have access to the right technology	2
14.2.3 ICT users must be familiar with the technology so that they can achieve optimal results.	3
14.2.4 None of the above.	4
14.2.5 Not sure	5

15. Is use of ICTs important for your studies, career growth and future? Mark the statement(s) that reflect your feelings.

15.1 It is important:

	1
	2

3
4
5

15.1.1 Learning through ICTs prepares a learner for digital world
15.1.2 for accessing lectures that have been made educationally sound; they make my life easier.
15.1.3 All of the above.
15.1.4 None of the above.
15.1.5 Not sure

18. Do you regularly **(Mark/Choose all applicable options)**:

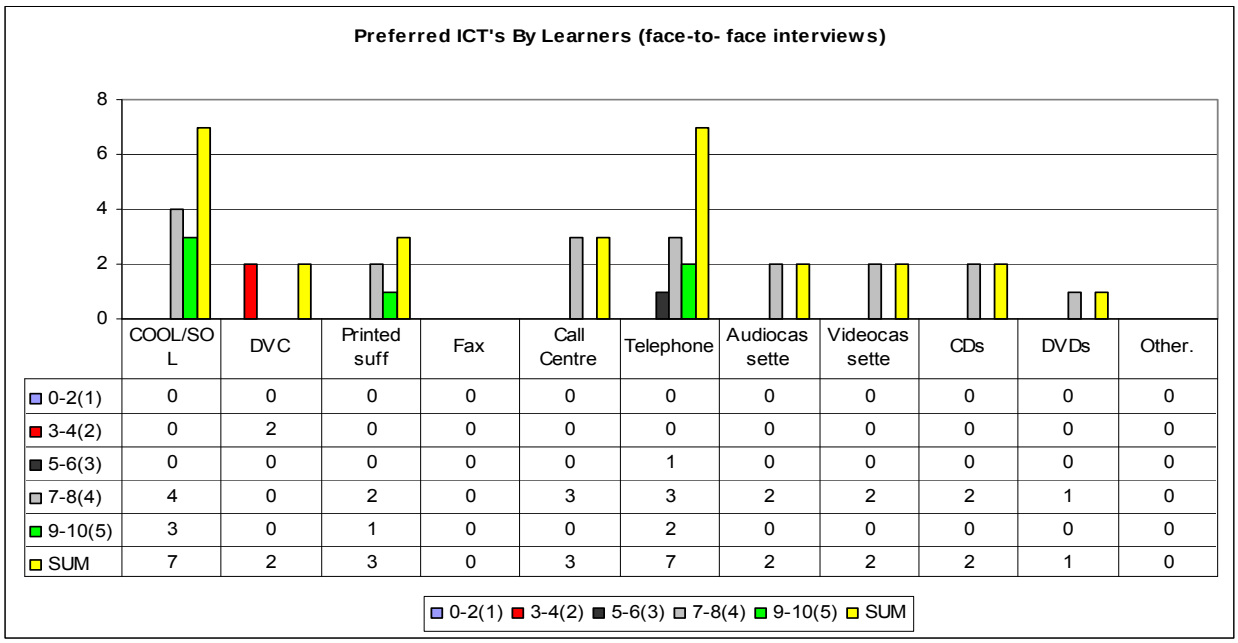
18.1 use technology to consult with experts?	1
18.2 use technology to consult with students in other institutions?	2
18.3 use technology to produce projects of your own design?	3
18.4 Participate in online projects?	4
18.5 None of the above.	5
18.6 Not sure	6

Thank you so much for your time and participation!!

XI. Transcripts Personal Interviews

ENGINEERING LEARNERS L1, L2, L3, L4, L5, L6, L7, L8

Interviewer:
1.1 Interviewee: Which technology do you prefer (as a learner)?



	COOL/SOL	DVC	Printed suff	Fax	Call Centre	Telephone	Audiocassette	Videocassette	CDs	DVDs	Other.
0-2(1)	0	0	0	0	0	0	0	0	0	0	0
3-4(2)	0	2	0	0	0	0	0	0	0	0	0
5-6(3)	0	0	0	0	0	1	0	0	0	0	0
7-8(4)	4	0	2	0	3	3	2	2	2	1	0
9-10(5)	3	0	1	0	0	2	0	0	0	0	0
SUM	7	2	3	0	3	7	2	2	2	1	0

Table 5.3

L6, L7, L8

1.2 What do you like about the ICT-based projects COOL/SOL and DVC?

L1 Interviewee: COOL is easy to use to get in touch with lecturers, discuss issues online, getting info at own time, place and quicker implementation of downloads of printout, no need to call call-centre for some info; some lecturers do tasks via COOL

L2 COOL allows one to get different information when out of the country
Telephone allows direct talk.

L4 COOL/SOL -Because for Distance Education it is easy to get in touch with lecturers; - discuss Issues online; easy access for information and quicker implementation e.g. courseware and Download from COOL; - some lecturers do give tasks via COOL.

L5 COOL/SOL - Sorry, May you please hold on for a minute, I have an important call to attend to (end of recording with student 5).

L6 COOL/SOL – check information anytime; do not have to call the call centre; good communication wise factor than the mail.

L7 COOL/SOL- access anytime; - it makes studying easy; there are great notes.

L8 COOL/SOL – it is nice because you can see the results; you can see when you are to write the exams (time-table); the student has the whole information they need. It is very user-friendly and not difficult to use.

3. What are their (ICTs) weaknesses, if any, with regard to the way they are used for flexible learning?

L2 COOL/SOL –Couldn't get the account balance, it takes time to get info on how much I owe the university so that I can pay (Interviewer: Any other problems?) That's all.

L4 COOL/SOL – Access - not easy to access myUnisa (COOL) when one is off-campus

L6 COOL/SOL –viable site is Frequently Asked Questions; - no quiz on COOL; - academic quiz … is not there; - unavailability of information.

L7 COOL/SOL – sometimes when one looks for notes they are not available; again sometime there is no access to certain information.

L8 COOL/SOL: Initially it is difficult to load your personal details (maybe to login), but if you know how to do it is easy.

4. What are your current uses of the two technologies (myUnisa & DVC)?

L1 COOL – once in 3months

L2 COOL_ I Use it once or twice ….

L4 COOL/SOL – for discussion online, course updates; for assignments, give track and get access to results, exam dates and change exam venues.

L5 Blank

L6 COOL/SOL- exam; identity

L7 COOL/SOL – sometimes when one look for notes they are not available; again sometime there is no access to certain information.

L8 COOL/SOL- Use it once or twice.

5 Interviewer: How would you like to see the ICT-based technologies used for learning?

L1 Interviewee: Establish Unisa/local branches in Lesotho
Establish cheaper affordable rates
Enable easy communication with my lecturer and Unisa
After hours and over weekends DVC is fine, as during the week I work
To include everyone in discussion on COOL the discussion should be made available through other formats of media – fax, and cassettes

L2 Since I'm far form the resource learning centre the technologies such as DVC could be more useful for after the hours sessions say evening, or even on Saturday because during the week I work.

L3 Blank

L4 I think to cover everybody; - discussion on COOL can also be on video or fax to help the learners.

L5 Blank

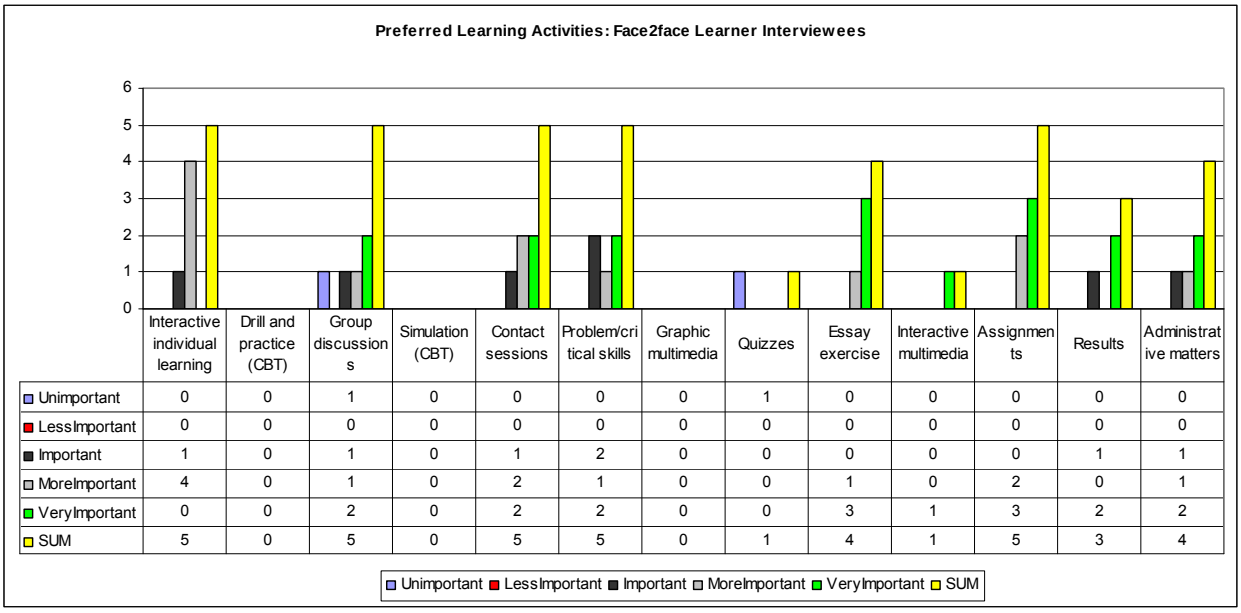
L6 Printed material – good - …. And information; COOL – insufficient.

L7 No answer **(Blank)**

L8 Nice if more examples can be given for the students to work with.

6. Interviewer: What would attract you to the use of COOL/SOL and DVC?

(Rate 0 to 10 by ticking the appropriate column for both COOL/SOL and DVC.) L1, L2, L4, L6, L8, as learners
Rating by Learners Presentation Activities



	Interactive individual learning	Drill and practice (CBT)	Group discussions	Simulation (CBT)	Contact sessions	Problem/critical skills	Graphic multimedia	Quizzes	Essay exercise	Interactive multimedia	Assignments	Results	Administrative matters
Unimportant	0	0	1	0	0	0	0	1	0	0	0	0	0
LessImportant	0	0	0	0	0	0	0	0	0	0	0	0	0
Important	1	0	1	0	1	2	0	0	0	0	0	1	1
MoreImportant	4	0	1	0	2	1	0	0	1	0	2	0	1
VeryImportant	0	0	2	0	2	2	0	0	3	1	3	2	2
SUM	5	0	5	0	5	5	0	1	4	1	5	3	4

Table 5.4

7. Interviewer: Rate the technical set-up/presentation: DVC
Interviewee: Left Blank by all (see Table 5.5 below), citing lack of information about DVC.

(Rate 0=Unimportant, 10=V.Important)

	0–2 (1)	**3–4(2)**	**5–6(3)**	**7–8(4)**	**9–10 (5)**
Picture					
Presenter					
Participants					
Subject relevancy					
Subject importance					
Screen design					
Screen appeal					
Human–computer interface					
Colour					
Use of buttons					
Audiovisual graphics					

Table 5.5

8. Interviewer: Would you like to see any changes in the aspects mentioned?
Interviewee:

Yes	Xxxxxx 87.5%
No	X 12.5%

9 Interviewer: Please mention the changes that you would like to see made to DVC:
L1 Interviewee: Challenges posed by the ageing technology relate to low bandwidth thus affecting the picture, and audio. There are also many technical faults during the connection.

