

DIGITAL LEARNING: PERCEPTIONS OF LECTURERS AT A TECHNICAL VOCATIONAL EDUCATION AND TRAINING COLLEGE

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ABSTRACT

This study investigated the perceptions of Technical Vocational Education and Training College (TVET) lecturers towards digital learning (DL) at the College. The study adopted a mixed research methodology to investigate the phenomenon, and utilised exploratory research. The study was conducted among a population of 125 lecturers and management at the TVET College; both stratified and purposive sampling methods were employed to determine the participants of the study. With the exclusion criteria that required that participants should have knowledge or experience of digital learning, have been working with for the College for more than a year, and must have attended the digital learning workshop hosted by the college and organised by the digital learning service providers in May 2017, researchers ended up with a sample size of 75 participants. Questionnaires and interviews were the principal instruments for data collection. The quantitative data gathered was examined by utilising the Statistical Package for the Social Science (SPSS), version 24.0, while the qualitative data gathered were transcribed manually and analysed using thematic analysis. The findings revealed that TVET lecturers perceived digital learning as a conducive way to facilitate interactions and discussions between lecturers and learners, is convenient to use, facilitates and improves teaching and learning, and is user friendly. Moreover, the TVET lecturers' perceptions indicated readiness and willingness to apply digital learning at the TVET College although infrastructure and systems in the college reflected non-readiness for effective roll out of digital learning. The study recommends that; institutional needs, instructor's needs and learner's needs be evaluated prior to the implementation of digital learning. It is also recommended that sufficient training be provided to all users prior to the full adoption of digital technology and that there is provision of complete infrastructure, including software and hardware, full access to the internet, IT manuals and reading and training materials as key requirements to achieve effective implementation of digital learning.

Keywords: digital learning, Technical and Vocational Education and Training Colleges, perceptions of Lecturers, technology and education

INTRODUCTION

“The 4th Industrial Revolution is seen as the pervasiveness of digital technologies that are fusing the physical, digital and biological worlds, and affecting everything about human existence, in particular economies and industries.” (Nzimande 2017).

Some describe it as an upheaval that is changing the manner by which individuals live, work and correlate with each other.

The truth about this phenomenon is that it posits both a significant opportunity and at the same time a danger to the improvement of the African continent. While it is a remarkable opportune to maximise economic development, the 4IR can likewise be a platform to further widen inconsistent worldwide economic growth.

The rise of the fourth Industrial Revolution compel people to contemplate on what sort of institutions they require in their post-educational system, and specifically, what sort of Technical Vocational Education and Training (TVET) colleges are required. The most significant abilities required are those that will empower individuals to be analytical, nimble and adaptable to quick technological innovation. Building up the abilities of the populace, especially the TVET personnel and students are at the heart of the South African transformation agenda (Nzimande 2017).

The South African government has embraced the introduction of digital learning (DL) to support teaching and learning at education institutions in the country. Several scholars and stakeholders of education have suggested the necessity to move from the conventional lecture room scenario, where students are viewed as unassertive recipients of instructive learning, to a state where interactivity, cooperation and collaboration is prioritised (Nyambane and Mzuki 2014). In order to support this inevitable change, equipment and programming designers have introduced contemporary innovative apparatuses, more particularly tablet gadgets, laptops etc. as powerful implements to fortify teaching and learning in education establishments. Two-thirds of the global population have mobile telephones (Businessinsider 2017), thus the widespread use of digital gadgets is compelling lecturers to implement digital learning in their classrooms. The South African government has encouraged teachers as well as lecturers across the country to employ modern technologies in order to convey learning and educational programmes digitally. Over the years, the government has provided innovative apparatuses to schools and has prepared educators on the best way to utilise them (Sherman and Howard 2012). According to Du Toit (2015, 1), some of the projects that have responded to this digitalisation of education in the country are; the Khanya Project rolled out in the Western Cape province

from 2001 with a view to elevate learning and to boost educators' ability to utilise suitable, accessible and moderate technology during educational program delivery.

During the year 2007, 76 per cent of schools in the Western Cape were furnished with computer laboratories (Isaacs 2007; Sherman and Howard 2012). Similarly, the "one laptop per child" project was introduced in Gauteng, which provided some schools with tablets, laptops and smart boards to assist in teaching and learning (Bizcommunity 2014).

LITERATURE REVIEW

Digital learning

Carrier, Ryan, Damerow and Bailey (2007) depicted DL as the employment of technology to the learning and teaching development. Hayes (2017, 1) contended that DL may be portrayed as learning that is encouraged by computerised advancements. Nonetheless, to examine DL only along these lines undermines the imperative intricacies connected to dialect, culture, legislative issues and the economy. Hayes and Jandric (2014) warned that this underestimate or decreases the superb role of human contribution in the scholarly world and beyond, adding that DL must contribute to economic improvements such as educational performance and proficiency. On the other hand, Alliance for Excellent Education (2016) as cited in Carrier (2017) portrayed DL as an educational practice that maximises the employment of technology in order to empower students' learning experience and educational journey. DL comprises a wide range of solutions or tools, as well as applications to equip and empower lecturers, including online courses, blended or hybrid learning, digital content and resources. Davies, Mullan and Felman (2017, 6) maintain that DL can improve the efficiency of running an education programme. Evidence from 15 years of project work in the United States proposes that efficient curriculum redesign utilising digital learning can empower education platforms to improve learning outcomes and decrease costs at the same time. By and large, these projects achieved investments of 31 per cent, with 72 per cent of projects bringing about improved student outcomes, with outcomes in the other 28 per cent remaining constant (Davies et al. 2017, 6).

Technical Vocational Education and Training (TVET)

Education governance in South Africa has two divisions, namely the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET). The DBE is accountable for primary and secondary school education and regulates public schools,

independent educational institutions, early childhood development (ECD) centres, and special needs schools. On the other hand, the DHET's mandate covers tertiary education and vocational training. It presides over TVET, adult basic education and training centres (ABET) as well as higher education (HE) institutions, i.e. universities and universities of technology (Education South African Government, 2017). TVET comprises vocational, occupational and artisan education and training. This band of education and training is likewise alluded to as post school, meaning it alludes to education and training that takes place in the wake of leaving school, even if only with a Grade 9 completed.

