

The Impact of E-Learning on Student Performance: A Case Study of an Entry-Level Module at a South African University

Mabutho Sibanda, PhD

Lecturer in Finance, School of Accounting,
Economics & Finance, University of KwaZulu-Natal, South Africa
Email: sibandam@ukzn.ac.za

Shelley Donnelly

Lecturer in Finance, School of Accounting,
Economics & Finance, University of KwaZulu-Natal, South Africa

Doi:10.5901/mjss.2014.v5n9p478

Abstract

This study seeks to establish the impact of introducing an online learning platform, using an entry-level module, on student performance. Measures of central location and dispersion are used to analyze the secondary data for three consecutive periods of which the most recent is the year in which an online learning platform was introduced. The results show that there were no noticeable changes in the overall pass rate during the year in which the online learning platform was introduced. However, there were improvements in the distribution and dispersion of the marks in that year. When the class is segmented into racial groups, results show that the African students were the most adversely impacted by the introduction of online learning, while the Indian students benefited the most from the implementation of the online learning tool. Furthermore, the full-time mainstream students realized an improvement in the pass rate compared to full-time evening students. These findings imply that in spite of marginal changes in the student performance it is essential for institutional mechanisms to provide online support to entry-level students in order to realize the full benefits of online learning platforms in universities in developing countries. This may be done through the promotion of student engagement and by introducing some 'stick and carrot' initiatives into e-learning activities.

Keywords: entry level, higher education, online learning, success rate

1. Introduction

Learning and teaching methods driven by Information Communication Technology (ICT) are fast becoming common in higher education worldwide. Online learning has received much attention from higher education institutions and scholars alike in the past fifteen years. The success of first-year students requires an appropriate orientation programme to prepare them for the university environment. In most cases first-year students are underprepared, and the most vulnerable are nontraditional students who come from poor families and are generally first-generation students (Brock, 2010; Jama, Mapesela, & Beylefeld, 2008; James, Krause, & Jennings, 2010). Very little literature has documented the impact of online learning platforms on student performance using secondary data. Most studies focus on students' perceptions, attitudes and experiences (Balaji & Chakrabarti, 2010; S. J. Lee, Srinivasan, Trail, Lewis, & Lopez, 2011; Paechter & Maier, 2010; Song, Singleton, Hill, & Koh, 2004), online systems quality (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012; J.-W. Lee, 2010), and student engagement (Balaji & Chakrabarti, 2010; Jaggars, 2011; Kupczynski, Ice, Weisenmayer, & McCluskey, 2010; Lear, Ansoorge, & Steckelberg, 2010; Sher, 2009).

This study is premised on data obtained from the University of KwaZulu-Natal (UKZN) for the Management Science 101 module. The study is motivated by: (i) the recent institutional stance on the use of the Modular Object-Oriented Dynamic Learning Environment (Moodle) platform as a teaching and learning tool across the university, (ii) the need to reflect on one's teaching and learning practices, and (iii) the observation that some registered students did not use the platform throughout the year in which it was introduced. The platform, first introduced at UKZN in 2010, is available on the University website as 'e-learning@ukzn' and is accessible to both staff and registered students. It was introduced to the Management Science module for the first time in 2013. The module lecturer uploads all teaching and learning materials, including initiating discussion forums and other interactive exercises on Moodle. No additional support

has been explicitly provided to the students except for lecturers demonstrating and encouraging students to use the online platform.

This study uses a quantitative approach based on secondary data to ascertain the impact of the introduction and use of the e-learning platform on student performance. The 2013 student performance is compared to that achieved in 2011 and 2012 for the same module, but without the Moodle platform. The ultimate objective of this study is to promote student success and reduce attrition in higher education as proposed by the Council for Higher Education (2013). Issues relating to student success and attrition are major concerns of the higher education sector and a holistic approach is needed to retain students enrolled in higher education institutions (Council on Higher Education, 2013). The study seeks to answer the following questions: Did the introduction of e-learning impact on overall student performance, in terms of both formative and summative assessment? How did the introduction of e-learning impact on different racial groups and students from different study programmes?

2. Literature Review

E-learning has become a pillar of success in higher education as it enhances the quality of teaching and learning (Bhuasiri et al., 2012). A positive relationship exists between the use of learning technology and student engagement and desired learning outcomes (P.-S. D. Chen, Lambert, & Guidry, 2010). However, high attrition rates emanating from online learning have been of concern to educators worldwide (K.-C. Chen & Jang, 2010). Studies have been conducted on student preference for online learning versus face-to-face learning, albeit without cross-cutting conclusions. Students prefer face-to-face learning to acquire conceptual knowledge in the subject matter, while online learning is preferred in acquiring self-regulated learning skills (Paechter & Maier, 2010). According to Paechter and Maier, online learning does not only provide students with time and place flexibility, but also with the ability to apply one's knowledge and "metacognitive self-regulation strategies such as monitoring one's learning progress" (p.296). However, whether these student preferences ultimately benefit student performance is another matter. Although mixed findings related to student success and the use of online learning platforms have been documented, most scholars show that online learning tools enhance student engagement and lead to them achieving the intended learning outcomes (P.-S. D. Chen et al., 2010). Chen and associates find that students using online learning platforms are "more likely to make use of deep approaches of learning like higher order thinking, reflective learning, and integrative learning in their study and they reported higher gains in general education, practical competence, and personal and social development" (p.1230). Furthermore, according to Chen et al, students who engage in online learning tend to score higher marks than those who do not. ICT-based learning platforms further adversely affect lecture attendance as students can easily access learning resources such as PowerPoint slides online (Traphagan, Kucsera, & Kishi, 2010).

For an online learning environment to be successful, there is a need for effective instructional design which specifies the goals, objectives and expectations of the course; assists students in time management skills; and enables students to establish communities of connection in relation to online contexts (Song et al., 2004).

The main characteristics related to success that strongly emerge in the online learning discourse, point to "reading and writing skills, independent learning, motivation and computer literacy" (J.-W. Lee, 2010). Reading and writing skills and computer literacy work concurrently in online learning, and motivation emanates from both instructor and learner. As discussed later, findings are mixed on whether independent learning and motivation can be viewed as critical success areas achieved by online learning.

Other demographical factors, such as age and critical thinking, and age and metacognitive self-regulation have been found to have a strong correlation in graduate students (Colorado & Eberle, 2010). However, these findings may differ when using undergraduate students as participants. Nevertheless, the study by Colorado and Eberle shows that the older the student is, the better are the student's abilities to effectively use online tools for learning purposes. Consequently, a student using online learning tools is expected to perform better as he or she grows older. According to Lee, online support is more valued than instructor's feedback although timely feedback is crucial for effective online learning.

In supporting the student engagement discourse, there is a significant positive correlation between learning and participation and online study time for first-time online users (Sadera, Robertson, Song, & Midon, 2009). This suggests that first-time online students become actively academically engaged in learning as they become familiar with the online learning platforms. Instructors and students have different motivations and attitudes towards the use of online teaching and learning techniques. On one hand, instructors use online tools to complement their teaching activities while on the other hand students use online tools to enhance their learning activities (Liaw, Huang, & Chen, 2007). These different but complementary attitudes help in developing e-learning environments. However, it may be argued that motivation or self-

determination does not directly influence or predict learning outcomes thus suggesting that "intrinsic motivation, extrinsic motivation and amotivation are distinctive constructs" as theorized by Deci and Ryan's self-determination theory (Chen & Jang, 2010:741). The self-determination theory postulates that all individuals "have psychological needs to be competent, autonomous and related to others" (Deci & Ryan, 1985, 2012). Issues such as multimedia instruction, autonomous learning, instructor-led instruction, and improving learning effectiveness should be taken into consideration when developing online learning environments (Liaw et al., 2007). Consequently, three factors have been put forward as affecting lecturers' satisfaction in an e-learning environment. These three factors are: student-related factors including opportunities to engage in interactive communication; instructor-related factors including interest in using technology; and institution-related factors including administrative support, and these three factors are central to successful student academic engagement (Bolliger & Wasilik, 2009). According to (Sher, 2009), the main contributors to student learning and learning satisfaction are student-instructor interaction and student-student interaction, whilst utilising online learning platforms.

