Lecturers' attitudes, computer attributes, ICT skills and ICT usage for teaching and learning in the Faculty of Education at NMMU

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Abstract

This exploratory case study, underpinned ontologically by a post-positivist paradigm, focused on lecturers' perceptions pertaining to anxiety, computer attributes, relevance, Information and Communication Technology (ICT) skills and ICT usage for teaching and learning. The rationale was that this would provide Faculty with an overview of the current perceptions and as such would enable Faculty leadership to plan for future staff development by taking cognisance of the findings. A quantitative Likert scale survey instrument was used as data gathering tool. A total of forty-five staff members completed the survey which resulted in a 69% response rate. The results suggest that faculty staff is reasonably competent in various ICT components and has a very positive attitude with reference to ICT. However, it seems that there is a need for assistance related to the usage of online learning management systems in order to promote blended learning as a teaching and learning approach. The results pertaining to computer attributes were also very positive. The findings also indicated that ICT tools were used mostly in classroom contexts when staff delivered content by means of direct instruction, to promote active discussion and for demonstration purposes. The implications of the findings appear to indicate that ICT strategies could be modelled to staff as observability could influence staff to realise the relative advantage that ICT implementation affords. However, it is also important to realise that not all staff members have the same epistemological disposition and hence the adoption of ICT tools and ICT related learning strategies will not be implemented by all staff at the same rate. It is suggested that frequent modelling is provided in a community of practice support context including extensive classroom support in order to promote diffusion.

Introduction and background

Information and Communication Technology (ICT) tools are part of our everyday existence, but to what extent have they been embraced by lecturers in Higher Education Institutions for teaching and learning? Literature suggest that there are several challenges that prohibit integration of ICT to teaching and learning processes (Balanskat, Blamire & Kefala, 2006; Ertmer, 1999; Govender, 2006, 2012, Govender & Govender, 2014, Rogers, 1983, 1995, 2003). Research conducted by Ertmer (1999), Govender (2006; 2012), Govender and Govender (2014), Rogers (1983, 1995, 2003) and Venkatesh, Morris, Davis and Davis (2003) has suggested that the *'self'* or individual human being plays a pivotal role related to ICT adoption and implementation. However, this does not negate the possible influence of external contextual and system wide factors that also plays a role towards adoption or rejection of ICT implementation.

The purpose of this study is on the *'self'*, specifically on the attitudes, adoption attributes, ICT skills and ICT usage of lecturers in the Faculty of Education at the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth, South Africa. It is argued that although ICTs have been infused at NMMU over the last fifteen years for administration and teaching and learning, it has become important to ascertain what can be deduced from ICT usage in terms of the 'self'.

[1] Dr Danie Venter of the NMMU played a huge role with the survey design and quantitative data analysis.

Research focus

It is important to take note that lecturer attitudes pertaining to ICT implementation could vary even within similar contexts. As the 'self' appears to be key for ICT adoption pertaining to teaching and learning, it has thus been deemed appropriate and important to explore lecturers' attitudes, adoption attributes, ICT skills and ICT usage for teaching and learning in the Faculty of Education. Findings could then assist the Faculty to propose areas where lecturers could be assisted in order to promote the use of ICTs for teaching and learning. Based on the above, the following main research question and sub-questions have been formalised:

- What is the current ICT-related status within the Faculty of Education at NMMU in terms of lecturers' perceptions pertaining to anxiety, computer attributes, relevance, ICT skills and ICT usage for teaching and learning?

Based on the comprehensive multi-level question above, the following sub questions have been formulated:

  - What are the perceived attitudes of lecturers toward ICT in education?
  - What are the lecturers' perceptions towards computer attributes?
  - What are the lecturers' perceptions towards computer relevance?
  - What are the lectures' perceived level of computer competence?
  - How do the lecturers use ICT for teaching and learning?