Interviewer: Any other suggestion(s)?

L1 Interviewee: Change everything. Up-date the technology (DVC);
For COOL, lecturers need to submit results on time; need to see more quizzes; Call centre- certain departments need to submit important relevant information about students on time.

L2 Interviewer: Unisa has responsibility to its learners for their educational development, and if this is not properly done it's like neglecting that responsibility to help its students.

L3 Blank

L4 Interviewee: In addition to what is available, there is need to have access to computers (provided by the institution); if there can be improvement (in provision of services) across.

L5 Blank

L6 Interviewee: More students use COOL. Therefore there is need for educational quiz on COOL. No empty pages on COOL

L7 Interviewee: Include activities in the campus e.g. extramural activities

L8 Interviewee: It is just for the first time users, I would like to see them getting help on COOL

Interviewer: Ok. Any suggestion(s) that you can say about the ICT based technologies e.g. DVC?

L8 Interviewee: Not really, it's just for the first time users I would like to see them get help with COOL.

10 Interviewer: Does ICT-based learning contribute to your learning or not?

Interviewee: **L1**, L8, L4, L2, L6, L7

COOL/SOL

Yes	Xxx 50%
No	Xxx 50%

L6 But it can Refer NO above: but it can (if up to scratch)!???

L1 Interviewer: If YES, what is the percentage contribution (%) compared to other resources? 85, 2% (70; 98,80x2, 98) **L8, L4, L1, L2, L6, L7** 2 blanks

9.1 Interviewer: Say whether weekly or monthly.

L1, L8, L6, L4, L2, L7 Blank :

Daily	
Weekly	Xxx
Monthly	X 1/month

9.2 Interviewer: List the courses/activities/tasks for which you use the technology in your studies.

L1 I use it to check for the results regarding my subject.

L8 COOL – for any new development and information.

L7 Helps with lecture's notes and online group discussion.

L6 Do the exchange of information with lecturer, do library search, it is also easier to get exams time table.

9.3 If NO (to contribution to studies), what could be seen as the cause of such failure?

L4, L1 Interviewee:

L4 (COOL/SOL) – Lack of access.
L1 DVC – Ageing technology; lack of promotion; underutilisation.

10. Interviewer: Is there any need for learners to be given orientation/training on how to use technology (COOL/SOL/DVC) for learning?

Yes	Xxxxx
No	X

11. Interviewer: How did you learn of the ICT-based technologies?

L1 Interviewee: I learnt to use COOL from the guideline provided by the Dept handout.
L2 I attended contact session and was shown how to register and other activities by the consultant.
L6 I was given guidelines in contact session and shown how to register .
L4 On my own from the hand-out materials obtained during registration
L8 COOL/SOL - from the hand-out materials and study guides
L7 COOL/SOL- through a friend

12. Interviewer :Would you recommend COOL/SOL and DVC to any of your colleagues?
Interviewee: **L1, L2, L4, L6, L7, L8,** COOL/SOL

	Yes	Xxxx xx
	No	
L3, L5 cancelled DVC	Lack of info	
	Yes	
	No	

12.1 Interviewer: If YES, why?

L1 I recommend COOL because you can learn wherever you are; I use the technology itself for my diploma … (inaudible).
L2 It brings people located in different parts of the world into the same class; it makes communication easier with others; it's like you are in the class but in effect you are outside.
L4 (COOL/SOL): Because of the benefits it afford the students, because one does not attend only the class, but it helps one to communicate with the lecturer.
L6 COOL/SOL: If student use COOL, more study happens.
L8 COOL/SOL- I find it very useful and saves a lot of time and money You don't have to phone anybody you can just go to the internet to look for "the required" information.
L7 – no response (blank response), suggests lack of knowledge due to no relevant experience.

13. Interviewer What is your perception or experience of how the programme(s) should function? (Repeated) with e.g. getting assignments, etc.

L1 COOL/SOL- There are many problems e.g. lack of multimedia content; interactivity; lecturer participation minimal when assessing facilities. Basically it is enough, however, continue with information dissemination about the existence and use of COOL & DVC.
L2 COOL/SOL – basically it is enough, continue to have the session of how it works; people need to be informed of its existence and what it provides , but so far I'm satisfied (end of audible part of recording, rest difficult to discern words/logic)
L4 COOL/SOL – Not much, just don't see any change
L6 COOL/SOL – censorship may be necessary later
L7 COOL/SOL – whatever is happening on campus (events), including extramural activities must be put in COOL
L8 COOL/SOL- I think it functions quite well; I don't have a lot of suggestions of how it should function; I think it is working fine.
DVC - blank

14. Interviewer: General comments regarding the use or lack of use of technology by the New Unisa community (learners, lecturers, tutors, administrators):

L1 Community needs to be aware of it in order to use it … (inaudible)
Continue to campaign for the use of COOL; it is also important to allow users to air their own views regarding use as in the case of research
Use of COOL & DVC help lessen digital divide

Interviewer: what about the lecturers, do they use it to communicate with you?

L1 Lecturers- lack of lecturer input in group discussion must be looked into by Unisa ...
L2 - continue to use COOL; it is important to allow us to air our own views; there is need for computer lab.
L4 As part time learners, the use of COOL and other technologies should help us a lot (as part time learners are mostly on their own).
L6 -use of technology can help a lot.
L7 -while trying to contact the lecturer telephonically, and it happens he is not available, (instead) use COOL (for backup)

15. Interviewer: If the necessary changes could be made timeously to improve the ICTs (COOL/SOL and DVC), would you be interested in using these technologies for your studies in future?

L1, L2, L4, L6, L7, L8

Yes	Xxxxxx 75%

No | 0 |

L3, L5 Blank 25%

16. Interviewer: Is use of ICTs important for your studies, career growth and future? Discuss.

L1 It is important though some modules are not relevant/direct to what I study; accessing lectures has been made easy; life is technologically oriented – ICT based studies should also help orientate students.

L2 Interviewee: Yes a lot. I feel I am able to help contribute especially when online.

L4 Interviewee: It is important because it allows me to access lecturing material. It also helps to send via email or fax.

L6 Interviewee: It helps as our lives depend on tech- oriented world; use of ICTs help to orientate student at low level.

L7 Interviewee: Like for instance you get to the web and see home for the mailing, posting or receiving; it is also advisable to have fax number ready.

L8 Definitely important because you can find useful information; and it can eliminate confusion; it makes study much easier.

L3, L5 – interviewees recused themselves due to lack of information

17. Interviewer: In terms of the use of ICTs for flexible learning, out of 100%, how much would you credit the New Unisa as flexible? Give reason(s).
Interviewee:
L1, L2, L4, L6, L7, L8, COOL/SOL: 80%_90%_80%_80%_ 90%_ 80%
The overwhelming majority i.e. 83% (on average) credited it as flexible.

L1 REASON(S): There are quite a number of things relevant to my studies.
L2 It is new combined institution.
L4 COOL: Now that we have COOL centres across the country where we get information quickly we do not have to drive (for long distances to get access) I like the security unlike with other institutions where they just put only the student number, but with COOL there is student name and the pin code (thus ensuring confidentiality)
L6 - no comment
L7 - always one gets what you want.
L8 Overall the programme works fine. It is just fine, there and then they might have to change (some things) but as we use it (now) it works perfect.

TELEPHONIC INTERVIEW SCHEDULE L9, L10, L11, L12, L13, L14,

1.1 <u>What's the preferred technology for courseware delivery</u>

L9 I use telephone because you can easily describe and explain the problem to the lecturer
- I also use email limitedly especially when I practice mathematics
- I know about the digital video conference but I live near Florida so I don't use it

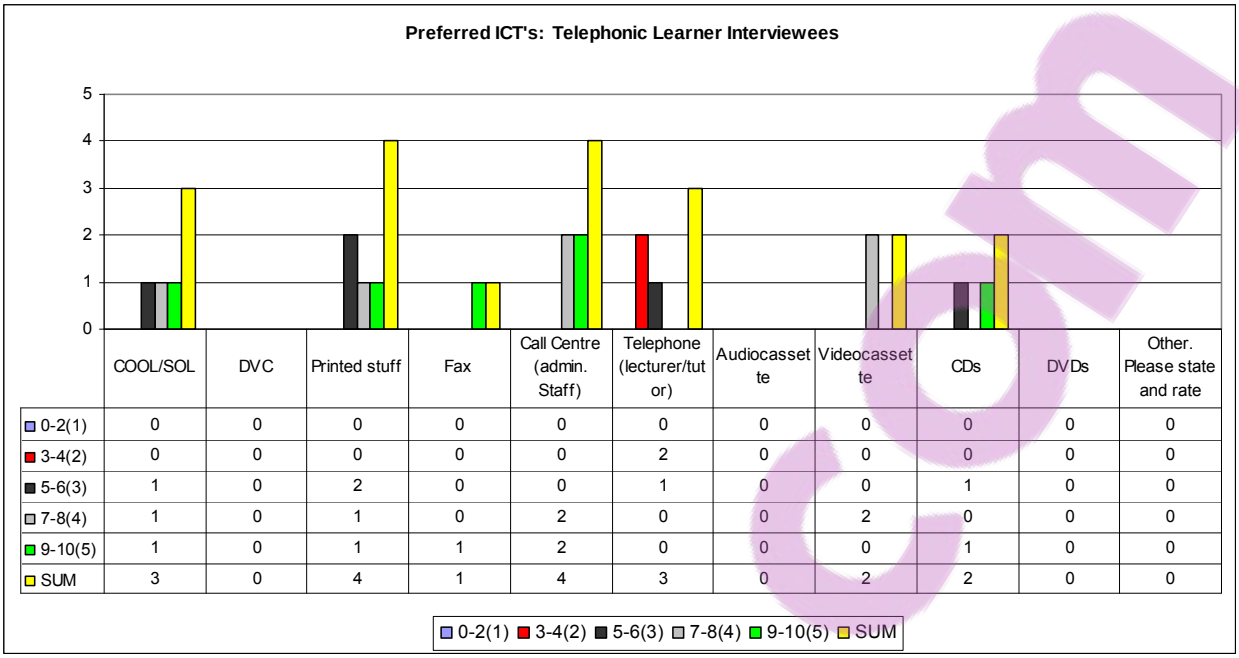
L10 - Enrolled in 1998, I'm in my second year
I prefer using telephone but the problem is you don't meet the same person, when you phone once again and it forces me to explain once again
Email – I don't get response

L11 L11- Beside COOL I use telephone I don't use DVC
Use Unisa COOL once a week
I prefer Unisa COOL
I access Unisa COOL at work
I use Unisa COOL for results, check assignment results,
I rate technical set up of Unisa COOL 8

L12 Quiz based on COOL
I like COOL because I don't have to phone somebody at Unisa
Individual work (is the main) weakness
Technical set-up rated fair – 7

L13 Engineering is my career line
Unisa COOL: I don't use it often
I use telephone, I don't use fax at all, but emails
Unisa COOL rated low– lecturers don't use it either.

L14 Often I use Unisa's COOL
Study engineer diploma 2nd year
DVC haven't used it before
Use fax and telephone for my studies



	COOL/SOL	DVC	Printed stuff	Fax	Call Centre (admin. Staff)	Telephone (lecturer/tutor)	Audiocassette	Videocassette	CDs	DVDs	Other. Please state and rate
0-2(1)	0	0	0	0	0	0	0	0	0	0	0
3-4(2)	0	0	0	0	0	2	0	0	0	0	0
5-6(3)	1	0	2	0	0	1	0	0	1	0	0
7-8(4)	1	0	1	0	2	0	0	2	0	0	0
9-10(5)	1	0	1	1	2	0	0	0	1	0	0
SUM	3	0	4	1	4	3	0	2	2	0	0

Table 5.7

1.2 Which technology do you prefer, rate different ICTs accordingly?

L9 I have a videocassette for one subject
- I rate the video and the subject matter 8
- I use CD for excel and word
- Printed material 5
- The call centre was very helpful 10, but sometime when you phone you find that everyone is on lunch; telephone can be rated 4

Often, the lecturers are not in office
I use COOL to track finance, academic record, assignment and the results.

