



A Literature Review based Conceptual Model of Factors Affecting Instructors' Perceptions on the Impact of E-Learning on Academic Performance

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ABSTRACT

E-Learning offers several benefits to different education stakeholders including students, educators, and administrators. For example, it gives to students the ability to review previously learned lessons in a convenient manner, as well as the freedom to decide when and where to learn their lessons. Surprisingly, academic failure remains high especially in universities despite all the above presented benefits of e-Learning. The main problem at the heart of this study is this high failure rate in universities in this e-Learning era, especially for first year students. The aim of this study is therefore to design a theoretical model of the factors that affect the perceptions of academics on the impact of e-Learning on academic performance. The reviewed thirty-four (34) studies are presented according to seven (7) themes: studies' authors and publication years, their countries and continents, their theories and models, their analysis methods. A new conceptual model is presented by this study which identifies the following seven (7) academic performance factors in the context of e-Learning: Demographics; intensity of use of e-Learning, self-efficacy and learning approach, sense of community and interactivity, perceptions on the suitability of e-Learning, and motivation and pride. The findings of this study indicate that the studies that it reviewed differ on the existence and nature of a correlation between e-Learning and most of their identified factors. Therefore, this study recommends more studies on the identification of the reasons behind these conflicting results. This study also calls for the conduct of many empirical studies for validation of its own proposed theoretical framework.

Key words: e-Learning, Academic performance, Instructors' Perceptions

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1. BACKGROUND TO THE STUDY

There are currently many definitions for e-Learning. For example, Guri-Rosenblit (2005) defines e-Learning as "the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters". For Zhang (2003), "e-Learning refers to any type of learning situation when instructional content is delivered electronically via the Internet when and where people need it". As for Hrastinski (2008) e-Learning refers to teaching and learning "online through network technologies". All these three examples of e-Learning definitions are insisting on the online aspect of e-Learning, but offline versions of e-Learning also exist. There are two types of e-Learning, namely synchronous e-Learning, and asynchronous e-Learning. These two e-Learning types are well contrasted by Hrastinski (2008) who defines synchronous e-Learning as a learning process that occurs in a two-way real-time communication, and asynchronous e-Learning as a learning process that occurs in a one way non-real-time communication. Examples of asynchronous e-Learning tools include discussion boards, e-mails, repository; while examples of synchronous tools include chats and video conferencing. These e-Learning tools are sometimes hosted in specialised e-Learning software packages known as learning management systems or learning content management systems.



According to McIntosh (2016), there are currently more than 500 commercial e-Learning software packages, and 300 educational e-Learning software packages; and the top five LMSs in academic institutions are Blackboard, Brightspace (formerly Desire2Learn), Moodle (open source), Instructure Canvas (gaining traction on the above), and Sakai (open source). The classification of these different e-Learning software packages is quite confusing; In fact, Watson and Watson (2007:28) consider it as “a veritable alphabet soup of terms and acronyms”. However, this study will limit its classification of e-Learning software packages to the following two categories: Learning Management Systems (LMS) and Learning Content Management Systems (LCMS). The main difference between these two types of e-Learning software packages is that “the primary objective of a learning management system is to manage learners [...] [but,]. By contrast, a learning content management system manages content or learning objects” (Irlbeck and Mowat, 2007: 12). All the other e-Learning terms and acronyms can be considered either as synonyms of LMSs or as synonymous of LCMSs. For example, Weller (2007:5) states that one “should consider VLE and LMS to be synonymous” where VLE stands for Virtual Learning Environment.

E-Learning offers several benefits to different education stakeholders including students, educators, administrators, and so on. It gives to students the ability to review previously learned lessons in a convenient manner, as well as the freedom to decide when and where to learn their lessons. According to Cantoni (2003), its “delivery of content in smaller units may contribute further to a more lasting learning effect”. E-Learning also gives to students the freedom to express their thoughts and ask questions without limitations, and it offers them some levels of independence from the time constraints of their instructors (Bouhnik and Marcus, 2006). It gives to instructors and to researchers the ability to conveniently provide satisfactory responses to their students’ queries and to share ideas and resources with their peers. For universities, e-Learning is able to compensate for shortages of academic staff and for the lack of infrastructure. Its ability to provide learning strategies that are economically viable is a win-win formula both for parents and for university administrations.

2. STATEMENT OF PROBLEM

One would expect that the above presented benefits of e-Learning would have eradicated academic failure by now, but unfortunately, the surprising fact is that academic failure remains high especially in universities despite all the above presented benefits of e-Learning. Consequently, the main problem at the heart of this study is the high failure rate in universities in this e-Learning era, especially for first year students, as reported by existing literature. For example, Sadler and Erasmus (2005) report that black students only enjoyed a pass rate of 21% in 2003, and a mere 9% in 2004, at the University of South Africa’s CTA (Certificate in the Theory of Accounting). Bennedsen and Caspersen (2007: 4) also cites another example where “one school reported an average failure rate, over a ten-year period, of 90%”. They also mention a university with “a failure rate of 72%”. The same authors are adamant that “there is a huge number of students enrolling in tertiary education who do not graduate” (Bennedsen and Caspersen, 2007: 4). Similar trends are reported by Selingo (2013) according to whom only 38 percent of Fairleigh Dickinson’s students graduated in 2006. These reported failure rates are alarming; hence the need to investigate them further in this e-Learning era.