Theoretical Framework

Ertmer (1999) refers to a two level typology framework that influence the adoption of ICT. She posits that these barriers can be referred to as first order (external to the self) and second order barriers (intrinsic to the self). The first order barriers denote lack of time, lack of support, lack of resources, etc. whereas second order barriers refer to attitudes, beliefs resistance, etc. (Ertmer, 1999). Both Ertmer (1999) and Rogers (1983, 1995, 2003) posits that beliefs and attitudes influence technology adoption. The role that attitudes play with reference to ICT implementation has been reported by Govender (2006), Albirini (2006), Ntema and Olatokun (2012) and Wario (2014). Govender focused on teachers in the South African context and Albirini on Syrian teachers. On the other hand, Ntema and Olatokun and Wario focused on staff in higher education institutions in Lesotho and South Africa respectively. Ertmer's (1999) two level typology has been expanded by Tsai and Chai (2012) as they added design thinking and design skills of teachers or lecturers to design and adapt resources to the needs of their learners or students as a third barrier that has to be overcome. Hence, it is important to note that in order to promote ICT usage in existing and new ways, lecturers will have to be supported in all three categories pertaining to the first-, second- and third-order barriers. At the same time, I want to argue that we should not view these above mentioned aspects as barriers per se, but rather as opportunities that could be overcome not only by means of self-efficacy as alluded to above, but also by establishing communities of collaborative practice (Lave & Wenger, 1991; Wenger, 1999) where experts and novices learn from one another and support each other, as novices learn from experts and experts learn from novices too, hence, creating enabling sharing learning spaces.

According to Rogers (1983, 1995, 2003), several aspects are key to the diffusion process of innovation in his book titled *'Diffusion of Innovations'.* He argues that the adoption process which is referred to as the *'innovation decision process'* comprises of five stages. There is a knowledge phase about the innovation and possible persuasion, which then is followed by either accepting or rejecting the innovation. If the innovation has been accepted, implementation follows. However, a person could

confirm or reject the innovation after adoption at any time (Rogers, 1983, 1995, 2003). At the same time, positive attitudes appear to be crucial (Albirini, 2006; Ntemana & Olatokun, 2012; Rogers, 1983, 1995, 2003; Wario, 2014). Furthermore, Rogers (1983, 1995, 2003) also alludes to a theory of perceived attributes that posits that simplicity, trialability (trying-out), observability, relative advantage and compatibility are important aspects that could assist with the adoption process, and Wilson, Sherry, Dobrovolny, Batty, and Ryder (2001) have added the importance of support.

