

ARE PEERLESS E-RESOURCES ANY BETTER TOOLS FOR SUPPORTING STUDENTS IN OPEN AND DISTANCE LEARNING ENVIRONMENTS THAN THE MORE TRADITIONAL TOOLS? THE CASE OF MZUZU UNIVERSITY, MALAWI

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ABSTRACT

E-resources have gradually been introduced and accepted into the academia around the globe over recent years. Accordingly, a variety of novelty learning technologies have been developed to serve students both for open and distance learning (ODL) and Face to Face residential delivery modes (F2F). To serve our ODL Bachelor of Education students well, Mzuzu University decided to develop e-modules, based on blending PowerPoint slides, audio and videos as complementary initiatives to printed-based materials. The aim of this study was to explore students' perceptions of e-resources as learning tools compared with other more traditional tools used in the 8th, 9th and 10th semester arts, humanities and science courses. The study employed qualitative and quantitative research design and the data were collected using questionnaires, observations and related case-studies. We established that while our anticipation was that modern students would very much prefer e-resources to printed materials, the results came out differently. For example, students in the sciences programme mostly preferred e-resources, lecturers, study-circles and print-based materials but not podcasts and slides. Conversely, students in the arts and humanities mostly preferred print-based materials, lectures and study-circles but not the e-resources, podcasts and slides. The results demonstrated that while e-resources were generally perceived as ideal learning tools against other learning tools, some sections of students based on the programme of study, age and priori experience had serious issues with the e-resources and WhatsApp. We also noted that culture, attitude, perceived ease of use, perceived usefulness and adaptability were some of the major factors that influenced students' rate of adoption of novelty technologies such as our peerless e-resources. The paper therefore recommended that e-resources must, at least for now, be used as supplementary materials along with other traditional media.

Keywords: F2F, ODL, podcasts, textbooks, Camtasia, Mzuni

INTRODUCTION:

Mzuzu University, also known as Mzuni's main challenges concern infrastructure, human resource and finances (Zozie, 2017). The number of student admissions in this university is rapidly increasing every year but teaching staff and infrastructure remain constant. Limited infrastructure has thus negatively impacted on the University's ability to cost effectively deliver its programmes as reported by Mzuni Annual Report, (2015). Due to small-sized classroom infrastructures, same lectures have been held several times in order to accommodate all the students. This would have been otherwise if lessons were held in spacious rooms (Zozie, 2017). Moreover, split lectures have often made timetabling an extremely difficult task. Likewise, lack of IT infrastructure means that Mzuni cannot take full advantage of the benefits that come along with the technologies (www.mzuni.ac.mw). Such benefits include improved e-learning and distance learning delivery modes that are not only cost effective but are also flexible, interactive and stimulating (Wright, 2011 & Zozie, 2017).

The enhanced e-learning model being proposed herein has the potential to supplement the face to face (F2F) residential delivery mode and the traditional open and distance learning (ODL) delivery mode which are predominantly based on lectures, traditional textbooks and modules. This is particularly true when we consider that e-resources are relatively cheaper to produce and distribute than paper-based modules as Amazon Books Team (2014) argued. In addition, electronic content is believed to be much more interactive and responsive to users and changing times than printed materials. Moreover, students using the e-resources may receive immediate feedback on quizzes and assignments unlike their counterparts. In addition, multimedia files enhance student motivation and learning experiences as per the views from Zozie (2017). According to Johnson, et.al (2011) and NEPAD Africa Commission (2003) universities in Africa will benefit immensely if they expedite the adoption of clever and swift e-learning tools into their education systems hence in line with our assumptions.

It should be noted that the Malawi government founded Mzuni in 1998 through an Act of Parliament. Mzuni became the country's second National University whose prime aim is to be a responsive university that will help deal with issues of access to tertiary education while providing responsive and quality education to the masses (www.mzuni.ac.mw). As of 2008, statistics indicated that both the University of Malawi (Unima) and Mzuni had only managed to enrol at least 0.03% of the eligible students due to lack of bed and teaching space (Malawi Government Report, 2014). This figure was deemed no way near the United Nations Organization Millennium Development Goals' 35% university admission requirement. Consequently, Malawi had two options for increasing access to higher education: expand education infrastructure at the expense of other priority areas such as agriculture and health, and or offer programmes through ODL (Chibambo, 2014). Given Malawi's relative poverty, the first option was perceived to be more expensive and time consuming unlike the second one. To this end, Mzuni established the Centre for Open and Distance Learning (CODL) in 2006 to put the generic degree programmes on ODL (www.mzuni.ac.mw). CODL started with print media as the main instructional mode supported by selected electronic media. The issue, however, concerned the selection of the most appropriate media to support the learners, who usually come to the campus for a one month f2f orientation, then go home for a five month self-study before they return to the campus for examinations in the sixth month (Chibambo, 2009 & Chibambo, 2014).

The dilemma came in when Mzuni realised that lecturers were taking too long time to produce print modules and that students who were in their 8th, 9th and 10th semesters in almost all key science, arts, humanities and education subjects had no modules. To make up for this, CODL decided to introduce peerless e-modules- a combination of slides, audio, video and text utilising PowerPoint, Latex and Camtasia software. Training workshops were organised where lecturers were trained on how to record their lessons using Camtasia. Thereafter, they were periodically taken to some far and placid lodges where they would record their notes. The modules were then edited and uploaded on an e-learn platform using Moodle software, and or burn in CD-ROMs or USBs. This content could also be played online and or offline anywhere and anytime. A student need to have any of these: computers, CD players, DVD players, phones or a flush-players to access the study materials. E-modules were not of course initially meant to substitute lectures and the printed materials but rather to complement them.

However, in our views, e-modules of this nature were inimitable in many contexts especially at the time of their introduction, and did represent an absolute novelty and agile learning concept. This aside, the concept was expeditiously hatched as a makeup concept providing little or no room for substantive needs and feasibility analyses. Accordingly, it was important for us to investigate how students perceived these learning tools so that we should improve on them to best meet the intended goals. The aim of this study, therefore, is to explore students' perceptions of the e-resources as learning tools against other traditional media such as textbooks and

printed modules. To do this, we had to investigate how Mzuni could sustainably integrate various e-learning tools into the traditional teaching and learning environments. The study was conducted among 8th, 9th and 10th semester education students at Mzuni. This study is therefore significant as it will provide mechanisms and benchmarks for integrating technologies into the teaching and learning environments while making use of locally available resources.

LITERATURE REVIEW:

E-learning and e-resources have over the recent years increasingly penetrated the education sector. Because of this, a variety of learning tools such as games (Caudill, 2007; Kim & Chang, 2010), Camtasia and Mediasite (Zozie, 2017; Harvel, et.al, 2012 & Vasu, 2008), Skype (Michaels & Chang, 2011), Web 2.0 tools (Laru, Näykki, & Järvelä, 2012), podcasts, mobile-phones and tablets (Chibambo, 2009 & Hendrix, 2009), e-readers (Mealer, 2011), Web-CT, Blackboard, Moodle and Dig-lib (Burgess, 2003 and Galy, Downey, & Johnson, 2011) have been developed and experimented in the schools. Most of these tools have essentially targeted ODL programmes though their uses have infiltrated into the f2f residential delivery mode (Galy, et.al, 2011 & Percival & Muirhead, 2009).

The use of e-learning tools in higher education serves different purposes. Some tools make ODL possible and flexible as suggested by various researchers including Foss, (2009); Burgess, (2003) & Singh, (2010). Others simply enhance the learning experience (Douglas, et.al, 2012 & Laru, et.al, 2012) while some may basically heighten fulfilment and build aplomb in the learners according to previous studies such those done by Blakely, et.al, (2009) & Douglas, et.al, (2012). Moreover, e-learning tools have gained traction simply because today's learners enormously anticipate agility in the learning processes, and this is inherent in the novelty-centred technologies as cited by Gabriel, et.al, (2012); Owens (2007) and Percival & Muirhead (2009). This view is also corroborated by Cox, et.al, (2004); EU Commission, Report, (2006) and World Bank Report, (2010) who argued that while e-resources have seemed to be relatively new in the education sector and they have been mainly associated with the leisure market, various studies have established that these resources were increasingly being accepted in other markets including education, law, health and commerce (Khalil, 2011; Stone, 2008 & Gregory, 2001). The reasons behind this development have included the need for low-cost textbooks, learner mobility, and learner engagement which are believed to be characteristic of e-resources and the technologies (Johnson, 2011 & Librero, 2006). Johnson further observed that the incorporation of multimedia and social elements has facilitated collaborative learning among learners. Based on these assumptions, the University of Leicester conducted a survey on the impact of e-resources on ODL Masters students from overseas including Africa. Interestingly, many students viewed e-resources as having significantly met their learning needs (Rainie, et.al, 2010). However, the cost of e-readers and copyright fees made the project unsustainable as the university was meeting all the costs. That aside, today e-reader manufacturers, internet providers and traditional publishers have faced tough competition which has forced them to reduce their prices. In addition, e-reader screens that once caused eye fatigue and irritation have significantly been improved (Bryan, 2004 & Attewell, 2005) thereby by providing a similar experience such as the one offered by printed books.

Similarly, at the University of London, studies wanted to establish if e-resources would be effective for learning and possibly reduce the cost of sending printed textbooks to students (McKellar, et.al, 2013). Initial results showed that the majority of the students favoured the e- resources', and e-readers' portability and usability unlike printed textbooks. The study concluded that e-resource distribution was becoming the *de facto* mechanism for consuming content. It also revealed new working relationships among educators, publishers and device manufacturers. However, e-cultural resistance, energy issues, and poor internet connectivity were reported particularly in Kenya and other developing countries just like Mutegi, L. (2014) and Malekata (2012) established. Moreover, the debate on OERs versus DRM materials was also very contentious and significant. The researchers observed that while copyright sustained creativity, it also did inhibit access to knowledge, and indeed promoted piracy agreeing with what Boezman, (2011) had observed. Even then, the study established that use of analytics for gathering learners' behaviour was a milestone for publishers and educators as Perrone, (2009) had observed. While analytics were considered as a positive development, the study failed to balance issues of consumer privacy, security and preference as enshrined in the Data Protection Act (1998) demands. The unresolved question is whether it is lawful for both publishers and educators to spy onto readers' reading practices and behaviours or not. Probably this could be another area calling for more investigation.

Prior to the London studies, the Virginia State University conducted studies in 2008 that sought to replace

traditional textbooks with open e-books under the Flat World Knowledge (FWK). Surprisingly, 85% of the students accessed the e-books more than the 47% who used printed books. Importantly, higher grades were obtained in the courses that used e-books than those that utilised printed books. However, whether the higher grades were due to the e-books alone or a combination of factors remains unanswered and this could be another area that requires further studies. Moreover, while every student could have accessed the e-books, only 93% did, and 85% registered for the Seat-Licence that allowed them access supplementary materials. Arguably, the 22% (7%+15%) that shunned this service suggested that some people still suspected e-resources just like Morris (2014) observed. Conversely, it could also be possible that the 22% that shunned the e-resources had alternative means of accessing content. Even then, the higher percentage (85%) that preferred e-books testifies to the fact that today's students are digital natives and love to go for options that are easy, swift and flexible as Campbel, et.al, (2012) and Percival & Muirhead, et.al, (2009) hinted. Worth our take is the fact that, students' ability to download files was made simple through use of the Seat-licence and Creative Commons Licences. In this case, the value was in the information itself but not the books as *objects-de-art*. Such free access to information is critical for students' success in education. Everything being equal, these studies present educators with some insights on how technologies can enhance teaching and learning experiences.

THEORETICAL FRAMEWORKS:

Technology Acceptance Model (TAM/TAT):

This study is based on two models: Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI). TAM was proposed by Davis (1986). It was based on the assumption that an individual's acceptance of information systems is determined by Perceived Usefulness (PU) and Perceived Ease of Use (PEoU) (Lee, Kozah, & Larsen, 2003). Davis (1986) and Davis, Bagozzi & Warshaw (1989) defined 'perceived usefulness' as the degree to which people believe that using a particular system would enhance their performance. They also defined PEoU as the degree to which people believe that using a particular system would be free of effort. Similarly, Sharma & Chandel (2013) observed that TAM was developed to establish the factors which make people accept or reject information technologies (ITs). Likewise, Davis, et.al, (1989) found out that the PU is the strongest predictor of individual's intention to use technology. Since then, TAM has been applied to different technology fields such as word processors, email, websites and, Hospital Management Systems. Moreover, researchers in the information sciences still use TAM in their studies as Lee, Kozah, & Larsen, (2003) observed. See diagram below.

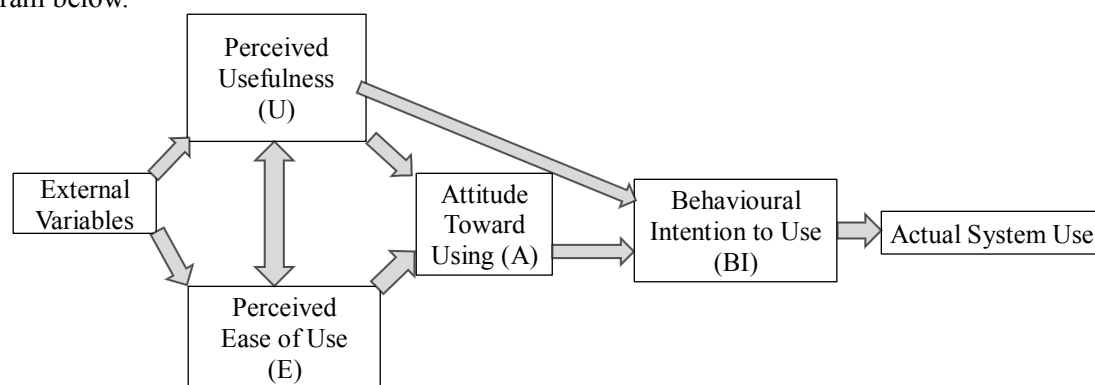


Figure 2-3 Technology Acceptance Model

Having observed that there was a tremendous increase in the use of and demand for e-learning among university students, Sharma & Chandel (2013) felt the need to investigate factors that influenced use and acceptance of e-learning in order to make it an effective tool in education. The focus of their study was at individual level but not otherwise. The following research questions were formulated for Sharma and Chandel's study:

1. What are the main constructs that are affecting student's intention to use websites for learning?
2. What is the degree of strength of the relationship among these constructs?
3. What is the order of importance of these constructs?

In their study, Sharma & Chandel (2013) also added three more constructs to TAM: Perceived Web Quality (PWQ), Computer Self-Efficacy (CSE) and Attitude towards e-learning (ATT). Their proposed model looked as follows:

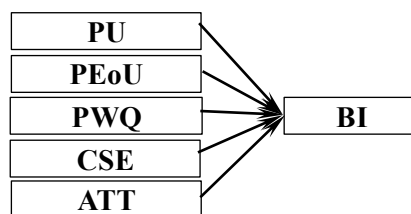


Figure 2: Improved revised TAM as assumed by Sharma

Sharma and Chandel used parametric statistical techniques to test the proposed research hypotheses and established that all the five constructs had positive relationship with behavioural intention. The possible constructs that can be used in this study from the Sharma & Chandel's (2013) findings are PU, CSE and ATT. This decision obtains because our study depended on technology hence CSE was mandatory. Integration of technology in education requires people who have positive attitudes towards IT if they are to accept the innovation as Chibambo, (2014) & Zozie, (2017) observed. Furthermore, if individuals find technology useful in their tasks, it is likely that they will adopt and use it.

In a similar study, Lederer, Maupin, Sena & Zhuang (2000) validated TAM with the World Wide Web as the users' application. The study confirmed that use of Websites largely depended on its usefulness and ease of use. Another study by Teo, Lim & Lai (1999) established that both usefulness and ease of use were predictors of usage but usefulness had a stronger effect.

Although the role of IT has increased significantly in education, Hu, Clark & Ma (2003) noted that resistance to technology by teachers worldwide was still far too high. They also observed that older public school teachers did not have technology know-how partly because they received their training when technology was less developed. This then, coupled with demanding workload and strict timeframes prevented them from accepting the technology. This observation forced Hu, Clark & Ma (2003) to conduct a longitudinal study, in cooperation with the Hong Kong Professional Teachers' Union, to examine teachers' acceptance and decision-making at the beginning and the end of a four-week intensive PowerPoint training programme.

According to them, a teacher's decision to adopt a technology is directly affected by his or her perception of the following constructs: the technology's usefulness, ease of use, computer self-efficacy and subjective norm. They proposed that the teacher is likely to consider a technology useful if it is easy to use. Their model was- of course- an offshoot of the TAM.

From their model, they concluded that perceived usefulness was a determining factor for technology acceptance. They further noted that teachers were likely to consider technology useful if it were relevant to their job. While subjective norm was seen as the best driver of acceptance at the beginning of the study, its powers gradually declined as the participants became experienced. This suggested that people who advocate for use of technology should first foster a positive community norm when they introduce a new technology because this creates an initial technology acceptance. Afterwards, the technology adopters should be helped in acquiring more knowledge and skills in using the technology. The study also established that perceived ease of use had limited direct influence on users' technology acceptance. The implication then was that users were very unlikely to accept a technology simply because it was easy to use. Perceived ease of use will have a positive effect on user acceptance only if the users really see that the technology is very useful. Consequently, continued training and user support were necessary to ensure that users found the technology user friendly after they adopted it.

An analysis of CSE, which referred to individuals' judgement of their ability to use computers (Compeau & Higgins, 1995), showed that it had an effect on technology acceptance. Generally, Hu, Clark & Ma (2003) established that most of their hypotheses were supported. They however warned that the study had several limitations hence generalisation of the findings should be done with caution. Some of the limitations were that their results were obtained from a single study and the sample only consisted of teachers who were attending a technology competency training. That aside, this theory has much to offer to our present study given that we are dealing with technology issues and learners who have diverse attitudes, preferences and expectations.

DIFFUSIONS OF INNOVATIONS THEORY:

According to Tornatzky & Klein, (1982) DOI attempts to explain how innovations are generally accepted by a people. To this end, DOI is considered as the process by which an innovation is communicated through some medium for a certain period of time within a social echelon according to Rogers, (2003). Since, the 1960s, DOI has been used to examine different innovations in agriculture, health and construction and commerce among others (Tornatzky & Klein, 1982).

