

**Extent of e-Learning at Universities of Technology –
our strength for our future?**

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Reference: Badenhorst, JJC. 2015. Extent of e-learning at universities of technology – our strength for our future?, Journal of New Generation Sciences, 13(1):1-18

Abstract:

The current status of e-learning implementation at the Universities of Technology (UoTs) in South Africa is explored in terms of specific aspects of teaching and learning. In this study the process categories, dimensions and perspectives for the benchmarking of e-learning of the e-maturity model (eMM) of Marshall (2005), the Pick & Mix benchmarking of Bacsich (2009), the six dimensional approach (HELAM) of Ozkan and Koseler (2009), the six dimensions of Sun, Tsai, Finger et al (2008) and the benchmarking of the Australasian Council for Open, Distance and E-learning (ACODE) are compared and a six dimension approach, called SILSTI, is identified as base for the benchmarking of the implementation of e-learning at universities. Aspects of these dimensions were investigated at UoTs by means of a questionnaire. The results are discussed according to the six dimensions. A conclusion is then reached on the level of e-learning implementation at UoTs in South Africa and areas for further research are recommended.

Keywords

e-learning; benchmarking; e-learning implementation; e-maturity; measuring; universities of technology

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1. Introduction

E-learning developed as an educational tool in traditional face-to-face teaching in higher education. E-learning can broadly be defined as instruction delivered through any electronic medium, including the Internet, television broadcasts, satellite communication and electronic printed media (Engelbrecht 2003:37). The delivery of instruction through web-based media and the introduction of learning management systems (LMS) is now a common implementation at higher education institutions.

Higher education institutions implement e-learning in various configurations, which are influenced by several factors. The financial investment by higher education institutions is one of the determining factors in implementation of e-learning, particularly the investment in information and communication technology (ICT) infrastructure utilised in e-learning programmes (Engelbrecht 2003:38). When Marshall (2005) formulated the rationale for a project to determine e-learning capacity at New Zealand Tertiary Institutions, he stated that rising costs is of primary importance when universities decide on investing in e-learning. Other factors playing an important role include the training of staff, on the one hand, and the development, delivery and administration of e-learning programmes on the other hand (Engelbrecht 2003:38).

One of the commonly accepted methods to assess the effectiveness and value of e-learning in higher education institutions is through benchmarking with their peer institutions. A number of e-learning implementation benchmarking projects can be found in literature and were undertaken in Australia and New Zealand (cf. Marshall 2005, ACODE 2007), Great Britain (cf. Bacsich 2009), Europe (cf. Ozkan and Koseler 2009) and Taiwan (cf. Sun, Tsai, Finger, Chen and Yeh 2008).

Over the last ten years, Universities of Technology (UoTs) worldwide have started to implement e-learning each in its own way by building capacity in e-learning. This is also true for the six UoTs in South Africa, however, little is known about the extent of implementation of e-learning at these universities. The aim of this paper is thus to investigate the current status of e-learning at UoTs in South Africa by proposing a framework for benchmarking e-learning implementation and to determine the status of e-learning implementation at UoTs by applying the proposed framework.

2. Methodology

The first objective of this study was to construct an e-learning benchmark framework to benchmark e-learning implementation at the different UoTs in South Africa. An extensive literature review was undertaken to identify different strategies of e-learning implementation. These strategies were then used to identify the different dimensions of e-learning implementation at higher education institutions. These dimensions are descriptors of the elements that contribute to the e-learning implementation strategy.

The second objective was to obtain data from UoTs that can be used to determine the status of e-learning implementation at UoTs in South Africa. The different

dimensions of e-learning implementation were used to inform the development of a questionnaire that was distributed to UoTs. The results of the questionnaire were then used to describe the status of e-learning at UoTs in South Africa by comparing the results in relation to the benchmark framework.

3. Towards a benchmarking framework

The diversity and complexity of all the factors contributing to the implementation of an e-learning system may be confusing when assessing the implementation of an e-learning system. To understand these factors it is necessary to identify dimensions or perspectives to assess them.

When institutions' senior management consider investment in e-learning the effectiveness of e-learning is interpreted from different perspectives. Levy (2006:1) mentioned the perceived effectiveness of e-learning from a learner's perspective. The perspectives of all users of e-learning, including the instructors, designers or lecturers all contribute to the perceived value of e-learning which may differ from the viewpoint of the institution's management.