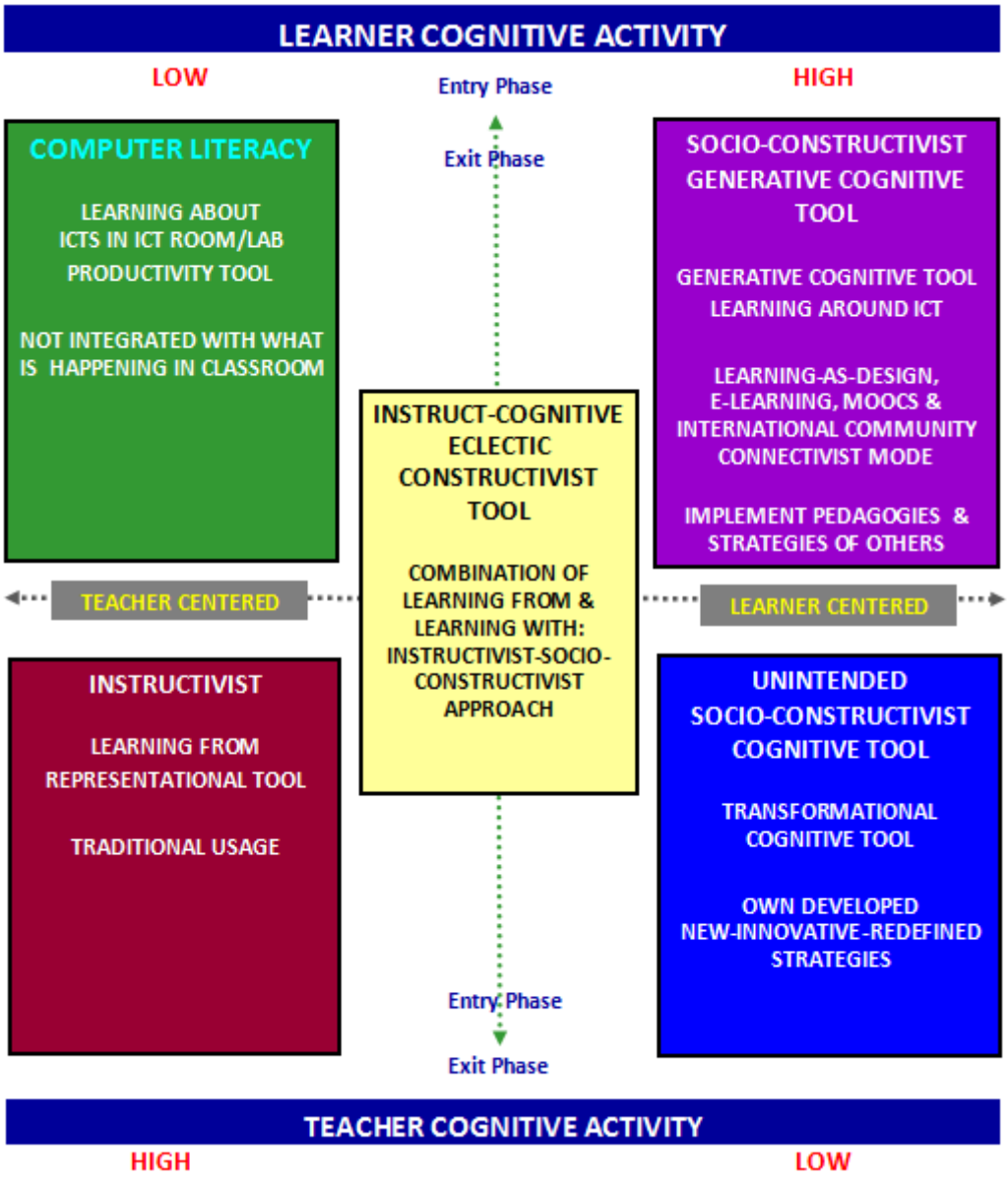
Therefore, it becomes evident that a potential adopter could be influenced to try-out something new, in this case ICT as educational tool for teaching and learning, if certain criteria are met. These criteria refer to the following: If ICT is perceived as simple to use, it can be tried out, one can see how others use it and at the same time observe positive outcomes including holding promise as a relative having a relative advantage, and if it appears to holding an advantage when being used and seems to be compatible with existing practices (Albirini, 2006; Rogers, 1983, 1995, 2003), then adoption is more likely. In addition to attitudes and the attributes of technology, Rogers (1983, 1995, 2003) also suggest that cultural perceptions or social norms are important, an aspect that is also highlighted by Albirini (2006), Govender (2006) and Wario (2014). All of the above appears to suggest that the *'self'* as second order barrier (Ertmer, 1999) is key for implementation as the individual appears to have the final say in the decision making process. The question that arises is what has to be done to assist with the ICT implementation process besides the Rogers perspective? It is proposed that social learning theory (Bandura, 1997) could be key here, as self-efficacy is a key enabler. Bandura (1997) suggests that the development of self-efficacy, i.e. the personal belief that an individual will be able to master a skill or skills at a certain level and hence perform that skill at the required level, is important. Self-efficacy can be promoted by means of personal mastery by the individual, observing how others implement a task in context, persuasion by peers and by limiting anxiety with reference to the implementation context (Bandura, 1997).