The main age limitation for an individual wishing to learn at the TVET College is that the individual ought to be 16 years or older.

Theoretical framework

The Technology Acceptance Model (TAM) (Davis 1989), shaped the theoretical base of the study. TAM and the Unified Theory of Acceptance and Utilization of Technology (UTAUT) (Venkatesh et al. 2003) have been broadly described to be successful in foreseeing acknowledgment among users in the academic space. Hence this theory is relevant in the context of this study. TAM was Davis's idea (1989), his frame of reference was derived from a burning desire to explicate the user's comprehension of Technology Acceptance.

As exhibited in Figure 1, the TAM authentic technology utilisation is decided by one's behavioural expectation to utilize a chosen technology. Behavioural expectation is influenced by one's point of view towards the utilisation of technology, and by the immediate and indirect impacts of perceived usefulness and ease of use. Perceived ease of use and perceived usefulness mutually influence the usage point of view, perceived ease of use on the other hand has an unswerving influence on perceived usefulness (Davis 1989).

Having explored the abovementioned and five different models of technology adoption, Venkatesh et al. (2003) tabled the UTAUT model to explicate users' intent to utilize technology and resulting usage conduct or behaviour. UTAUT model is dependent on four essential constructs viz. (Performance expectancy, effort expectancy, social influence, and facilitating conditions) to envision the usage intent and behaviour or conduct. Taking into account the evidence drawn from investigations that utilized the above theories and models. Teo (2010) built up a model delineating technology acceptance as a multidimensional construct containing five elements, viz: perceived usefulness; perceived ease of use; attitude towards technology as well as exterior variables viz: subjective norm; and facilitating conditions.

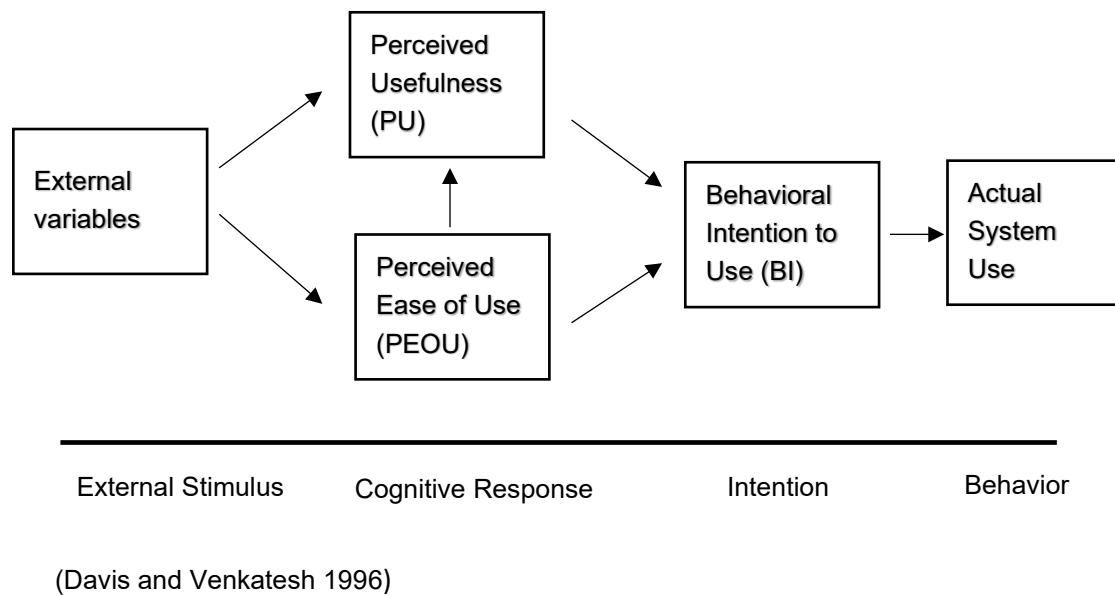


Figure 1: Technology Acceptance Model (Davis and Venkantesh 1996)

RESEARCH METHODOLOGY

The study adopted a mixed method research methodology to investigate the phenomenon, and utilised exploratory research. The study was conducted among 125 lecturers and management at a Training and TVET College. Stratified and purposive sampling methods were both employed to choose the participants for the study. A sample size of 75 participants were chosen for the study, 10 interviews were conducted and 65 questionnaires distributed to respondents and 62 questionnaires were returned. Questionnaires and interviews were the main instruments for data collection, with data quality control being achieved through validity, reliability, trustworthiness and credibility testing. The quantitative data gathered were analysed using the Statistical Package for the Social Science (SPSS), version 24.0, while the qualitative data gathered were transcribed manually with the help of thematic analysis and transcription. Ethical approval was obtained from the Social Science Research Ethics Committee of the University of KwaZulu-Natal. The main objectives of the study were:

- i. To determine the perceptions of TVET lecturers on the use of DL;
- ii. To investigate the link between the perceptions of the lecturers and their application of DL;
- iii. To assess the readiness and willingness of TVET lecturers to apply DL; and
- iv. To establish the support that the College and DHET is providing their lecturers with support to encourage DL adoption.

PRESENTATION OF FINDINGS FROM THE QUALITATIVE STUDY

The data collected from the participants through the interviews were analysed using thematic analysis, the data collected were coded and categorised into main themes and subthemes. The main and subthemes are presented below.

Perceptions of TVET Lecturers on DL

The study revealed the following with regards to perceptions of TVET lecturers on digital learning.

DL facilitates interaction and discussion between lecturers and learners

Based on the interviews, seven ($n = 7$) out of the ten participants perceived digital learning as an aspect of technology which makes it easier for lecturers and learners to interact on one platform. One of the participants said that:

“Digital learning provides the platform where lecturers and students can share information and this facilitates interaction. So that is my expectation of digital learning, that the student must be able anywhere to interact and to be able to upload assignments any time.” (Participant 6).