Related to the instructor-learner relationship are the issues of e-learning systems quality and students' e-learning readiness, both of which have been found to have a positive and significant influence on the e-learners' competency (Ho, Kuo, & Lin, 2010). These findings imply that higher education institutions have to focus on improving individuals' online skills when implementing e-learning systems. E-learner readiness has also been found to be greater in higher grade students than in lower grade students (Hung, Chou, Chen, & Own, 2010). Hung et al. also revealed that e-learner readiness was more pronounced in learners with computer self-efficacy and online motivation than in learner-controlled and self-directed learning. Consequently, for e-learning to be successful, instructors have to assist students in developing control and self-directed learning. In addition, students who only use online learning platforms just before an examination have a much lower satisfaction and quality rating compared to students who regularly use the online platform (Horvat, Dobrota, Krsmanovic, & Cudanov, 2013). This further means that students who only use online learning tools close to the examinations will negatively rate the online system as they find it cumbersome to use, and consequently may perform poorly in such online-driven modules. Overall, online learning acceptance and satisfaction among students has been found to be highly predicted by support service quality (J.-W. Lee, 2010).

In spite of the positive aspects of online learning tools, several challenges have been documented and form part of the contemporary online learning discourse. These challenges, according to Song et al. (2004), include issues pertaining to "technical problems, a perceived lack of sense of community, time constraints and difficulty in understanding the objectives of the online courses" (p.59). For e-learning to be a success, several critical factors have to be incorporated into e-learning systems, especially in developing countries (Bhuasiri et al., 2012). These critical success factors, according to Bhuasiri and associates, include inter alia "the curriculum design, technology awareness, motivation and changing learners' behavior" (p.843). These factors are important, especially given that most developing countries have underprepared students who may never have had access to ICT in pre-higher education studies. However, online learning comes with its own deficiencies, such as, hindering the progression of low-income and underprepared students who may have difficulties accessing and using online materials (Jaggars, 2011). Thus, in developing countries such as South Africa specifically, students from previously disadvantaged backgrounds may fail to adapt to the demands of the university environment which consequently leads to high attrition rates (Jama et al., 2008).

It is evident from the above review of literature that most studies have focused on surveys to measure attitudes and perceptions of both instructors and learners regarding the online learning systems. Whilst institutional factors such as online support mechanisms, and learner-specific factors such as readiness, motivation and computer literacy emerge strongly as success factors; the use of secondary data to ascertain the impact of introducing online-learning mechanisms into a face-to-face learning environment have not been given much emphasis in the literature. The blended teaching and learning approach, which uses both face-to-face and online approaches especially at entry level, may thus yield different findings and contribute immensely to the online learning discourse in higher education.

3. Method

This study evaluates the uptake of ICT-based learning resources and student performance at the University of KwaZulu-Natal (UKZN) using an entry-level module in the College of Law and Management Studies. The module under consideration in this study is Management Science 101, which is offered to first-year Bachelor of Administration (BAdmin), and Bachelor of Business Administration (BBA) students. The BAdmin students are either specializing in Public Administration (PA), or Human Resources Management (HR). Management Science 101 is a 16-credit full-semester module, and is a core module in these programmes although some students use it as a bridge to register for a Bachelor of Commerce general degree. Of the two programmes, the BAdmin is offered through the mainstream platform

where lectures and tutorials take place during the day, while the BBA is a fulltime programme offered in the evening. The main distinguishing attributes between these two groups is that the day-time class (mainstream) comprises mainly young post-secondary school students, while the evening stream (which is a self-funded programme) comprises mostly mid-career adults.

The study uses secondary data obtained from the UKZN database - *institutional intelligence*, from 2011 to 2013, which yields a three-year period of observation. The database, which is highly interactive, captures all Management Science students as one group and further allows one to categorize data according to programme of study, race and age. The data is then reorganized into mainstream and evening groups in order to separately analyze the trends in student performance based on these student types. First, a blanket comparison is done based on formative and summative assessments using descriptive statistics such as the mean, median and standard deviation. The module pass mark is 50 percent for both the main and supplementary examinations. The average mark (mean and median) per class is calculated for each of the three years and a comparison is made across the three years. Furthermore, the study compares the pass rates for each discipline (programme) based on the overall student marks across the three years. A major assumption here is that both formative and summative assessments are of the same standard throughout the three years under consideration in this study. Another key assumption is that the quality of students and their teaching and learning activities remained the same over the three-year period. This assumption is supported by the fact that the same lecturer has been teaching the module on both programmes over the three-year period. The only variation is that lecture notes, exercises, problem cases, and tutorial questions were uploaded on Moodle in 2013 compared to the use of printed handouts in 2011 and 2012. Again, the assumption here is that the students used Moodle in preparing for both formative and summative assessments in 2013.