Rogers (2003) identified relative advantage, compatibility, complexity, triability and observability as prime attributes of innovations. Relative advantage is the extent an innovation is seen as better than the concept it replaces. People are likely to adopt an innovation if they consider it rewarding. Likewise, Ostlund (1974) contended that individuals with positive perceptions of a new idea will most probably adopt that innovation. The prospective candidates of a new idea must however be introduced to the merits of that innovation.

The other feature is compatibility: the extent an innovation is seen as being in line with the established values, culture, and the demands of the prospective adopters. Norms and values of a social scheme are crucial for the adoption or rejection of any novelty ideas. If the innovation is incompatible with the values of a society, it will not be adopted. Rogers (2003) also avowed that the adoption of a new incompatible innovation will often require pre-adoption of new values and this is usually a plodding process.

Complexity, as a quality, is defined as the extent to which possible embracers perceive the hardness to comprehend and consume the innovation. Ideas that are easy to appreciate are usually swiftly adopted because they are not arduous and tedious.

Rogers (2003) also identified initial innovation experimentation of an innovation as a critical factor. Novel ideas that are discernible and can be tested usually permeate nippily. He observed that triability reduces uncertainty to the person prospective adopter as he learns through practice.

On the other hand, observability (also known as peer-to-peer networks) attribute is founded on the assumption that individuals will most likely embrace a new concept if they see the actual results. This comes about because such results inspire peers to discuss the new ideas freely in a free milieu.

In a nutshell, innovations that will easily be adopted are those that prospective adopters perceive to be advantageous, compatible, triable, and observable and are easy to use. These qualities potentially and crucially help explain the rate of adoption. Nonetheless, out of these qualities, Rogers (2003) identified relative advantage and compatibility as the most powerful factors that explain the rate of adoption of an innovation. Agreeing with this assumption, Bradford & Florin, (2003) identified compatibility, simplicity and relative advantage as equally important factors that affect the adoption of innovations.

Another important element for innovation diffusion is re-invention, which Rogers (2003) defined as the degree to which an innovation can be modified by its users. Some innovations may undergo considerable re-inventions while others may not. Adopting an innovation is an active process where adopters can customise the innovation to suit their needs. Research has established that an innovation that can be re-invented by its adopters diffuses more easily and is more likely to be sustained. Perhaps, this is a crucial element in this study considering that e-resources are much more fluid, flexible and re-adaptable than printed materials.

On the other hand, rate of adoption is defined as the relative speed at which an innovation is adopted by members of a social system, which is measured by the number of individuals who actually adopt a new idea in a specified period (Rogers, 1983). Rogers then identified perceived attributes of innovations, type of innovation decisions, communication channels, nature of the social system, external change agents and promotional efforts as variables that determine the rate of diffusion and adoption.

Moore & Benbasat (1991) working in an IT context expanded Rogers' perceived attributes of innovation to eight. They identified voluntariness, relative advantage, compatibility, image, easiness, results, visibility and triability as equally major issues that determine adoption of IT. While these theories principally concerned technology, we found that the DOI Theory and its assumptions are very much applicable in this study considering that our study introduces a new model of learning that is predominantly technology driven. This innovation also calls for peer to peer support, and perceived usefulness, and ease of use as suggested by the proponents of TAM.

METHODOLOGY:

This study blended qualitative and quantitative research design and case-studies. Data was gathered through specialised questionnaires.

Cohort one had about 20 students who were enrolled in 2011 and currently in the fifth year of their Education Degree programme, and cohort two had about 129 students while Cohort three had 200 students who participated in this study for a period of 12 months (two semesters). The study invitation was given at the end of the first semester through f2f, email and mobile phones. Reminders were also sent via personal e-mails. The questionnaires were anonymously distributed in hard copies.

ETHICAL CONSIDERATIONS:

The questionnaires were spontaneously depersonalised by ensuring that nobody indicated their personal details unless they wanted to be considered for follow-up studies. Individual responses were solely used for this study and were kept under the tight lid.

RESULTS:

The tables below present our findings. In general and on average, 50% (n = 350) of the 700 students who started in the first semester participated in the study. The participation rates by study year were 54% for cohort one, 50% for cohort two and 46% for Cohort three. These students were offered eight different learning tools. Table 1 below shows the tools that contributed to learning in the arts and humanities subjects.

Table 1: Percentages for arts and humanities (n = 350).

	very good	good	less good	bad	not used
e-modules	10	15	40	15	20
Lectures	60	30	5	3	2
WhatsApp	20	20	10	12	8
Study circles	60	35	5	3	7
Podcasts	2	2	6	30	60
Slides	8	10	12	20	40
Printed modules	55	20	15	5	5
Traditional textbooks	50	20	12	10	8

From the table above, lectures (60%) and study-circles (60%) scored highly followed by printed modules (55%) and textbooks (50%). When we combine traditional textbooks and printed modules (60%+50%) we find that both e-modules and WhatsApp (10%+20%) still cannot match them especially for this group of students. Conversely both podcasts (2%) and slides (8%) scored poorly.

We also wanted to establish how science students rated these learning tools and the table below summarises the findings.

Table 2: Percentages for tools that contributed to learning in sciences (n = 350).

	very good	good	less good	bad	not used
e-modules	65	20	10	0	5
Lectures	60	35	2	0	3
WhatsApp	50	30	15	1	4
Study circles	55	35	5	0	5
Podcasts	5	10	20	15	50
Slides	10	15	25	20	30
Printed modules	40	30	10	16	4
Traditional textbooks	38	20	12	12	18

In sciences class, the majority of the students found the e-modules very useful (65%) followed by lectures (60%) and Study circle (55%). Like in the previous class, podcasts and slides were poorly scored. While e-modules scored highly in this class, traditional textbooks and printed modules also performed relatively well.