DL facilitates easy teaching and learning

Almost all ($n = 10$) of the participants perceived digital learning to be a technology that facilitates easy teaching and learning. The participants expressed the view that digital learning facilitates student learning because it allows students to get access to quick and useful information. One of the participants said:

“Well in my view most students have smart phones and other technological devices and digital learning will provide them with an opportunity to receive teaching and learning within a platform they are familiar with and that they can relate to and not just the old fashioned chalk and talk.” (Participant 4).

Another participant expressed the view that:

“The first thing that just came to my mind is that the student can learn at their own pace, in their own space and according to their own ability.” (Participant 6).

DL is convenient

Findings from the study indicate that the majority ($n=8$) of the participants perceived digital learning to be convenient. The participants perceived digital learning as flexible teaching and

learning platform that can be used everywhere by lecturers and students, without necessarily going to the classroom. One of the participants explained how digital learning is convenient:

“I think what is good about digital learning is you can use it anywhere at your own time at your own space. So wherever and whenever you can access internet and you have all the gadgets required you can use it, you do not have to be in class and you can play a lesson over and over again until you understand.” (Participant 7).

DL facilitates as well as improves teaching

The results of the study reveal that DL facilitates as well as improves teaching. The majority (n = 7) of the participants perceived digital learning to be a useful tool to facilitate and improve teaching. One of the participants expressed the view that:

“Using digital tools in our teaching will lead to a lot of improvement in the way we deliver our lessons and will familiarise our students with the technological advancements globally and equip them for the workplace.” (Participant 3).

The dominant perception from Lecturers interviewed was that DL is an effective tool for improving teaching. It helps make teaching and learning more meaningful and fun when properly used.

DL reduces cost and is time efficient

The results from the study reveal that the majority (n = 7) of the participants perceived digital learning as reducing teaching and learning related cost. Furthermore, it is time efficient. One of the participants mentioned that:

“Digital learning will save time for lecturers to go to the library, they can just connect to the internet and research, delivering lessons online can save on travel costs and classroom time.” (Participant 10).

Relationship between the perceptions of TVET lecturers and the application of digital learning

The second objective of the study explored the relationship between the perceptions of TVET lecturers and the application of DL.

Relationship between digital learning, teaching and learning

The finding of the investigation indicates that there is a significant relationship between the use of digital learning tools to general teaching and learning. The findings from the study as

mentioned above and displayed in Figure 2, indicated that DL has an inclination to improve learning, enhance teaching, enhance information sharing and improve students' performance. Details under each variable are given in the section below.

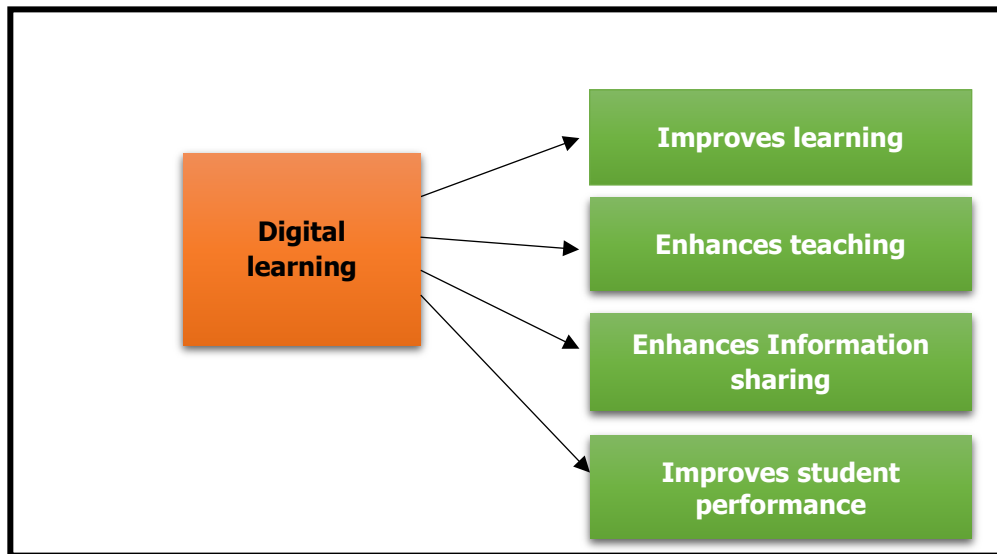


Figure 2: Relationship between digital learning and teaching and learning

The relationship between DL and student performance

The outcome of the investigation further indicates that there is a positive relationship between digital learning and student performance, (n = 6) out of 10 participants indicated that they see DL with a high potential to improve student's academic performance. A participant indicated that:

“DL can assist in significantly improving student's performance as it will introduce creative and innovative ways to learning that can be a motivator for students to learn and ultimately help in improving their academic performance.” (Participant 1).

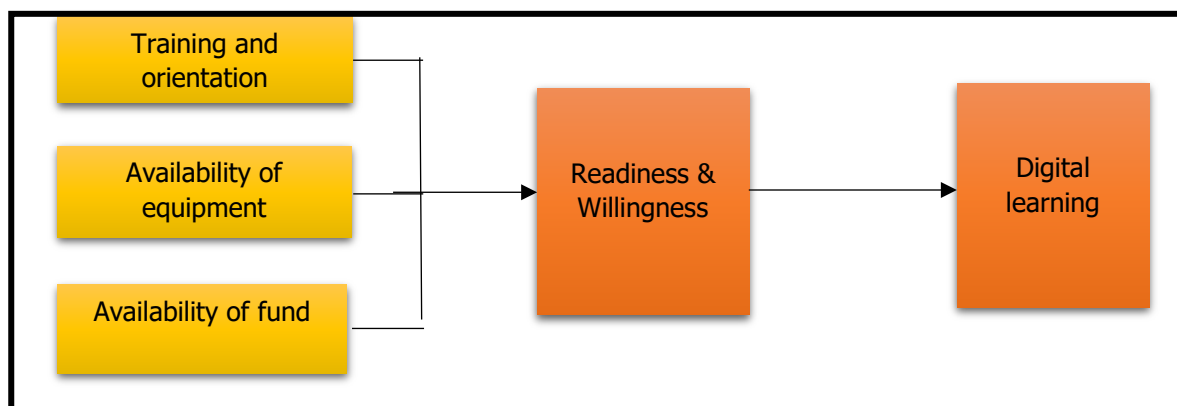


Figure 3: TVET lecturers' readiness and willingness to apply digital learning

TVET lecturers' readiness and willingness to apply digital learning

The third objective of the study explored TVET lecturers' readiness and willingness to apply digital learning in their respective classrooms. Both the main and sub-themes were identified in relation to this, as per Figure 3.

