ascilite
ascilite 2012
FUTURE CHALLENGES | SUSTAINABLE FUTURES
25 - 28 November 2012 | Wellington | New Zealand

Faculty experiencing first-line implementation of Technology Enhanced Learning

Marichelle van Deventer
North-West University

Higher education is entering an interesting period of change. Faculty and students will have to adapt to a more technologically enhanced environment for teaching and learning. Adopting new pedagogy can place a critical responsibility on faculty. This article evaluates members of a small faculty's experience of the implementation of laptops as part of Technology Enhanced Learning (TEL) at a residential higher education institute (HEI) in South Africa. The study population comprised 36 first year Humanities students, the Faculty Dean, and seven lecturers of the first year modules. Data collected through semi-structured interviews, focus group discussions and an open ended questionnaire were captured in an integrated dataset using Atlas.ti^{TM}. Coding and categorization focused on the requirements of TEL in the faculty and the researcher derived at two themes: (i) Demands of TEL and (ii) initiation characteristics.

Keywords: Faculty; Technology Enhanced Learning; Information and Communication Technology

Introduction

With traditional pedagogical methods in higher education (HE), changing at an accelerating speed to online or blended learning, change is expected (Tang & Austin, 2009). Adopting the use of new (and some not so new) Information and Communication Technology (ICT) devices, e.g. laptop computers, iPads, smartphones, tablets, and android devices as learning technologies have implications for HE teaching pedagogies. This implies change beyond verbal and visual learning to a virtual way of teaching and learning. Traditional learning principles should be revisited and adapted accordingly (Njenga & Fourie, 2010; Proserpio & Gioia, 2007) to develop teaching and learning strategies to incorporate the strengths and opportunities of online learning with those of traditional modes of learning (Emerson & MacKay, 2010). Moving towards a more technologically enhanced learning approach seems revolutionary yet necessary.

Technology enhanced learning

Technology enhanced learning (TEL) is "characterized as maximizing the best advantages of face-to-face learning and multiple technologies to deliver learning" (So & Brush, 2008, p. 321). Salinas (2008) suggests that this new environment relates to enhanced motivation, new roles for students and faculty, and improved learning outcomes. For a transition like this to take place, a paradigm shift is predictable. Teaching and learning have to move away from a teacher-centered approach to a cooperative and student-centered model (Salinas, 2008; Weaver & Nilson, 2005).

Adapting to this environment poses new responsibilities for the faculty. Faculty have to become creative in the redesigning of their courses in order to actively integrate technology for learning (Emerson & MacKay, 2010; Proserpio & Gioia, 2007; Tang & Austin, 2009; Wurst, Smarkola, & Gaffney, 2008) and create innovative learning opportunities for their students (Proserpio & Gioia, 2007). Technology integration in HE demands major changes in the way faculty views technology, as well as in teaching and learning (Salinas, 2008). Faculty has to combine technology, assignments and learning material in such a matter that it leads to optimal learning. This may ultimately lead to better student learning and satisfaction, and the best combination may enhance faculty members teaching abilities and lead to better teaching evaluation (Tang & Austin, 2009). Faculty are compelled to consider students' "learning styles, perceptual modality preferences and computer or Internet proficiency when introducing technology into their teaching" (Tang & Austin, 2009, p. 1252). These changes lead to additional challenges for teaching and learning (Tang & Austin, 2009) as the roles of students and faculty during course communication change (Proserpio & Gioia, 2007; Salinas, 2008; Wurst, et al., 2008). These changes result in instructional implementation of the technology; it is not technology itself that effects the learning that takes place (Tang & Austin, 2009).

The Internet with its quick access to a wealth of information does not necessarily lead to meaningful knowledge creation and demands much more from faculty to ensure the transformation of information into knowledge (Guri-Rosenblit, 2005). The availability of modern technologies does not imply educational usage thereof

(Proserpio & Gioia, 2007). This statement highlights the importance of the compatibility of ICT with the users, their preferences, and the way technology is implemented.

Faculty members often remain sceptical about the value of these new technologies to improve teaching and learning and research on the topic is still inclusive (Salinas, 2008). Sufficient knowledge and skills are needed to ensure that the use of technology is beneficial in teaching and learning (Kay, 2008). Research should focus on developing a better understanding of ICTs used at HEIs and the effect thereof on the different role-players. Therefore, this paper aims to contribute towards the understanding of a HE faculty experiencing first-line implementation of Technology Enhanced Learning to foster sustained research, support, and training for high quality teaching and learning.

Research design and methodology

Context of the study

The Teaching and Learning Committee of the North-West University (NWU) launched a pilot study to determine the feasibility of issuing laptops to all students on the Potchefstroom Campus. They targeted the smallest faculty on the Potchefstroom Campus and at the onset of the 2011 academic year each first year student received a custom loaded laptop computer. The cast contained *inter alia* anti-virus software, MS Office™, OneNote™, and several e-books. The computers linked to the NWU wireless Internet network that gave the students access to e-Fundi—the university's learning management system (LMS) which provided links to an email account, the library's resource database, electronic study guides, communication to faculty, discussion forums, technical assistance, posting of assignments, and online assessment. In spite of contradictory indications from the literature, the Committee aimed to determine if the Virtual Generation students perceived their teaching and learning experience to be positive (Fried, 2008; Kirkwood & Price, 2005; Mottarella, Fritzshe, & Parrish, 2004; Njenga & Fourie, 2010; Tang & Austin, 2009; Wurst, et al., 2008). The Committee also aspired for improved student achievement as a positive spin-off of the "Laptop Project."

The Dean of the involved Faculty's strategic plan aligned with the HEI's change towards technologically driven teaching and learning and its perceived competitive advantages for the global market (Rice & Aydin, 1991). The Dean's vision was to gradually evolve ICT into teaching and learning, shifting the current instructivist teaching paradigm towards a learner-centred approach (Salinas, 2008), changing the perceptions of faculty members and students about dealing with information and content. This change encompassed establishing new partnerships between teaching and learning responsibilities at his Faculty.

Participants

The participants comprised the total intake of 36 first year on-campus students, registered for a qualification in the Humanities, seven Theology faculty members responsible for the first year modules and the Dean of the Faculty of Theology.

Methods

The study followed a qualitative case study design to capture insight, discovery, holistic descriptions, and a better understanding of the experiences of lecturers during TEL (Leech & Onwuegbuzie, 2007; S. B. Merriam, 1998; 2009). The researchers collected data at several occasions over a period of one year, according to five strategies:

(i) An interview with the dean of the faculty which focussed on his strategic views on the establishing and implementation of a TEL environment.
(ii) Semi-structured individual interviews with six purposively selected students. The questions focused on students' expectations, their experiences and their use of the technology for academic or other purposes.
(iii) A semi-structured focus group discussion with faculty members focussing on the integration of technology into teaching and learning.
(iv) A semi-structured focus group discussion with seven first-year students that focussed on how technology supported their learning.
(v) An open-ended questionnaire posted to the learning-management system for all 36 participants, although only fourteen students responded to the questionnaire.

The use of the different strategies aimed to triangulate the data of the semi-structured focus group discussions with faculty's experiences that added value to the results.

Data analysis

Data were analysed with the focus on the requirements of TEL on the faculty. Atlas.ti™, a qualitative data analysis and research software programme, combined the textual data from the five data collection strategies as an integrated dataset. The author coded and categorized the participants' responses into 68 codes, seven categories, and two themes according to the use of the constant comparative analysis method (Leech & Onwuegbuzie, 2007, 2008). This method identified underlying themes from the data. The researcher grouped phrases together as meaningful parts and linked them with a code. Subsequent chunks of text were pared with existing codes. Codes were grouped together due to their similarity as categories, and then as themes (Figure 1).