Table 3: Percentages for overall perception of print media in arts, humanities and sciences (n = 350)

	very good	good	less good	bad	not used
Arts	85	15	0	0	0
Humanities	65	35	0	0	0
Sciences	60	30	10	0	0

This question was deliberately asked to verify the results obtained from the previous two questions regarding print media after noting some inconsistencies. It was clear that 85% of the Arts students perceived print media as very good; 65% in humanities and 60% in sciences. This was consistent with what (Zozie, 2017 and Virginia State University, 2008) found. Conversely, nobody considered printed materials as wholly bad and that almost everybody at least used these print-based modules.

DISCUSSION:

The most interesting result of this study is that print-based materials were mostly favoured by the Arts and humanities students see table 1 and 3. On the other hand, science students mostly favoured e-modules as shown in Table 2.

From our observations and in-depth interviews, we established that a good number of those students that rated e-modules highly were mostly those that joined the ODL Programme later than 2015. These were mostly youngsters who had just completed their secondary schools (Note that these results are not covered by the tables) and that computer studies were compulsory in their schools. However, those in cohort 1, the majority of whom were old and primary school teachers rated e-modules as less effective. This may be because at the onset of this programme in 2011, the only learning tool that was introduced to them were printed modules as (Chibambo, 2009) indicated. Besides, the time they were living secondary schools, computer studies had not been introduced in their schools. Simply put, the majority of them had no prior knowledge of computers a requisite (Zozie, 2017 and Foss, 2009) emphasised. This may as well help explain why students in the later cohorts were more enthusiastic about the e-modules and the technologies that delivered the content.

One might argue that the higher ratings of e-modules by the science students does not necessarily mean that it was the e-modules that were good, but rather that the other learning tools were just bad. This may sound a conceivable argument in some respect; however we should not forget that lectures, study circles and printed modules performed very well too. This means, while they perceived e-modules to be much better tools, they also considered lectures, study-circles and print-based materials as equally better tools.

From these findings, it seems e-modules voting depended on age and field of study. Furthermore, while these findings might be challenged to some extent, given the limited sample study, generally e-modules were regarded as “very good” learning tools by the science students and the younger students. Likewise, printed materials were perceived as better tools mostly the arts and humanities students and the older learners. Maybe this could be due to the nature of our ODL programme and the courses. Firstly, ODL students at Mzuni come to the University for a two week F2f Orientation and thereafter they go home for a six month self-study before they come back for final examinations. In such cases, it is easy for humanities and arts students to study on their own using print-based materials. Contrariwise, science students require experiments, something printed modules cannot really address. This then requires that lecturers solve the problems or take them through the experiments. However, since they are away from their teachers, e-modules become their saviour as they can read the text, listen to the audio and or see the videos in a Virtual Learning Environment. This maybe the reason science students favoured most the e-resources. In other words, e-modules provided them with a better substitute for frontal lectures. Considering that most courses in higher education are print-based, these findings may also infer that the new generation of scientists are more enthusiastic about, or even demanding of, digital learning tools with new possibilities, as previously observed by Zozie, (2017); Gabriel, et.al, (2012); Owens & Floyd, (2007) and Percival & Muirhead, (2009). This was also supported by our findings that the science students and the young stars mostly voted for e-modules.

We were also surprised to see that podcasts and slides performed poorly. We did not anticipate these results given that the content in the slides and the podcasts was the same as that in the modules. We expected that modern students would enjoy the flexibility and ability to learn while in transit. However, this finding may suggest that the students had already attended the lectures and did not see any need for podcasts. It could also be

that the students had already listened and watched the videos in the e-modules; hence no need to use the podcasts and or the slides. It could also be possible that some students understood that podcasts needed some bundle to be downloaded them from the internet and wanted to save their money. It was also possible that the learning tools given to them were just too many and that podcasts and slides were the worst. It could also be probable that slides usually covered much space and needed to be printed first, which is usually the case, before using them. Probably these were the reasons these tools scored abysmally. The results on podcasts however contradicted what Delaney, et.al. (2010) and Evans, (2008) found. For example, Delaney and Evans reported that podcasts were the most favoured learning tools. Likewise, Foss, Oftedal & Løkken, (2012) also established that 49% of the students scored podcasts as highly contributing to learning. However, in that study, the students ($n = 107$) only used up to eight podcasts (average = 3.5) over a shorter period of time, thus making the findings less reliable unlike ours. Nevertheless, these contradictions need not be taken lightly, hence the need for longitudinal investigations. Moreover, while WhatsApp seemed to have been highly rated, further interviews revealed that many students had serious issues with it. For example, they complained of individuals who abused the system through posting of offensive materials. Some students also sent messages during midnight and this caused family problems just like Zozie, (2017) observed. In addition, many students did not have WhatsApp enabled phones and were unable to benefit from this service. Even those that had seemingly good phones, they still had issues with small screens and low resolutions that made reading of content really difficult as Zozie, (2017) & Chibambo, (2016) observed. The question is, how and why did these students rate WhatsApp as highly as they did against other potential tools? Results like these can possibly be explained by the DOI Theory's assumptions which tries to explain how innovations are adopted in a population (Rogers, 2003); and TAM's assumptions (Lee, Kozah, & Larsen, 2003). Perhaps WhatsApp and e-modules both of which rely on IT were novel, trendy and agile for the younger learners. So, even though they had issues with these tools, for example, internet connectivity, electricity and prohibitive costs, as Zozie, (2017) and Chibambo, (2014) established, still the experiences and excitement presented by such technologies were much more appealing than the shortfalls.

A relevant and plausible question is whether the use of our peerless e-modules increased learning outcomes and performance. This issue was not addressed even though Zozie, (2017); Douglas, et.al., (2012); Hassanien, (2006); Laru, et.al., (2012) and Singh, (2010) predicted that e-learning tools may improve learning experiences. In fact, identifying how learning tools affect learning outcomes seems difficult because of the so many variables that come into play when measuring such behaviours. For example, Säljö, (2010) & Perraton, (2000) identified student engagement, Quality Assurance, individual intelligence, student support services and the environment as factors that may affect student performance. However, a review of educational gaming by Blakely, et.al., (2009) showed various positive outcomes that were not directly linked to exam results; such as increased motivation and active learning reinforced by instruments of entertainment. These kinds of outcomes may be relevant for other e-learning tools as well as our peerless e-modules. Significantly, outcomes like these, which may not directly improve exam results, can improve study habits, which can improve examination results in the long run. Whether this is the case for our peerless e-modules or not is just another area that call for further research.