It is important to note that addressing the issues raised above, would not necessarily lead to the adoption of ICT for teaching and learning by all. In addition, not all staff will implement ICT in similar ways. This could be attributed to the fact that not all staff in a particular department will subscribe to the same teaching philosophy, as we are unique individuals and have different beliefs and dispositions which acts as filters that shape our action (Bourdieu, 1977; Fives & Buehl, 2012, Maton, 2008). It is thus argued that beliefs and dispositions is part of the individual's habitus and that the habitus is shaped by history and experiences which in turn influence action (Bourdieu, 1977, 1990).[2]

The final aspect that has to be addressed is associated with how ICT usage can be presented by means of a matrix. In order to plot usage, a matrix (see Figure 1) was designed informed by the ideas of Donnelly, McGarr and O'Reilly (2011), Hodgkinson-Williams (2006), Hokanson and Hooper (2000), Jonassen, Myers and McKillop (1996) and Jonassen, Peck and Wilson (1999) and Siemens and Tittenberger (2009). This matrix not only indicates ways in which staff could use ICTs, but it also suggests their ICT usage with reference to their teaching beliefs.

[2] The Faculty of Education at NMMU subscribes to a humanising pedagogy (see Keet, Zinn & Porteus, 2009; NMMU Vision 2020 Story, 2010; Salazar, 2013).

Figure 1: ICT implementation flexible matrix for positioning implementation (Du Plessis, 2016, p. 143 – slightly adapted)



Methodology

This quantitative exploratory case study is embedded within the post-positivist paradigm with the ontological position that reality is only partially apprehensible (Denzin & Lincoln, 2005; Guba & Lincoln, 2005). A quantitative survey similar, but not identical to the survey used by Albirini (2006) was implemented. The survey included:

- an updated biographical data section,
- attitudes towards computer[3] technology 20 item Likert scale,
- computer attributes 28 item Likert scale,
- cultural relevance 16 item Likert scale,
- computer competence 19 item Likert scale,
- computer usage for teaching and learning 19 item Likert scale,

[3] Computers or technology refers to desktop computers, laptops, tablets, etc.

- teaching strategies *'yes'* or *'no'* to 11 responses and
- computer usage when teaching Likert scale associated with the teaching strategies responses.

All Likert scale items comprised of a five-point scale. Adaptations were made to the existing survey, including adding the three last sections referred to in order to contextualise the survey to the NMMU context and to gather data pertaining to teaching preferences. Ethical clearance was obtained from the NMMU Research Ethics Committee and participants were then informed via email and on the survey what the focus of the survey was. Convenient sampling was used as the target population was Faculty of Education lecturers. The survey was hand delivered to each participant.

After two weeks the participants were reminded to complete the survey. Sixty-five surveys were distributed by hand and email and forty-five were returned, resulting in a response rate of 69%. The good response rate can possibly be attributed to the fact that the researcher reminded staff members at all staff meetings and that staff were made aware by means of a cover letter of the purpose of the survey.

The data were captured in Excel and analysed by the Unit for Statistical Research Analysis at the NMMU. The Cronbach alpha coefficients (α) for reliability were determined. All coefficients were above 0.60 which suggest that the items were reliable (Ary, Jacobs & Razavieh, 2002).

Findings

Biographical data

The survey was completed by 45 participants, 24 females and 19 males. Thirty-five of the participants were over fifty years in age. Sixty-one percent of the participants have been in higher education for more than ten years. Eighty percent completed an Honours degree, Masters' degree or Doctorate degree. Thirty-one were full time employed and fourteen on a part time basis. Ninety-eight percent had a computer at home and eighty-eight percent indicated that they had internet access at home. Only four staff members indicated that they don't have a computer at work, which probably suggests that these participants are part time, as the university provides computers or laptops to all permanent full time lecturers. The great majority also indicated that they had internet access at work. Furthermore, the great majority also responded that they obtained their ICT skills by teaching themselves. Table 1 also clearly indicate that staff has either access to a laptop or desktop at work, including at home. Hence, they have access to these tools and as such would be in a position to use ICT in their office and classroom with reference to designing student learning tools. However, they will have to be enabled by means of training to infuse ICT within the learning context.

Table 1: Frequency Distributions of ICT - Hardware

Hardware	Home		Work	
Desktop	22	49%	23	51%
Laptop	40	89%	21	47%
Notebook	4	9%	0	0%
Tablet	14	31%	3	7%
iPad	1	2%	0	0%
Computer in Office	-		38	84%
Computer in Teaching Venue	-		8	18%

Attitudes towards computers

The attitudes of lecturers towards computers were divided into three categories namely, affective, cognitive and behaviour (see Table 2). The data in Table 2 suggests that the overall attitudes of the participating lecturers were very positive. Combining the positive and very positive responses (Table 2) indicate that the overall results indicated 31% had a positive attitude and 69% a very positive attitude towards computers, hence 100% combined.

Table 2: Anxiety, computer attributes and cultural relevance (overall)

	Very Negative [1.0 to 1.8)		Negative [1.8 to 2.6)		Neutral [2.6 to 3.4]		Positive (3.4 to 4.2]		Very Positive (4.2 to 5.0]		n	Mean	S.D.
Affective	0	0%	0	0%	5	11%	12	27%	28	62%	45	4.3	0.6
Cognitive	0	0%	0	0%	0	0%	21	47%	24	53%	45	4.4	0.5
Behavioural	0	0%	0	0%	3	7%	12	27%	30	67%	45	4.4	0.5
Overall	0	0%	0	0%	0	0%	14	31%	31	69%	45	4.3	0.4

The positive attitudes were also highlighted by the high mean scores that were beyond 4 for all three attitude related aspects.

Computer attributes

The data revealed that when combining the positive and very positive responses, observability (i.e. observing how peers use ICTs) with 94% and trialability (i.e. opportunities to use ICTs within the individual's context) 87% appeared to be the two most important computer attributes (Table 3). Compatibility receiving 86%, relative advantage 84% and simplicity with 78% was following very closely to the observability and trialability, hence suggesting that all five aspects appeared to be important to promote the adoption of computer (ICT) as innovation.

Table 3: Computer attributes (overall)

	Very Negative [1.0 to 1.8)		Negative [1.8 to 2.6)		Neutral [2.6 to 3.4]		Positive (3.4 to 4.2]		Very Positive (4.2 to 5.0]		n	Mean	S.D.
Relative Advantage	0	0%	1	2%	6	13%	15	33%	23	51%	45	4.2	0.7
Compatibility	0	0%	0	0%	6	13%	20	44%	19	42%	45	4.1	0.6
Simplicity	0	0%	0	0%	10	22%	21	47%	14	31%	45	4.0	0.6
Observability	0	0%	0	0%	3	7%	26	58%	16	36%	45	4.1	0.5
Trialability	0	0%	2	4%	4	9%	26	58%	13	29%	45	3.8	0.8
Overall	0	0%	0	0%	6	13%	21	47%	18	40%	45	4.1	0.5

Cultural relevance

The cultural relevance dimension tried to elicit responses pertaining to the relevance of computers as teaching and learning tools within the NMMU context or higher education in the South African context in general. Three staff members indicated on the survey that some of the items related to this could be ambiguous. The data indicated that 67% of the participants were positive or very positive of the relevance of computers in society and higher education and 31% was neutral (Table 4).

Table 4: Cultural relevance (overall)

	Very Negative [1.0 to 1.8)		Negative [1.8 to 2.6)		Neutral [2.6 to 3.4]		Positive (3.4 to 4.2]		Very Positive (4.2 to 5.0]		n	Mean	S.D.
Cultural Relevance	0	0%	1	2%	14	31%	21	47%	9	20%	45	3.7	0.6

Computer competence

Table 5 shows that 24% of the participants classified themselves as very much competent, 33% as much competent and 24% moderate competent. None of the lecturers indicated that they had no competence.