Findings and Discussion

The findings are presented according to the two themes identified from the data: (i) Demands of TEL and (ii) initiation characteristics (Figure 1).

Demands of TEL

The theme demands of TEL originated from four categories: (i) Mind shift for teaching and learning with technology, (ii) concern about students, (iii) barriers caused by the laptops, and (iv) added responsibility.

Mind shift for teaching and learning with technology
Some faculty members had little confidence in the changes stowed upon them regarding their new roles and pedagogical practices of integrating technology into their established learning environments. Although there was conscientiousness amongst faculty members about their new role and responsibilities (seeGuri-Rosenblit, 2005), the new technologies required that faculty had to make a mind shift and develop new teaching and technology skills. Nevertheless, faculty still felt responsible to attain the previously defined pedagogical outcomes that did not take into account a different teaching environment (Mottarella, et al., 2004). They took the responsibility to adhere to and reach these outcomes during a contact session seriously, in spite of a dramatically changed learning environment. This stance compromises the ideals of TEL and illustrates resistance to change:

> I did not make any mind shift. My preparations remained the same. I teach or lecture the same way while I will communicate with them through e-Fundi and all that...

Due to their insufficient knowledge on TEL, faculty members reduced ICT's potential to the use of e-Fundi, a dependable Sakai™-based e-learning platform (Abbad, Morris, & de Nahlik, 2009; Fichter, 2005); some computer applications; and PowerPoint™ presentations. These previously used ways of teaching let faculty to believe that traditional learning can continue as usual and that the students needed to adapt:

> I did not need to make a paradigm shift but my concern is not about myself but about the students (Faculty, focus group discussion).

Faculty members were no longer considered as the *sage on the stage* (Palloff & Pratt, 2003), with students perched at their feet, ready to absorb any knowledge. Faculty should evolve to *guides on the side* (Palloff & Pratt, 2003) who holistically share in the teaching learning experiences of their students. This will involve role adjustment and a pedagogical shift to learner-centred learning. However, not all of faculty shared this progression and they strongly voiced their traditionalist defiance:

> I must reach my outcomes...There are outcomes to be achieved and someone says make it work and I say it's not working and we are wasting time by this argument its working, make it work, it's not working, make it work and so forth and where is the process of teaching and learning it's being hurt (Faculty, focus group discussion).

Faculty members agreed that the success of the pilot project depended on their positive attitude and change of teaching philosophy according to the demands of TEL. Change did not happen easily. Resistance, being one of the most important stumbling blocks in implementing e-learning (Njenga & Fourie, 2010), was strongly experienced by some faculty members:

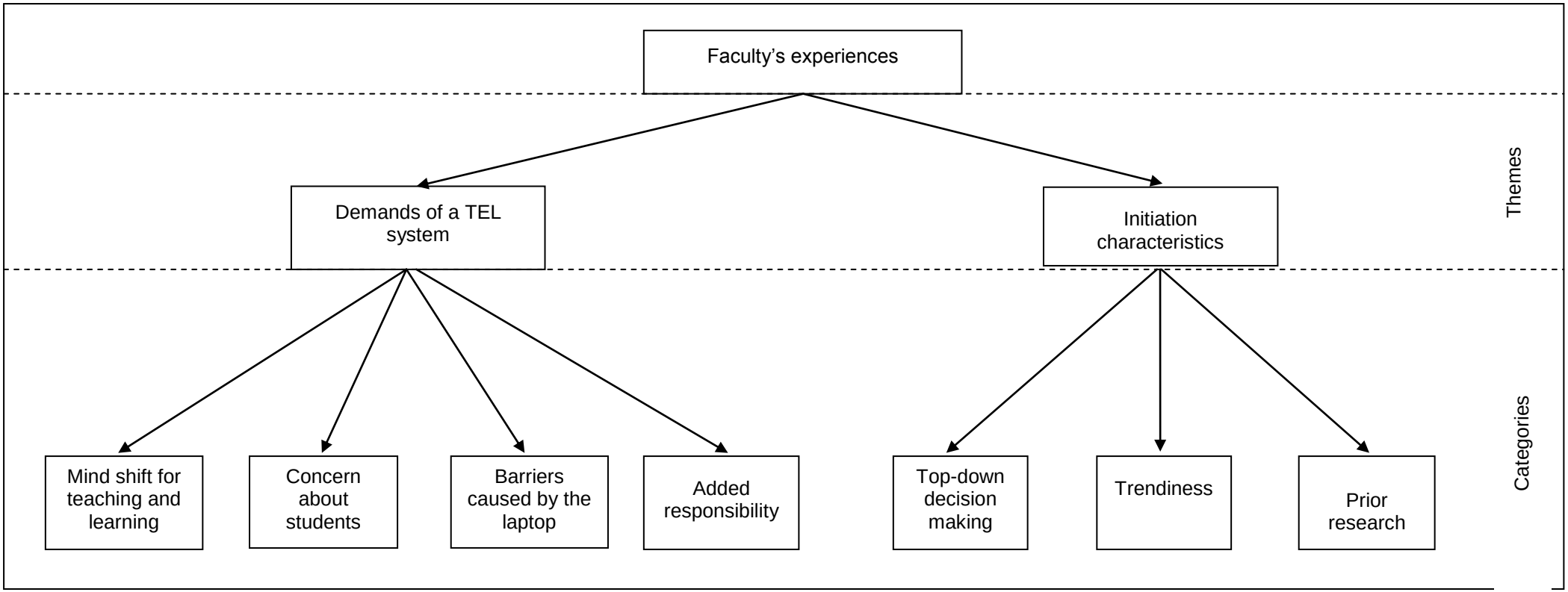

Figure 1: Categories and their distinguished themes relating to the Faculty's experience of the implementation of Technology Enhanced Learning at a residential Higher Education Institution

> I think when we closed last year I was halfway with my preparation for Greek for this semester and then only to come back in January and hear that there is this thing. Can you imagine now I'm halfway with my work. Some of my tests are already set. I know I am going to do this work at this time and so forth. You had your schedules and know you have to adapt to the new system. It's a traumatic situation that we've started this academic year (Faculty, focus group discussion).

Concern about students

Management initiated the laptop initiative, but during the first year of the rollout, faculty did not fully buy into the change. They were uncertain about the advantages of the endeavour for the students, and felt that more research should have been done. Guri-Rosenblit (2005) warns against these substantive issues of ICT implementation in HE. Faculty members were concerned how the shift towards TEL would affect the students. Faculty members not from the Virtual Generation voiced their concerns that the pilot project was too much, and too fast. They maintained that the approach did not take into account the technology preferences of the Virtual Generation. The students voiced their concerns:

> I was affected in a huge way, when I was used to taking note on paper and now it is done on the laptops it's a big change which on the other hand it slows you down, because I'm still getting used to the typing (Student, open-ended questionnaire).

> The change, previously just listening to the professor and taking notes (it's easier this way) now it's different. Somehow it can be in the negative, it can even effect your concentration or the effectiveness to think... This can influence your learning experience. At first you don't feel all together in class with all these things in the class. I felt like, am I really going to manage this (Student, individual interview).

Uncertainty about the advantages associated with TEL and the unforeseen mistakes and gaps that accompany such change predominated faculty members' concern for their students' learning process:

> Has it been resolved by whoever that the future is an e-learning environment as they describe it, and why, and what are the advantages and why is it better than the previous? (Faculty, focus group discussion).

> I'm very worried about is actually the gap which is created especially in the contact session. The focus and participation is actually reduced. The attention is now given to the computer (Faculty, focus group discussion).