Training and orientation

Training and orientation programmes are important in determining the readiness and willingness of an institution to move towards the implementation of digital learning. The study shows that not all the lecturers at the College were equipped with the necessary training to enable them to use the digital learning system. A few participants expressed the view that the College does not take any steps to train people on the pedagogic use of digital learning. One of the participants said that:

“At this present moment Lecturers are not well equipped so they might need sufficient training to deliver digital learning effectively.” (Participant 5).

In addition, one of the participants verbalised that:

“The readiness and willingness to adopt digital learning can be determined by how well the institution is training its staff towards the application of digital learning. Instructors or lecturers must be trained to use e-learning tools at their disposal if the full benefits of e-learning is to be obtained. Training as a factor will increase performance levels.” (Participant 5).

Availability of DL equipment

The readiness and willingness of an institution to implement a digital learning system in an institution can be determined by the availability of equipment that supports digital learning. One of the participants said that:

“As the College we are not fully equipped for digital learning, we do not have sufficient equipment and infrastructure to effectively and fully deliver our lessons digitally, we have old computers which are also not enough for the number of students that we have, no electronic boards, no computer projectors in all classes, we have no full access to the internet, no Wi-Fi facilities for our students, therefore we do not have the equipment to deliver DL effectively and completely.” (Participant 3).

The relevance of the availability of digital learning equipment in determining the readiness and willingness of an organisation towards the implementation of digital learning cannot be over-emphasised. From the findings above, the College under study did not have all the necessary equipment to support digital learning.

Availability of funds to support digital learning

Readiness and willingness to use digital learning in an institution can also be measured in terms of the amount of money or budget allocated to digital learning; digital learning is an expensive programme that requires huge financial investments. The results of the study reveal that funding is a big hurdle to the introduction of digital learning at the College. One of the participants said that:

“We are a public institution so budget wise we depend on the state grant, at the moment we have not seen any serious financial investment towards DL infrastructure, equipment and training.” (Participant 2).

Training TVET lecturers towards the digital learning application

The last objective of the study investigated the initiatives taken by the DHET to support TVET lecturers towards the digital learning application. The main themes from the study are summarised in Figure 4.

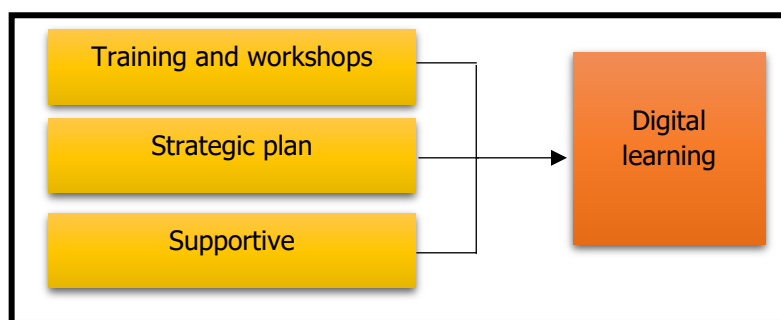


Figure 4: Strategies to support digital learning

Strategies to support digital learning

The study aimed to discover from the participants what strategies or back-up plans are in place at the DHET to educate and support lecturers encountering challenges towards an effective delivery of digital learning. The findings from the study indicated that DHET does not have adequate strategies in place to support the implementation and use of digital learning at the College. According to one of the participants:

“Well I must be frank with you, at the moment. I am not sure what strategies are in place in order to assist Lecturers on DL, nonetheless it’s understandable that infrastructure and training will need to be in place before any implementation support is provided” (Participant 8).

Training and workshops for TVET lecturers

The results of the study show that the DHET has no initiatives planned towards the provision of training and workshops for TVET lecturers and regarding the implementation and use of

digital learning. Based on the interviews, one of the participants said that:

“From the DHET side we have not had any initiatives in terms of training lecturers for digital learning. Whatever has come through has come through the college itself so maybe if the college continues to implement the pilot training programmes for digital learning, then DHET can come on board as well if they see College potential and provide more investment and support towards DL initiatives.” (Participant 2).

PRESENTATION OF RESULTS FROM THE QUANTITATIVE STUDY

Perceptions of TVET lecturers on DL

This section of the study explores the perceptions of College Lecturers on DL. The findings of the investigation are depicted in Figure 5.