Table 5: Computer competence (overall)

	Not competent [1.0 to 1.8)		Little competence [1.8 to 2.6)		Moderate competent [2.6 to 3.4]		Much competent (3.4 to 4.2]		Very much competent (4.2 to 5.0]		n	Mean	S.D.
Computer Competence	0	0%	8	18%	11	24%	15	33%	11	24%	45	3.5	0.8

Computer usage for teaching

The data revealed that computers or ICT resources were used often, very often or always by 51% of the lecturers (Table 6). It was also noticed that 36% rarely used ICT for teaching purposes and 13% never used it.

Table 6: Computer usage for teaching (overall)

	Never [1.0 to 1.8)		Rarely [1.8 to 2.6)		Often [2.6 to 3.4]		Very often (3.4 to 4.2]		Always (4.2 to 5.0]		n	Mean	S.D.
Computer usage for Teaching	6	13.3%	16	36%	11	24%	8	18%	4	9%	45	2.8	0.8

The data presented in Table 7 were used to determine the overall values in Table 6, provide deeper insight into the lecturers' usage of computers. From Table 6, it is evident that staff is not feeling incompetent at all. Equally important, the attitude results (Table 2) also alluded to the fact that they are very positive to computers as ICT resources. It was noted that 20% indicated that they always use the iLearn Learning Management System (LMS) of the NMMU, 9% indicated that they use the LMS very often and 18% often. Hence, it is thus important to ascertain why 53% use it rarely or never. A very small percentage indicated that they have designed a module on the learning platform.

The great majority use presentation software for teaching and learning and word processing software to create notes or worksheets. Internet usage to collect information and email communication with students was also high. Social media usage was low, but social chat for communication was high. The use and download of digital media in the form of videos was also often used by 18%, very often by 29% and always used by 22%. Usage of questionnaires, tests, quiz and forum function on the iLearn LMS system was low, as was the usage of TurnItIn as online plagiarism checker.

Table 7: Computer usage for teaching

	Never [1.0 to 1.8)		Rarely [1.8 to 2.6)		Often [2.6 to 3.4]		Very often (3.4 to 4.2]		Always (4.2 to 5.0]		n	Mean	S.D.	
I use an iLearn learning platform	9	20%	15	33%	8	18%	4	9%	9	20%	45	100%	2.8	1.4
I design a module on a learning platform	17	39%	15	34%	3	7%	2	5%	7	16%	44	100%	2.3	1.4
I make worksheets/notes by using word processing software	2	4%	5	11%	9	20%	11	24%	18	40%	45	100%	3.8	1.2
I use Presentation Software	0	0%	4	9%	9	20%	14	31%	18	40%	45	100%	4.0	1.0
I use the internet to collect information related to my subject area in a module	0	0%	3	7%	4	9%	14	31%	24	53%	45	100%	4.31	0.9
I use email to communicate with students in a module	0	0%	1	2%	5	11%	10	22%	29	64%	45	100%	4.5	0.8
I use social media	22	49%	7	16%	9	20%	5	11%	2	4%	45	100%	2.1	1.3
I use a wiki in a module with my students	28	62%	12	27%	3	7%	1	2%	1	2%	45	100%	1.6	0.9
I use social chat for communication	17	38%	8	18%	4	9%	11	24%	5	11%	45	100%	2.6	1.5
I use a Spreadsheet	8	18%	9	20%	9	20%	8	18%	11	24%	45	100%	3.1	1.5
I use online videos	1	2%	13	29%	8	18%	13	29%	10	22%	45	100%	3.4	1.2
I download videos from YouTube for a module	5	11%	5	11%	13	29%	12	27%	10	22%	45	100%	3.4	1.3
I use computer simulations in a module	21	47%	7	16%	8	18%	4	9%	5	11%	45	100%	2.2	1.4
I use the quiz function on the NMMU iLearn platform in a module	25	56%	9	20%	3	7%	3	7%	5	11%	45	100%	2.0	1.4
I use the questionnaire function on the NMMU iLearn platform in a module	25	56%	11	24%	3	7%	2	4%	4	9%	45	100%	1.9	1.3
I use the test function for student assessment on the NMMU iLearn platform in a module	25	56%	12	27%	1	2%	3	7%	4	9%	45	100%	1.9	1.3
I use the TurnItIn function on the NMMU iLearn platform in a module	17	39%	13	30%	8	18%	2	5%	4	9%	44	100%	2.2	1.3
I use the forum function on the NMMU iLearn platform in a module	20	45%	15	34%	5	11%	0	0%	4	9%	44	100%	2.0	1.2
I use a spreadsheet in a module to analyse my students' marks	9	20%	9	20%	6	13%	5	11%	16	36%	45	100%	3.2	1.6

Teaching strategies used

The data presented in Table 6 indicated that direct instruction, active discussion and demonstration as teaching strategies were used mostly, as 97% of the lecturers indicated that this was the preferred teaching strategies when not using ICT.

Table 6: Teaching strategies used without computers

Teaching strategies	Yes		No		n
Direct instruction	41	98%	1	2%	42
Active discussion	41	98%	1	2%	42
Demonstration	40	98%	1	2%	41
Collaborative Activities: Pair Share	34	81%	8	19%	42
Collaborative Activities: Jigsaw	29	71%	12	29%	41
Role playing	33	80%	8	20%	41
Discovery learning	33	85%	6	15%	39
Project based learning	31	76%	10	24%	41
Hands-on learning	33	82%	7	18%	40
Blended learning	23	56%	18	44%	41
Flipped learning	21	54%	18	46%	39

Blended learning and flipped learning were not teaching strategies that were often used, however, the concepts meaning could have been miss-interpreted. This can probably be attributed to the findings presented in Table 5 and alluded to in the previous section, as the associated skills related to blended learning appeared to be lacking such as setting up online quizzes and tests.

Teaching strategies used when using ICT

It is evident from the data in Table 7 that direct instruction, active discussion and demonstration was either daily, often or regularly used by lecturers when ICT was implemented for teaching and learning, hence, alluding to what was indicated in the previous section that these three strategies were also very much prevalent when ICT was not used.

Table 7: Teaching strategies used when using ICT

Teaching strategies used when using ICT	Never		Seldom		Regularly		Often		Daily		n	Total	Mean	S.D.
Direct instruction	0	0%	8	20%	15	37%	13	32%	5	12%	41	100%	3.4	0.9
Active discussion	1	2%	12	29%	10	24%	11	26%	8	19%	42	100%	3.3	1.2
Demonstration	3	8%	5	13%	12	31%	15	38%	4	10%	39	100%	3.3	1.1
Collaborative Activities: Pair Share	9	25%	12	33%	6	17%	6	17%	3	8%	36	100%	2.5	1.3
Collaborative Activities: Jigsaw	12	35%	10	29%	6	18%	3	9%	3	9%	34	100%	2.2	1.3
Role playing	12	36%	10	30%	6	18%	3	9%	2	6%	33	100%	2.1	1.2
Discovery learning	7	19%	6	16%	11	30%	10	27%	3	8%	37	100%	2.9	1.2
Project based learning	8	23%	6	17%	11	31%	9	26%	1	3%	35	100%	2.7	1.2
Hands-on learning	6	17%	8	22%	8	22%	10	28%	4	11%	36	100%	2.9	1.3
Blended learning	10	29%	2	6%	11	31%	6	17%	6	17%	35	100%	2.9	1.5
Flipped learning	11	37%	3	10%	10	33%	3	10%	3	10%	30	100%	2.4	1.4

The data suggest that ICTs are used ranging from regular to often pertaining to direct instruction and demonstrations. Hence, ICTs are used, but not necessarily always in every lecture. It seems thus that lecturers are in need of training that includes modelling, as this could lead to a higher uptake of ICT when engaging in different teaching and learning strategies. However, staff training will not necessarily result in the uptake by all, as teaching beliefs are highly personal (Ertmer, 2005).