3.1. Benchmarking strategies

The most commonly used benchmarking strategies for e-learning includes the e-maturity model (eMM) of Marshall (2005), the Pick&Mix benchmarking of Bacsich (2009), the six dimensional approach (HELAM) of Ozkan and Koseler (2009), the six dimensions of Sun, Tsai, Finger, Chen and Yeh (2008) and the benchmarking of the Australasian Council for Open, Distance and E-learning (ACODE). These six

benchmarking strategies for e-learning will be discussed in terms of their roles and contributions to a benchmarking framework.

The e-Maturity Model (eMM) was designed to benchmark e-learning implementation at higher institutions in New Zealand to improve sustainability and quality of e-learning (Marshall, 2006:5). Initially eMM adopted five process categories namely, learning, development, support, evaluation and organisation (Marshall 2006:10). These five categories that address the processes that are needed to implement e-learning are listed in Table 1.

Table 1: eMM process areas (adapted from Marshall 2006:10 and Marshall 2007:6)

Process Area	Brief Description	Number of Processes
Learning	Processes that directly impact on pedagogical aspects of e-learning	11
Development	Processes surrounding the creation and maintenance of e-learning resources	7
Coordination / Support	Processes surrounding the oversight and management of e-learning	6
Evaluation	Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle	3
Organisation	Processes associated with institutional planning and management	9

In developing the second version of the eMM, the developers moved away from the concept to evaluate the processes in terms of levels of performance in a hierarchical model to a dimensional concept, thereby creating a more holistic perspective. In this approach five new dimensions were formulated. After assessing each of the

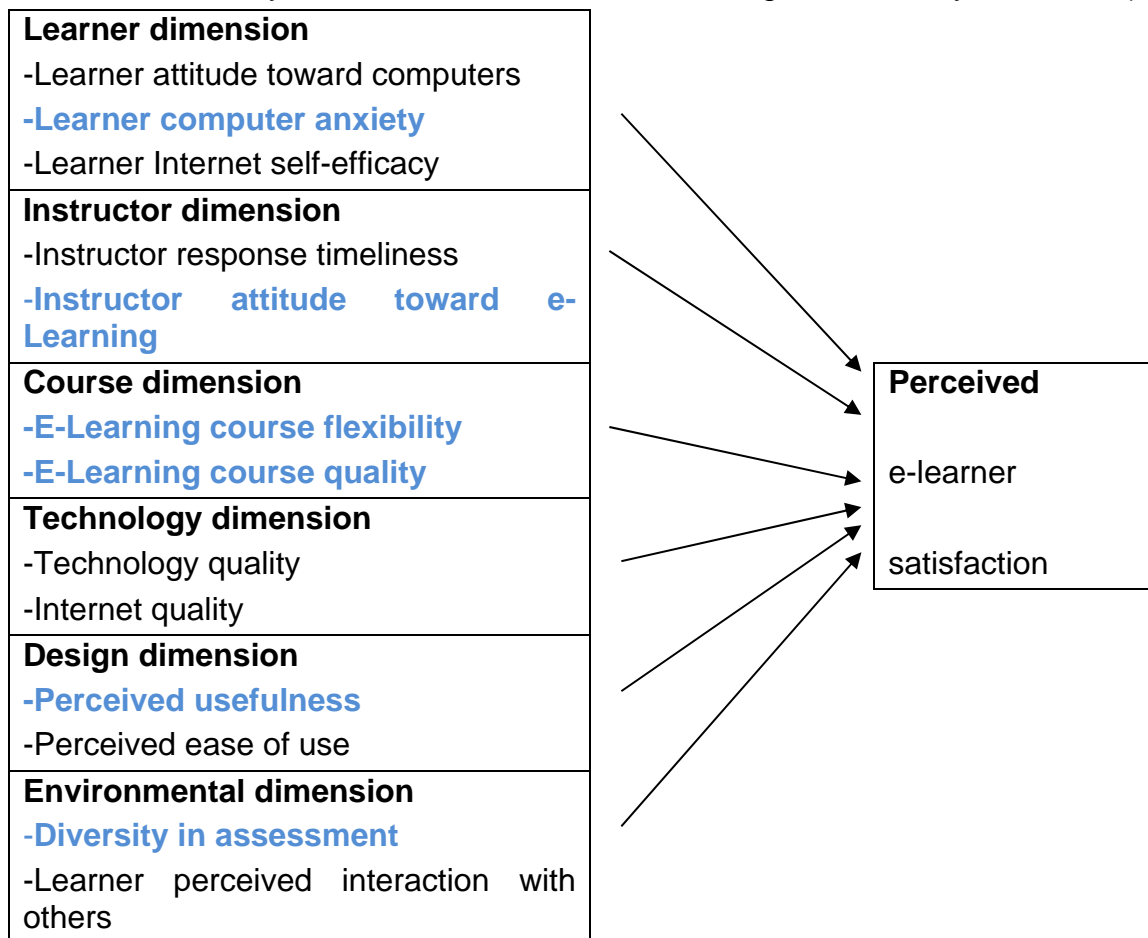
processed according to five dimensions, the level of implementation of e-learning was presented in the form of a matrix (Marshall, 2006:10). The eMM process dimensions are summarised in Table 2.