4. Results

The size of the Management Science class was between 236 and 267 students during the period 2011 to 2013. However, not all registered students for the module wrote the examinations, possibly due to them dropping out from their studies. Table 1 below shows the module pass rate in 2013, the year in which e-learning was introduced, and in 2011 and 2012. The years 2011 and 2012 are selected for comparison purposes and they represent a period when students did not engage in any formal online learning or interaction for the module.

Table 1: Management Science 101 Pass rates

<i>Panel A: All students</i>	2011	2012	2013
Pass rate (% of registered)	65	78.5	78.8
Pass rate (% of wrote)	68	83	83
<i>Panel B: Non-repeat students</i>			
Pass rate (% of registered)	63.1	78.8	79
Pass rate (% of wrote)	68.1	82	83
<i>Panel C: Repeat students</i>			
Pass rate (% of registered)	59.4	77.6	77.8
Pass rate (% of wrote)	65	84	82

Panel A above shows results achieved in the module during the three years for all registered students. This includes repeat and non-repeat students enrolled for the module. The overall pass rate in the panel shows that there was no significant change in the pass rate from 2012 to 2013. However, the pass rate in these two periods improved significantly from 2011 levels. Thus, the introduction of online learning to the Management Science students did not have a noticeable impact on the overall pass rate in any way. This is further supported by the figures in Panels B and C, which show the same trends as those found in Panel A.

On the other hand, descriptive statistics reveal that the distribution of marks from both formative and summative assessment varied significantly during the three years, as depicted in Table 2 below.

Table 2: Management Science Performance Statistics at module level (standard deviation (SD) in parenthesis)

	2011		2012		2013	
	Mean (SD)	Median	Mean (SD)	Median	Mean (SD)	Median
Class Mark (%)	56 (16.5)	57	72.7 (10)	74	60.5 (9.5)	61
Main exam (%)	44 (17.6)	43	41.5 (12.6)	40.5	49.1 (11.3)	47
Final Mark (%)	49 (14.4)	50	54 (9.3)	53	57.5 (11)	57

The 2011 pass rate seems to be an outlier and very little engagement with this year's results will take place hereafter. Despite maintaining the same pass rate during the 2012 and 2013 academic years, results from descriptive statistics show that the distribution of marks varied considerably. Formative assessments yielded lower marks in the year of introducing online learning. The average mark in 2013 was 60.5 percent compared to 72.7 percent in 2012. Similarly, the standard deviation of formative assessment marks was lower than that attained in previous years. This suggests that online learning adversely impacted on the students' performance in formative assessments mainly due to the fact that these assessments were conducted as early as the first month of the academic calendar. The assessments were conventional tests and assignments which were not online. However, the fact that the teaching and learning material was posted online could have deterred students from effective learning during the earlier periods of the academic calendar. Nevertheless, the decline in the standard deviation from 12.6 percent in 2012 to 11.3 percent in 2013 shows that marks became more evenly distributed in 2013 compared to other years.

For summative assessments, however, the average mark was 49.1 percent in 2013 which is much higher than that of 2012 and 2011. This means that the students were more prepared for the summative assessments than for formative assessments in 2013 than in 2012. However, the poor performance in the 2012 summative assessment could have been driven by complacency as students might have put less effort into the preparation due to high formative assessment marks. The higher average summative assessment marks could imply that students were better prepared for the examination through online learning than they were before the introduction of online learning. This is further supported by the fact that the median mark for summative assessment in the year of introducing online learning was much higher than that for years when teaching and learning materials were distributed via printed handouts. A lower standard deviation of marks of 11.3 percent in 2013 could further support this argument.

Since the final mark is a function of the class mark and the examination mark, it follows that the average final mark for 2013 would be higher than for previous years mainly due to the fact that the examination mark has a higher weighting of 60 percent of the final mark compared to the 40 percent contributed by the class mark due to the weighting bias of the marks. Similarly, the standard deviation is higher at 11 percent for the 2013 cycle than for the previous year. The other measure of central tendency, the median, shows that the 2013 cycle produced a better result (57 percent) compared to previous years (50 percent in 2011 and 53 percent in 2012). The median and the mean both show that performance in 2013 was much higher than that achieved in previous years.

The relationship between formative and summative assessment is further analyzed by the use of Pearson's correlation coefficient as shown in table 3 below.