6. What would attract you to the use of COOL/SOL and DVC: Presentation Activities

Interviewee: **L9, L11, L13 (wanted items – finance, assignment, record, results),** – not able to comment here; **L10, L14**

7. Rate the technical setup and presentation

L9 **A**dministration issue – good
Picture visuals – good
Subject presentation – they give us marks
Screen design is appealing
Colours are visible – for me is fine I can see what I want
Buttons – the use of buttons are very user friendly 8

L10 Concerning Unisa COOL, some students do not know Unisa COOL especially new ones, Unisa COOL is something good to have, however some information is not up to date
Pictures are userfriendly
Screen is appealing

Colours are very clear, I don't have a problem. It is better if they create student forum where students can raise the problems or issues. It is good if we can (chat/discussion forum) where we can see message on COOL and get answers immediately
Subject relevancy is accurate.

L11 Presentation on website 10 much better
Subject rate 8
Subject importance not sure
Screen design 8
Buttons – great
Graphic – 8
Computer – 10
Interact learning helpful rate 8
Never attend contact session
Problem not sure (about COOL)
Done one essay (concerning my studies)
Admin matters on Unisa COOL – no comment
I have not used quiz on Unisa COOL

L12 Individual work weakness
Technical set – up rated fair – 7
Presentation is good and easy to use
Use of buttons – 7

L13 Printed material – not really
Unisa COOL 6
Weakness to use
Presentation – 20
Technical set-up – 6
Presentation - 7
Participants – 4
Subject relevancy – important
Screen design – 7
Colour – fine
Audio – visual
Graphic – 6
Buttons – fine
Changes – fine
Recommend COOL to other students

L14 Never use dvc before
Use audio and cd
Call centre helpful – 8
Mistakes – information on tutorial letter contradict information on the book but I eventually take information on books as correct one
COOL – rate it I also recommend if we can send assignment on COOL
Weakness on COOL – nothing
Use COOL for assignment, exam marks, email questions and marks
Technical set-up – happy 9
Presentation – good 9

Subject relevance – 9
Screen design – good
Graphics – 8
Use of buttons – 8

Interviewee: **L9, L10**: **L11, L12 (contradicting intro statement), L13, L14 (Rate 0=UnImportant, to 10=V.Important**

Q7 DVC Technical Presentation: Telephonic Learners

	0–2(1)	**3–4(2)**	**5–6(3)**	**7–8(4)**	**9–10(5) SUM**	
Picture	0	0	Xx	xx	Xx	6
Presenter	0	0	0	xx	Xx	4
Participants	0	X	0	X	0	2
Subject relevancy	0	X	X	xx	X	5
Subject importance	X	0	0	xx	X	4
Screen design	0	0	0	xxxx	0	4
Screen appeal	0	0	0	xxx	X	4
Human–computer interface	0	0	0	X	X	2
Colour	0	0	0	xxx	X	4
Use of buttons	0	0	0	xxxx	0	4
Audiovisual graphics	0	0	X	xxxx	0	5

Table 5.8

8. Interviewer: Would you like to see any changes in the aspects mentioned?

Interviewee:**L9, L10, L11, L12, L13, L14**

Yes	Xxxxx
No	

Interviewer: Does ICT-based learning contribute to your learning or not?

Interviewee:**L9 , L10, L11, L12, L13, L14 How much %? 50%, 70%, 50%, 20%, 100%, 80%**

Weekly		Monthly
COOL/SOL		
	Yes	Xxxxxx
	No	
DVC		
	Yes	
	No	

9.2 List the activities/courses/tasks for which you use the technology in your studies

9.2 COOL – easy to use, has personal details of students, courses can be downloaded.
Weaknesses: does not show marks of individual assignments, only final mark.

It should also give more information on the library, what sort of books is available i.e. within the catalogue system.

L10 Contact session, I never attend any. I call Benoni office, they said they don't have contact session
It is good if student are trained to use Unisa COOL
Quality of printed material (hand out/accurate) easy to follow and satisfied
Call centre- some appreciate, some don't; it depends on the person sending stuff
Videocassette – I never use them
Call Centre "some staff have AN attitude of tomorrow still another day"
Email - you sometime don't get any response
COOL **–** userfriendly**,** useful for financial, assignments, results, and academic records should have a link with library as one-stop shop where one gets information on prescribed books.

L13 Technical (COOL) contribution to flexibility 9
Use of contact session – 8
Assignment and essay - 9
Administration matters – email
Question on COOL – never use it.

L13 Unisa COOL for flexible learning – 70 accessibility

L10, L11, L12 Blank

11. How did you learn of ICT-based technologies?

L10 I learned of it from brochures**.** Some students are not aware of it; also some information is outdated

L11 COOL – I learnt about it through contact with staff at Florida; I also learnt from course manuals; it's easy to learn COOL because I'm used to browsing the Web

L12 Changes – give detail on library and stuff like that; time and couple of things books
Rate all – no comment
Flexibility rated 100

L14 Administration matters – email
Question on COOL – never use it

12. Would you recommend COOL & DVC to your colleagues?
L9, L10, L11, L12, L13- Marked COOL Yes x xx xx.

12.1 COOL can help link up students studying same courses together

13. What is your perception of how should the programme function?

L9 Problem- They want us to register for a subject without knowing whether you have passed or not. Group discussion I never attended group discussion because I have no time for it

14. General comments regarding use or lack of use of technology:

L9 CONCERN is separating practical from theory, and having to travel for practical; many hand- outs have misprints Email – used to a limited extent because it is not good for Maths, you cannot express yourself well especially when it comes to drawings.

L10 Comments: Registration cycle frustrating, if you want to register for 3rd year, one has to wait for almost a year for the results of the previous course, say Maths2 before they register. This waiting makes learner to lose out the basics they learnt.

L11 Separation of theory from practical makes studies difficult, e.g. having to travel to Vereeening for Engineering practical is too costly. Why not any closest institution to Johannesburg like Wits?

L12 COOL needs to be used more. Lecturers don't seem to be using it; lecturers need training on using it. No need for training learners how to use it, simple to use it. Sell COOL more than spend time trying to improve it.

L13 General comments – improve it and sell it
Important for career guidance

L14 Lecturer lack of participation in COOL – failure to respond to emailed questions, not Pleasing. Also there were no response regarding administrative matters (COOL)

17. In terms of the use of ICTs for flexible learning, out of 100%, how much would you credit New Unisa as flexible? Give reason(**s**)

L9 Generally – I am able to get (enough) information
Other students – I don't know whether they use it or not
I see that technology contribute to flexible learning 50%, (definitely) so much easily

L10 I only use COOL for group discussion when I was doing maths basically you are forced to use COOL
Assignment presented – no problem

L13 Use COOL for results, courses, some course student,
Contact session – don't use it but telephone, only check results, and administration

L14 Technology contribution to your learning
Technology contribution and my learning – 80
COOL is user friendly I recommend to other student

18. Interviewer: How flexible is it according to the essentials mentioned in this table?
Interviewee:**L9, L10,L13, L14 –** unmarked; **L11, L12** -marked
Pace=2, Time=2, Place=2, Learning Requirements=2

XII. ENGINEERING ACADEMICS & TUTORS INTERVIEW SCHEDULE
A,B,C,D,E,F,G,H,I

2.1 Give the reasons for the preferred technology

(C) 2.1 – Call centre - I feel that the call centre is the first line for any student queries. The have got access on the computer to all the students data.
- They (call centre) give access to information about the university as well as student financial records.
- All those things are there (information) and they give a very efficient service (call centre).
-can I say something about e-mail?
Interviewer: … Oh yes, the use of e-mail. You can say something about it.

(C) Interviewee You see for flexible learning emails are very important because many students use it to ask the questions, even if they are using someone's email, I found that the use of email is gaining ground.

Interviewer: Yes … email. Eh… what about the printed …?

(C) Interviewee: Oh yes… Printed form – how I use it: I use that say two to four times a year. It Depends on the subject and the feedback I feel is necessary for the student
Sometimes you pick up something during the year that you feel lots of students got trouble with, so I send out the follow-up tutorial letter

(A) 2.1 Interviewee: It (COOL) is very easy accessible and easy, it gives a lecturer and student access, to communicate.

(D) 2.1 I use Email to send some materials to learners
- CD and videos are very effective, I send them later to the students to help them understand the course modules better as it is difficult to get all the students to the same contact session. They use the telephone if they have a problem
COOL is nice but half of our students are not registered on it .

(E)2.1 Interviewee - Telephone is good because a student can be assured that a lecturer is in the office or not. COOL is also good because always you get what you want when you open the page; you also get your personal information.

(B)2.1 Interviewee: Fax is very good, if you can explain something to a students you have to get a feedback; Use of the phone is difficult, especially us in engineering. That is why I can rate fax because a student can give you feedback through fax, and also reply by fax. Telephone is very difficult

F. Interviewee: Why COOL? What was the question again? (Interviewer repeats question) O.k.., my choice is DVC, it allows one to conduct real-time communication with his/her colleagues.(*Interviewer insistent*: Can you give any reason for COOL?) ***F continues*** Why COOL? (giggling) I mean you keep pushing me to COOL, …while there are other technologies … why?)
Interviewer: (laughing) Well some questions have options others don't. Do you have knowledge about COOL? (Interviewee:

Yes, I do.) That's what we want- you can give us reasons for COOL
Interviewee: Ok with COOL
students should be able to communicate with the lecturers.

G. COOL & Dvc, if ok they provide the required communication medium with the learners

H. COOL working well, not so many hassles;
DVC- many appear to be screen shy; technology is expensive; otherwise good tool to reduce travelling a lot while delivering service.

2.2 Interviewer; How often do you use the technology that you mentioned in 2.1 (see Table 5.10 below)

(C) – Videos will help for mathematics – use it quarterly
Call centre work best – feedback for the students – use it quarterly
Printer - use two to three times a year
Email – daily queries (assignment and more)

(A) COOL: To check marks for the assignment, to check marks for the exams, to check whether the student got the results and got the exams.

(E) It depends on contact classes but I use telephone daily; I don't use COOL daily

(B) I use fax often and telephone often but some students don't have telephone and some don't have fax facility.