Table 2: eMM process dimensions. (from Marshall, 2006:10)

	Dimension	Focus
1	Delivery	Creation and delivery of process outcomes
2	Planning	The use of predefined objectives and plans in conducting the work of the process.
3	Definition	The use of institutionally defined and documented standards, guidelines, templates and policies during the process implementation.
4	Management	How the institution manages the process implementation and end ensures the quality of the outcomes
5	Optimisation	The Extent an institution is using formal approaches to improve capability measured within the other dimensions of this process.

Sun *et al.* (2008) studied the perceived e-learner satisfaction in Taiwan to determine the relationship amongst 13 benchmarking factors. The different factors were grouped into six dimensions, namely, student dimension, instructor dimension, course dimension, technology dimension, design dimension, and environment dimension (Table 3).

Table 3: Summary of the six dimensions of e-learning described by Sun *et al.* (2008).



Except for the technology dimension, the remaining five dimensions all demonstrated a critical relationship with perceived learner satisfaction. This could be explained by the fact that the study was conducted in an environment where high speed Internet connectivity was available and that technologies used in Taiwan are fairly mature and familiar to learners. The results from this study (Sun *et al.* 2008) provided valuable insights into the perspectives that require consideration when evaluating the implementation of e-learning systems.

The hexagonal e-learning assessment model HELAM used a learner's perspective on e-learning to propose a six-dimensional approach for a learner management system evaluation (Ozkan and Koseler 2009).The learners' perspectives of e-

learning was reviewed from a social and technical entity viewpoint and the conclusion was reached that a comprehensive evaluation model for e-learning is needed. They emphasised that future research should also focus on the perspectives of other role players for a complete evaluation of e-learning at an institution.

Table 4: HELAM dimensions (from Ozkan and Koseler 2009).

	Dimensions	Entity Viewpoint
1	Supportive factors	Social Issues
2	Learner perspective	Social Issues
3	Instructor attitudes	Social Issues
4	System quality	Technical Issues
5	Content quality	Technical Issues
6	Service quality	Technical Issues

The ACODE (Australasian Council on Open, Distance and E-learning) benchmarks for e-learning implementation at universities focused on the use of e-learning for the support of teaching and learning (ACODE 2007). It has been used in Australia, New Zealand, United Kingdom and the US (Krause, McEwan and Blinco 2009). The benchmark performance measures are grouped into eight ACODE Benchmark Areas (Table 5).

Table 5: ACODE Benchmark Areas (adapted from Krause *et al.* 2009)

1	Institution policy and governance for technology supported learning and teaching
2	Planning for, and quality improvement of the integration of technologies for learning and teaching
3	Information technology infrastructure to support learning and teaching
4	Pedagogical application of information and communication technology
5	Professional/staff development for the effective use of technologies for learning and teaching
6	Staff support for the use of technologies for learning and teaching

7	Student training for the effective use of technologies for learning
8	Student support for the use of technologies for learning

Pick&Mix, an initiative in the United Kingdom, was developed for an institution to benchmark e-learning implementation against its global competitors (Bacsich 2009). Pick&Mix went through a number of development phases and was eventually used by more than 24 institutions in a benchmarking exercise conducted by the Higher Education Academy in the United Kingdom. The developer mentioned the influence from the ACODE benchmarks. The eMM. Ninety-nine criteria were further developed and organised into the six MIT90s categories. Each of these criteria is then evaluated according to a scale with 6 levels of achievement. The categories used are listed in Table 6. (Bacsich 2009)

Table 6: Categories used in MIT90s and Pic&Mix (Bacsich, 2009)

1	External environment
2	Individuals (Staff and Students)
3	Processes
4	Organisation (Structure)
5	Strategy
6	Technology

A set of indicators to measure standards for the quality assurance of e-learning used in a blended teaching mode (where e-learning was not used as a distance education tool but as an educational tool on a residential campus) were grouped into six areas (Ellis and Calvo 2007). These indicators were formulated as part of a project to assure quality of LMS-supported blended learning in institutions using the dotLRN learning management system environment.