3. AIM AND OBJECTIVES

The above two sections can be summarized in two sentences. On one hand, there is a perception that e-Learning and its LMSs and LCMSs are so powerful that they have the ability to combat academic failure. On the other hand, there is another perception that e-Learning with all its LMSs and LCMSs are not powerful enough to combat academic failure. These are legitimate perceptions emanating from diverse sources according to various factors. The aim of this study is therefore to design a theoretical model of the factors that affect the perceptions of academics on the impact of e-Learning on academic performance. This aim will be achieved by three objectives: a) To identify from the existing literature the main factors that affect the perceptions of academics on the impact of e-Learning on academic performance, b) To craft these factors into a theoretical conceptual framework of the factors affecting the perceptions of academics on the impact of e-Learning on academic performance, and c) To compare the current literature review against similar previously published reviews and to highlight its research gaps.



4. EXISTING LITERATURE REVIEWS ON THE IMPACT OF E-LEARNING ON ACADEMIC PERFORMANCE

This section intends to provide a concise presentation of existing literature reviews on the impact of e-Learning on academic performance. This study only found two (2) existing literature reviews on the impact of e-Learning on academic performance, one from Broadbent and Poon (2015), and another one from Lahti et al (2012).

The literature review conducted by Broadbent and Poon (2015) is a presentation of twelve (12) existing studies on the impact of self-regulated e-Learning on academic performance in higher education. It includes papers published in the time period between 2004 and December 2014. These papers were collected from research databases such as PsycINFO, CINAHL Complete, ERIC, MEDLINE, and psychARTICLES. Studies included in this review all had higher education students as participants. These studies were surveys or experiments. The following nine (9) factors were found to have an effect on the impact of e-Learning on students' academic performance: metacognition, time management, effort regulation, peer learning, elaboration, rehearsal, organisation, critical thinking, and help seeking.

Lahti et al (2012) is a presentation of eleven (11) existing studies on the impact of e-Learning on knowledge, skills, and satisfaction for nursing students. It includes papers published in the time period between 1948 and 2010. These papers were collected from research databases such as MEDLINE, CINAL, Psychinfo, and Eric. These databases were searched during the month of May 2010 and during the month of December 2010. Studies included in this review all used experiments only as their research method. This review does not present the factors that are influencing the impact of e-Learning on academic performance; instead it simply presents results from existing literature supporting that e-Learning has an impact on the knowledge, skills, and satisfaction of nursing students.

5. METHODOLOGY

This study started with the googling of the composite keyword "factors affecting" + "impact of e-Learning" + "academic performance" in google scholar in pursuit of the first objective of this study. This search led to the selection of thirty-four (34) studies that are reporting on the impact of e-Learning on academic performance in higher education. It included papers published in the time period between 2003 and 2016. These papers were selected if they were freely available on google scholar and if they contained some empirical results either from surveys, from experiments, or from case studies. This search took place during the time period between the month of February 2017 and the month of April 2017. The findings of this review are presented on the next section as a result of the analysis of the secondary data that was collected by this study.

6. FINDINGS

The purpose of this section is to fulfil the first two (2) objectives of this paper which are: a) to identify from the existing literature the main factors that affect the perceptions of academics on the impact of e-Learning on academic performance, b) to craft these factors into a theoretical conceptual framework of the factors affecting the perceptions of academics on the impact of e-Learning on academic performance. The reviewed studies are presented according to seven themes: their authors and years publication, their countries and continents, their theories and models, their analysis methods, and their academic performance factors in the e-Learning context as perceived by academics. Table 1 to table 6 are showing how this review uses paper identification numbers for the identification of its studies. These tables also make use of the following abbreviations: POC (Positive Correlation), NEC (Negative Correlation), and NOC (No Correlation).

6.1. Authors and publication years

Thirty-nine (39) different names are cited as the main authors of the thirty-four (34) papers of this review. There is more than one paper in this review for three of these authors: Islam (2012, 2013, 2015), Lee and Lee (2008), Lee (2009), McGill (2008), and McGill and Klobas (2008). Almost half of these papers (49%) were published during the time period between the year 2008 and the year 2012. Almost a third (36%) of the papers were published during the time period between 2013 and the year 2017; and the fifteen percent (15%) were published during the time period between 2003 and the year 2007.

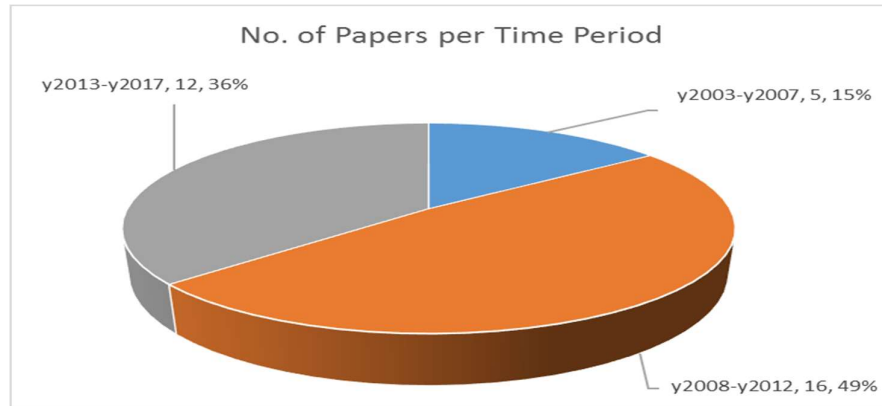


Fig. 1: No. of papers per time period

6.2. Continents and countries

Antarctica is the only continent that is not represented in the thirty-four (34) papers included in this review. Europe is represented in this review by thirty percent (31%) of the studies. Asia is represented by thirty-one (30%) of the studies. North America is represented by eighteen percent (18%) of the studies. Australia is represented by fifteen percent (15%) of the studies, and Africa is represented by six percent (6%) of the studies. European countries represented by this review are Spain with three (3) studies, Finland with three (3) studies, Netherlands with two (2) studies, France, and Greece with one (1) study each. Asian countries represented by this review are Malaysia with three (3) studies, Taiwan with two (2) studies and South Korea with two (2) studies, Philippines, Korea Republic, and Qatar (1) with one (1) study each. North American countries represented by this review are Canada with four (4) studies and USA with two (2) studies. The Australian counties represented in this review is Australia with five (5) studies. African countries represented in this review are Kenya with one (1) study, and Nigeria with one (1) study.