(E) Fax – I never use it to teach but only on one or two cases when I want to give feedback to the students; Video conference & teleconference – we busy planning to use them; Call centre – used once to phone, but the problem why we don't use the call centre is it is too expensive for the department

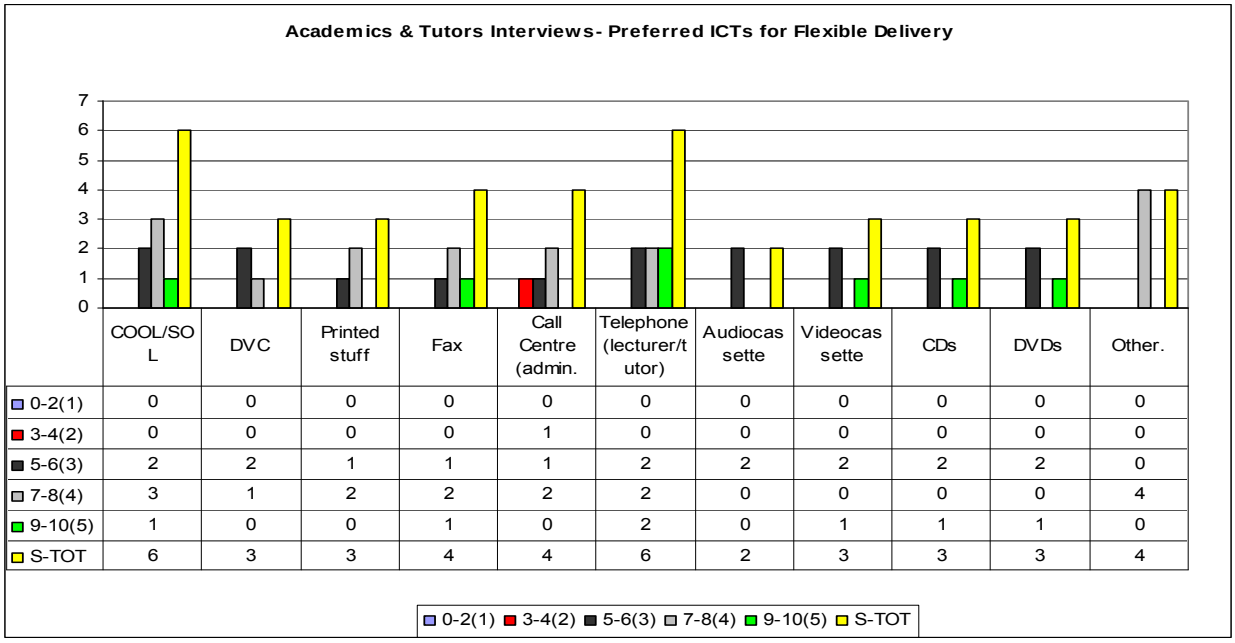
F I would say monthly (both COOL and DVC)

G. COOL daily except weekend.
DVC periodically depending on bookings.

H. COOL almost on daily basis.
DVC according to incoming booking; otherwise good tool for enabling daily meetings with Middleburg office.
Daily to weekly depending on need (COOL); DVC underutilised due to cost

3. 3. Interviewer: How would you rate myUnisa (COOL/SOL) and DVC for their performance roles?

(C) 3.3 Interviewee's comments: O.k. for content, it depends on what I put on it, so I would give it 10 (meant as joke/ lots of giggling) … no, it depends on what one put on it, 10 is not yet possible, so give it 7.



	COOL/SOL	DVC	Printed stuff	Fax	Call Centre (admin.	Telephone (lecturer/tutor)	Audiocassette	Videocassette	CDs	DVDs	Other.
0-2(1)	0	0	0	0	0	0	0	0	0	0	0
3-4(2)	0	0	0	0	1	0	0	0	0	0	0
5-6(3)	2	2	1	1	1	2	2	2	2	2	0
7-8(4)	3	1	2	2	2	2	0	0	0	0	4
9-10(5)	1	0	0	1	0	2	0	1	1	1	0
S-TOT	6	3	3	4	4	6	2	3	3	3	4

Table 5.11

4. Interviewer: How do you rate the overall technological strategy (flexible delivery/learning) in terms of your needs? (provision of quality education, competitive edge -globalisation, better performance, removes distance as barrier).

(C) I would say it is very good
(D) That's COOL thing, I would say 5, because I need to reach all the students, and I don't.
(A) Pass on
(E) Moderate
(B) The technology is fine as long as it can be up to date
(F) Please repeat it (Interviewer: REPEATS Q4) Eehmm … O'k I'll rate it as 5.
(G) Pass on
(H) I don't know
(I) Gesturing – raised hands (I don't know)

4.1 Interviewer (audio-recording problematic to end): Any weaknesses/positives ascribed to the integration process of the technology (COOL/SOL and DVC):

(C) At the moment is very user-friendly/good

(A) Don't know

(D) - Add new look of Unisa COOL
- Not easy to change
- Not user-friendly

(E) - Lack of computers
- Not aware of the technology (COOL)
- Not able to utilise the technology

(B) 4.1 Interviewer: Don't know

F. Not enough information – what you call eh … the layout as it indicates that it can do this and that but when you get into it there is not enough information (Interviewer: Ok, and then other weakness?)

F. Not all the students have what do you call … eh … eh …access

G. The technology arrangement is ok, but is very much underutilised, this tells you something is wrong the way implementation is done; -marketing is poor -lack of management participation; -few learners registered as part of COOL, therefore few participate; -COOL has no info on assignment records -Academic assignment data statistics lacking; -It discourages proactiveness when no assignment arrives through the system; -There is no system accepting assignment online, assignment sent via email has to be printed; and submitted via print. DVC's old and outdated technology discourages users; problems associated with low bandwidth makes communication difficult.

H Underutilisation of both COOL & DVC
COOL – better utilised than DVC due to resources and advertisement campaigns
DVC -low bandwidth makes communication difficult; it is also expensive technology due to costly call.

I. DVC suffers from low bandwidth, delayed unclear picture & sound
COOL, insufficient content; and no lecturer participation and interaction with learners

4.2 Interviewer: Any strength identified?

(C) Time wise very good, and it is new technology as compared to the old printed materials
- Printing media is old but it is still good.

(A) Unisa COOL is good. It is a tool you can rely on because it is accessible and reliable. With COOL you can do anything like checking marks, (yes, with COOL you can do everything x2)

(D) Checking for Academic records, I use it often; makes my life easier.

(E) COOL is easy to use and you can be able to check the academic records

(B) You can be able to access everything

F What …? Does it have any? (giggling) (Interviewer: Ja … what are the strengths of UNISA COOL?) Yes… I know what you mean. Communication but as indicated the problem is access (Interviewer: Yes you can give as much as you can). That's all, I don't have any more.

G COOL and DVC are likely to bring about general improvement of students' performance in their results if properly utilised

H If the ICT is properly working there is less monitoring of students, after their

registration on COOL there is literally lot of information (academic & administrative) at the disposal of the students _-ICTs are costeffective.

I. DVC real time connection can save time and money
COOL – is more flexible because it allows users to work at own time, place and pace.

5. Interviewer: If it were your decision to introduce changes about the technology:

5.1 Interviewer: what would you keep the same and why?

(C) I will keep COOL the same because I can get a lot of information there, and I do not need IT degree or technological expertise (all the time) to get things done and my students can contact me through COOL and email, if they forget my email contact, they have the tutorial letter for reminder, so I like that and I would keep that.

(A) I will keep the COOL system because of its accessibility. Other technologies are not accessible. Because they need more tools, …additional items to function. I will then change the way it is uploading, and make it more easily accessible (off-campus).

(D) Student information bit, marks –make no change here, keep them the same.

(E) The problem with COOL is you cannot send information to the students from within the site.

(B) Like I said the technology is fine but not up to date. You get questions posted by the lecturer to the students for discussion, but there is no communication between students. I don't think many students use COOL when they are supposed to be using it. They only use COOL for assignment but not for questions

F. Are you referring to COOL and other technologies as well? (Interviewer: Yes, COOL and other technologies as well.) Well the technology has to be improved and it will make the communication easy and faster,… eh, especially when you do research it is a good tool for that.

G. Strategies and policies appear to be well intended but there is failure at implementation. DVC outreach/use is very costly; integrating strategy is confusing in that a lot of travelling still allowed despite the availability of the technology. COOL – Promotion drive good but actual use by the relevant stakeholders disappointing.

H. Increase promotion campaigns for both DVC & COOL.

H. COOL: biographical information, assignments info, examination info, and use of passwords

5.2 what would you change and why?

(C) I don't think I can make changes about COOL

(A) Interviewee: … (hesitation)…. Long pause, no answer

(D) Change book list or design (does not work for me)

(E) - I will keep the telephone the same, and I will insist that the students write down their cell phone numbers on our system/database. Therefore we can able to send them information through the SMS because it is easy and cheaper
– In keep COOL the same but change few things flexibility in terms of up – loading. The other changes will be problem of the two similar subjects with different codes.

(B) Nothing

F I would change the set-up of COOL because it doesn't give much information whatever the product they put there it should be improved (Interviewer: Oh … just improvement?) Ja, they should put exactly the information appearing on the lay-out (with necessary graphical elaboration/explanation/demos)

G COOL should remain, actually increase promotion drive
Use SMS in communicating with learners as way to increase the promotion campaigns of its use DVC sessions could also be promoted through use of SMSs to learners in order to increase participation.

H Not sure

I. Response time by the lecturer's group discussion needs to be reviewed.

5.3 Interviewer: what innovations would you like to see implemented?

(C) I would like to see interactive CD for mathematics (practice mathematics - problems), where students can actually try problems and get corrected (on their own). When they get wrong answer, they are allowed chance to try again. But I should also see the marks on COOL. It is something for the future (It won't be for me to develop it … why??? Reason ???). And all the students should have access to it through the use of the computer.

(D) New things, ehh… study letters and tutorials I would place them in COOL because sometime students receive materials late, can access them from there. Access from home

(E) – On COOL if you can able to link subjects
- I would like the system of compulsory on using cell phone, it will help us to communicate with the students anytime anywhere

F Well, at the regional offices we need to see more computers with the internet

sites like. COOL and students enjoying the access to them. Let's say you have COOL with all the necessary information it will be more appreciated by students if it is more userfriendly.

G SMS to be used in conjunction with the COOL & DVC use by way of increasing learner participation.

I Integration process requires use of project management to ensure proper participation by all the relevant key role players.

6. Interviewer: In the case where the technology was never used, what are the main reasons for it not being used?

C The main reason being basically the cost; the other
- Inaccessibility for the students in using COOL

(D) Our study materials not on COOL yet; we just never had time for it; that's going to be our focus next year. And the interactive bit (Interviewer interjecting: Interactive ??) Ja…Interactivity students can email you through COOL, download anything, but most of the students do not register hence it has not been done before.

(E) – I heard of the use of satellite and it sounded good; Digital video conference and teleconference; The use of D.V.D; In fact I need the system that can be used to talk to the students at the same time at different places to avoid students travelling from far to come to the campus.

(B) Some don't have access to the Internet

F I think people lack information on COOL, and at the same time as I have mentioned earlier that some people do not have access due to lack of computers

I Lack of proper consultation, as result there is lack of interaction between the administrators, academics and professionals; Lack of promotion & proper maintenance in the case of DVC.

Q6.1 Are you Supportive of Engineering Courses going online?

Interviewee

Yes 75%	xxxx
No 25%	X X

7. Interviewer: Does your programme group have any subject/courses loaded/conducted via the technology?

(D) No … not yet

(E) yes…but totally dependent

(B) They should be but not sure

(F)

Yes X

(G)

Yes X

No

7.1 If YES, how many?

(C) N/A
(A) Almost all the subjects are on COOL
(E) - In my case 40%
*(G)*_Not sure
(B) blank
F Some, I do not have the exact number
H. Not sure.
I. Don't know
Blanks C, I, G, H

7.2 Interviewer: If NO, why not?

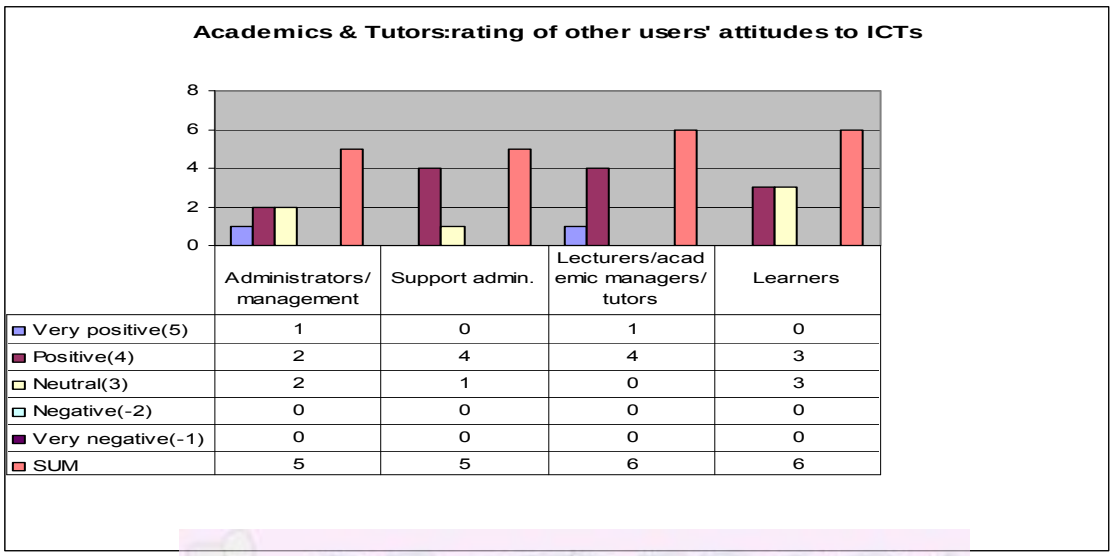
(C) 7.2 Our students don't have access to the technology

(D) 7.2 Time and people constrained – most people work from home, we never had secretaries for support

(I) Not sure, each lecturer ensure whether their subject/courses are uploaded; some of the courses/modules are available online.

8. Interviewer: How would you describe support for technological use within your programme group by: (Tick the appropriate box)

(B) 8 Don't know



	Administrators/ management	Support admin.	Lecturers/academic managers/ tutors	Learners
Very positive(5)	1	0	1	0
Positive(4)	2	4	4	3
Neutral(3)	2	1	0	3
Negative(-2)	0	0	0	0
Very negative(-1)	0	0	0	0
SUM	5	5	6	6

Table 5.12

9. Interviewer: How would you describe your COOL/SOL and DVC capability for flexible delivery?

Interviewee blank

Low	x
Moderate	xxxx
High	xxx

(D) 9 I think it is High … we not using it but it is there.

10. Interviewer: How would you describe your capability of helping learners learn ICTs?

Interviewee:

Low	x
Moderate	xxx
High	xxx

10. Interviewer: How would you describe your capability of helping learners learn ICTs?

Interviewee:

Low	x
Moderate	xxx
High	xxx

(D) 10 Moderate … we don't know that much, we still have to learn as well**.**

11 Interviewer: How would you describe your learners' capability to learn through COOL and DVC?

Interviewee

COOL

Low	Xx
Moderate	Xxxxx
High	Xx

DVC

Low	Xx
Moderate	X
High	

12. Interviewer: In the case of the use of COOL/SOL and DVC, what would you describe as a promising situation? Discuss.

F It will be more promising to make things easier for the students I think if COOL is made easier to use to understand the environment and coarse materials;
And for the students to be able to use it for their own things beside their studies as well; especially in terms of tests, and to be able to get the previous tutorials.

(C) Feedback I will it get from my students with access
Few have access.
The other positive thing is that more students will become registered on myUnisa (COOL/SOL) .

(A) As I have mentioned before the students use the tool, this is going to help them to pass examinations easily because they will be in better position to access anything in the system.

(D) More and more people have got access to the Internet as a result more people will have access to COOL.

(E) Students need to be informed about COOL and its capabilities.

(G) If fully utilised COOL could help both the learners and lecturers and administrators achieve their intended goals.

(H) If all users play important role in the use of ICTs for teaching & learning, success won't be far.

(I) The available ICTs could be properly utilised for teaching and learning by all the role players.

(B) Students are aware of service like COOL but no access to COOL does help.

12.1 Interviewer: What should be the way forward? Discuss.

(C) More general awareness campaign is needed towards the students

(A) -there is need to improve the COOL system

(D) Students, lecturers and administrative staff should get training on how to use COOL.

(E) They must market and advertise the ICTs (e.g. COOL)

(B) Don't know

(F) Improvement … improvement? (Interviewer: Yes improvement {both laughing}) As I have indicated the structure is fine outside but they should put more of it to good use, lecturers should be encouraged to bring in more academic information to

the site, and the students should have more access and in that case there will be more communication between the students and the lecturers.

(G) Review implementation strategy by revisiting the current policies
Involvement of key stakeholders in the use of both COOL & DVC is needed.

(H) Right technology to be fully utilised
Correct implementation strategy to be followed.

(I) Jerk-up low bandwidth within DVC.
Jerk up lecture participation in online learning.
Update the technology in place.

12.2 Interviewer: <u>In the case of a grim picture in the use of ICTs, what needs to be done to remedy the situation?</u>

(C) Eeh … on what should be done? (Interviewer interjecting – YES!) Well the first thing is that more money should be allocated for the use of technology
- Administration must try to do better job, e.g. What I mean is that Satellite for the Mathematics 1 promised earlier this year, has been pushed incessantly backward, resulting in empty promises, and there is been many cases of maladministration of technology; students need to be informed on the use of technology to make management of technology and its use easy.

(A) Not sure

(C) Its difficult because of accessibility to internet, it is not in our hands.
*(Interviewer interjecting:*But what if you were to offer advice what would you suggest?) I think if brochures/booklet were developed about COOL and sent to students – to show them that the technology is there and it has advantages. Except when we do it via tutorial letters which accommodates only a paragraph – advising students on how to improve their marks through use of COOL could be the required catalyst… (Interruption by telephone, audiorecording stops)

(B) Not sure

F Ehh… full usage of all the ICTs, (Interviewer: full usage?) Ja … it shouldn't just be in paper …It should be practise and fully utilised.

G. I don't know

H. I'm not sure.

I. Don't know

12.3 Interviewer: <u>How do you perceive the New Unisa's drive for the integration of technology for educational use? Discuss in terms of resource allocation and accountability.</u>

(C)12.3 No idea

(D)12.3 I think it is good. Personally I love the technology, I like seating at home and having access to everything in the study … I think it would also equally serve the students well, less papers and more convenience.

(E)12.3 – I think there is enough room for improvement

(B) Don't know

(F) Resource allocation, I think they should assure more computers are accessible for students' use. Between the two old internet systems (COOL & SOL), the one with more userfriendly should be chosen to be made more available for use (by the institutional community)

(G) Allocation of resources o'k
Utilisation is the problem as it appears not to be supported by accountability.

(H) Right idea in terms of resource allocation but spoilt by outdated technology in terms of DVC. Accountability is lacking a lot.

(G) Technology is o'k, the problem is underutilisation.

13 Interviewer: Is the description 'flexible institution through use of ICTs for education delivery or learning' suitable for the New Unisa? 13.1 If NO, what needs to be done for the New Unisa to attain flexible status? Discuss.

(E) – They must study and work very hard to be flexible institution

(B) Not sure

(F) There should be more communication
There should be much understanding (Interviewer: Much understanding) Yes much understanding in the sense that there must be more research into certain areas or even PGs where the top management could be invited to help promote culture of use of ICTs in the staff.

(G) Pass on
(H) Don't know
(I) Don't know

COOL	No	Xxx 33%
	Yes	Xxxx 45%
	No	Xxxxx 55%
SOL		
	Yes	
	No	
DVC		
	Yes	

13.2 Interviewer: Any plans to have course/modules converted to technology delivery in future?

(C) 13.2 Pass on.

(D) 13.2 Yes, We are planning to load all of them (course/modules) to COOL so that everyone can have access to them

(B) 13.2 Almost all subjects on engineering, we are looking on mechanical to be on COOL next.

(F) Ja... I think there are a number of courses/modules that needs to be technologically converted to COOL, let's say if you put study materials or most of it to COOL so that they can be utilised by students, I think most/all of them needs to be in COOL if people use COOL.

G. 'Not sure, normally the initiative is taken by the lecturer and programme head.

H Not sure, lecturer should know better.

I. Lecturer priority, but plans are afoot to include other courses online, and to even conduct some of them via DVC.

Interviewer: What are your expectations with regard to changing to flexible delivery through COOL/SOL and DVC?

(C) With COOL, I hope within the next 5years we should be able to do it

(D) My expectation is students should get the material quicker. Presently students are relying on postal mail which can be slow- now they can get materials a lot quicker and attend to their assignments a lot quicker.

(E) I think everything needs to be revised or revisited.

(B) Definitely in future with ICT support I don't have to send the study guide. Student should download the section that they want from COOL.

F. Ja … I think communication would be good. (Interviewer: Communication?) Yes. (What else?) And then the improvement in the exam results.

G. Improvement in teaching and learning by New Unisa. Huge number of students travelling to regional site Mafikeng for help is likely to drop if the technologies are up to scratch and well utilised.

H. Improvement in results obtained by learners at end of semester. Queries becoming less by learners, and overall better client satisfaction.

I. General improvement in student's performance in courses conducted via ICTs.

14. <u>Is role change required for the lecturer/tutor and learners when using ICT-based technologies?</u>

(E)14 blank

(B)14 Interviewee: blank

COOL		
	Yes	Xxxxxxx
	No	X
SOL		
	Yes	
	No	
DVC		
	Yes	Xxx
	No	

(C) O'k you have to take much active participation because of the distance

(A) Because, since we use COOL now we to access everything unlike in the past where student have to phone, spent a lot of money to send the whole information, now we call is easy to process the whole information.

(D) Learn technology and be able to use it; I think so in that instead of relying on old technology like telephones – dependent on description/hand writing, the challenge is to learn new way of communicating through new technology.

(B) Don't know

(F) I think technology is the in-thing when it comes to communication … if you want to communicate you just can't drive to all the libraries

(G) COOL is likely to help lecturers to know more about their individual learner strong or weak points. DVC contact will help learners to be more focussed in more important study areas through question and answer methods conducted.

(H) Learners will have better resources through technology at hand of coping with their tasks. Lecturers to be pleased by improvement in quality in terms of performance.

(H) Not sure, why?

15. <u>Interviewer: What is the ideal process (individual/Instructional design model) that needs to be followed for changing subject presentation/delivery into technological delivery mode?</u>

(C) It has to be much more interactive, I can see that would be to the benefit of the learner.

(A) Blank

(D) Hmmm … ideal process? (Interviewer: *Ja…So what you need to do*?) (Interviewee *Continues* …) Convert study material into electronic format or something that works better electronically than on paper, and you may have to change lot of things to make it more interactive.

(B) Not sure

(F) Please repeat question, Interviewer repeats). Some of the courses/modules are not compatible for technological use, so you must pilot them first to see how best they work, and from there one can get a clear picture of how each one of them can work in the technological process

(G) Not sure, but more of multimedia interactive design Instructional model could be the right answer; that is through involving all the role players in the Instructional design strategy according to their proper role.

(H) Not sure.

(I) Not sure

16. <u>Interviewer: What should be done to ensure that the process of integration of ICTs for educational delivery is characterised by inclusiveness and shared interests by main stakeholders?</u>

(C) Don't know

(A) Not sure

(D) Get lecturers interested and informed on how it is done and give them proper training of how to use it; they have to be shown models and even steps of how to do it; they try it themselves they struggle and end as a result giving it up.