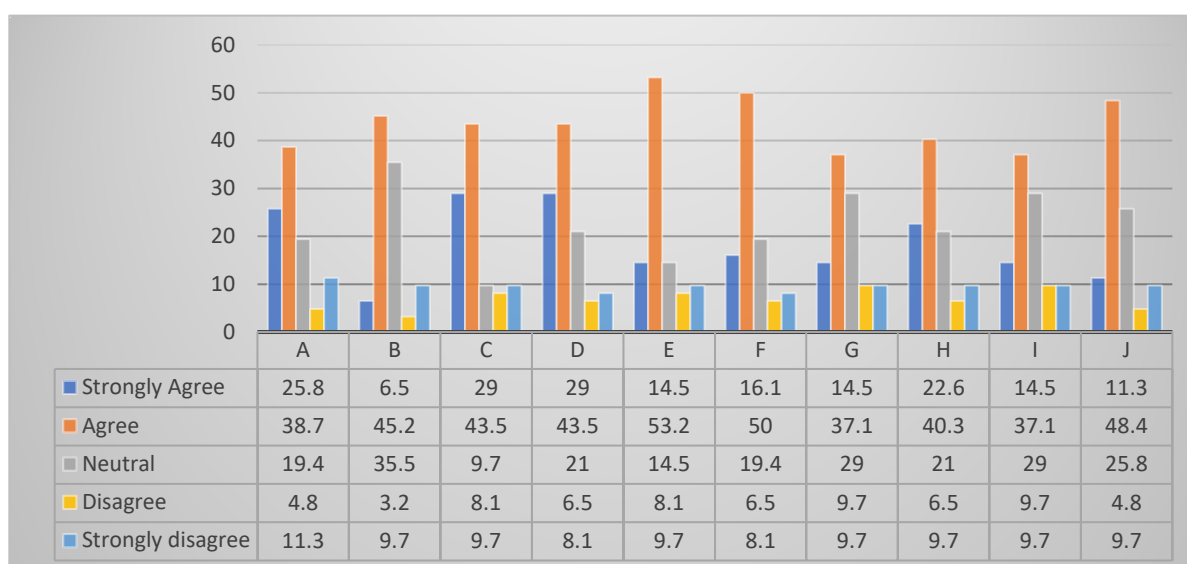


Figure 5: Perceptions of College Lecturers on DL

As per Figure 5, in column (A) 64.5 per cent (38.7+25.8) of the respondents perceived DL to be a technological innovation which improves teaching in TVET Colleges, 19.4 per cent neither agreed nor disagreed, and 16.1 per cent disagreed. The results of the study revealed in column (B) 51.7 per cent (6.5+45.2) of the respondents perceived DL to be user friendly, 35.5 per cent were neutral, and the remaining 13.1 per cent disagreed. In column (C) 72.5 per cent (43.5+29.0) of the respondents perceived DL as a technological innovation that enhances lecturers' professional prestige and status, 9.7 per cent were neutral, and 17.8 per cent disagreed. Furthermore, in column (D), the results of the study showed that the majority which is 72.5 per cent (43.5+29.0) of the respondents agreed that the integration of DL into the College is useful to students and lecturers in many ways, 21 per cent were neutral and the remaining 14.6 per cent disagreed. The results of the study further in column (E) showed that 67.7 per cent

(53.2+14.5) of the respondents perceived that DL affords learners flexibility in learning, such that they can learn as individuals or groups, 14.5 per cent were neutral, while the remaining 17.8 per cent disagreed. Results in column (F) showed that 66.1 per cent (50.0+16.1) of the respondents perceived that DL in the College helps lecturers to design different learning activities based on different learning theories, 19.4 per cent were neutral, and the remaining 14.6 per cent disagreed.

The findings also suggested in column (G) that 51.6 per cent (14.5+37.1) of the respondents perceived that the DL system in the College will be useful for uploading lecture notes on the Moodle, 29 per cent were neutral and the remainder (19.4%) disagreed. In column (H) the results indicated that 62.9 per cent (22.6+40.3) of the respondents perceived DL as very helpful in downloading assignment and quizzes, 21 per cent indicated they were neutral and the remainder (16.2%) disagreed. The study also revealed in column (I) that 51.6 per cent (14.5+37.1) of the respondents perceived that DL in the College will help lecturers to upload students' grades, 29 per cent were neutral and 19.6 per cent disagreed. Finally, the results of the study in column (J) showed that 59.7 per cent (11.3+48.4) perceived DL as a great system in the College to facilitate discussion forums, 25.8 per cent were neutral and the remaining 14.5 per cent disagreed.

Perceptions of TVET lecturers and the application of DL

This section reports on the results of the causal link between the perceptions of TVET lecturers and the application of DL. Five items measured the causal link, and the results from the study are presented in Figure 6.

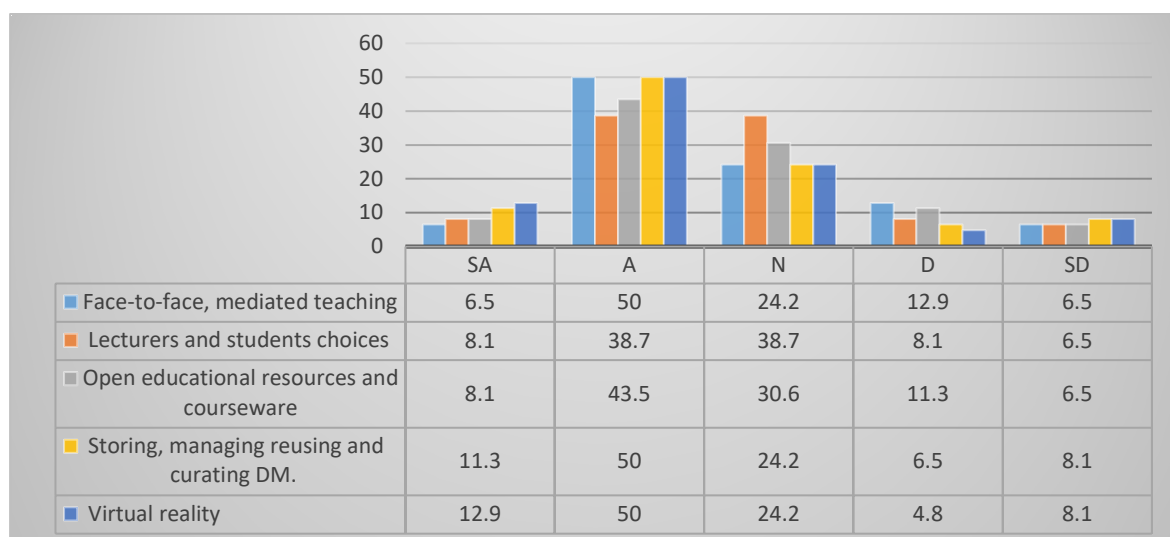


Figure 6: Perceptions of TVET lecturers and the application of DL.