Table 3: Pearson's correlation analysis

	2011	2012	2013
	Exam Mark	Exam Mark	Exam Mark
Class mark	0.3833	0.2649	0.5256

The correlation coefficient for the 2013 assessments is much greater than that of the previous two years. The coefficients are statistically significant at all conventional levels. The fact that the correlation coefficient between the exam mark and class mark is much higher in 2013 implies that students' learning abilities gradually improved during the 2013 cycle. Thus the students' performance in formative assessments could be used to explain their performance in the summative assessments much better than in previous years.

The use of online materials could impact on students differently depending on their background. In Table 4, students' performance is categorized according to race, with a major assumption that race provides a basis for the student's sociocultural and economic background. The pass rate is expressed as the number of students who passed the module as a percentage of the number of enrolled students. The pass rate is further categorized as the number of students who passed the module as a percentage of the number of students who wrote the examination (shown in

parenthesis in table 4).

Table 4: Performance according to race (pass rate of number that wrote in parenthesis)

Race Group	2011		2012		2013	
	Pass rate %	Proportion of Registered students. %	Pass rate %	Proportion of Registered students. %	Pass rate %	Proportion of Registered students. %
African	66.7 (70.1)	60.5	75.4 (79.2)	64.2	72.3 (76)	59.8
Colored	83.3 (83.3)	2.2	66.7 (100)	1.2	75 (81.8)	5.1
Indian	59.6 (62.8)	37	83.9 (88)	33.5	89.9 (93.4)	33.5
White	100 (100)	0.3	100 (100)	1.1	100 (100)	1.6

On average the Management Science class largely comprises African students (61.5 percent over three years) followed by Indian students (34.6 percent). Emanating from the earlier observation that the 2011 cycle was an outlier, it is therefore prudent to compare student's performance in 2012 and 2013 where a similar overall pass rate was obtained. The performance of African students dropped slightly from 75.4 percent in 2012 to 72.3 percent in 2013. The same trend is observed when the pass rate is determined using the number of students who wrote the examination. Very slight changes are observed for the Colored students while the White students maintained a 100 percent pass rate throughout the three years despite increasing enrolment from 0.3 percent in 2011 to 1.6 percent of the class in 2013. However, the Indian students recorded an increase in pass rate over the period. In summary, the introduction of the online learning tool seems to have had a marginally adverse effect on the African students while marginally improving the performance of other race groups, and in particular the Indian students.

As discussed earlier, the Management Science module is offered to three groups of students, namely, those studying towards a BAdmin specializing in Public Administration (PA), those studying towards a BAdmin in Human Resources Management, and those studying towards a BBA. The first two groups attend lectures in the same venue at the same time, while the third group attends in the evening and comprises mainly mid-career adults. Table 5 below provides a summary of the students' performance based on programme of study.

Table 5: Performance according to qualification of study

<i>Panel A: Bachelor of Administration (PA)</i>	Proportion of class	Pass rate: Percent of enrolled	Pass rate: Percent of wrote
2013	67	79.9	82.5
2012	72	75.3	78.7
2011	74.5	60.8	64.0
<i>Panel B: Bachelor of Administration (HR)</i>			
2013	2	80	100
2012	3.8	90	100
2011	3.7	50	50
<i>Panel C: Bachelor of Business Administration</i>			
2013	31	76.4	82.1
2012	24.2	85.9	91.7
2011	21.8	79.3	83.6

BAdmin (PA) in Panel A in the table above constitutes on average of at least 71 percent of the Management Science module enrolment followed by BBA in Panel C. The students enrolled for the BAdmin (PA) performed better in 2013 (82.5 percent pass rate) compared to the previous two years. In Panel B, the performance of the BAdmin (HR) students remained the same in the 2012 and 2013 cycles. However, a significant drop is observed for the BBA programme in Panel C above, where the pass rate based on the enrolled students dropped from 86 percent in 2012 to 76 percent in 2013. A similar decline is observed in the Panel C pass rate based on the number of students who wrote the examination. The above findings are in contrast with the overall pass rates as per Table 1, which remained around the average of 83 percent for both years.