LIMITATIONS OF THE STUDY:

Several aspects of this study have suggested that our results must be interpreted judiciously. Firstly, the researchers were the designers of the peerless e-modules. It is possible that they may have inadvertently affected the students' perceptions and ratings of the various learning tools, for example, the way the tools were reviewed. This may have affected the outcome of the study. Secondly, it may be argued that comparing three or more different learning tools was out of order because different tools have different purposes and effects on learning. We do agree with this misgiving, nevertheless, the aim of this study was to compare different learning tools, even if they had different goals. Thirdly, it is possible that the students who participated in this study were those who were mostly engaged with the available learning tools, and that those who were less fervent did not participate. That aside, general students' perceptions on some tools indicated that not all the tools were embraced with the much anticipated zest. Besides that, our data were based on self-reports, which can be prone to recall bias. It has been suggested that the most ubiquitous problem for response bias is people's tendencies to present a favourable image of themselves (Polit & Beck, 2004)). We cannot dismiss the possibility such biasness, but the effects of such bias should not be embellished. Lastly, this study was done at Mzuzu University, among Faculty of Education students only, therefore these findings may not be representative of other students in other universities in Africa and beyond.

CONCLUSION:

The study has presented us with diverse interesting results. While we anticipated that modern students would unanimously opt for e-modules and podcasts as opposed to the more traditional tools, ironically, that did not just happen. For example, students in the arts and humanities classes mostly favoured print-based media unlike those in the sciences who preferred e-modules and lectures. We also established that, in general, young students did prefer e-modules to print-based materials although they also used print-based materials to some extent. We, however, established that podcasts and slides were the least favoured learning tools for the reasons well known to them. We of course attempted to assume the reasons behind their behaviour as shown in the discussion section. For instance, issues of costs associated with downloading podcasts and probably the too many better learning tools at their disposal might have made them behave that way. We did not precisely establish factors that make students prefer to use our website for learning simply because our students had different options for accessing materials, for example phones, CD-ROMs, Flash discs, DVD players and alike. Moreover, Mzuni website is not well managed and is sometimes inaccessible in other regions. We however managed to infer reasons students may adopt or reject an innovation such as our e-modules. The critical elements that influenced their behaviour included culture, attitude, perceived ease of use, perceived usefulness and adaptability. We added culture to Chandel and Sharma's (2013) list because culture significantly influenced our students' decision to use the e-resources. For example, older students, who were also the pioneers of our ODL programme, had a negative attitude towards the e-modules because of their secondary school background and experiences they had when they first joined ODL in 2011 as explained already. Similarly, young learners and those who did their secondary school during the computer era easily accepted the e-modules and WhatsApp because it was already enculturated in them. Of course, we could not easily rank these factors since we did not set out particular questions to help us systematically do that. Nevertheless, from the informal observation and interaction with the students, we managed to deduce and rank these factors as shown above.

In a nutshell, e-modules were popular among the scientists and younger students; while the arts, humanities and older students preferred print-based materials against e-modules. Moreover, lectures and study circles were also favoured by almost all the students from all the three programmes. From the cross-examination questions, WhatsApp revealed a lot of challenges which made it somewhat questionable for formal studies. Likewise, in a separate question on use of printed materials, it was revealed that even the very scientists who first seemed to loath print, did endorse it in large numbers suggesting that print-based materials were still a force to reckon with. They perhaps valued printed materials given the limitations inherent in the novelty technologies. For example, issues of electricity, internet costs and poor bandwidth were cited by most of the students just like Johnson (2011) and Chibambo (2014) established. This study, without prejudice and pessimism, recommends that- at least for the moment- universities in Africa should not consider e-resources as replacements for print-based materials but rather as complements. We therefore recommend that until some later years, printed materials must be used along with the e-resources so as to provide adequate options for the diverse natures of our students, and the less privileged ones who cannot afford internet costs and expensive gadgets. Otherwise, any expeditious implementation of e-resource programmes will have serious repercussions on the finances of the institutions and hugely violate rights of the learners. We must understand that culture and behaviour change occurs gradually and it does take a long time.

REFERENCES:

- Amazon Books Team (2014). *Kindle Direct Readers United: Stop Fighting Low Prices and Fair Wages: E-books must be inexpensive*. Retrieved on 10 July 2017 from <http://www.amazon.com>; also available at <http://www.readersunited.com>.
- Attewell, J. (2005). *Mobile Technologies and Learning: a Technology Update and M-learning Project Summary*. London: Learning and Skills Development Agency. Retrieved on 12 June 2017 from <http://www.m-learning.org/docs/the%20project%20-20%summary.pdf>.
- Blakely, G.; Skirton, H.; Cooper, S.; Allum, P. & Nemes, P. (2009). Educational gaming in the health sciences: systematic review. In *Journal of Advanced Nursing*, 65(2), (pp. 259-269). Doi: 10.1111/j.1365-2648.2008.04843.x.
- Blevins, A. & Elton, C.W. (2009). An Evaluation of Three Tutorial-creating Software Programs: Camtasia, PowerPoint, and MediaSite. In *Journal of Electronic Resources in Medical Libraries*, 6(1), (pp. 1-7). Doi: 10.1080/15424060802705095.
- Boezman, T (2011). *Piracy is good*. Retrieved on May 12 2016 from [http://www.futurebooks.net/piracy is good](http://www.futurebooks.net/piracy%20is%20good)