Lastly, the findings of the investigation revealed that 62.9 per cent of the respondents agreed

that DL promotes virtual reality (VR), which enables learning from simple, exact and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments, 24.2 per cent were neutral, and 12.9 per cent disagreed..

Readiness and willingness to apply DL in the classrooms

This section reports on the results of the readiness and willingness of TVET lecturers to apply DL in their classrooms. Five items measured this objective as shown in Figure 7.

As per Figure 6, 56.5 per cent of the respondents had a perception and agreed that the application of DL allows for both face-to-face mediated teaching and learning courses which can be delivered by blended learning, 24.2 per cent were neutral and the remaining 19.4 per cent disagreed. 46.8 per cent of the respondents agreed that DL offers lecturers and students options in where, when, how, the duration and by what they need to study according to their needs and circumstances, 38.7 per cent of the respondents were neutral in their response and 14.6 per cent disagreed. In relation to open educational resources and open courseware, 51.6 per cent of the respondents agreed that the DL system leads to the use of open educational resources (OER) and open courseware (OCW), 30.6 per cent were neutral and the remaining 17.7 per cent disagreed. The findings also suggested that 61.3 per cent of the respondents agreed that DL provides helpful methods of storing, managing, reusing and curating digital materials with the end goal of achieving education, research and administration. 24.2 per cent were neutral and 14.6 per cent disagreed.

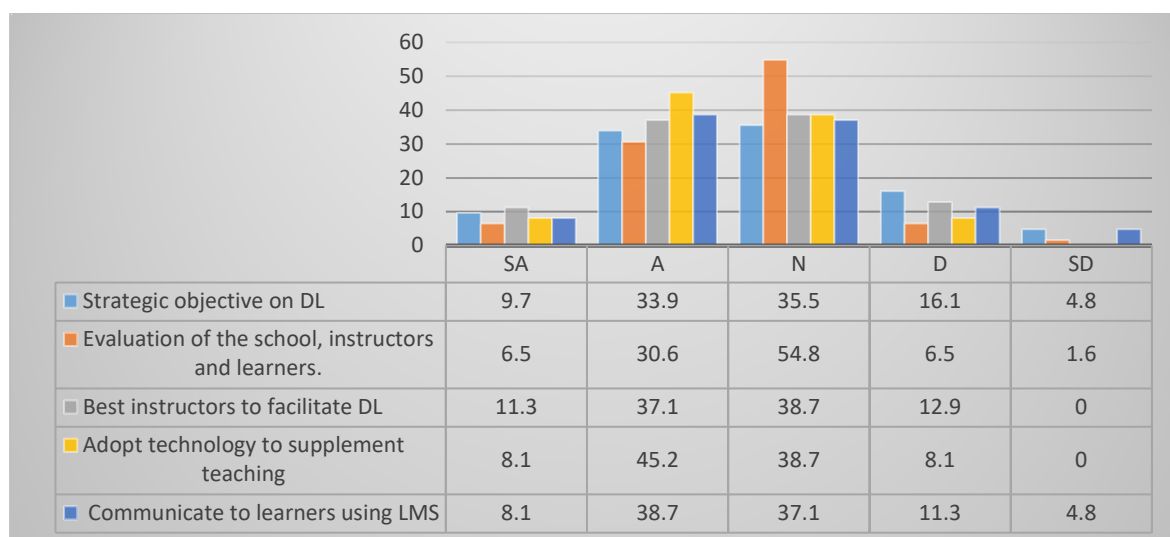


Figure 7: Readiness and willingness to apply DL in the classrooms

The results of the study revealed that 43.6 per cent of the respondents agreed that the College shows some level of willingness as it has the strategic objectives in place to support digital learning initiatives, 35.5 per cent were neutral, while the remaining 20.9 per cent disagreed. The findings also showed that 37.1 per cent of the respondents agreed that the College does evaluation of the, instructors and learners, 54.8 per cent were neutral and the remaining 8.1 per cent disagreed. The study also revealed that 48.4 per cent agreed that the College has the best instructors to facilitate digital learning only if they can receive sufficient training and support they will be ready to facilitate digital learning, 38.7 per cent were neutral and the remaining 12.9 per cent disagreed. The results also showed that 53.3 per cent of the respondents agreed that college lecturers have some willingness to adopt technology to supplement teaching, 38.7 per cent were neutral, and 8.1 per cent disagreed. Finally, 46.7 per cent of the respondents agreed that instructors, administrators and lecturers at the College communicate to learners using the Learner Management System (LMS), 37.1 per cent were neutral and the remaining 16.1 per cent disagreed.

Initiatives of the DHET towards the training of TVET lecturers on the application of DL

This section reports on the results of the initiatives of the DHET towards the training of TVET lecturers on the application of DL. The results from the study are presented in Figure 8.