Barriers caused by the laptop

In their minds, incorporating ICTs in-class proved to be more of a hindrance and faculty preferred the traditional teaching environment. Obtaining and maintaining students' attention while they were interacting with their laptops irritated the lecturers and disrupted their classes. Faculty asserted that the laptops distracted students' attention in classes and that students required maturity and discipline to focus their attention on the facilitation at hand:

> I think what needs to be done is a way of… if using a computer in a contact session, to prepare the students, they need that preparation. Yes, they need that shift for them to be able to use the computer and concentrate at the same time (Faculty, focus group discussion).

The in-class use of the laptops diminished the interactivity with course content during contact sessions and estranged social interaction in real time and space:

> I feel that a contact session, in the deepest sense of the word, it must be a face to face talk and then questioning and answering, discussing, rather than a communication by passing through the computer... (Faculty, focus group discussion).

However, they acknowledged that out of class use of the laptops was convenient. Communication and studying could now take place in the students' own time and space; and that this boundless environment had a positive effect on TEL (Guri-Rosenblit, 2005; Mottarella, et al., 2004; Proserpio & Gioia, 2007; Tang & Austin, 2009).

Besides the insufficient attention and focus in-class, faculty were concerned about possible loss of traditional skills by students in the TEL environment:

> The other problem I said to the class is that yes you can use this tool but the problem is when you go to the exam I'm not going to allow you to use the computer. I need to be able to write the Hebrew characters with your own hand so in a way computer is not helping in this situation (Faculty, focus group discussion).

In spite of the challenges, some students, faculty and management believed that TEL could contribute towards an improved teaching and learning experience:

> Improvement of teaching and learning is like that, it can lie within effective access to information that one has as result of this teaching aid (Management, individual interview).

> The level of teaching that can be supported by technology is much better if everybody involved adapts to it and takes part (Student, open-ended questionnaire).

Faculty made an effort to incorporate the laptops in class and use other available technology; everything to the students benefit:

> They make quite an effort to get us involved with the laptops (Student, individual interview).

> A few of the older lecturers or Prof. seem to have problems with the e-Fundi. They say they don't quite know what to do yet. And one of the other lecturers uses e-Fundi but loads the material wrong. He puts the dates wrong, but he is working on it, so he is managing. They are all definitely making an effort to learn (Student, individual interview).

> They undoubtedly do everything to be to my advantage. I will not be disadvantaged because of e-Fundi or the computers (Student, individual interview).

Added responsibility

Faculty feared for the quality of their teaching. Previously insurmountable information at students' fingertips could enrich their learning experiences, yet did not replace the distinction between information and knowledge (Guri-Rosenblit, 2005). The responsibility fell on faculty to devise learning strategies to ensure that students benefited from instant access to data (Wurst, et al., 2008). Faculty members pronounced that it was not their responsibility to teach computer literacy to students and viewed TEL as an additional burden that will delay students' academic development:

> The students needed the proper preparation to use this tool, because I think instead of helping, it's not… it can't progress to their full potential at the moment it's not going to work well especially with the languages (Faculty, focus group discussion).

Initiation characteristics

Three categories relate to the theme initiation characteristics: Top-down decision making, trendiness and prior research.

Top-down decision making

Changing a pedagogical system requires careful planning and inter-systemic collaboration. Several factors should be taken into consideration like, potential users, the effects on these users, management and existing research. Faculty had to make a systemic change. Adapting to TEL meant working through much uncertainty, concern and reluctance. In this kind of development all role-players should be involved (Davis, Bagozzi, & Warshaw, 1989). Adoption of TEL takes effort and careful consideration. A partnership between all role-players is vital before changing from traditional classroom-based teaching and learning to TEL. This may be the most important aspect in successfully integrating TEL at traditional HEIs. The Dean of the faculty conceded irrevocable changes in HE, but faculty members experienced being excluded from this process:

> We don't know why it has been implemented, we were simply confronted with it and it happened like that (Faculty, focus group discussion).

> We were not part of the process; we were just informed that from now on it will be like this (Faculty, focus group discussion).