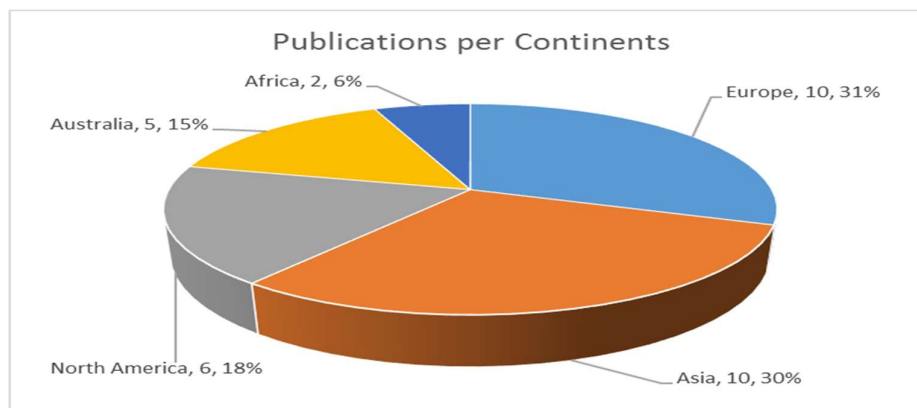


Fig. 2: No. of papers published per continent

6.3. Sample sizes and research populations

Students from higher education institutions constitute the research population of all the thirty-four (34) papers included in this review. Forty-four percent (44%) of the studies have a sample size between 101 and 300. Twenty-three (23%) have a sample size between 30 and 100. Twenty-one percent (21%) of the studies did not specify their sample size. Nine percent (9%) of the studies have a sample size between 501 and 1500, and three percent (3%) of the studies have a sample size between 301 and 500.

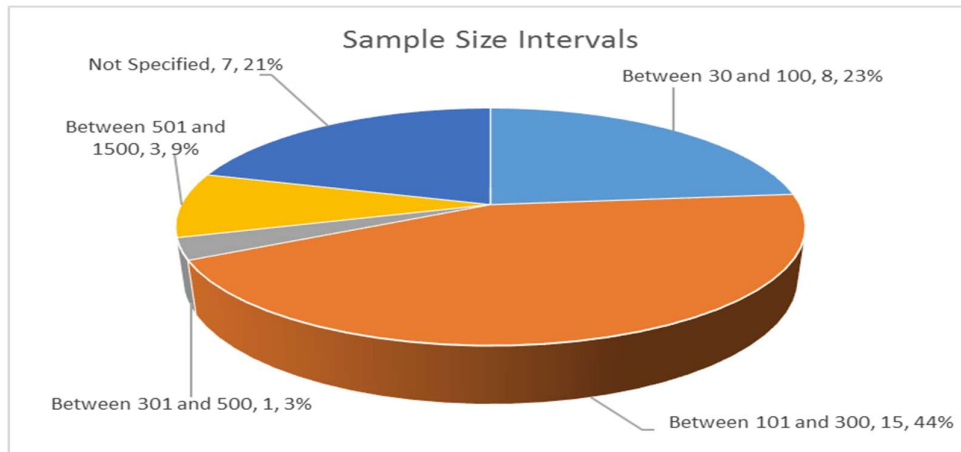


Fig. 3: No. of papers published per sample size interval

6.4. Research instruments

Thirty-seven percent (37%) of the studies included in this review did not specify their research instrument. Nineteen percent (19%) of the studies adopted their research instrument from Davis's (1989). Eleven percent (11%) of the studies adopted their research instrument from Lee et al. (2002 and 2008), and the same applies for Goodhue and Thompson (1995), Sun et al. (2008), and Pintrich et al. (1991 and 2000).

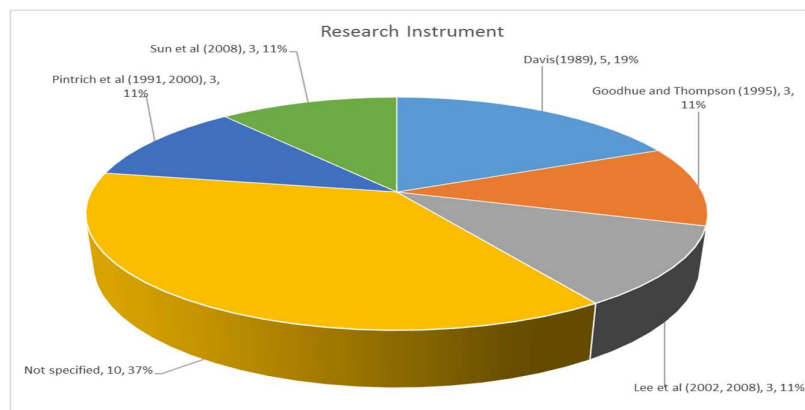


Fig. 4: No. of papers published per research instrument

6.5. Theories and models

Almost half (49%) of the studies included in this review did not specify their theoretical model or framework. Fifteen percent (15%) of the studies used a self-developed theoretical framework. Twelve percent (12%) of the studies adopted TAM as their theoretical framework. Six percent (6%) of the studies adopted Technology-to-performance chain model, and the same applies for Information systems success model, as well as the structural equation model.