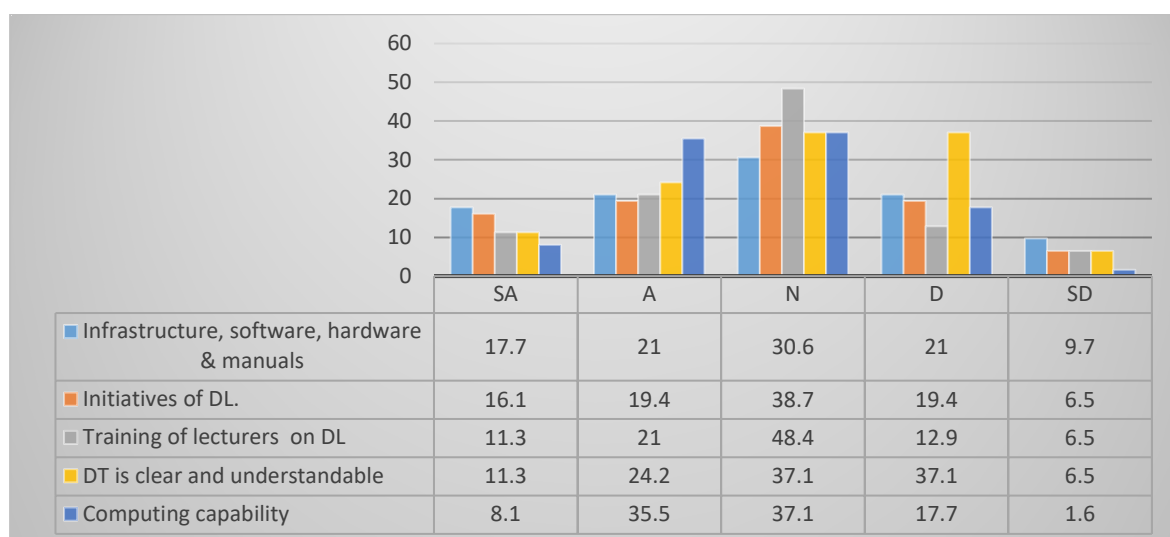


Figure 8: Initiatives of the DHET towards the training of TVET lecturers on the application of DL

As per Figure 8, 38.7 per cent of the respondents agreed that the DHET has provided some

minimal infrastructure, software and hardware to support digital learning in TVET Colleges, 30.6 per cent were neutral, and the remaining 30.7 per cent of the respondents disagreed. Further results revealed that 35.5 per cent of the respondents agreed that the DHET supports initiatives that ensure TVET lecturers are trained on DL, 38.7 per cent indicated they were neutral, and 25.9 per cent disagreed. Respondents agreed that the DHET has made some few provisions to ensure that TVET lecturers are trained on DL, although they did not specify what provisions, 48 per cent indicated neutral, and 19.4 per cent disagreed. 35.5 per cent of the respondents agreed that through the DHET initiative, the process of developing and delivering digital training at the College is clear and understandable, while 37.1 per cent were neutral, however 43.6 per cent disagreed. Finally, 43.6 per cent of the respondents agreed that lecturers know the extent of their students' computing capability before using DL, 37.1 per cent were neutral and 19.3 per cent disagreed.

Inferential statistics

Pearson correlation

Pearson correlation was employed to evaluate the relationship between perceptions, link, readiness and willingness, and the training of TVET lecturers towards DL.

Table 1: Pearson correlation

CORRELATIONS					
		Perceptions	Links	Readiness and willingness	Training
Perceptions	Pearson Correlation				
	Sig. (2-tailed)				
	N	62			
Link	Pearson Correlation	.716**			
	Sig. (2-tailed)	.000			
	N	62	62		
Readiness and willingness	Pearson Correlation	.342**	.511**		
	Sig. (2-tailed)	.007	.000		
	N	62	62	62	
Training of TVET Lecturers	Pearson Correlation	.152	.175	.627**	
	Sig. (2-tailed)	.238	.174	.000	
	N	62	62	62	62

**Correlation is significant at the 0.01 level (2-tailed).

Table 1 exhibits the correlation between perceptions, link, readiness and willingness, and the training of TVET lecturers. The Pearson correlation coefficient between perceptions and causal

link indicated a positive and significant relationship ($r = 0.716$, $p < 0.01$). This denotes there is a causal link between the perceptions of TVET lecturers and the application of DL. The correlation coefficient between the perceptions of TVET lecturers and readiness and willingness signifies a significantly positive relationship as well ($r = 0.511$, $p < 0.01$). Furthermore, the correlation coefficient between the perceptions and the training of TVET lecturers shows a significantly positive relationship ($r = 0.627$, $p < 0.01$). Among the three variables, the Pearson correlation coefficient between perceptions and causal link ($r = 0.716$, $p < 0.01$) had the highest interplay in the TVET College. This suggests that the association between perceptions and causal link was extremely important to the application of DL in TVET Colleges in South Africa.

One sample T-Test

Table 2: T-Test: TVET perceptions on DL, causal link, readiness and willingness, training and gender

ONE-SAMPLE TEST						
	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Perceptions	19.622	61	.000	2.46129	2.2105	2.7121
Link	22.307	61	.000	2.57742	2.3464	2.8085
Readiness and Willingness	31.454	61	.000	2.60968	2.4438	2.7756
Training	22.885	61	.000	2.80645	2.5612	3.0517

* $p < 0.01$

As per Table 2, there is no significant difference between males and females concerning their perceptions of DL, the causal link between the perception and application of DL, readiness and willingness, and training initiatives.

ANOVA: Dimensions of perceptions, link and application of DL, readiness and willingness, training and race, age and tenure

ANOVA was computed on all the dimensions in relation to perceptions, link and application of DL, readiness and willingness, training, and race, age and tenure.

Table 3: ANOVA: Dimensions of perceptions, link and application of DL, readiness and willingness, training and race, age and tenure

Dimension	Race		Age		Tenure	
	F	P	F	p	F	P
Perception of TVET lecturers on DL	0.442	0.645	0.672	0.614	0.887	0.350
Link between the perception and application of DL	0.468	0.629	1.767	0.148	1.362	0.248

Dimension	Race		Age		Tenure	
	F	P	F	p	F	P
Readiness and willingness to use DL	0.237	0.789	0.373	0.827	1.505	0.225
Training of TVET lecturers	0.945	0.394	0.602	0.663	1.180	0.282

Table 3 indicates that there is no significant difference in the perceptions of employees of different races, ages and tenures regarding perceptions, link and application of DL, readiness and willingness as well as training and support.

