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A conceptual framework highlighting e-learning implementation barriers

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A CONCEPTUAL FRAMEWORK HIGHLIGHTING E-LEARNING IMPLEMENTATION BARRIERS

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ABSTRACT

Purpose– E-learning has gained much focus from educators and researchers, with many extolling e-learning over traditional learning. Despite this focus, implementation of e-learning systems often fails. Literature considers a range of barriers, impacting the success of e-learning implementations, yet to the best of our knowledge no conceptual framework is able to consolidate existing research.

Design/methodology/approach– This paper undertook an in-depth review of literature concerning e-learning implementation barriers. Papers were extracted from established peer-reviewed journals and open sources. Articles not related to e-learning implementation barriers were discarded. A total of 259 papers were identified, published between 1990 and 2016. Hermeneutics and data-driven qualitative content analysis was used to define 68 unique barriers.

Findings– The 68 unique barriers were thematically grouped into four conceptual categories, i.e. Technology (T), Individual (I), Pedagogy (P) and Enabling Conditions (EC). These 4 categories led to the conceptualization of 'TIPEC' Framework, which highlights the key concepts hindering e-learning implementation and delivery. Results show that most articles only consider a narrow range of success barriers.

Practical implications– The proposed TIPEC framework acts as a guide for education practitioners, system developers, policy makers and researchers. It provides stakeholders with a summary of e-learning barriers.

Originality/Value– This paper fulfils an identified need for a conceptual framework that consolidates all current research related to E-learning implementation barriers.

KEYWORDS

E-Learning, Barriers, Challenges, Conceptual Framework, Hermeneutic, Technologies in Education/Workplace.

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INTRODUCTION

E-learning relates to the use of electronic systems and applications within learning processes. E-learning facilitates the potential for remote interaction between students and experienced teachers/professors (Wang et al.,2009). Learning content is delivered remotely via an electronic solution, e.g. internet, satellite TV, radio, CD-ROM etc. (Bates, 2005), and includes consideration of electronic based learning systems; for example digital collaboration and virtual classrooms. E-learning is transforming the map of both global education and corporate training (Bell et al.,2004). The ubiquitous accessibility afforded by e-learning, especially in developing countries, has gained much attention from researchers across a range of diverse cultures and contexts (Lin,2010); with many researchers extolling e-learning over traditional learning due to its blend of synchronous and asynchronous structures (Zengin et al.,2011). Vast development has been made in the provision of e-learning solutions, driving expectations concerning e-learning's potential (Bell et al.,2004). Despite such rhetoric the long-term adoption, diffusion, and exploitation of e-learning solutions has been much less successful than originally projected (Bell et al.,2004).

Asia, for example, currently has the highest demand growth rate (17.3% per annum), yet high implementation failure rates, and high student drop-out statistics is risking long-term use by Higher Educational Institutions. In Pakistan, for example, e-learning is widely adopted across the entire education system, yet institutions are facing a complex combination of barriers that is limiting the long-term success of e-learning solutions. This paradox between growing public demand, yet failing implementation/acceptance, has resulted in researchers and practitioners focusing on e-learning implementation failure barriers (Lee et al.,2009). Although extensive work has been done to understand e-learning implementation barriers (Kwofie and Henten,2011), limited work has been done to consolidate this understanding. The aim of this paper is to highlight e-learning implementation barriers, by undertaking an in-depth review of e-learning literature. In addition, barriers will be categorized; to facilitate the proposition of an e-learning barrier framework; supporting education stakeholders with systems development and implementation.

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METHODOLOGY

In our research, literature was sorted using a two-step process. The first step related to sourcing relevant literature articles. Well-established peer-reviewed international journals were sourced, from relevant and reputable publishers; including EmeraldInsight, IEEE, Jstor, ScienceDirect, SpringerLink, Wiley etc. Search terms (including E-learning, Technology Based Learning, Technology Mediated Learning, Technology Enhanced Learning, Virtual Learning, Online Learning, Distance Learning, Distance Education, Virtual Education, ICT based Learning) were used in combination with a range of synonyms that expressed the semantics 'barrier'; e.g. Issues, Barriers, Hurdles, