

Research in Perceptions and Models for Distance Learning in Computer Science and Information Systems in South Africa

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Abstract

There is an increasing need for distance learning in South African education institutions. The South African government emphasises the importance of distance learning. However, lecturers are not always trained in the teaching methods, and often do not have the necessary knowledge and experience of the methods to teach distance learning successfully. This study aimed to identify different methods which can be used to ensure effective management of distance education in the field of Computer Science and Information Systems, keeping in mind that this field of study has practical and theoretical components. Methods studied included: web-based education systems, virtual classrooms, experiential learning/simulation learning and interactive-/multimedia lessons. Research was done to determine the views of experienced and inexperienced lecturers with regard to distance learning. The views and experience of students regarding distance learning were also investigated. The obtained results indicate that in general, distance educators/lecturers do not necessarily offer modules consisting of both theoretical and practical components. Contact learning educators/lecturers would prefer receiving additional training if they are required to offer distance learning. Results indicate that the majority of contact learning students would prefer studying through contact learning rather than distance learning, while the majority of distance learners believe that if there had not been contributing factors to choosing distance learning, their first choice of education would be contact learning.

1. Introduction

There is an increasing need for distance learning in South African education institutions. The words transformation and diversity are used on a daily basis when South African universities are the topic of conversation. During a study in 2011, the Department of Higher Education and Training found that in South Africa there is still a huge demand for graduates who have specialised in Science, Engineering and Technology courses [4]. In the White Paper for Post School Education and Training (20 November 2013), the South African government emphasises the importance of universities starting to incorporate distance learning [4]. A huge problem, however, is that lecturers are not always trained in the teaching methods, and often do not have the necessary knowledge and experience of the methods to teach distance learning successfully [2]. Lecturers who are only experienced in contact learning now

have to adapt the teaching methods they have used in the past. It is required that the teaching methods implement a variety of learning techniques and teaching techniques that are more flexible and innovative for students. This will change the attitude of the student towards the course outcomes and the way the course is offered.

In this study, research is done to determine the views of experienced and inexperienced lecturers with regard to distance learning. The views and experience of students regarding distance learning is also investigated.

This project also focuses on the methods to be used to successfully offer Computer Science and Information Systems for distance learning. It is required that the teaching methods should implement various learning techniques and teaching techniques which are more flexible and innovative for students. This should change the attitude of the students towards the course outcomes and the manner in which the course is offered.

According to Bergstrand and Savage [2] the fact that lecturers are not always trained in the teaching methods and often do not have the necessary knowledge and experience regarding the methods used to successfully offer distance learning, poses a big problem. Therefore, lecturers have to make adjustments in the approach they have used in the past. Lecturers need knowledge concerning the correct methods for successfully offering their field of study in terms of distance learning.

2. Literature study: lecturers and distance learning

According to Sandberg et al. [13] many traditional educators, who are more familiar with class room education, are getting involved in distance learning. The transition from traditional teaching to distance learning should be done on a voluntary basis and does not necessarily have to be supported by systematic training of the abilities required to become involved in distance learning [13]. It is assumed that the lecturer will be able to easily adapt to the handling of distance learning. According to Beaudoin [1] the teaching function is not regarded as outdated, but the role of the educator is being transformed. The lecturer is seen as a mediator between students and available resources. The seven levels of concern an educator experiences when a new practice is adopted is discussed by Hall and Loucks [6]. A sequential process, loosely based on the model, is set out for the phases to be followed

when a distance faculty is developed [3]. In the first phase (awareness), questions about distance learning are asked by lecturers.

During this phase lecturers need general information which can for example be offered by means of workshops, where clear information will be provided regarding distance learning. The more information is provided to lecturers, the sooner the phase of consideration will be reached. During this phase lecturers decide whether they are interested in offering distance learning. The advantages and quality of distance learning is questioned. What is critical during this phase is the interaction with other lecturers who have previously offered distance learning and detailed information about the available support [3]. Lecturers who decide to become involved in distance learning then move on to the implementation phase. At this stage lecturers may feel overwhelmed by the demands set by the preparation and offering of distance learning.

According to Clay [3] training of lecturers should take place during this phase. Lecturers need answers to questions such as how to evaluate students, the amount of assistance to be given to the particular student, etc. It is important that the correct support is offered to lecturers during this phase; since lecturers will most probably follow tried and tested methods. Lecturers will then move on to the next phase (innovation) where new methods for distance learning will possibly be developed and further research will be done on distance learning.

According to an existing study it was found that among groups of lecturers who are uninformed regarding distance learning, there are different attitudes and paradigms for example, a view/paradigm that distance learning is not as effective as formal education, indecision as to whether distance learning is a sufficient education system, that it can be seen as an alternative to formal education and that it can therefore be used as a supporting model for formal education [8]. According to Rockwell et al. [11] some lecturers have a resistance towards distance learning.

Lecturers feel that distance learning will increase their work load even more. Not only the increased work load makes lecturers negative towards distance learning, but also the fact that class/course enrolments would increase. There are various other reasons why faculties and educators have a negative view of distance learning; lack of institutional support and training, insufficient remuneration and incentive structure, management of curriculum which can no longer be executed correctly [11]. It is clear from the discussed literature that lecturers may adopt a negative attitude towards and view of distance learning if they feel that they lack the necessary background and training to offer distance learning, and there will not be any resources and

support offered to them should they have to offer distance learning in the near future.

3. Literature study: students and distance learning

In many ways distance learning study methods differ from conventional study methods. Students who are involved in distance learning do not have to attend classes and do not have the opportunity to experience interaction between themselves, lecturers and other students. Distance learners are responsible for their own learning experience; the students decide when, where and how much time is spent on getting through the study material [17]. Research on the student's view of teaching tends to be more focused on how the student regards the use of technology, that is whether the background and computer literacy of the student has an impact on the paradigm created by technology [15], [18], and [19].

According to Young and Lewis [20] the view of distance learners and those students, who are educated on campus, differ greatly. Research on the effectiveness of distance learning, for students with different styles of learning, is still in the growing phase [5]. According to Richardson [10] the student's demographic background may have a direct influence on the student's attitude and motive for using distance learning. Not all students have the aptitude for distance learning and distance learning cannot necessarily be adapted to offer any subject. The student's attitude and study behaviour may in turn have a direct influence on the mastering of the learning outcomes. It has been found that distance learning students who are more mature, will more likely make a success of their studies [16]. According to Valentine [16] distance learning students differ from the normal graduate students, since most distance learning students are already following a career. Distance learning students who are already employed have well defined goals and are more motivated. The successful student should possess certain characteristics: tolerance when there is confusion regarding learning outcomes, a need for independence, the ability to work individually as well with group members, proper time management skills and the ability to be flexible. The attitude and perception of students, the corresponding attitude of the distance lecturer, the technological ability of the distance lecturer, as well as the ability of the lecturer/educator to handle problems interactively, either with the course of the study material, are regarded as important aspects which influence the learning process of distance learners [7].

According to Sampson [12] access to library services and resources is a key component in distance learning. Access to library resources is regarded as limited for distance learners. This creates a problem for the distance learner and may lead to

the student developing a negative attitude towards the learning experience. Distance learners who have access to library services and resources, experience more success in their studies. Another key component identified by Sampson [12] for distance learning, is support services for the students. According to Sampson [12] any higher education institution offering distance learning should make support services available to their students. Support services identify the needs of the student and then determine how the needs of the student can be met in terms of limitations regarding costs, technology and geography. Students identified the following disadvantages relating to their experience of distance learning [9], [14], and [16]:

- The student feels overloaded and lacks time management skills.
- Negative attitude to group assignments.
- Feels isolated.
- Students have to discipline themselves: Distance learners have a greater need for attention from the educator/lecturer.
- Experience psychological/psychic tension.

4. Literature study: Presentation methods for distance learning

The specific focus of this section is the technology and methods used to offer distance learning. These methods discussed in this section include: web-based learning environments, virtual classrooms, experiential learning and interactive/multimedia lessons.

4.1. Web-based learning environments

According to Mümine [21] there are different web-based environments for distance learning. Each web-based environment is organised and functions according to a different method. If a distance learning environment is implemented, the type of environment used should provide in the needs of the faculty or university [21]. Consequently, the environment should not only effectively offer the course material to the students, but the environment should also be user-friendly and effective for the educator. UNISA has moved away from using printed material to teach students and has implemented a completely web-based teaching environment [22]. The aim of the environment is to provide an effective, interactive and cost-effective channel which will promote online learning.

According to Ojokoh and Balogun [24], the environment includes online client server activities, built on the World Wide Web framework. Access to the Internet is essential for this design, since all learning activities take place online. Access to safe and reliable information is controlled by a

registration process and user passwords. The effective and purposeful use of information technology plays an important part when a web-based learning environment is used to offer distance learning. It influences the learner's perspective and experience of the online learning process [23]. Should a university decide to implement a web-based learning environment, the infrastructure of its information technology should be adequately reliable and efficient to offer online courses by using the necessary resources [23]. The Information Technology resources that make the implementation of a web-based learning environment more effective, includes: network bandwidth, network security, network accessibility, internet availability, multimedia services, video conferencing software, course management systems and user-friendly interfaces.

4.2. Virtual classrooms

Virtual classrooms („Collaborative Virtual Classrooms“) are used to improve the education of students by decreasing cost and time limitations. Collaborative learning is a process which encourages group or co-operative attempts among educators and students, as well as encouraging active participation and interaction between students and educators, and allows for new knowledge to emerge among people who share ideas and information [24]. This new learning concept shifts the focus from lecturer-student interaction to the role of peer relationships in order to facilitate learning. Virtual classrooms and the collaborative learning process make it possible for students to connect right across the world by means of Internet technology.

According to Ojokoh and Balogun [24] it offers students the opportunity to acquire three skills which are essential in the 21st century; communication between different cultural groups, co-operation and computer skills. Study material is made available on the World Wide Web (WWW); note that the WWW is used as medium and that it is not the main focus for distributing study material. The primary emphasis is to stimulate class interaction and participation. Collaborative projects are performed where students are dependent on the input and activities of others; the students are evaluated individually as well as collectively. Virtual classrooms make use of Computer-Mediated Communication (CMC). Computer-Mediated Communication promotes a type of interaction which is often lacking in the traditional classroom [25]. It offers students the freedom to follow alternative routes in order to shape their own learning style. CMC and networks in general enable long distance collaboration among students and specialists in various areas. Course management is done by means of the Internet; teaching, instruction, lesson preparation and tutorials

are done on the web. In general, all course-related communication between lecturers and students takes place by means of emails and discussion forums. CMC technologies emphasise asynchronous communication, which implies that students do not have to attend classes which are scheduled on specific days or at specific times; the study guides containing online material as well as assessment tasks are developed as web pages [24].

4.3. Experiential learning/simulation learning

Experiential learning simulations vary from models which offer a mirror image of reality, to synthetic environments which are created by means of interfaces which place students in virtual worlds [26]. Simulations create a learning experience for one or more students who are interactively involved in a scattered virtual environment. According to Dede [26] simulations enable students to simplify learning outcomes which before, were regarded as complex. Educators have already been using simulations for quite some time. Single-user simulations allow an individual to interact with a model of reality; scattered simulations allow a large number of students, in different locations, to create a general synthetic environment and model of reality, for example, flying a virtual aeroplane. An example of an experiential learning simulation in Computer Science is software engineering training. Students are trained by means of a technical process; to explore programming code and rule-based expert systems [26]. By using experiential learning simulation, the students is placed in a future working environment, where a large number of the aspects of the software engineering profession is still unknown.

The simulation allows the student to practise the process of formal programming code inspection. The student is placed in a simulation where the programming code must be explained within the “environment.”

4.4. Interactive/Multimedia lessons

Educational applications which use multimedia, simultaneously display data to students in various formats; text, image, animation, video, sound. Multimedia and hypermedia are learner-controlled interactive technologies. The ability of students to develop knowledge can be improved, if educators/lecturers use various formats to create an extended learning environment. The term interactive is used to describe various learning activities, including interaction between two or more students, interaction with the lecturer/educator and interaction with the study material itself [27]. If study material and lessons are in the form of a multimedia computer system, interaction takes place between the student and the computer system. Mayer [28] states that the

understanding of students improves if both text and visual elements are used to explain information.

Multimedia instruction is effective when text and graphics (can also include other media elements) are represented together. An example where multimedia is used during the learning process is computer-based assessments. According to Kuo and Wu [29] the advantages of computer-based assessments as opposed to conventional paper-based assessments, have already been identified for decades. Students are exposed to the use of multimedia to test complex skills and understanding. Students navigate through a complex database and try different strategies in order to achieve the aims of an assessment task. Multimedia is not only used for computer-based assessments; multimedia is used for the development of study material. According to Lupo and Erlich [30] study material is developed which utilises various types of media to highlight important sections in a course. Some of the courses already developed, employ interactive course material, which is made available on CD-ROM/DVD, as an integral part of study material distributed to distance learning students. These multimedia-based course material programmes improve, stimulate and enhance the learning process and replace passive learning styles and learning processes.

5. Comparisons

Table 1 includes the advantages and disadvantages of web-based learning environments. The advantages and disadvantages of virtual classrooms are briefly outlined in Table 2. The tables clearly show that both virtual classrooms and web-based environments regard the Internet as essential. Both web-based environments and virtual classrooms offer students the opportunity to study while eliminating the distance factor. Web-based environments do not offer students the opportunity to establish interaction with the educator/lecturer of the module. Virtual classrooms encourage students to ask questions and actively participate in the classroom and encourage active participation and interaction which expands and improves the student's social skills. Virtual classrooms only allow the student to apply theoretical knowledge by means of tasks and assessments, but do not improve the student's decision-making ability and experience to identify certain background knowledge for a specific situation.

Table 1. Advantages and Disadvantages of Web-based learning environments

	Advantages	Disadvantages
Web-based learning environments	<ul style="list-style-type: none"> - Easy to use - Eliminate time and distance factors 	<ul style="list-style-type: none"> - Internet is a necessity for continued existence - Could make student feel isolated. - Do not encourage interaction - Do not improve communication skills or decision-making skills - Do not always utilise more than one media element

Table 2. Advantages and Disadvantages of Virtual Classrooms

	Advantages	Disadvantages
Virtual Classrooms	<ul style="list-style-type: none"> - Eliminate distance factor. - Facilitate interaction between student and educator. - Easy to use. 	<ul style="list-style-type: none"> - Internet is regarded as a necessity. - Theoretical knowledge is not necessarily applied.

In Table 3 the advantages and disadvantages of experiential learning simulations are briefly outlined. Experiential learning simulations may utilise the Internet to adapt a simulation. Experiential learning simulations and multimedia study material/interactive lessons could form part of a web-based environment in order to more clearly convey the content and learning outcomes of a module to students. It is quite apparent from Table 1 that web-based environments do not develop the same decision-making skills as experiential learning simulations. Experiential learning simulations could be designed in such a way that more than one student could simultaneously be placed in the simulation. This improves the communication and social skills of the students, but when too many students are involved in a simulation, a student could develop a negative attitude in the learning experience.

Experiential learning simulation is more complex to design and to develop as web-based environments. Experiential learning simulations are not as dependent upon the Internet as web-based environments. The equipment and cost involved in developing an experiential learning simulation is more expensive than developing a web-based environment. Experiential learning simulations allow students to experience a situation which is similar to that of a future working environment. The student gains experience and applies theoretical knowledge in the situation.

Table 3. Advantages and Disadvantages of Experiential Learning Simulations

	Advantages	Disadvantages
Experiential learning simulations	<ul style="list-style-type: none"> - Can use web-based environment to make study material available. - Eliminate time and distance factors. - Improve decision-making skills. - Improve communication skills. - Can involve more than one student in a simulation. - Place students in a similar future working environment. 	<ul style="list-style-type: none"> - Not dependent on an Internet connection. - Complex design.

Table 4 includes the advantages and disadvantages of interactive/multimedia lessons. Web-based learning environments do not always comply with the unique learning style of a student, while interactive/multimedia lessons accommodate different learning styles. Interactive/multimedia lessons are developed in such a way that they utilise more than one media element, while the focus is not necessarily on the use of more than one media element when developing web-based environments. A student, who uses interactive/multimedia lessons, could obtain the study material and lessons in a different way than obtaining it from the Internet. During a virtual classroom session the educator can use multimedia lessons. Interactive/multimedia lessons offer the student the opportunity to interact with the study material. Should a student fail to understand the learning outcomes of an interactive lesson, the procedure of contacting the educator/lecturer in order to completely understand and master the learning outcomes, is not as simple as in a virtual classroom.

Table 4. Advantages and Disadvantages of Interactive/Multimedia Lessons

	Advantages	Disadvantages
Interactive/Multimedia lessons	<ul style="list-style-type: none"> - Support different learning styles. - Could make use of web-based learning environments to make study material available. - Focus on more than one media element. - Internet connection is not a necessity. 	<ul style="list-style-type: none"> - Could make student feel isolated. - Does not encourage interaction. - Could obtain lessons by other means than Internet connection.

6. Data collection and processing

The methods and strategies that accompany distance learning are evaluated by means of questionnaires sent to distance educators and distance learners. The views of contact learning educators and contact learning students were also obtained by means of questionnaires.

6.1. Data collection method

The questionnaires sent to distance lecturers comprised open-ended questions. 30 questionnaires were sent to distance lecturers of which 12 questionnaires ($n = 12$) were completed correctly and returned to the researcher. The questionnaires sent to contact learning lecturers comprised Likert scale questions and open-ended questions. The questionnaires were sent to contact learning lecturers of the School for Computer Science and Information Systems, the School for Statistics and the School for Mathematics (North West University, Potchefstroom Campus). The number of questionnaires that were returned is 8 questionnaires ($n = 8$). The questionnaires sent to distance learners comprised open-ended questions. 100 questionnaires were sent to distance learners, of which 46 questionnaires ($n = 46$) were correctly completed and returned to the researcher. 50 questionnaires were sent to contact learning students of which 38 questionnaires ($n = 38$) were correctly completed and returned.

7. Results

Data and results are discussed separately for each of the questionnaires. The most important data and results from the questionnaires were summarized as follows:

7.1. Most important data and results obtained from the questionnaire to distance learning educators/lecturers

75% of the distance lecturers do not offer a module that contains both theoretical and practical components. The distance lecturers only offer modules that are theoretical by nature. If distance learning should be implemented in the Computer Science and Information Systems study field, an extended study will have to be conducted concerning how practical components are offered in distance learning, since the study field includes both theoretical and practical components. The distance lecturers who offer a module which includes a practical component do not assess practical principles or concepts during the semester. Classes are offered to explain the practical component. It is the responsibility of the distance learner to ensure

that the practical component is understood. Practical concepts are only assessed during an examination.

67% of the distance lecturers do not believe that the students are satisfied with the way in which the module is offered. Face to face communication can be regarded as a factor that complicates the implementation of distance learning.

42% of the distance lecturers contact distance learners who are enrolled for the module offered by the distance lecturer at least once a week via email.

58% of the distance lecturers only contact students if a student first contacts the lecturer via mail. Other means of interaction and communication that were noted include telephone calls and faxes.

67% of the distance lecturers take between a week and two weeks to give feedback to distance learners in terms of assignments, assessments and tests. 33% of the distance lecturers take longer than two weeks to give feedback to distance learners in terms of assignments, assessments and tests. Distance lecturers provide feedback to students in the form of letters. The letter discusses the learning outcomes of the assessment and the aspects that the distance lecturer could identify that the student did not understand correctly. The learning outcomes of the assessment that were overall not achieved by the other students are also discussed.

8% of the distance lecturers spend between 0 and 2 hours per day interacting with students, 17% of the distance lecturers spend between 2 and 4 hours per day interacting with students and 75% of the distance lecturers spend between 4 and 6 hours per day interacting with students.

83.33% of the distance lecturers think that distance learning does not take up more of the educator's time than contact learning. 8.33% of the distance lecturers think that distance learning takes up more of the educator's time than contact learning. The respondents think that more time should be spent on lesson planning and the development of study material in order to convey it effectively to the distance learners.

67% of the distance lecturers would recommend distance learning to prospective students.

7.2. Data and results obtained from the questionnaire to contact learning lecturers

The Likert scale measures questions such as: disagree strongly (1), disagree (2), no opinion (3), agree (4), agree fully (5). The conclusions drawn from the results are as follows:

Half of the contact learning lecturers who answered the questionnaire think that more detailed lesson planning must be done for distance learning. The other half of the contact learning lecturers think that lesson planning can be done the same way for distance learning as for contact learning.

The majority of contact learning lecturers, who participated, think that they do not have sufficient background knowledge and training to act as distance learning lecturers. The contact learning lecturers would prefer to receive additional training and support should they have to act as distance learning lecturers.

The majority of the contact learning lecturers think that multimedia can contribute positively to the learning experience of the student. The contact learning lecturers often use videos, sound and other forms of multimedia during class sessions. Students are encouraged to use multimedia when studying. The study methods of students are definitely considered.

The majority of contact learning lecturers, who participated in answering the questionnaire, would make use of virtual classes to offer distance learning, should the necessary software and hardware be available.

The majority of contact learning lecturers who participated in answering the questionnaire think that the number of enrolments in the Computer Science and Information Systems field of study will increase if distance learning is made available in the study field, but that students would generally rather use contact learning than registering for an online course.

The majority of contact teaching educators/lecturers who participated, are of the opinion that they do not have sufficient background knowledge and training to act as distance learning educators/lecturers. The contact teaching educators/lecturers would prefer to receive additional training and support, should they be expected to offer distance learning. Contact teaching educators/lecturers believe that contact teaching focuses more on the needs of the student than distance learning does.

7.3. Data and results obtained from the questionnaire to distance learners

Reasons why students do distance learning is that it is cheaper than full time studies at a contact learning institution, and other financial reasons; Student can follow a career and study at the same time; and The Higher Education institution is the only institution that offers the specific course.

54% of the distance students are dissatisfied with the study material they receive. Others feel the study material is outdated or irrelevant.

50% of the distance learners were dissatisfied with the feedback they received after assessments had been submitted. The reasons are that the time it took to receive the feedback was too long. Some of the distance students noted that the feedback they receive is vague and that no explanations are given as to why an answer is not regarded as correct.

The respondents noted the following forms of study material: Study guides (Theoretical assessments are explained in the study guides); Text Books; PDF format articles and study material; CDs containing study material.

Half of the distance learning students would prefer a combination of a web-based learning environment which also contains multimedia as teaching method. A third of the students would prefer interactive/multimedia lessons.

78% of the distance learning students are not given the opportunity to make use of virtual classrooms. 26% of the distance learning students are enrolled for a course comprising theoretical and practical study material and tasks. This also supports the emergence of the research question which was explored.

50% of the distance students have no experience in web-based learning environments. 28% of the distance students studied by means of a web-based learning environment, but found the environment/system ineffective and not always available when students needed it. 22% of the distance students studied by means of a web-based learning environment and thought that if the system is well organised, it improves communication between the student and the educator.

Suggestions for improving support services are: Mentors/study leaders, for example a final year student; Study tips as well as adapting study material to the learning method of a student. 78% of the distance students do not use library services to complete an assignment.

52% of the distance students think that if factors and circumstances do not contribute to choosing a distance course, the student would rather make use of contact learning. The students think that the interaction between the educator/lecturer and the student is poor and it complicates the learning process.

48% of the distance students believe that they have the necessary self-discipline to do a distance learning course. The students also thought that it was cheaper than contact learning.

7.4. Data and results obtained from the questionnaire to contact learners

The conclusions made from the results are as follows:

The majority of contact students who participated in the study think that learning progress does not have to be monitored by the educator/lecturer. The students believe that they are self-disciplined enough to realise when they have to set aside time to study.

Contact learning students believe that should their educators/lecturers make use of multimedia during class sessions, it would certainly contribute to

the clarification and increased understanding of certain concepts in a module.

The majority of the contact students currently use emails to increase communication with an educator/lecturer. Other electronic and technological media are used to communicate with fellow students and discuss assignments.

The majority of the contact students would rather study by means of contact learning than distance learning.

8. Conclusion

The findings of this study provide insight into the handling of distance learning, especially if contact learning educators/lecturers should have to offer some form of distance learning in future. The study focuses on the views and paradigms educators and students have formed about distance learning. The methods currently being used in distance learning were investigated and the effectiveness of the methods was determined by means of questionnaires.

The results obtained indicate that distance learning lecturers generally do not offer modules which include both theoretical and practical components. The majority of distance educators think that distance learning does not take up more time than contact learning. The lecturers believe that lesson planning and preparation of study material is done the same way as for contact learning. The view is contrary to that of contact learning lecturers.

The majority of contact lecturers believe that lesson planning and preparation of study material takes up more time in distance learning. Contact learning lecturers would prefer to receive additional training should they be expected to offer distance learning. Contact learning lecturers currently use multimedia and their view is that it could contribute positively to the learning experience of the student using distance learning.

Results show that various factors contribute to the choice of a student to make use of distance learning. Results indicate that the majority of contact learning students would prefer contact learning over distance learning. The majority of distance learners believe that if there had not been contributing factors to choosing distance learning, their first choice of education would be contact learning.

Different methods used in distance education were compared during the study, these methods included: web-based learning environments, virtual classrooms, experiential learning/simulation learning and interactive-/multimedia lessons. The disadvantages and advantages of each of the mentioned methods were compared. Web-based learning environments, experiential learning and interactive/multimedia lessons eliminate time and distance factors, while virtual classrooms only eliminate the distance factor. All of the mentioned

methods are easy to use. Virtual classrooms create an opportunity for the student to easily communicate and interact with the lecturer. Web-based learning environments and interactive-/multimedia lessons do not necessarily create an opportunity for students to interact with fellow students and lecturers and the student can feel isolated. Methods can also be combined, for instance web-based learning environments can be used as a medium from which a student can have access to interactive-/multimedia lessons.

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