Table 7: Six areas for dotLRN environment (from Ellis and Calvo 2007)

1.	Leadership and ongoing funding
2	Policy
3	Evaluation services
4	Support for teaching and learning with ICTs
5	Support for planning, design and development with ICTs
6	The decision to develop or redevelop a course with ICT

The different perspectives on e-learning benchmarking strategies have some commonalities and omissions. A framework to evaluate e-learning implementation will now be formulated.

3.2. Formulating the Student, Instructor, Learning design, Support, Technology environment and the Institutional dimensions (SILSTI) approach

The move from the assessment of categories to assessments in terms of dimensions in the eMM Benchmarks created a holistic view of e-learning. To get a better understanding of the status of the implementation of e-learning at an institution it is more appropriate to benchmark in terms of dimensions than to only benchmark the processes of e-learning implementation. Bacsich (2009) argued that by adding the cross cutting layer of dimensions to the criteria, the benchmarking process is made more time-consuming - although he admitted that the addition of a cross cutting layer of dimensions will make it more thorough. However, he decided not to create a dimensionalised version of Pick&Mix.

Marshall (2009) argued for a holistic approach to benchmark e-learning implementation. He compared the eMM and ACODE Benchmarks and found that the eight benchmarks of the eMM could be grouped into the five processes used in the ACODE Benchmarks. Although the ACODE Benchmarks are quite comprehensive and most of the dimensions could be identified when the questions are organised, all dimensions are not attended to. Marshall (2009) found that the eMM has a more holistic approach while the ACODE benchmarks focus on a specific set of issues where areas of concern have already been identified.

The researcher compared the different categories and dimensions identified in the previous paragraphs and they are summarised in Table 8. The dimensions or categories with the same characteristics were then colour coded. The dimensions that stood out were: student (yellow), instructor (red), learning design (orange), support (cyan), technology environment (blue) and institutional (green).

The focus or approach of each benchmarking model also influenced the use of dimensions or categories. eMM, Pick&Mix and ACODE benchmarks used a process approach while the HELAM and Sun benchmarks used a student satisfaction approach. It is noticeable that dimensions are used where user satisfaction (or the value for the user) is the focus while categories are used where processes are the focus.

Table 8: SILSTI - A Comparison of dimensions or categories used for benchmarking of e-learning.

Combined perspective (SILSTI)	ACODE Benchmark (ACODE)	eMM process categories (Marshall)	Pick & Mix Adopted from MIT90s (Bacsich)	Dimensions (Sun <i>et al.</i>)	HELAM (Ozkan, <i>et al.</i>)
Student Dimension	Institution policy and governance for technology supported learning and teaching	Learning	Organizational Strategy	Student dimension	System quality
Instructor Dimension	Planning for, and quality improvement of the integration of technologies for learning and teaching	Development	Structure	Instructor dimension	Service quality
Learning Design Dimension	Information technology infrastructure	Coordination/Support	Processes	Course dimension	Content quality
Support Dimension	Pedagogical application of information and communication technology	Evaluation	People and their roles	Technology dimension	Learner perspective issues
Technology environment Dimension	Professional/staff development	Organisation	Technology	Design dimension	Instructor attitudes
Institutional Dimension	Staff support			Environment dimension	Supportive issues
	Student training				
	Student support				
Approach	Processes Approach	Processes Approach	Best practices / processes Approach	Student satisfaction Approach	Student Satisfaction Approach

The combined perspective takes into account the different areas used for benchmarking of e-learning as listed in Table 8. This leads to the formulation of the SILSTI approach.

The SILSTI approach for the evaluation of e-learning implementation is a six dimensional approach with the following dimensions: student dimension, instructor

dimension, learning design dimension, support dimension, technology environment dimension and the institutional dimension.

To evaluate the value of e-learning from a dimensional view will therefore give a more holistic view from where the management of an institution can assess the implementation of e-learning. Selecting criteria representing each of the defined dimensions can then be the building blocks for a benchmark exercise on e-learning.