Discussion

The findings confirmed that Roger's framework (1983, 1995, 2003), his computer attributes indicated in Table 2 (simplicity, trialability, observability, relative advantage, compatibility) are attributes that the lecturers indicated were of great importance for computer and ICT infusion for teaching and learning. The participants also indicated that they had a very positive attitude towards ICTs, aspects that are important to promote diffusion as highlighted by Rogers (1983, 1995, 2003) and Albirini (2006). The importance of cultural relevance; i.e. the value and relevance to society where society in this study refers to the Higher Education context; to support adoption and diffusion, alluded as important by Albirini (2006), was high and as such it appears that the relevance dimension lead to that the majority of lecturers used ICT resources for teaching and learning.

The data also suggest that overall the lecturers are competent ICT users, but that there are areas where their ICT competence can be addressed, especially pertaining to the iLearn LMS blended system. This was also evident from the computer and ICT usage section, as it seems from the findings that LMS skills are needed. In order for ICT skills and ICT usage for teaching and learning to be promoted, it is thus argued based on the theory of Rogers (1983, 1995, 2003) that the attributes of simplicity, trialability, observability, relative advantage and compatibility will have to be planned for in such a manner that lecturers experience that they will be able to reach the required skill levels (Bandura, 1997). Thus, it appears that the possible raising of self-efficacy is important by means of social persuasion, modelling and observability (Bandura, 1997) as these aspects could advance the promotion of ICT usage for

teaching and learning. The *'self'* as second order barrier is not the only challenge, the third order challenge of providing the required support and skills for the design and creation of ICT resources is also vital (Tsai & Chai, 2012). Lastly, the data seems to suggest that plotting the usage of ICTs for teaching and learning on the matrix shown in Figure 1 would probably indicate that most staff members use ICT at this point in an instructivist, instruct-cognitive eclectic constructivist manner and to a certain extent by some in the socio-constructivist generative cognitive tool mode by some that uses the iLearn LMS blended learning platform. The above thus implies that lecturer talk as instruction is still very prevalent, however, at the same time constructivist learning engagement are not excluded. The varied usage is based on the argument that teacher beliefs influence how ICTs are implemented for teaching and learning (Ertmer, 2012; Zhao & Cziko, 2001). Perceptual Control Theory (PCT) (Govender & Govender, 2014 with reference to Powers, 1973) could be key to explain why some lecturers prefer certain teaching strategies and using ICT in the manner they do. PCT posits there appears to be a greater possibility of ICT adoption to realise the attainment of higher learning goals if one holds constructivist beliefs than someone holding traditional instructivist beliefs (Zhao & Cziko, 2001).

Conclusion and recommendations

The findings suggest that there is a very positive attitude towards ICTs and that the lecturers are ICT competent in various areas, but that the online blended LMS approach appears to be an area in which staff obtains training due to the fact that blended learning seems to be not often used. The findings also showed that the computer attributes (Rogers 1983, 1995, 2003) appear to be important for ICT diffusion pertaining to teaching and learning.

It is thus recommended that careful consideration is given when planning for when ICT skills and strategies are presented to staff. It is suggested that modelling in authentic Higher Education contexts (Bandura, 1997) is used as learning space when lecturers are exposed to ICTs in order that staff can practically observe implementation in action. In addition to this is infusing the attributes of simplicity, trialability, observability, relative advantage, compatibility (Rogers, 1983, 1995, 2003) in the training programme process. However, lecturers' beliefs about teaching and learning are not all necessarily similar and thus we have to be cognisant of the position of Fives and Buehl (2012) that beliefs inform action, hence beliefs influence how staff implement ICTs (Ertmer, 2012; Zhao & Cziko, 2001). This then highlights the fact that staff have different epistemological positions. As such, the above will have to be taken into consideration and therefore staff has to be supported according to their preferences.

Change in how ICTs are used and the adoption of new ICT related strategies to support teaching and learning will not happen overnight, but that does not suggest that we should not promote the use of ICTs in different modes. It is highly likely that the establishment of a community of practice (Lave & Wenger, 1991; Wenger, 1999) which provide on-going support and sharing of experiences could be useful to assist with the developmental process that promotes the enhancement of the learning environment.

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