Faculty members felt that although change was mandatory, their opinions were not heard and that the responsibility of reaching traditional teaching and learning outcomes was still their responsibility:

> What I'm trying to say here is having introduced to the whole system and it's like we (personnel) are not listening to each other. When I stand up and say in Greek it won't work in our environment someone will stand up and say make it work and you see now there is a struggle I must make something to work while time is passing by (Faculty, focus group discussion).

> I must reach my outcomes, there are outcomes to be achieved and someone says make it work and I say it's not working and we are wasting time by this argument its working, make it work, it's not working, make it work and so forth and where is the process of teaching and learning it's being hurt (Faculty, focus group discussion).

Besides being pushed far beyond their comfort zone, faculty members remained true to their perceived responsibility towards their students:

> I will do anything to improve things for my students. Really, I think it is every lecturer's responsibility (Faculty, focus group discussion).

Trendiness

Faculty members experienced this change to be beyond feasible, especially for languages. Being pioneers in the use of TEL did not only place much pressure on them, but they felt concerned about possible errors during decision making:

> We pay a price for being trendy and being first and other people might learn from our mistakes, but we learn from our own mistakes and worst of all the students learn from our mistakes and I don't know if it can be corrected (Faculty, focus group discussion).

> I don't know if they (lecturers) had any...A course or something to teach them how to use the technology better. It seems to me that some of them (lecturers) are forced to use it. So they are doing it to meet the minimum requirements, but it is of little use, giving us computers to enhance the learning experience without equipping them with the abilities to meet the possibilities that has been created (Student, individual interview).

Prior research

The success of the pilot project depended on the initial project preparation, which included thorough research of the system requirements to adopt TEL. Thorough research is vital when changing a pedagogical paradigm. Insufficient knowledge of this system aroused questions, like "Was significant research done before the initiation of the change?"; "What was the rationale for the project?" and "Do we know enough about the generation students we teach?":

> Much more research should have been done beforehand on all possible aspects, advantages and disadvantages, and experience from other people should have been interpreted (Faculty, focus group discussion).

> I feel that it is my responsibility as a faculty member if it is a new system at the university let it be well researched let us be well trained as faculty and professors and let the student be well oriented to the system (Faculty, focus group discussion).

> I think we fooled ourselves. We said children were computer literate from the age of four years and that is why it will be wonderful for them to continue with the computer here. We were wrong, it isn't like that (Faculty, focus group discussion).

Faculty had to plan ahead, consider controlling measures, as well as augment stereotypical classroom teaching. Both ease of use and usefulness depend on how faculty design the classroom experience and not on the technology itself (Proserpio & Gioia, 2007). Having faculty members trained to

effectively integrate ICTs with their teaching will be a vital factor to promote learning (Fried, 2008; Proserpio & Gioia, 2007; Wurst, et al., 2008).

Conclusion

All motives, rewards and promises of TEL have not yet been explored. However if technology is incorporated to suit both the user and the pedagogy the result can be surprising. The researcher is suggesting the following technology implementation aspects that might be helpful during this adaptation (suggestions is applicable for this context):

1. Top-down decision making creates resistance and negative attitudes in faculty. Faculty members need to be involved from the initiation phase of TEL to become a motivated and transformed teaching corps.
2. A partnership between all system role-players must be formed.
3. There is a need for sustained overt communication between management and faculty members.
4. Current research in the field needs to be studied and the value of TEL needs to be communicated to faculty members.
5. For a TEL system to function sufficiently all learning material and the method of teaching will have to change.
6. To move away from the traditional teaching culture faculty members can start exploring a more constructive, learner-centred approach to teaching.
7. Training members of faculty for their new role and the pedagogical transformation is very important. Training can focus on new innovative and creative ways to effectively integrate technology with teaching and learning and the appropriate learning strategies effective in TEL.

References

Abbad, M. M., Morris, D., & de Nahlik, C. (2009). Looking under the bonnet: Factors affecting student adoption of e-learning systems in Jordan. *International Review of Research in Open and Distance Learning, 10*(2).