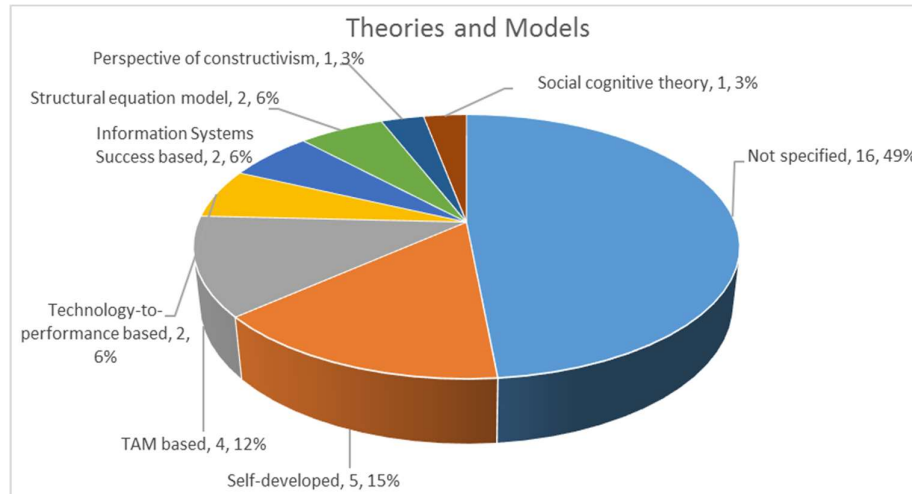


Fig. 5: No. of papers published per theory or model

6.6. Analysis methods

Fifty percent (50%) of the studies included in this review used Pearson correlation as their analysis method. Fourteen percent (14%) of the studies used SEM (structural equation modelling), twelve percent (12%) of the studies used t-test and the same applies to PLS (partial least square). Six percent (6%) of the studies used ANOVA and only one percent (1%) used ANCOVA. Three percent (3%) of the studies did not specify their analysis method.

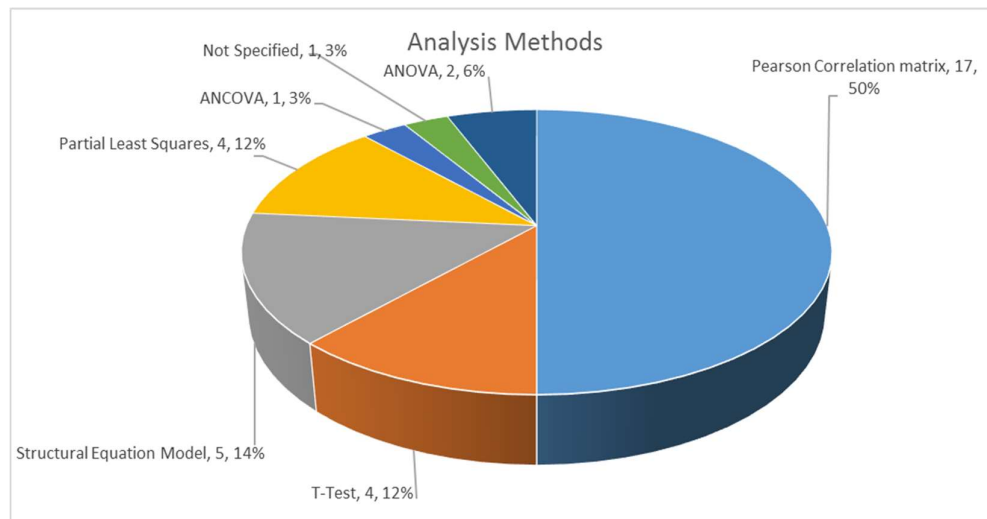


Fig. 6: No. of papers published per research method

6.7. Academic performance factors and the new conceptual model

The different academic performance factor identified by the thirty-four (34) studies included in this review can be grouped into six (6) categories: a) Demographics; b) Intensity of use of e-Learning, c) Self-efficacy and learning approach, d) Sense of community and interactivity, e) Perceptions on the suitability of e-Learning, and f) Motivation, pride, and computer anxiety.



Thirty-five percent (35%) of the factors can be considered as Intensity of use of e-Learning, Self-efficacy and learning approach follows with twenty-two percent (22%). Sense of community and interactivity cover the nineteen percent (19%) of the factors, followed by perceptions on the suitability of e-Learning with sixteen percent (16%). While the demographics had a portion of seven percent (7%), and motivation, pride, and computer anxiety are only three percent (3%) of the factors affecting instructors' perceptions on the impact of e-Learning on academic performance.