5. Discussion

The results show varying levels of interaction between performance and different indicators of entry-level students. The overall marks fail to show any significant changes in performance in the years without online learning compared with the year with online learning. There is no clear evidence to support the literature that posits that the use of online learning technology improves the attainment of the desired learning outcomes as postulated by Chen, Lambert and Guidry (2010). The results further fail to show differentiating characteristics in student performance based on whether they are repeat or new students during the year the online learning platform was introduced. This means that the performance of both new and repeat students during the year of introducing online learning was consistent with that in previous years without the online learning platform. However, in terms of formative assessments it is evident that the introduction of online learning could have had an adverse initial impact on performance, as students grappled to adapt to the online learning platform as shown by the lower class mark in the year of introducing online learning relative to the previous year. This confirms Bhuasiri et al.'s (2012) assertion that underprepared students fail to use online learning platforms. This may particularly be so in the early stages of the module or programme as the students try to fit into the university environment. As students acclimatize to the university environment, it becomes much easier for them to use online learning facilities. This is shown by the increases in the summative assessment pass rate during the year of introducing the online learning platform. The students' performance further improved gradually during the course of the year in which online learning was introduced, as evidenced by the increase in correlation between formative and summative assessment in the year of introducing online learning, relative to the previous years. This implies that students gradually became academically engaged as they became familiar with the online learning platform as put forward by Sadera et al (2009).

On the other hand, in terms of student profiles, the African student group was adversely impacted by the introduction of the online learning platform, as evidenced by the drop in the pass rate for this group compared to other groups and the module average. Of further interest is the increase in the pass rate of the Indian student group during the year of introducing the online learning platform. This result has implications that the African student population could be underprepared to use online learning platforms compared to other racial groups. This could be supported by Jama et al.'s (2008) retention theory, which asserts that African students perform lower than other groups since they are from previously disadvantaged backgrounds. Furthermore, this implies that African students could have been underprepared and could have had difficulties in using and accessing online materials as posited by Jaggars (2011). However, the degree of change in the result is not large enough to make conclusive assertions.

Moreover, the classification of students by programme of study shows that the mainstream class recorded an improvement in the pass rate during the year of introducing the online learning platform. On the other hand, there was a drop in the pass rate for the evening students during the same period. This trend is quite interesting in that one would have been expected that evening students should have better access to learning material than the mainstream group due to the fact that the former are in employment and are mostly adults. The result, however, reveals that online learning improved the performance of younger and mainstream students rather than otherwise. This means that the mainstream students quickly adapted to and became fully engaged with online learning compared to their evening stream counterparts. This is not consistent with Colorado and Eberle's (2010) finding that there is a strong correlation between age and metacognitive self-regulation among adult learners.

6. Conclusion

The study reveals that the introduction of the online learning platform of the entry-level module did not impact on the performance of the students overall. Based on the fact that the repeating students could have possibly had printed lecture material and handouts from the previous year, the study further fails to provide evidence that online learning impacted on the students' performance. However, the introduction of the online learning platform improved the mark dispersion and as such lowered the standard deviation of marks in the year the online learning platform was introduced. Consequently, the mean and median marks improved after the adoption of the online learning platform. The study further reveals that the African group of students was the only racial group adversely affected by the introduction of the online learning platform, suggesting that they could have been underprepared in the use of online resources. On the other hand, the Indian group of students is the only racial group that experienced an improvement in the pass rate after the introduction of the online learning platform. Furthermore, inconsistencies were observed in the performance of students categorized by degree class. The mainstream students showed an improvement in performance compared to the evening stream. This suggests that young students attending mainstream classes quickly adapted to the use of the online learning platform better than their evening counterparts. This could be due to young students' greater learning abilities and cognitive skills.

The findings fail to provide strong conclusions regarding the impact of online learning on the performance of first-year students. In spite of this however, more institutional aspects need to be addressed to promote academic engagement and deep learning skills in using online materials. This could be done by providing adequate student and lecturer support on the use of the online platform. This could further be enhanced by providing students with an ICT orientation programme to enable students to interact and engage with each other and lecturers in their learning activities. As a consequence, students will not only use the online learning tool for downloading learning materials, but will also be active in collaborative learning, which is a principal aspect of teaching and learning activities (Barkley, Cross, & Major, 2005; Council on Higher Education, 2004; Smith, 1996). These findings should, however, be treated with caution as the study was primarily based on secondary data and the use of measures of central tendency instead of primary data and possible regression analysis. To further contribute to this discourse, it is further recommended that online formative assessments be used and then compared with the conventional formative assessment methods. The interaction, the perceptions and experiences of the students could further enhance the discourse on online entry-level modules.