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of two Theoretical Models. *Management Science, 35*, 982-1003.

Emerson, L., & MacKay, B. (2010). A comparison between paper-based and online learning in higher education. *British Journal of Educational Technology*. Retrieved from http://www3.interscience.wiley.com/cgi-bin/fulltext/123492346/PDFSTART. doi:10.1111/j.1467-8535.2010.01081.x

Fichter, D. (2005). The many forms of e-collaboration: Blogs, Wikis, Portals, Groupware, Discussion Boards, and Instant Messaging. *Online 29*(4), 48-50.

Fried, C. B. (2008). In-class laptop use and its effects on student learning *Computers & Education, 50*(3), 906-914.

Guri-Rosenblit, S. (2005). Eight paradoxes in the implementation process of e-learning in higher education. *Higher Education Policy 18*(1), 5-29.

Kay, R. H. (2008). Exploring the relationship between emotions and the acquisition of computer knowledge. . *Computers & Education, 50*(4), 1269-1283.

Kirkwood, A., & Price, L. (2005). Learners and learning in the twenty-first century: what do we know about students' attitudes towards and experiences of information and communication technologies that will help us design courses? *Studies in Higher Education, 30*(3), 257-274.

Leech, N. L., & Onwuegbuzie, A. J. (2007). An array of qualitative data analysis tools: A call for data analysis triangulation. *School Psychology Quarterly 22*(4), 557-584.

Leech, N. L., & Onwuegbuzie, A. J. (2008). Qualitative data analysis: A compendium of techniques and a framework for selection for school psychology research and beyond. *School Psychology Quarterly 23*(4), 587-604.

Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco, California: Jossey-Bass.

Merriam, S. B. (2009). *Qualitative research: a guide to design and implementation*. San Francisco, California: Jossey-Bass.

Mottarella, K., Fritzshe, B., & Parrish, T. (2004). Who learns more? Achievement scores following web-based versus classroom instruction in psychology courses. *Psychology Learning & Teaching, 4*(1), 51-54.

Njenga, J. K., & Fourie, L. C. H. (2010). The myths about e-learning in higher education. *British Journal of Educational Technology, 41*(2), 199-212.

Palloff, R., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners.* San Francisco, CA: Jossey-Bass.
Proserpio, L., & Gioia, D. (2007). Teaching the virtual generation. *Academy of Management Learning & Education, 6*(1), 69-80.
Rice, R. E., & Aydin, C. (1991). Attitudes toward new organizational technology: Network proximity as a mechanism for social information processing. *Administrative Science Quarterly 36*(2), 219-244.
Salinas, M. F. (2008). From Dewey to Gates: A model to integrate psychoeducational principles in the selection and use of instructional technology. . *Computers & Education, 50*(3), 652-660.
So, H.-J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education, 51*, 318-336.
Tang, T. L.-P., & Austin, M. J. (2009). Students' perceptions of teaching technologies, application of technologies, and academic performance. *Computers & Education, 53*(4), 1241-1255.
Weaver, B. E., & Nilson, L. B. (2005). Laptops in class: What are they good for? What can you do with them? *New Directions for Teaching & Learning*(101), 3-13.
Wurst, C., Smarkola, C., & Gaffney, M. A. (2008). Ubiquitous laptop usage in higher education: Effects on student achievement, student satisfaction, and constructivist measures in honors and traditional classrooms. [doi: DOI: 10.1016/j.compedu.2008.05.006]. *Computers & Education, 51*(4), 1766-1783.

Author contact details:

Marichelle van Deventer, marichelle.vandeventer@gmail.com

Please cite as: van Deventer, M. (2012). Faculty experiencing first-line implementation of Technology Enhanced Learning. In M. Brown, M. Hartnett & T. Stewart (Eds.), Future challenges,sustainable futures. Proceedings ascilite Wellington 2012. (pp.958-966).