DISCUSSION AND SUMMARY OF FINDINGS

The findings from both quantitative and qualitative studies revealed that TVET lecturers perceive that digital learning facilitates interactions and discussions between lecturers and learners, facilitates easy learning in schools, is convenient to use, facilitates and improves teaching, and is user friendly. In a study by Jethro, Grace and Thomas (2012, 203) they also found that DL “presents an entirely new learning environment for students, it offers learners control over content, learning sequence, pace of learning, time, allowing them to tailor their experiences to meet their personal learning objectives” furthermore, the findings showed that there is a link between the perceptions of the TVET lecturers and the application of digital learning. Moreover, the TVET lecturers’ perceptions indicated readiness and willingness to apply digital learning at the TVET College although infrastructure and systems in the college reflected non-readiness for effective roll out of digital learning. Kotsik et al. (2009) confirmed that a specific state of affairs should be attained before digital learning can effectively be executed in TVET. They identified strategic readiness; pedagogical readiness; organisational readiness; and technical readiness. Findings also revealed that there was no strategic direction in place which aligns DL with the needs of college curriculum, students and lecturers hence DL implementation was not catered for in the programmes in place. This is consistent with the findings of Edumadze et al. (2014) who stated that TVET colleges need to complete an assessment of the compatibility of DL with the current philosophy of learning, an examination of diverse prospects for incorporating DL in TVET, an appraisal of the technological proficiency requirements for teachers and learners. Warranting that, DL will meet the students’ educational requirements and arrangement that lecturers are able to encourage the incorporation of DL in their class rooms (Edumadze et al. 2014).

RECOMMENDATIONS

Based on the findings above, the study recommends that TVET Colleges should have a strategic objective or plan which supports the introduction and application of DL. TVET Colleges should

undertake a thorough evaluation of their institutions, instructors and students when introducing DL, and introduce a proper evaluation system to determine its readiness and willingness to introduce DL. Again, the College must evaluate the needs of their students to determine their readiness and willingness to accept DL. This will enable the College to make decisions on what kind of DL system should be introduced. Furthermore, a detailed evaluation of the lecturers is necessary to determine their level of experience in DL, as well as their readiness and willingness to apply DL in their teaching. The study recommends that TVET Colleges should appoint or recruit qualified instructors who will train staff and students on how DL systems can be used. This will in turn enable the College, students and lecturers to appreciate the relevance of the DL system. TVET Colleges must take advantage of the current technological innovations and advancements to support DL. As DL is an aspect of technological innovation, its sustainability will depend on how well the TVET Colleges take advantage of the new technology. The study recommends that the DHET take the necessary steps to ensure the provision of infrastructure and equipment to TVET Colleges to support the application of DL. DHET and TVET Colleges should provide training for lecturers and students towards the use of DL. Training is a key tool for equipping people with skills and knowledge in a particular field.

CONCLUSION

The study concludes that the application of DL allows for both face-to-face mediated teaching and learning courses which may be delivered by blended learning; offers lecturers and students options in the where, when, how, for how long and by what means of study, according to their needs and circumstances; and leads to the use of open educational resources (OER) and open courseware (OCW). The findings also suggested that DL provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration. In addition to this, it promotes virtual reality (VR) which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments. Furthermore, it gives exceptional visualisation that cannot be easily achieved in a traditional classroom.

REFERENCES

- Bizcommunity. 2014. One laptop per child launches first project in SA – Bizcommunity.com. <https://www.bizcommunity.com/Article/196/627/116899> (Accessed 3 June 2017).
- Businessinsider. 2017. Two-thirds of the world's population are now connected by mobile devices. <https://www.businessinsider.com/world-population-mobile-devices> (Accessed 3 October 2017).
- Carrier, M., M. Ryan, M. Damerow and K. M. Bailey. 2007. *Digital language learning and teaching: Research, theory, and practice*. Taylor & Francis.

- Carrier, M. 2017. Introduction to Digital Learning. In *Digital language learning and teaching*, 1–10. Routledge.
- Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*: 319–340.
- Davies, S., J. Mullan and P. Feldman. 2017. *Rebooting learning for the digital age: What next for technology-enhanced higher education?* HEPI Report 93. Higher Education Policy Institute.
- Du Toit, J. 2015. Teacher training and usage of ICT in education. *New directions for the UIS global data collection in the post-2015 context*. Background paper for ICT in Education Statistics. UNESCO Institute for Statistics.
- Education South African Government. 2017. www.gov.za/ABOUT-SA/education (Accessed 3 June 2017).
- Edumadze, J. K. E., T. A. Ossei-Anto, G. Edumadze, W. K. Tamakloe and E. A. E. Boadi. 2014. Evaluating the awareness and perceptions of lecturers in using e-learning tools for teaching in University of Cape Coast. *International Journal of Computing Academic Research (IJCAR)* 3: 1–11.
- Hayes, S. 2017. Digital learning, discourse, and ideology. In *The Encyclopaedia of educational philosophy and theory*, 1–6.
- Hayes, S. and P. Jandrić. 2014. Who is really in charge of contemporary education? People and technologies in, against and beyond the neoliberal university. *Open Review of Educational Research* 1(1): 193–210.
- Isaacs S. 2007. Invest Africa. *Using ICTs and blended learning in transforming TVET*, 143.
- Jethro, O. O., A. M. Grace and A. K. Thomas. 2012. E-learning and its effects on teaching and learning in a global age. *International Journal of Academic Research in Business and Social Sciences* 2(1): 203.
- Kotsik, B., N. Tokareva, F. Boutin and C. Chinien. 2009. ICT application in TVET. In *International handbook of education for the changing world of work*, 1879–1894.
- Sherman, K. and S. K. Howard. 2012. Teachers' beliefs about first-and second-order barriers to ICT integration: Preliminary findings from a South African study. In *Proceedings of Society for Information Technology and Teacher Education International Conference*, 2098–2105. Association for the Advancement of Computing in Education (AACE).
- Nyambane, C. O. and D. Nzuki. 2014. Factors influencing ICT integration in teaching – A literature review. *International Journal of Education and Research* 2(3): 136–155.
- Nzimande, B. 2017. Address by Minister of Higher Education and Training, during the budget vote speech, National Assembly (16/05/2017). www.polity.org.za/dhet-blade-nzimande-address-by-minister-of-higher-education (Accessed 8 July 2017).
- Teo, T. 2010. A path analysis of pre-service teachers' attitudes to computer use: Applying and extending the technology acceptance model in an educational context. *Interactive Learning Environments* 18(1): 65–79.
- Venkatesh, V., M. G. Morris, G. B. Davis and F. D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*: 425–478.