3.3. Constructing of an e-learning implementation questionnaire

An open ended questionnaire was developed by the researcher to record the experience of the six South African member universities of the South African Technology Network (SATN) similar to a questionnaire Ellis and Calvo (2007) used to record the experience of seven universities in relation to the indicators they used. For each of the SILSTI dimensions some current aspects of e-learning implementation were selected to determine the status of e-learning at these universities. The questionnaire is attached as Appendix A.

Representatives from the e-learning component from each UoT were asked to complete the questionnaire. Responses were received from all six of the UoTs in South Africa.

4. Results

The open-ended nature of the questionnaire prevents that the results be reported in a table format and therefore the results are discussed below according to the dimensions of the SILSTI dimensions.

4.1. Student Dimension

Access to the e-learning environment is mainly on campus. Only three UoTs indicated both on and off campus access by students. The use of laptop computers by students and the availability of wireless access is a critical factor for access to e-learning. It is clear from the responses that the availability of campus wide wireless access for students (in the form of selective hotspots or across the campuses) is a priority at UoTs. The important factor is that students have more access to their own laptop computers and are now starting to move away from using only computers in open-access computer labs.

The introduction of more and cheaper smartphones and other mobile devices changed the mobile communication scene radically and soon the general use of this means of communication will have a real impact on e-learning. An important current issue is the implementation of specifically designed mobile modules of an LMS. Only one UoT implemented the mobile unit of their LMS, while a second is busy with a pilot to evaluate the concept.

4.2. Instructor Dimension

Staff Development

The training of lecturers is mentioned as an important way to improve the quality of their e-learning interventions. Two of the six UoTs have formal staff development programmes in e-learning. These are however in-house non-certified programmes. Ad hoc training of the features of the LMS is done in the other UoTs. At one UoT the training is integrated with the training for new lecturers during their probation period.

It should however be noted that there are no formal qualifications in place at these institutions for training in the use of e-learning. The development of modules that could form part of a professional teaching qualification for higher education academics should be considered.

4.3. Learning Design Dimension

Learning model

Respondents were not requested to indicate a specific learning model, but all UoTs follow what could be described as a blended learning approach where e-learning forms part of curriculum delivery combined with traditional delivery methods. Academic staff members are encouraged to use e-learning as one of their teaching and learning delivery methods to deliver their curriculum.

Online Assessment

Online assessment is used for formative assessment at all UoTs. One UoT indicated that they do not use it for summative assessment. Another UoT indicated that the use of online assessment is very limited for summative assessment. The available tools in the LMS are not the only means of online assessment used.

Dedicated computer labs for assessment are not readily available at UoTs. Two UoTs, however, indicated that there are labs available for online assessment. UoTs indicate that the use of online assessment is increasing.

Improvement of e-learning interventions

There are no formal quality assurance measures in place for e-learning at the UoTs. The normal quality assurance measures for courses are also applied to the e-learning interventions in courses. Programme reviews are the main instrument to ensure the quality of courses. Student satisfaction surveys are also used to determine the perception of the quality by students. It is however mostly the responsibility of the users (lecturers and students) to ensure the quality of the e-learning components in courses.

4.4. Support Dimension

E-learning Unit

Is the success of an e-learning implementation determined by the support that users can get? This question may be answered by comparing the existence, size and position in the university of an e-learning unit with the level of implementation at that institution.

Five of the six UoTs indicated that they do have an e-learning unit. One UoT does have staff dedicated to e-learning, but they are not in a separate unit. One UoT has an independent unit that reports directly to the DVC: Academic and the rest are all (under different names) situated in the section that is involved with teaching and learning development or academic development.

The number of staff allocated to e-learning and the nature of the appointments vary between the UoTs. It is not possible to determine from the questionnaire the ratio of

the number of staff to the number of lecturers that should be supported. The determining of an ideal ratio should be further investigated.

The technical and administrative staff are support staff appointments while at three institutions the e-learning practitioners are academic appointments. A fourth UoT is in the process to change some of the appointments of e-learning practitioners to academic appointments. The academic appointments have an obligation to contribute to the research outputs of the university. Only one UoT has staff of the e-learning unit dedicated to a specific Faculty.

In comparing the level of implementation with the e-learning unit at the specific universities it should be noted that the universities with dedicated units for e-learning and with more staff have a higher level of implementation of e-learning.