- Bradford, M., & Florin, J. (2003). Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems. *International Journal of Accounting Information Systems*, 4, 205–225.
- Bryan, A. (2004) *Going Nomadic: Mobile Learning in Higher Education*. Educause, 39(5) 28-35.
- Burgess, L. (2003). WebCT as an E-learning tool: Study of technology students' perceptions. In *Journal of Technology Education*, 15(1), (pp. 6-14).
- Caudill, J.G. (2007). The growth of m-learning and the growth of mobile computing: Parallel developments. In *International review of research in open and distance learning*, 8(8).
- Chibambo, M. (2009). How Mobile Phone Technology Can Support ODL in Malawi. *The Cambridge International Conference on Open and Distance Learning 2009*. The Von Hügel Institute, St Edmund's College, Cambridge, OUK and COL: Supporting learning in the digital age: Rethinking inclusion, pedagogy and quality Tuesday 22 September - Friday 25 September 2009 Collected Conference Papers and Abstracts September 2009. Accessed from <http://www.camcon/ODL/09> 10 May 2017.
- Chibambo, M. (2014). *How Best to Support ODL Students Who Have No Access to Textbooks*. MA Thesis. London. Kingston University. Accessed from <http://Wwww.kingstonuniversity.ac.uk> on 6 June 2017.
- Chibambo, M. (2016). Scurrying for a Successful ODL Model in Malawi: Prevalent Issues and Trends in Distance Education. *Journal of Arts, Commerce and Sciences*. DOI: 10.18843/rwjasc/v7i4/01. DOI URL: <http://dx.doi.org/10.18843/rwjasc/v7i4/01>.
- Chibambo, M. (2016). Take It or Leave: Agile Business Models in Publishing and Value Addition in the Publishing Sector and forces impacting on these models. *Researchers World: Journal of Arts, Commerce and Sciences*. Doi:10.18843/rwjasc/v7i3/01; DOI URL <http://dx.doi.org/10.18843/rwjasc/v7i3/01>.
- Compeau, D., & Higgins, C. (1995). Computer self-efficacy: development of a measure and initial test. *Management Information Systems Quarterly*, 19, 189-211.
- Data Protection Act (1998). Accessed on 12 July 2017 from http://www.holisticdataprotection.com/Backup-Recovery?utm_source=google&int=off&pre=off&utm_medium=cpc&utm_term=GAW&utm_content=sy_lp07062017GOOGOTHR_GsidCommvault_MS_DataProtect&utm_campaign=Commvault_DataBackup_Microsite_EMEA&Offer=sy_lp07062017GOOGOTHR_GsidCommvault_MS_DataProtect
- Davis, F. (1986). *Technology Acceptance Model for Empirically Testing New End-user Information Systems Theory and Results*. Unpublished Doctoral Dissertation, MIT.
- Davis, F. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Davis, F., Bagozzi, R., & Warshaw, P. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982-1003.
- Delaney, E.; Pennington, N. & Blankenship, M.B. (2010). The role of podcast lectures in associate degree nursing programs. In *Teaching and Learning in Nursing*, 5(2), (pp. 54-57). doi: 10.1016/j.teln.2009.08.004.
- Douglas, M.; Wilson, J. & Ennis, S. (2012). Multiple-choice question tests: a convenient, flexible and effective learning tool? A case study. In *Innovations in Education and Teaching International*, 49(2), (pp. 111-121). Doi: 10.1080/14703297.2012.677596.
- Enhanced Higher Education*. Kjell Arholms hus: University of Stavenger. Retrieved on 04 June 2017 from <http://www.uis.no>.
- Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & Education*, 50(2), (pp. 491-498). Doi: 10.1016/j.compedu.2007.09.016.
- Foss, B., Oftedal, B.F. & Løkken, A. (2009). *Rich Media e-Compendiums: A New Tool for Learning*.
- Foss, B.; Oftedal, B.F. and Løkken, A. (2012). *Podcasts of long duration: Supplemental and substitutional learning tools*. Paper presented at the EDULEARN12, Barcelona, Spain, 2nd -4th July. 2012.
- Gabriel, M.; Campbell, B.; Wiebe, S.; MacDonald, R. J. & McAuley, A. (2012). The role of digital technologies in learning: Expectations of first year university students Canadian. In *Journal of Learning and Technology*, 38(1).
- Galy, E.; Downey, C. & Johnson, J. (2011). The effect of using E-learning tools in online and campus-based classrooms on student performance. In *Journal of Information Technology Education*, 10, (pp. 209-230).
- Harvel, G. & Hardmann, W. (2012). A comparison of different communication tools for distance learning in nuclear education. In *Journal of Energy and Power Engineering*, 6, (pp. 20-33).
- Hassanien, A. (2006). An evaluation of the web-quest as a computer-based learning tool. In *Research in Post-Compulsory Education*, 11(2), (pp. 235-250). Doi: 10.1080/13596740600769230 Information Science Publishing.
- Hendrix, J. (2008) 'Cell-phones as an Instrument for Student Support. The Case of University of Pretoria': a Report of research findings presented at the DEASA International Conference in Livingston, Zambia.

Gaborone, SADC.