(B) Interviewee: N/A

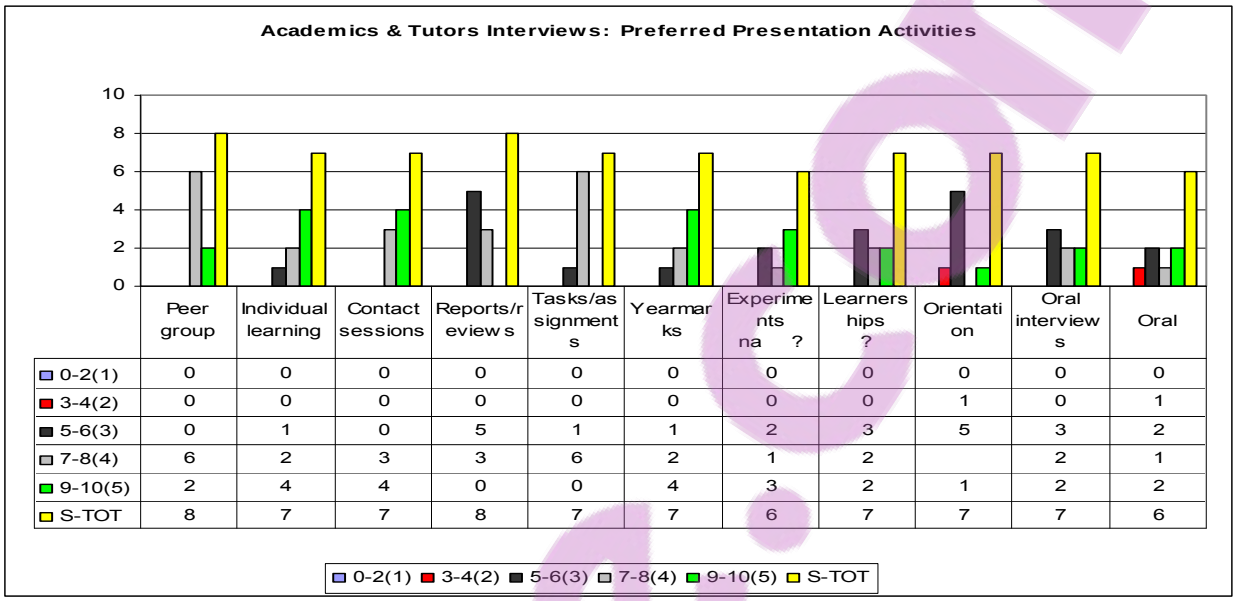
(F) (Please repeat question/ Interviewer repeats) Ok. Each an every technology according to their different nature should be assessed, to find out and eliminate those little weakness and maybe keep the positives and from there combine all the strong points – that could make up good ICT.

(G) Involve all the role players, content masters, lecturers, Ids, language, media experts, and producers, learners and administrators- each according to their roles.

(H) To follow the Ids model for using ICTs for Instructional delivery.

(I) Follow project management model as recommended.

17. Interviewer: Which of the following presentation activities would you like to see feature on COOL/SOL and DVC?



	Peer group	Individual learning	Contact sessions	Reports/reviews	Tasks/assignments	Yearmarks	Experiments na ?	Learnerships ?	Orientation	Oral interviews	Oral
0-2(1)	0	0	0	0	0	0	0	0	0	0	0
3-4(2)	0	0	0	0	0	0	0	0	1	0	1
5-6(3)	0	1	0	5	1	1	2	3	5	3	2
7-8(4)	6	2	3	3	6	2	1	2		2	1
9-10(5)	2	4	4	0	0	4	3	2	1	2	2
S-TOT	8	7	7	8	7	7	6	7	7	7	6

Table 5.13

18 Interviewer: What's your choice?

18 In the development of technology-based Instructional materials, I prefer the following: C, A, D, B, E, F, G, H, I

N=No; Y=Yes

18.1 Working with Instructional designers	Nyyyyyyyy	8	1
18.2 Working in the company of subject specialists	Yyyyyyyyy	9	0
18.3 Working with language practitioners	Nyyyyyyyy	8	1
18.4 Working with technology advisors	Yyynyyyyy	8	1
18. 5 Working on my own, because it allows me better concentration	Yyyyyynny	7	2
18.6 Group work	Nnynyyyyy	6	3
18.7 Working in a team with Instructional designers, subject advisors and technology advisors	Nyyyyyyyy	8	1

XIII. INSTRUCTIONAL DESIGNERS & OTHER DELOPERS

2.2 Qualifications/experience needed to fulfil this role

(A) No formal qualifications, but educational experience is needed for my type of career, BA Ed.
-You have to work on software programmes, quack, free hand, photo-shop, Scanning, programmes.

(B) - Web design, - Programming, - Graphic design background

(C) – quality assurance

(D) -Language practitioner, proof reading, translation, editing, checking graphics and technical errors

(E) Knowledge of Java and HTML, programming language and developing website

2.3 What other qualifications are required to develop a fully-fledged COOL/UNISA online/Interactive multimedia/DVC?

A You have to know software programmes e.g. quack, free hand, photo-shop, scanning programmes.

B online/Interactive multimedia/DVC
- Software skills in certain soft ware packages such as flash
- Web design skills
- Able to use software packages for multimedia
- I also need the director (another software package)

C They have changed qualifications I think …but for the right qualifications I would say, you need to have a knowledge background of education. Again you need to have an experience of teaching because you have to look at the text layout of the document to make sure that everything is in their right place. Next, in line with the O.B.E one need to check for the standard, relevancy and quality of the material before it can be signed off As acceptable for the given course level. The same rules and principles should apply when one is dealing with online such as myUnisa.

D Competence and eloquence in English language, expertise in basic MS Office, including MS Word and typing.

2.4 Do you enjoy working in the multimedia environment?
Interviewee:

Yes	xx xxx ABCDE
No	

2.5 If NO, please state the reason:

5N/A

3. What would you say are the strengths of COOL, SOL and DVC?

A It helps in getting feedback of assignment**s**
- You don't have to phone the lecturers to have certain information
- You have a password for personal details

B Technology is changing and everybody need to learn new things otherwise you'll be left behind
- We learn everyday to take life learning to another level of growth,
- It is the nature of technology.

C I would say is it is more direct, I mean …eh .. I mean you are able to get what you want immediately– and it is efficient.

D Language is easy, right level for the students and userfriendly, accessible, helpful and convenient

E Accessible, easy to use, able to download information, to access assignment, examination and year marks get response, help is available when needed; if not, one can ask the lecturer for guidance,

3.1 Based on these strengths, would you be willing to recommend any of the abovementioned technologies to others in distance education?

	Interviewee:
YES	xxxxx ABCDE
No	

3.2 Interviewer: Mention fascinating/interesting aspects of the job of developing, hosting, designing or facilitating the site/conference.

A. Interviewee: No moment of boredom, the job I'm doing in ID tends to vary from person to person, from project to project. The challenge lies in that one has to add unique colour to each project to make it more attractive to its users/owners. Hence I'm bound to approach each project in a different way while busy designing.

B. There is less computer literacy and less Internet access in this African environment which present its own challenges when one is planning for ICTs

C – I think you deal with different things, we read different things. You check the quality is not only there, you are not looking at one subject everyday but read different subjects everyday that is what makes more interesting and you read different material I think in a way you learn to deal with different things at the same time.

D Language usage is impressive because it has to be pitched at the right level for the learner so that it is not difficult; learning materials must be well coordinated.

E blank

4. Interviewer: What would you say are the drawbacks/weaknesses of COOL, SOL and DVC?

A COOL is very slow and sometimes when you open a page it says try latter I used to get tutorial letter on COOL it is no longer the case.

B The government must help with subsidy for UNISA to develop internet café dedicated to the students with minimum cost. In fact needy students shouldn't pay for it.

C – You know what I was just thinking the other day that sometimes you find that you can't just login. COOL developers must create a system that will still allow you to overcome login problems say with the password, some kind of backup.

D. Lack of use of more colours deprives it of fascinating aspect, youth can't enjoy sitting at it for long period; it is also slow to access while retrieving information.

E blank

5. How would you eliminate them?

A They must check the server or the network and try to fix it

B Lecturers must ensure that the tutorial letters are on COOL

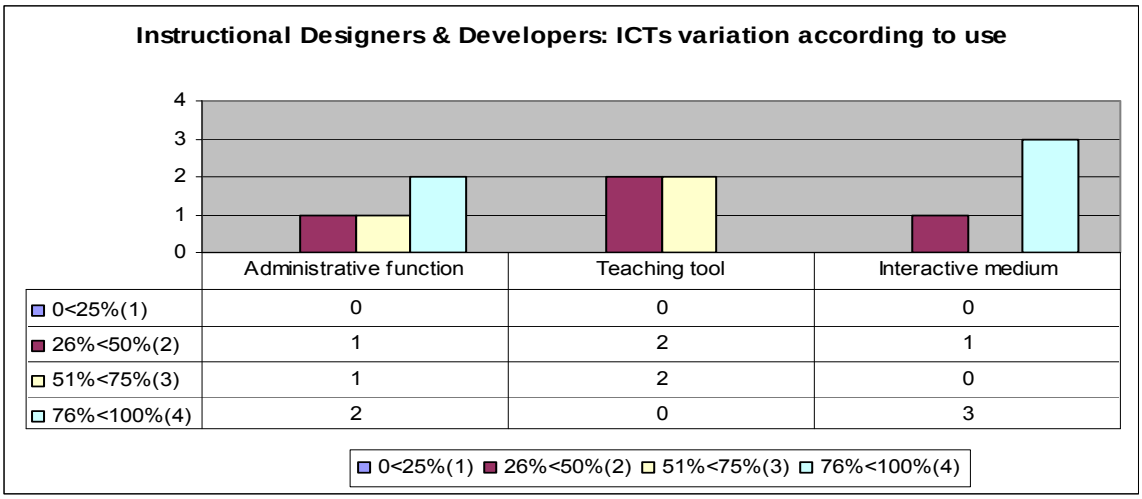
C I think that question can be answered by Information Technologist specialist

D I suggest that the technical design and its colours need to be revisited. And the web designers must be able to address the shortcoming.