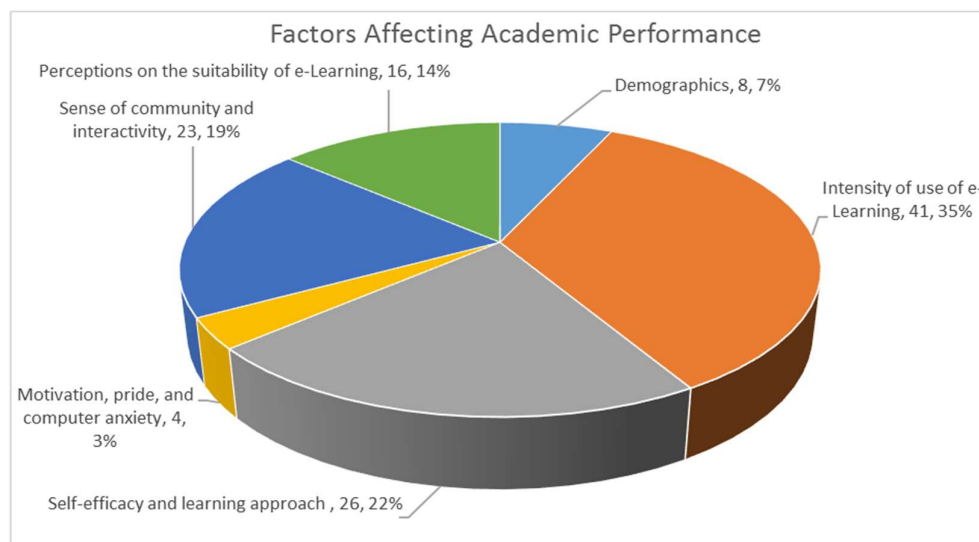
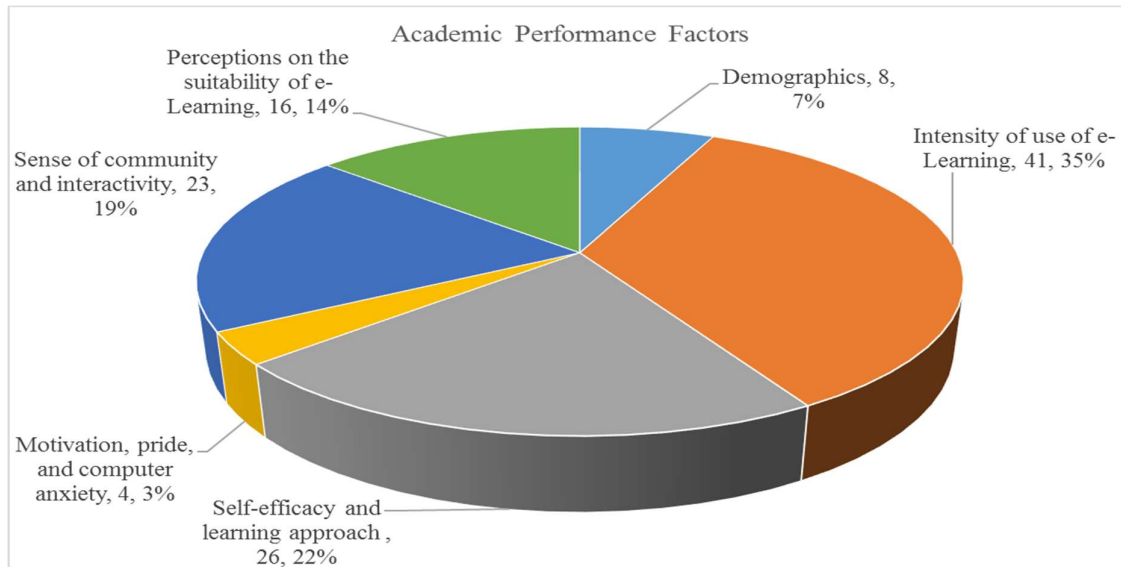


Fig. 7(a&b): No. of factors affecting academic performance



6.6.1. Demographics

Six (06) studies [05, 06, 09, 16, 24, 32] from this review have studied the impact of six (6) demographic factors on academic performance in the e-Learning context. These six (06) demographic factors are Gender/sex, Age, Subject, Location setting, and On-line distance education experience. The findings from these six (6) studies differ on the existence and nature of the correlation between the above identified demographic factors and academic performance in the e-Learning context. For example, study number sixteen (16) and study number twenty-four (24) found that age does not have any effect on academic performance in the context of e-Learning, but study number nine (09) found that age has a negative effect on academic performance in the context of e-Learning. Further details on these correlations can be seen on Table 1.

Table 1: Demographic factors

On-line distance education experience [05] (POC); Gender [06] (POC); Location setting [06] (POC); Subject [06] (POC); Age [09] (NEC); Sex [16] (NOC); Age [16] (NOC); Age [24] (NOC); Gender [32] (POC)

6.6.2. Intensity of use of e-Learning

Twenty (20) studies [01, 02, 03, 04, 06, 08, 09, 10, 16, 17, 18, 21, 23, 26, 27, 29, 30, 31, 32, 33] from this review have studied the impact of intensity of use of e-Learning on academic performance. The forty-one (41) e-Learning intensity of use factors identified by these twenty (20) studies are presented by Table 2. For example, some of these factors include the number of quiz viewed, the number of online classes, and the hours spent online. The findings from these studies differ on the existence and on the nature of the correlation between e-Learning intensity of use and academic performance. For example, study number one (01) found that the number of quiz viewed has a positive impact on academic performance in the e-Learning context, but study number eight (08) found that the number of quiz viewed does not have any effect on academic performance in the context of e-Learning. Further details on these correlations can be seen on Table 2.

Table 2: Intensity of use of e-Learning

Number of online sessions [01] (POC); Number of links viewed [01] (POC); Number of quiz views [01] (POC); Number of wiki views [01] (POC); Largest period of inactivity [01] (NEC); Average time per session [01] (NEC); Irregularity of study interval [01] (NEC); Time until first activity [01] (NEC); Number of discussion posts [01] (NOC); Irregularity of study time [01] (NOC); Studying through e-learning [02] (POC); Use of QUEST e-Learning tool [03] (POC); Use of WBLE e-Learning tool [04] (NEC); Hours spent online [06] (POC); Reading and posting messages [08] (POC); Quiz efforts [08] (POC); Number of files viewed [08] (POC); Number of assignments viewed [08] (NOC); Number of Quizzes viewed [08] (NOC); Number of Chat talk [08] (NOC); Number of online class [09] (NEC); Use of blended e-Learning [10] (NOC); Time spent on e-learning [16] (NOC); Time spent on non-relevant readings [16] (NOC); Time spent on relevant readings [16] (NOC); Time Flexibility [17] (POC); Time-on-Task [17] (POC); Working time [17] (NOC); Time of the day [17] (NOC); Task-technology fit [18] (POC); Contribution of e-Learning component in the overall Course structure [21] (NOC); Use of Mac-CARE [23] (POC); Use of LearningSpace [26] (POC); Overall grade for all courses [27] (POC); Class participation [27] (POC); Forum posting quantity [27] (NOC); Forum posting quality [27] (NOC); Total studying time in LMS [29] (POC); Regularity of learning interval in LMS [29] (POC); Number of downloads [29] (POC); Login frequency in LMS [29] (NOC); Participation in e-Learning [30] (POC); Engagement with peers and teachers [31] (POC); Task-Technology Fit [32] (POC); LMS (WebCT) Utilization [32] (NOC); Accessing tutorial resources [33] (POC); Virtual lectures accessed [33] (POC)
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6.6.3. Self-efficacy and learning approach