4.5. Technology environment Dimension

LMS

Blackboard 9 is used as the Learning Management System (LMS) or is in the process of implementing at all the respondent universities. One of the UoTs currently has some of their courses on SAKAI or Moodle which are open-source learning management systems, but they are now replacing it by phasing in Blackboard. The main reason for UoTs to use a proprietary system is mentioned as the existence of effective support to implement and maintain the software infrastructure. The availability of support from an established company that is available when needed (and with a service level agreement) and the added support from a user community are very important factors in this decision.

The UoTs are satisfied with the scalability of Blackboard 9 to accommodate their needs in terms of number of courses and number of students. Except for the one UoT that is moving to Blackboard, none of the other indicated that they consider any movement to another LMS.

The debate in UoTs on using open-source software seems to have died down in favour of using the proprietary LMS Blackboard.

4.6. Institutional Dimension

Policies

Five of the six UoT's do not have an approved policy or strategy on the utilisation of e-learning practices in the institution. One institution is in the process to develop such a policy or implementation plan. One indicated that they are in the middle of a project to roll out e-learning and part of the process is to revise current learning, teaching and assessment policies to include e-learning. A fourth UoT indicated that they are also revising their current learning and teaching policies.

There is no clear indication of a management initiated implementation model, since only two UoTs have a compulsory implementation of e-learning in all subjects. One UoT expect that half of its courses would have compulsory implementation of e-learning within three years, whilst at other UoTs it is up to the lecturers or departments to implement e-learning.

The fact that policies and strategies are lacking can therefore be considered as a negative factor in the implementing of e-learning at higher education institutions.

Level of implementation

Not all UoTs could give an indication of the percentage of usage of e-learning at their institutions. Two institutions indicated that they are only in the starting phases of formal implementation of e-learning. The percentage of courses with an active e-learning component varies from 28% to 65%. The percentage of lecturers involved was only reported by three UoTs. Two reported 17% and 20% respectively while the third reported 61%.

With reference to future implementations Open Learning and Massive Open Online Courses (MOOCs) were mentioned by the respondents. New technologies to be introduced include social media, integration of the student management system with the LMS and interactive learning.

5. Discussion

The **dimension of learning design** as well as the **instructor dimension** contribute to the quality of courses and need the attention of the institutions. The study shows that there is a shortcoming in the evaluation of the quality of the e-learning courses. Different levels and approaches of training of lecturers are in place at the UoTs. Training is mainly focused on building the capacity of lecturers to develop their own e-learning courses.

The **technology dimension** speaks to the LMS in use and there is unanimity in using the proprietary software from Blackboard.

In the **support dimension** there are different levels of support at UoTs, and that manifests in the level of implementation of e-learning at UoTs. In order for UoTs to increase their implementation of e-learning the support departments should receive the necessary backing by management.

Student satisfaction is an important angle for the **student dimension**. E-learning should be available on the technologies the students are using and on a level that they will benefit from.

The **institutional dimension** emphasized that the integration of e-learning into the teaching and learning policies needs attention at all UoTs in order to put e-learning on a higher level of implementation. Ellis and Calvo (2009) confirm in their study of the quality of LMS-supported blended learning at seven universities in Europe and Australia that policies for e-learning implementation are the most undeveloped part across the institutions. UoTs are on different levels of implementation with some only at the beginning stages of implementation while others have made significant progress in the implementation of e-learning.

6. Conclusion and recommendations

The results provide a peek into some burning issues with respect to the status of implementation of e-learning at UoTs. E-learning at Universities of Technology in South Africa can be described as a reality that is in different phases of implementation. Universities are striving towards implementation of e-learning as part of all courses but several factors are impacting on the rate of implementation.

The questionnaire gives a broad overview of the level of e-learning at UoTs in South Africa. The different dimensions of the SILSTI approach can be used to contribute to a good understanding of the status of e-learning implementation at UoTs in South Africa. The way in which a full investigation into the status of e-learning implementation should be conducted and how benchmarking of e-learning implementation at South African institutions should be done still requires deeper development and research.

Recommendations on what the future holds in terms of new e-learning implementation developments can be grouped into two groups:

Recommendations for policy and practice:

- Within the South African Technology Network (SATN) the development of a generic policy or strategy for e-learning can contribute to filling the absence of e-learning policies at UoTs. The integration of such a policy into the teaching and learning policy should be considered.
- The development of a certified qualification for higher education lecturers that includes the use of an e-learning system and which is available online to all lecturers across institutions may contribute to the quality of e-learning courses.