References

- Balaji, M., & Chakrabarti, D. (2010). Student interactions in online discussion forum: Empirical research from 'media richness theory' perspective. *Journal of Interactive Online Learning*, 9(1), 1-22.
- Barkley, E., Cross, K. P., & Major, C. H. (2005). *Collaborative Learning Techniques: A handbook for college faculty*. United States of America: John Wiley & Sons, Inc.
- Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, 58(2), 843-855.
- Bolliger, D. U., & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education*, 30(1), 103-116.
- Brock, T. (2010). Young adults and higher education: Barriers and breakthroughs to success. *The Future of Children*, 20(1), 109-132.
- Chen, K.-C., & Jang, S.-J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, 26(4), 741-752.
- Chen, P.-S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers & Education*, 54(4), 1222-1232.
- Colorado, J. T., & Eberle, J. (2010). Student demographics and success in online learning environments. *Emporia State Research Studies*, 46(1), 4-10.
- Council on Higher Education. (2004). *ITL Resource No.2: Improving Teaching & Learning Resources*. Pretoria: Council for Higher Education
- Council on Higher Education. (2013). A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure. Pretoria: Council on Higher Education.
- Deci, E. L., & Ryan, R. M. (1985). *Self-Determination*: Wiley Online Library.
- Deci, E. L., & Ryan, R. M. (2012). Overview of self-determination theory. *The Oxford Handbook of Human Motivation*, 85.
- Ho, L.-A., Kuo, T.-H., & Lin, B. (2010). Influence of online learning skills in cyberspace. *Internet Research*, 20(1), 55-71.
- Horvat, A., Dobrola, M., Krsmanovic, M., & Cudanov, M. (2013). Student perception of Moodle learning management system: a satisfaction and significance analysis. *Interactive Learning Environments*(ahead-of-print), 1-13.
- Hung, M.-L., Chou, C., Chen, C.-H., & Own, Z.-Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, 55(3), 1080-1090.
- Jaggars, S. S. (2011). Online Learning: Does It Help Low-Income and Underprepared Students? *CCRC Working Paper No. 26*.
- Jama, M. P., Mapesela, M. L. E., & Beyliefeld, A. A. (2008). Theoretical perspectives on factors affecting the academic performance of students. *South African Journal of Higher Education*, 22(5), 992-1005.
- James, R., Krause, K.-L., & Jennings, C. (2010). The first year experience in Australian universities: Findings from 1994 to 2009.
- Kupczynski, L., Ice, P., Weisenmayer, R., & McCluskey, F. (2010). Student perceptions of the relationship between indicators of teaching presence and success in online courses. *Journal of Interactive Online Learning*, 9(1), 23-43.
- Lear, J. L., Ansoorge, C., & Steckelberg, A. (2010). Interactivity/community process model for the online education environment. *Journal of online learning and teaching*, 6(1), 71-77.
- Lee, J.-W. (2010). Online support service quality, online learning acceptance, and student satisfaction. *The Internet and Higher Education*, 13(4), 277-283.
- Lee, S. J., Srinivasan, S., Trail, T., Lewis, D., & Lopez, S. (2011). Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*, 14(3), 158-163.
- Liaw, S.-S., Huang, H.-M., & Chen, G.-D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49, 1066-1080.
- Paechter, M., & Maier, B. (2010). Online or face-to-face? students' experiences and preferences in e-learning. *Internet and Higher Education* 13, 292-297.
- Sadera, W. A., Robertson, J., Song, L., & Midon, M. N. (2009). The role of community in online learning success. *Journal of Online Learning and Teaching*, 5(2), 277-284.
- Sher, A. (2009). Assessing the relationship of student-instructor and student-student interaction to student learning and satisfaction in Web-based Online Learning Environment. *Journal of Interactive Online Learning*, 8(2), 102-120.
- Smith, K. A. (1996). Cooperative learning: Making "group work" work. In T. E. Sutherland & C. G. Bonwell (Eds.), *Using active learning in college classes: A range of options for faculty*. San Francisco: Jossey-Bass
- Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *Internet and Higher Education*, 7, 59-70.
- Traphagan, T., Kucsera, J. V., & Kishi, K. (2010). Impact of class lecture webcasting on attendance and learning. *Educational Technology Research and Development*, 58(1), 19-37.