- Hu, J., Bertol, P., Hamilton, M., White, G., Duff, A., & Cutts, Q. (2006). Wireless interactive teaching by using keypad-based ARS. In D. Banks (Ed.), *Audience response systems in higher education* (pp. 209-221). Hershey, P.A: Information Science Publishing.
- Hu, J.-H., Clark, T. H., & Ma, W. W. (2003). Examining technology acceptance by school teachers: a longitudinal study. *Information & Management*, 41, 227-241.
- Jancarik, A. & Jancarikova, K. (2010). Wiki Tools in the preparation and support of e-Learning courses. In *Electronic journal of e-learning*, 8(2), (pp. 123-132).
- Johnson, J., Galy, E. & Downey, C. (2011). *The effect of using e-learning tools in online and campus-based classrooms on student performance*. In *Journal of Information Technology Education*, 10, (pp. 209-230).
- Ke, F. (2008). A case study of computer gaming for math: Engaged learning from gameplay? In *Computers & Education*, 51(4), (pp. 1609-1620).
- Kim, S. & Chang, M. (2010). Computer games for the math achievement of diverse students. In *Educational Technology & Society*, 13(3), (pp. 224-232).
- Kuhn, M.A. (1995). Gaming: A technique that adds spice to learning? In *Journal of Continuing Education in Nursing*, 26(1), (pp. 35-39).
- Laru, J.; Näykki, P. & Järvelä, S. (2012). Supporting small-group learning using multiple Web 2.0 tools: A case study in the higher education context. In *The Internet and Higher Education*, 15(1), (pp. 29-38). Doi: <http://dx.doi.org/10.1016/j.iheduc.2011.08.004>.
- Lederer, A., Maupin, D. J., Sena, M. P., & Zhuang, Y. (2000). The technology acceptance model and the World Wide Web. *Decision Support Systems*, 29, 269-282. Retrieved June 19, 2017, from <http://www.elsevier.com/locate/dsw>.
- Lee, J. (2009, July 21). Six key facebook strategies for University and College Administrators. Retrieved January 2017 from <http://www.adweek.com/socialtimes/6-key-facebook-strategies-for-university-and-college-administrators/225422>
- Lee, Y., Kozah, K. A., & Larsen, K. R. (2003). Technology Acceptance Model: Past, present and future. *Communication of the Association for Information Systems*, 12, Article 50, 752-780.
- Librero, F. (2006). *Trends in E-learning of Interest to Educators*. Paper presented at the National Conference of Philippines E-learning Society. November, 2006. Quezon, Diliman Publishing, 28-29.
- Lopez-Morteo, G. & López, G. (2007). Computer support for learning mathematics: A learning environment based on recreational learning objects. In *Computers & Education*, 48(4), (pp. 618-641).
- Luckin, R.; Clark, W.; Graber, R.; Logan, K.; Mee, A. & Oliver, M. (2009). Do Web 2.0 tools really open the door to learning? Practices, perceptions and profiles of 11–16 year old students. In *Learning, Media and Technology*, 34(2), (pp. 87-104). Doi: 10.1080/17439880902921949
- Malawi Government Education Report (2014). *Plans and Programmes for the Ministry of Education, Science and Technology: 2009 - 2014* Accessed on 13 July 2017 from https://www.malawi.gov.mw/index.php?option=com_content&view=article&id=24&Itemid=80
- Malekata, M. (2012) *African Nations Embrace E-learning*. Retrieved on 20 June 2017 from <http://www.pcadvisor.co.uk/news/network-wifi/3361705/african-nations-embrace-e-learning>.
- Mealer, C.K., Morgan, P.J. & Williams, C.W. (2011). *E-readers in Higher Education*. The University of Alabama. Retrieved on 14 March 2017 from <http://bama.ua.edu/~ckmealer/MealerEport/EReaders.pdf>.
- Michaels, B.J. & Chang, C.W. (2011). Attending a presentation at a distance in real-time via Skype. In *Tech Trends*, 55(1), (pp. 23-27). Doi: 10.1007/s11528-011-0465-0.
- Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 192-222.
- Morris, R. (2014). *How to Self-publish Your Book*. Keaney. Morris Publishing. Retrieved on 20 February 2017 from <http://www.morrispublishing.com/?ref=wwwb>.
- Mutegi, L. (2014). *E-learn Africa Report: Opening a Window on the Continent's Education Future*. Retrieved on 9 June 2017 from <http://www.cio.co.ke/news/top-stories/opening-a-window-on-the-continent%E2%80%99s-education-future>.
- NEPAD Africa Commission (2003). *The NEPAD e-Initiative: Ensuring that young people participate actively in the global information society and knowledge economy*. Johannesburg. NEPAD. Retrieved on 22 March 2017 from <http://www.eafricacommission.org>.
- Ostlund, L. E. (1974). Perceived innovation attributes as predictor of innovativeness. *Journal of Consumer Research*, 1, 23-29.
- Owens, J.D. & Floyd, D. (2007). E-learning as a tool for knowledge transfer through traditional and independent

- study at two United Kingdom Higher Educational Institutions: a case study. In *E-Learning and Digital Media*, 4(2), (pp. 172-180). Doi: <http://dx.doi.org/10.2304/elea.2007.4.2.172>.
- Oxford University Press ELT. (2016). *25 ideas for using WhatsApp with English language students*. Retrieved 5 February 2017 from Oxford University Press: English Language Teaching Global Blog: <https://oupeltglobalblog.com/2016/05/17/25-ideas-for-using-whatsapp-with-english-language-students/>.
- Percival, J.C. & Muirhead, B. (2009). Prioritizing the implementation of e-learning tools to enhance the learning environment. In *Journal of Distance Education*, 23(1), (pp. 89-106).
- Perraton, H.D. (2000). *Open and Distance Learning in Developing World*. London: Routledge Falmer.
- Perrone, A. (2009) *E-book collection development in Italy: a Case study*. *IFLA Journal*, 35(4), 305-312.
- Polit, D.F. & Beck, C.T. (2004). *Nursing research: principles and methods*. Philadelphia, Pa.: Lippincott Williams & Wilkins.
- Rogers, E. M. (2003). *Diffusion of innovations*. New York: Free Press.
- Säljö, R. (2010). Digital tools and challenges to institutional traditions of learning: technologies, social memory and the performative nature of learning. In *Journal of Computer Assisted Learning*, 26(1), (pp. 53-64). Doi: 10.1111/j.1365-2729.2009.00341.x.
- Sharma, S. K., & Chandel, J. K. (2013). Technology Acceptance Model for the use of learning through websites among students in Oman. *International Arab Journal of e-Technology*, 3(1), 44-49.
- Singh, M. (2010). M-learning: a new approach to learn better. In *International Journal of Education and Allied Sciences*, 2(2), (pp. 65-72).
- The World Bank. (2010). *The World Bank Working Paper No. 182*. Retrieved May 2017 from the World Bank Group: http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/Education_System_Malawi.pdf.
- Tornatzky, L., & Klein, K. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, 29(1), 28-45.
- Vasu, M.L. & Ozturk, A.O. (2008). A Rich-Media solution for distance education: A review of MediaSite. In *Social Science Computer Review*, 26(4), (pp. 528-533). Doi: 10.1177/0894439308317652.
- World Health Organisation. (2014). *Level of access to IT infrastructure*. Retrieved January 2017 from African Health Observatory: http://www.aho.afro.who.int/profiles_information/index.php/Malawi:Level_of_access_to_IT_infrastructure.
- Wright, C. (2009). *Malawi Instructional Design Report in ODL*. Vancouver: Commonwealth of Learning. Retrieved on 17 May 2017 from <http://www.col.org>
- Zozie, P (2017). *Integrating e-learning technologies into conventional teaching and learning in the school and higher education system with scarce resources: a case study of Mzuzu University*. PhD Thesis. Scotland. University of Glasgow.