Fifteen (15) studies [02, 07, 09, 12, 15, 16, 19, 20, 21, 22, 24, 25, 28, 31, 32] from this review have studied the impact of self-efficacy and learning approach on academic performance in the e-Learning context. The twenty-six (26) self-efficacy and learning approach factors identified by these fifteen (15) studies are presented by Table 3. For example, some of these factors include internet self-efficacy, collaborative learning, and ability to use communication tools.

The findings from these studies differ on the existence and on the nature of the correlation between self-efficacy and learning approach, and academic performance in the e-Learning context. For example, study number twenty-one (21) found that internet self-efficacy has a negative impact on academic performance in the e-Learning context, but study number thirty-two (32) found that internet self-efficacy has a positive effect on academic performance in the context of e-Learning. Further details on these correlations can be seen on Table 3.



Table 3: Self-efficacy and learning approach

<p>Improved learning process [02] (POC); Self-Development Outcome [02] (NOC); Collaborative learning [07] (POC); Ability to work independently [09] (POC); Computer self-efficacy [09] (NEC); Level of assistance towards learning [12] (POC); Level of learning assistance [15] (POC); ICT use ability [16] (NOC); Own efficiency estimation [16] (NOC); Intrinsic goal orientation [19] (POC); Self-efficacy for SRL [19] (POC); Self-efficacy for e-Learning [19] (POC); Ability to manage one's learning environment [19] (POC); Self-regulated learning strategy [20] (POC); Student learning style [21] (POC); Ability to interact with other students using e-learning [21] (NOC); Self-efficacy for learning and performance [22] (POC); Verbal ability [22] (POC); Internet self-efficacy [22] (NEC); Intrinsic goal orientation [22] (POC); Ability to manage time and studying environment [22] (NOC); Computer self-efficacy [24] (NEC); Locus on control [24] (NEC); Ability to use communication tools [25] (POC); Self-regulatory efficacy (moderate learning environment) [28] (NEC); Using collaborative learning [31] (POC); Self-regulation [31] (POC); Internet self-efficacy [32] (POC)</p>
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6.6.4. Motivation and pride

Four (04) studies [16, 21, 25, 31] from this review have studied the impact of motivation and pride on academic performance in the e-Learning context. The four (4) motivation and pride factors identified by these four (4) studies are motivation, student self-motivation, autonomous motivation, and pride. The findings from these studies all agree that motivation and pride have a positive impact on academic performance in the e-Learning context.

6.6.5. Sense of community and interactivity

Seven (7) studies [08, 12, 21, 24, 27, 29, 31] from this review have studied the impact of sense of community and interactivity on academic performance in the e-Learning context. The twenty-three (23) sense of community and interactivity factors identified by these seven (7) studies are presented by Table 5. For example, some of these factors include interactions with instructors, level of assistance towards building social community, and interactivity with peers.

The findings from these studies differ on the existence and on the nature of the correlation between sense of community and interactivity, and academic performance in the e-Learning context. For example, paper number twenty-nine (29) found that interactions with instructors do not have any impact on academic performance in the e-Learning context, but paper number thirty-one (31) found that interactions with instructors have a positive effect on academic performance in the context of e-Learning. Further details on these correlations can be seen on Table 4.

Table 4: Sense of community and interactivity

<p>Content creation contribution [08] (POC); Number of Chat talk [08] (NOC); Level of assistance towards building social community [12] (POC); Electronic feedback from instructor [21] (POC); Contribution of e-Learning component in the overall Course structure [21] (NOC); Feeling of belongness to a community as a results of the use of CMC [24] (POC); Metacognitive activity [24] (NOC); Creation of negative e-Learning friends [27] (NEC); Creation of positive e-Learning friends [27] (NOC); Creation of neutral e-Learning friends [27] (NOC); Interactions with peers [29] (POC); Interactions with instructor [29] (NOC); Interactivity with peers [31] (POC); Interactivity with instructor [31] (POC)</p>
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6.6.6. Perceptions on the suitability of e-Learning

Eleven (11) studies [07, 09, 13, 15, 18, 20, 21, 22, 24, 28, 31] from this review have studied the impact of perceived e-Learning suitability on academic performance. The sixteen (16) perceived e-Learning suitability factors identified by these eleven (11) are presented by Table 6. For example, some of these factors include perceived usefulness of e-Learning and e-Learning satisfaction.

The findings from these studies differ on the existence and nature of the correlation between the identified perceptions on the suitability of e-Learning and academic performance. For example, study number seven (7), thirteen (13), twenty-one (21), twenty-four (24), and twenty-eight (28) all agree that e-Learning satisfaction has a positive impact on academic performance, but study number twenty (20) found that e-Learning satisfaction has no impact on academic performance. Further details on these correlations can be seen on Table 5.