E blank

5. Interviewer: How would you rate the use of technology by UNISA for flexible delivery?

Interviewee: **2 No responses**

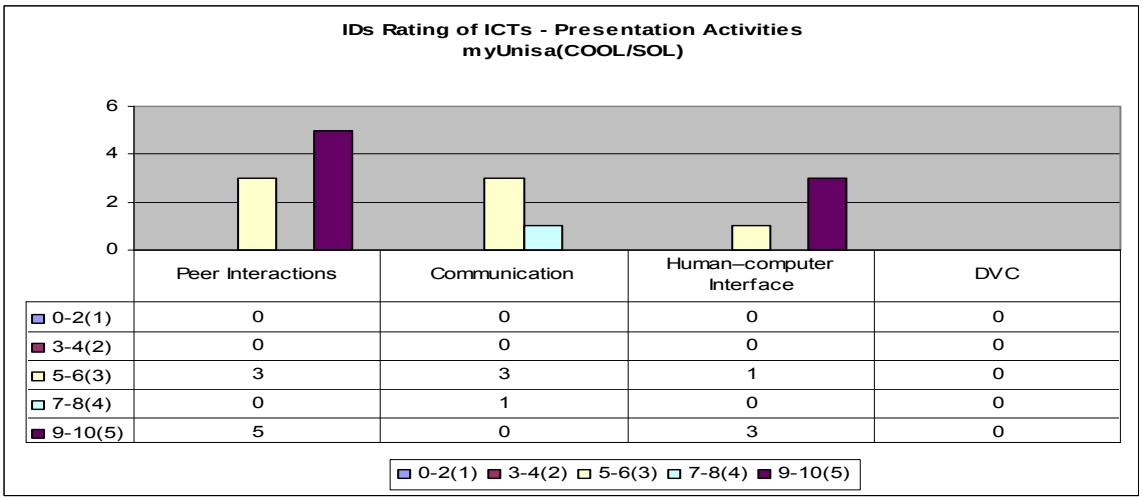


	Administrative function	Teaching tool	Interactive medium
0<25%(1)	0	0	0
26%<50%(2)	1	2	1
51%<75%(3)	1	2	0
76%<100%(4)	2	0	3

Table 5.14

6. Interviewer: How important do you rate current group discussions with regard to the use of the ICTs?

Interviewee: **E** blank



	Peer Interactions	Communication	Human–computer Interface	DVC
0-2(1)	0	0	0	0
3-4(2)	0	0	0	0
5-6(3)	3	3	1	0
7-8(4)	0	1	0	0
9-10(5)	5	0	3	0

Table 5.15

6.1 If not important, what can be done to improve the situation?
Interviewee: **A B E 3** blank

C. Because they call you to use COOL over the administrative matters - They must make the information available to the students

D More availability of the lecturers

6.2 Briefly explain why you rate it very important.

A If the screen is impressive the users of COOL will be impressed with the screen's appearance. As such chances are high that they will hold Unisa in high esteem.

B, D, E: N/A

C I rate group discussion high because it is more profitable to the students because the students are there but not in physical being, although they may not get the respond immediately but they will get it.

7. What would you describe as positives brought about by the use of technology at UNISA? Discuss.

A. The mere fact that one can get results through technology (COOL)

B Creation of virtual university class if u have got access to your lecturers scenario. People are scared to go on time to state the question. Effective communication

C The technology makes communication more easily
- Able to share information e.g. access server for apple (programme)
- Communication with outside world is easy if use email and internet

UNISA must be able to use the technology to their advantage (competitiveness).

D Effective distance learning, interaction between lecturers and peer groups, lecturers need to be more informed about the technology, promote literacy in information technology

E NA

7.1 What would you describe as negatives, lowering effectiveness of technology?
A. The machine/personal computers which are crashed
- Slow computers, which make us to wait for a long time to reboot

B - Can't leave without the computer
- Cost implementation

C People don't know that some of the technologies exist
- Some people don't know how to use the technology
- Some don't use technology because they don't see its importance for them –not work related *(Interviewer: O'k, anything else?)* We limited by what we know …sometime we do not make effort to learn technology that we don't know; others are embarrassed by the lack of knowledge, it becomes difficult to say I don't' know the system
- Probably there is a gap somewhere between the lecturer and the IT specialist e.g. the IT produces the technology that does not meet the requirements of the lecturer E.g. student profile – COOL

D. Accessibility in use of computers; illiteracy in computer technology; old software that need to be upgraded.

E. NA

7.2 Interviewer: <u>Describe some of the attitudes of the users of COOL, SOL and DVC.</u>
Interviewee: **A, B, C, D, E, NA**

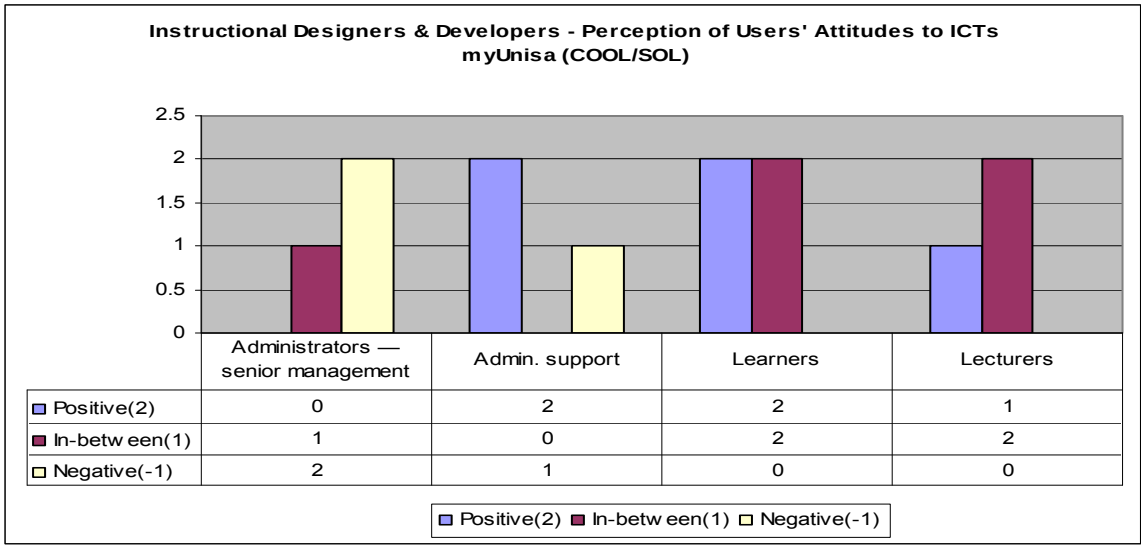


Table 5.16

7.3 Interviewer: If negative, what should be done to change them?

Interviewee: **A**, **B** no response

C There must be something that persuades the senior management to use the technology e.g. the student profile can help senior management to make decision on student matters

D Inform users about COOL and its benefits; the information should be passed on during the training

8. Interviewer: How would you describe the present use of the technology?
Interviewee:

Under-utilised	
Moderate	Xx
Optimum	Xx

E, NA

8.1 Interviewer: If under-utilisation/moderate, what should be done to bring the use to optimum?

Interviewee: N/A, N/A, NA, (A,B,D,E)

C If there are people who know how to use the tool they must teach them how to use it e.g. Sometimes senior management don't have to travel to address the staff they may use digital video conference and they can save time and a lot of money

8.2 Interviewer: If optimum, what are factors that you would credit as responsible for successes achieved?

Interviewee: **A** Best machines

- People or the staff
- Training that we receive at work

D ICT, that is Information Technology people, graphic artist, web designers and programmers will be the integral part of the process.
B, C, E N/A

9. Interviewer: If it were your decision to introduce changes about the technology
9.1 What would you keep the same?

A Interviewee: I will need COOL to remain

B Information technology use the same firewall (logging in to the net)
PC running and all based software

C I will keep COOL the same

D Type of media e.g. computer and software

9.2 Interviewer: what would you change?
A. Interviewee: I will need to see immediate feedback from the lecturers (same day respond)

B All learners should have PC
All PC must be at least Pentium 4 or at a, minimum level

C. I would like to change the design of COOL it does not look attractive, and it is straightforward

D. Process of links because they are too long..

E. No response

9.3 Interviewer: what new innovations would you like to see introduced?

A. Availability of lecturers in the offices when we need them

B. Integration between the two campus (TSA and UNISA)

C As an institution we need to keep pace with the latest technology e.g. for some staff members is very important for them to have Pentium 4. In fact we must not be left behind with the technology so that we can be competitive, because if we left behind we can't cope with the world outside

D Using more than language, change the name COOL "everything is COOL", come up with more appealing name.

9.4 Interviewer: what old/new stakeholder(s) would you like to see playing a meaningful role in making effective use of technology at the New Unisa.

A Every student, Lecturer, IT, Different departments

B. Telkom (because they run the lines)
- Soft ware companies
- Training companies and other companies as well

C: IT
- The top, middle and lower management

Ordinary People (Interviewer: In what sense?) Ordinary people/staff because they are users, so they must be there.

D Graphic artist, our principal at COOL because he can mean a lot to the students, minister of education also needs to be involved

E NA

10. Interviewer: Any other suggestion to help improve the use of technology?
    COOL
    SOL
    DVC

Interviewee: **A, E** No responses

B. COOL - It is important for everybody to have access to cutting edge technology.
- Use the latest and greatest technology

C To improve the situation put the information that can benefit the students and lecturer but also the management and administrators.

E Getting quick updated information

D Developing programmes and software

11. Interviewer: <u>Your opinion regarding the future use of the technology for flexible delivery. Choose one statement below and comment</u>.

"A bright future lies ahead for our learners with correct use of ICTs for their educational delivery."	Xxxxx
"The lack of correct implementation of an ICT strategy for educational delivery will worsen the problems associated with the digital divide for our learners."	

<u>11.1 COMMENTS:11.</u> - A – x

A - Yes if research is conducted on this kind of topics

C The future of learners will be brighter if all of them have access to the I.C.T

D. The programme will encourage the usage of technology to learners, i.e. to enhance the literacy in computer usage. Interaction between learners is likely to be enhanced.

B,E No response

XIV. Multimedia Developers Interview Schedules

2. Interviewer - Recommended experience to work in ICT multimedia environment

2.1 How long have you been working in multimedia (COOL) environment?
Interviewee: I would say about 2 years

2.2 Qualifications/experience

Interviewee
A Artistic background
Qualification in multimedia (e.g. D.I.T.)
Experience can be a good substitute e.g. quality of the work produced as opposed to Qualifications. Use of application software such as Adobe Photoshop, Flash, Macromedia, authorware, colour and shape.

B Programming experience (system & design methodology), and Networking skills.

C Knowledge and understanding of multimedia and their products
Web experience. Graphical design part of web.

2.4 Interviewer: Do you enjoy working in the multimedia environment?
Ja …definitely by **A, B, C**

Yes	Xxx
No	

2.5 Interviewer: If NO, please state the reason.
Interviewee N/A

3. Interviewer: What would you say are the strengths of COOL, SOL and DVC?

A. COOL - the developments are quite robust
We use Unisa's SOL system as opposed to UNISA's COOL
It is easy to change and update
It is interactive and informative
It offers the students the opportunity to see their financial (admin) and performance (academic) records

B 24hrs availability provide learner with choice and convenience
Cuts down costs related to transport, and time
Provides an alternative resource to lecturer and hand-out

C Learning is made easy through use of animations, graphics, video clips, and prompts in content presentation
DVC - blank

3.1 Interviewer: Based on these strengths, would you be willing to recommend any of the abovementioned technologies to others in distance education?

A Most definitely…for its useful in giving users access to information, but which one as best non-committal
A, B, C

Yes	Xxx
No	

3.2 Interviewer Mention fascinating/interesting aspects of the job of developing, hosting, designing or facilitating the site/conference.

A Website development application or recreate the application which have much more interesting activity that allow the user to understand information more easier, e.g. flash, macromedia (multimedia product)

B That kind of technology brings understanding (Java) of difficult concepts close to the students, because one student tries to understand long difficult sentences through reading. Instead if one uses graphics, motion graphics, and symbols as part of animation, communication may become much more effective. I like working with project teams, starting programme from scratch – developing it into fully-fledged programme that's going to help learners learn – actually it gives me a sense of fulfilment.

C Developing ICT-based courses is challenging because it is not easy. However, successful completion of project heightens one's sense of achievement.

4. Interviewer: Ok … What would you say are the drawbacks/weaknesses and their possible solutions for COOL, SOL and DVC?

A. I think it does not cater too much to the students' needs (Learning is not necessarily made easy – through use of graphics, animation, video clips)
- It only provides only certain aspects which related to course information and tutorials and some modules do not give holistic environment; ….. in that you can't take care of finances, you can't talk to students in other areas, e.g. rural areas …
It only allows you to interact with students in the same year, actually I would like to see interaction with more students at different levels (1st and 3rd) given the same materials designed and developed for one group say 2nd year (it should allow materials to be passed to and fro). The one thing that I don't like is that there is no sense of continuity between the students of previous year, current/subsequent students and the lecturers. Also it helps to improve communication between students and the lecturers.