Recommendations for further research:

- The place of the e-learning unit and the structure of such a unit should be investigated in more detail.

- Further research on a benchmarking system for South African universities should be undertaken to develop a conceptual framework for the implementation of an e-learning system at South African universities.

As a final remark the following future developments at UoTs are expected or need urgent attention as noted in the results:

- The introduction of mobile learning as part of the LMS as well as additional to the LMS.
- Open learning/MOOCs.
- New technologies to be introduced: Social media, Integration of the student management system with the LMS and interactive learning.

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Appendix A

1.	Institutional
1.1	Does your institution have an approved policy/strategy on the utilisation of e-learning practices? If yes, please highlight the objectives of the policy/strategy.
1.2	Is it compulsory to have e-learning modules for courses in the whole institution or only in certain Faculties or Departments/Schools or not at all?
2.	Learning model
2.1	How does e-learning fit into the learning model for curriculum delivery at your institution? E.g. Is it an integral part of the learning and teaching model?
3.	Staff Development
3.1	Do you have a formal staff development programme to empower lecturers to develop their own e-learning courses?
3.2	If yes, please give the main characteristics of the programme.
4.	Learning Management System (LMS)
4.1	What Learning Management System(s) platform is utilised at your institution? E.g. Blackboard/Moodle/Sakai
4.2	Have you considered an open source MLS platform at your institution? What were your reasons for your choice of an open source platform or commercial platform?
4.3	Can the current LMS effectively manage the number of courses and students at your institution?
4.4	Would you consider moving to an alternative LMS platform? If yes, please indicate what your reasons are.
5.	e-Learning unit
5.1	Do you have a structured (dedicated) unit for e-learning at your institution?
5.2	Please indicate the location of your e-learning component in your organisational structure. (Attach a copy of your organisational structure, please)
5.3	Please indicate whether your e-learning component staff members are academic appointments or support staff appointments? Briefly explain why your institution has appointed them in that capacity.

5.4	Please indicate the number of staff in your unit, their Peromnes levels and job designations.
5.5	Do you have e-learning representation in Faculties by representation on a forum such as the Executive committee of the Faculty? Please give details.
5.6	Do you have e-learning representation in Faculties by means of a dedicated or seconded person from the e-learning unit?
6. Student access	
6.1	Do your students mainly access their e-learning modules on campus or off campus or both?
6.2	Do your students mainly access their e-learning modules from computers in computer labs or from their own computers?
6.3	Do you have wireless access for your students available on the campus? If not, do you plan to make it available in the next year?
6.4	Do you have mobile access to your LMS? (using applications for smart phones and tablets)
7. Level of implementation of e-learning	
7.1	What is the level of e-learning implementation at your institution? Please use figures such as the following: % of courses with an active e-learning component. % of lecturers with active e-learning components in their courses.
8. Online assessment	
8.1	Do you use online assessment at your institution for formative or continuous assessment?
8.2	Do you use online assessment at your institution for summative assessment (final examinations)?
8.3	Do you mainly use your LMS for online assessments or do you use other online methods?
8.4	What LMS tools or other online tools are used for formative assessment? e.g. Surveys/Assignments/Tests/discussion boards etc.
8.5	Are the assessments done in groups in computer labs with invigilation or can test be completed in their own time?
8.6	What LMS or other online tools are used for summative assessment? e.g. Surveys/Assignments/Tests/discussion boards etc.
8.7	Do you have dedicated computer labs for online assessment?
8.8	Is there in the last three years an increase in the use of online assessment at your institution?
8.9	If you are not currently using online assessment,, are you considering using it in future?

9.	Improvement/enhancement of e-learning interventions
9.1	Do you have any quality assurance measures in place to monitor the quality of your online courses?
9.2	Briefly describe the measures you have in place to ensure good quality e-learning modules and to enhanced the utilisation of e-learning in your courses.
10	Future developments in e-learning practices
10.1	Are you considering other mobile applications as educational aid tools in your teaching and learning that do not directly integrate with your LMS? Please provide details.
10.2	Will you or have you considered Open Learning courses?
10.3	Will you or have you considered the implementation of MOOC's (Massive Open Online Courses)?
10.4	What other new technologies and innovations are you considering (or dreaming of) for implementation in your e-learning environment.