Table 5: Perceptions on the suitability of e-Learning

Students' satisfaction with LMS [07] (POC); Perceived ease of use of e-learning [09] (POC); Perceived usefulness of e-learning [09] (NEC); Perceived compatibility [11] (POC); Level of assistance towards learning [12] (POC); Perceived satisfaction [13] (POC); Perceived convenience [13] (POC); Perceived engagement [13] (POC); Perceived learning [13] (POC); Level of learning assistance [15] (POC); Perceived impact on learning [18] (NOC); Satisfaction with e-Learning system [20] (NOC); Electronic feedback from instructor [21] (POC); User satisfaction [21] (POC); Instructor knowledge and facilitation [21] (NOC); Verbal ability [22] (POC); Help seeking [22] (NEC); Perceptions on the reliability of e-Learning technology [24] (POC); Perceptions on e-Learning technologies ability to support group work [24] (POC); E-Learning Satisfaction [24] (POC); Satisfaction with learning environment [28] (POC); Enjoyment [31] (POC)

6.6.7. New conceptual model

Figure 8 is the new conceptual framework proposed by this literature review of the factors affecting instructors' perceptions on the impact of e-Learning on academic performance, as above presented. All the papers that were reviewed for the design of that framework are referenced on table 6 together with their findings.

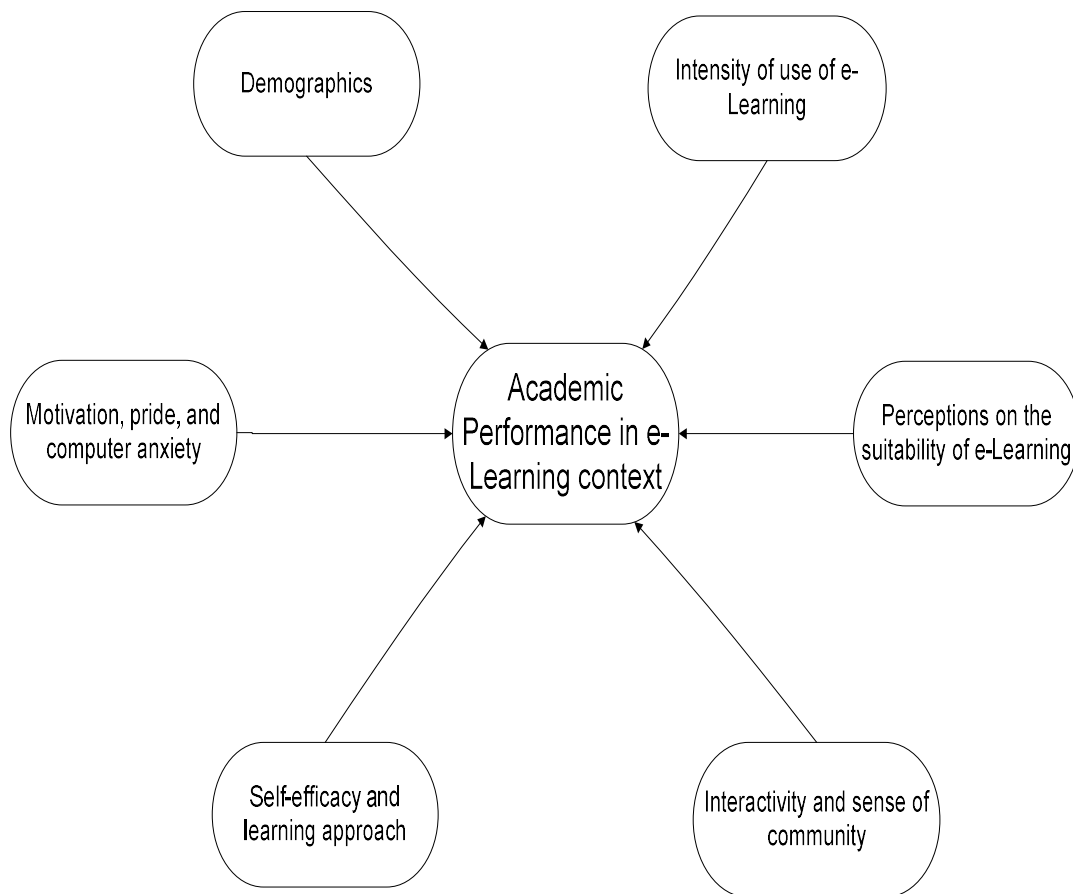


Fig. 8: The new conceptual model



Table 6: Reviewed papers

Study No.	Authors and Year	Findings
1.	Conijn (2017)	23 variables such as: Number of online sessions – POC; Number of links viewed – POC; Number of quiz views – POC; Number of wiki views – POC; Largest period of inactivity – NEC; Average time per session – NEC; Irregularity of study interval – NEC; Time until first activity – NEC; Number of discussion posts – NOC; Irregularity of study time – NOC
2.	Fayomi (2015)	Studying through e-learning – POC; Improved learning process – NOC; Self–Development Outcome – NOC
3.	Regueras et al (2009)	Use of QUEST e-Learning tool – POC
4.	Chong (2010)	Use of WBLE e-Learning tool – NEC
5.	Dodd (2009)	On-line distance education experience (compared to traditional distance education experience) – POC
6.	Owinoi (2016)	Hours spent online – POC; Gender – POC; Location setting – POC Subject – POC
7.	Othman (2014)	Collaborative learning – POC; Students' satisfaction with LMS – POC
8.	Zacharis (2015)	29 variables such as: Reading and posting messages – POC; Content creation contribution – POC; Quiz efforts – POC; Number of files viewed – POC; Number of assignments viewed – NOC; Number of Quizzes viewed – NOC; Number of Chat talk – NOC
9.	Galy et al (2011)	Perceived ease of use of e-Learning – POC; Ability to work independently – POC; Perceived usefulness of e-learning – NEC; Computer self-efficacy – NEC; Age – NEC; Number of online class – NEC; Computer Anxiety – NOC
10.	Al-Saai et al (2011)	Use of blended e-Learning – NOC
11.	Islam (2015)	Perceived compatibility – POC
12.	Islam (2013)	Level of assistance towards learning – POC; Level of assistance towards building social community – POC
13.	Owston et al (2012)	Perceived satisfaction – POC; Perceived convenience – POC Perceived engagement – POC; Perceived learning – POC
14.	Islam (2012)	Level of learning assistance – POC
15.	Castillo-Merino and Serradell-López (2013)	Motivation – POC; Time spent on e-learning – NOC ICT use ability – NOC; Time spent on non-relevant readings – NOC Time spent on relevant readings – NOC; Own efficiency estimation – NOC; Sex – NOC; Age – NOC
16.	Romero and Barbera (2011)	Time Flexibility – POC; Time-on-Task – POC; Working time – NOC; Time of the day – NOC
17.	McGill and Klobas (2008)	Task-technology fit – POC; Perceived impact on learning – NOC
18.	Sharma (2007)	Intrinsic goal orientation – POC; Self-efficacy for SRL – POC; Self-efficacy for e-Learning – POC; Ability to manage one's learning environment – POC
19.	Lee (2009)	Self-regulated learning strategy – POC; Satisfaction with e-Learning system – NOC