B. The section where learners are expected to change their password it does not work well – plans afoot to have that changed. Some people still afraid of technology and consider things like pin codes security risk.

C Training and marketing vitally important
Users must be taught not to share personal information e.g. pin codes

SOL

DVC

4.1 Multimedia Developer Interviewees – ITCs functional variation

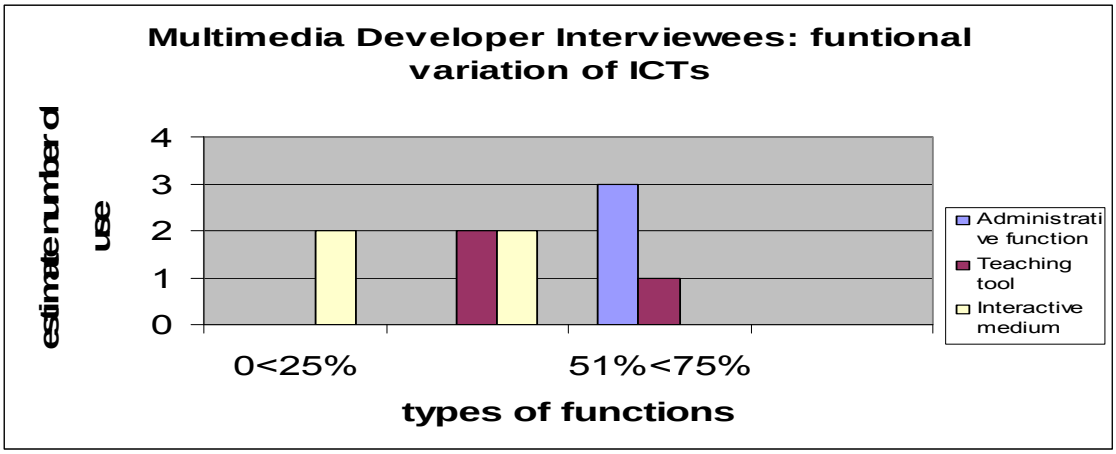
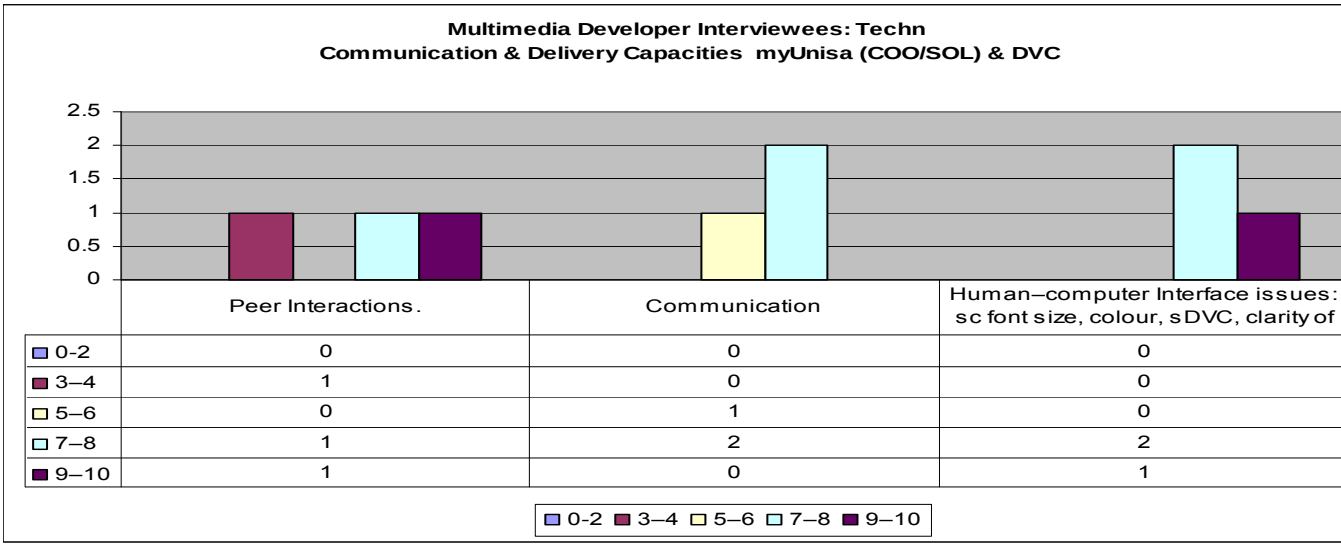


Table 5.17

6. Interviewer How important does your current group discussions rate with regard to the use of the ICTs? (Repeat question, sound of stop sound of the recording) Technical hiccup – interviewer forgot to record the rating discussion on the audio cassette, but captured it through writing the response)

(Rate 0 =Very Unimportant to 10 =Very important, for both COOL/SOL and DVC.)



	Peer Interactions.	Communication	Human–computer Interface issues: sc font size, colour, sDVC, clarity of
0-2	0	0	0
3–4	1	0	0
5–6	0	1	0
7–8	1	2	2
9–10	1	0	1

Table 5.18

6.1 Interviewer: If not important, what can be done to improve the situation?

A I think what should happen is that lecturers on the online system like COOL, should initiate the discussion themselves about the subject matter within the textbooks, as it is now, there is no interactions between the students and lecturers on the system.

B Lecturers should develop interesting subject matter for the online system

C Group Discussion makes life easier for participation –could improve performance; help in flow of ideas.

6 Interviewer: If very important, briefly explain why you rate it very important.

A Group discussion? mhm… I think it provides more value than reading textbooks because you develop a greater appreciation for the subject matter.

B As the subject matter stands in the textbook it is just all you need to pass the exams; having group discussion has a showing of true value of subject matter is applicable, what new development are there, and where subject matter is going.

C. COOL is quick to load, does not waste students' time and it's easy to access the information.

6.2 Interviewer: What would you describe as positives brought about by the use of technology at Unisa? Discuss.

A Definitely it assists the learners more, it removes the learners focus from administrative functions of sending/receiving materials through the post, transfer/delivery function of information is rendered easier to the learner

B. Accurate management of information statistics is rendered more accurate

C blank

7.1 What would you describe as negatives, lowering effectiveness of technology?

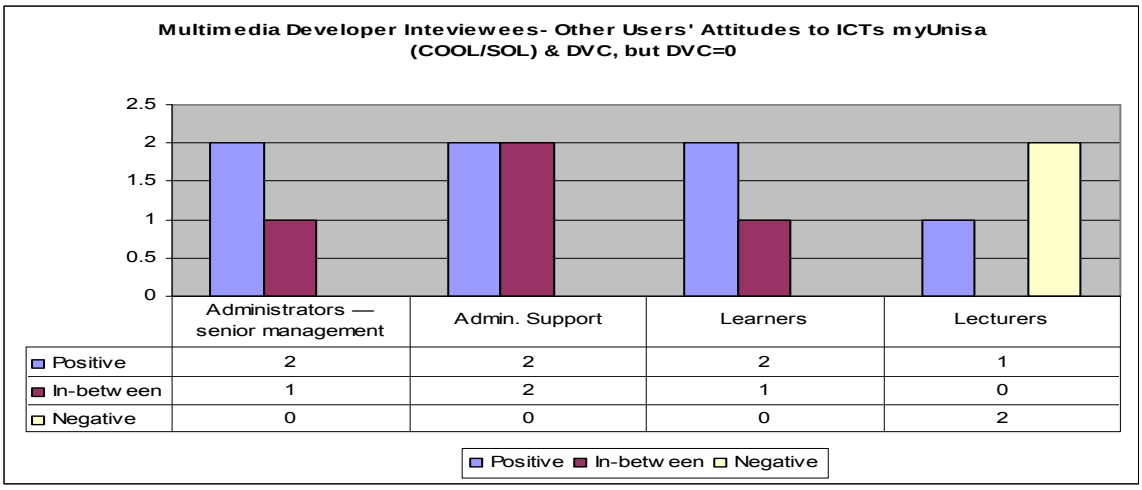
A… for example, I do a lot of flash presentations, whereas that provide additional value over and above the PowerPoint Presentation, not that much value, only use it for presentation for couple hours in a conference that might add some flair to the presentation

- I recommend flash, in that it is fast in rendering complex subject matter easy to the learner through combination of animation and graphics. It simplifies stuff that's complex in books.
- People don't understand far-reaching consequences that can be achieved through proper use of technology as they are not sufficiently exposed to technology, they don't know their true value.

B Bandwidth? Limit imposed by the bandwidth restricts use of technology as in DVC.

C The infrastructure as well with minimum requirements won't perform as long as minimum requirements have not been met. Often such minimum requirements may amount to huge expenses that are difficult for an institution to raise. For example, if a person wants to use some of the highly interactive software like Word PD you need to have machine that's multimedia interactive enabled, such machine may be too expensive to an institution r participating learners. .

7.2 Describe some of the attitudes of the users of COOL, SOL and DVC.



	Administrators — senior management	Admin. Support	Learners	Lecturers
Positive	2	2	2	1
In-betw een	1	2	1	0
Negative	0	0	0	2

Table 5.19

7.3 If negative, what should be done to change them?

A- It just requires more communication between the different groups
You need to understand the value of what's been done over the years and use it more productively. ___

B The lecturers need to be reassured that technology is not going to replace them, rather to help their students

8. How would you describe the present use of the technology?

Under-utilised	Xx
Moderate	X
Optimum	

8.1 If under-utilisation/moderate, what should be done to bring the use to optimum?

A - You need more communication, more research
- Take a step back with technologies and see what other people are doing with other technologies,
- be reactive like in our environment we see a problem we use technology to try to fix it
- be proactive, start/create own projects while using other people's creations (products)as basis to improve use of the technology

C -educate different stakeholders about the importance/role of technology in education

B- blank

9. Interviewer: If it were your decision to introduce changes about the technology,

9.1 what would you keep the same?

A Keep more profitable people because they understand how the technology is utilised
- Keep programs like COOL and improve COOL and make it useful to the users and satisfy their needs more profitably.

B One needs to take the best of both COOL & SOL to develop more superior system

C: blank

9.2 What would you change?

A I would keep some of the old and introduce couple more new changes because some of the technologies we use today are actually redundant and outdated, need to be replaced; the new technology should provide us with more opportunities.

B, C blank

9.3 what new innovations would you like to see introduced?

A – Renew Flash packages, renew video component, apply 3rd generation multimedia package to make learning of modules easier.

C Use more animation/multimedia approach to revitalise learning experience

B blank

9.3 What old/new stakeholder(s) would you like to see playing a meaningful role in making effective use of technology at the New Unisa?

A Clients/learners - to be oriented

B IT (now ICT) must improve their knowledge on what to do regarding implementation of ICTs. Lecturers and learners appear not to know what role to play

C Management – need to be decisive in directing lecturers what to be done

10. Any other suggestion to help improve the use of technology?

COOL

A- I think one needs to create awareness
More marketing is important.

B CD as back-up to study materials e.g. engineering

C - Video cassettes
- Audio tapes

DVC – blank

11. Your opinion regarding the future use of the technology for flexible delivery. Choose one statement below and comment.

"A bright future lies ahead for our learners with correct use of ICTs for their educational delivery." Xxx

"The lack of correct implementation of an ICT strategy for educational delivery will worsen the problems associated with the digital divide for our learners."