Study No.	Authors and Year	Findings
20.	Eom (2006)	Student self-motivation – POC; Student learning style – POC; Electronic feedback from instructor – POC; User satisfaction – POC; Instructor knowledge and facilitation – NOC; Ability to interact with other students using e-learning – NOC; Contribution of e-Learning component in the overall Course structure – NOC
21.	Lynch and Dembo (2004)	Self-efficacy for learning and performance – POC; Verbal ability – POC; Help seeking – NEC; Internet self-efficacy – NEC; Intrinsic goal orientation – NOC; Ability to manage time and studying environment – NOC
22.	Bianchi et al (2008)	Use of Mac-CARE – POC
23.	Johnson et al (2009)	Perceptions on the reliability of e-Learning technology – POC; Perceptions on e-Learning technologies ability to support group work – POC; Feeling of belongingness to a community as a result of the use of CMC – POC; Level of interaction with other students using e-learning – POC; E-Learning Satisfaction – POC; Computer self-efficacy – NEC; Locus on control – NEC; Age1 – NOC; Metacognitive activity – NOC
24.	Giesbers et al (2013)	Autonomous motivation – POC; Ability to use communication tools – POC; Web-videoconference participation – POC
25.	Ladyshevsky (2004)	Use of LearningSpace – POC
26.	Yang and Tang (2003)	Overall grade for all courses – POC; Class participation – POC; Creation of negative e-Learning friends – NEC; Creation of positive e-Learning friends – NOC; Creation of neutral e-Learning friends – NOC; Case based learning – NOC; Forum posting quantity – NOC; Forum posting quality – NOC
27.	Lee and Lee (2008)	Satisfaction with learning environment – POC; Self-regulatory efficacy (moderate learning environment) – NEC
28.	Yu and Jo (2014)	Total studying time in LMS – POC; Regularity of learning interval in LMS – POC; Number of downloads – POC; Interactions with peers – POC; Login frequency in LMS – NOC; Interactions with instructor – NOC
29.	Michinov et al (2010)	Participation in e-Learning – POC; Procrastination to participate in e-Learning – NEC
30.	Al-Rahim and Othman ()	Interactivity with peers – POC; Interactivity with the teacher – POC; Engagement with peers and teachers – POC; Using collaborative learning – POC
31.	McGill et al (2008)	Task-Technology Fit – POC; LMS (WebCT) Utilization – NOC
32.	Villavicencio and Bernardo (2013)	Self-regulation – POC; Enjoyment – POC; Pride – POC
33.	Chang (2014)	Internet self-efficacy – POC; Gender1 (Females) – POC
34.	Crampton et al (2012)	Accessing tutorial resources – POC; Virtual lectures accessed – POC



7. DISCUSSION, LIMITATIONS, AND CONTRIBUTION

The proposal of a new conceptual model and the inclusive nature of the scope of this review are the two main innovations of this study compare to the two reviews earlier on presented. All the studies reviewed by Broadbent and Poon (2015) are only interested in the impact of self-regulated e-Learning on academic performance in higher education. On the other hand, all the studies reviewed by Lahti et al (2012) are only interested in the impact of e-Learning on knowledge, skills, and satisfaction for nursing students. The current review does not restrict itself to any specific subject neither factor. This review only made use of free research studies downloadable from the internet, and this can be seen as one of its main limitation.

It is important to compare the conceptual model of this study with existing classical technology adoption models such as the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) whose main focus is on technology acceptance, ease of use, and usefulness. A quick analysis of the conceptual framework of this study shows that its component on the intensity of use of e-Learning includes the technology acceptance factor (see table 2), and its component on perception on the suitability of e-Learning includes the ease of use and usefulness factors (see table 5).

8. RECOMMENDATIONS FOR FUTURE RESEARCH

This review has unearthed evidence from existing literature on the factors affecting instructors' perceptions on the impact of e-Learning on academic performance. Unfortunately, the findings from the reviewed studies differ on the existence and nature of the correlation between e-Learning and most of the identified factors. More research is therefore needed on reasons behind these conflicting results.

9. CONCLUSION

This study has shown that the examination of existing e-Learning literature can be used as a tool for the construction of a conceptual framework of the factors affecting instructors' perceptions on the impact of e-Learning on academic performance. Nevertheless, more empirical research projects are required in order to test the validity of this framework. More research is also needed on the factors that are identified by certain studies as influencers of academic performance in the e-Learning context while other studies are exhibiting different results on these factors.



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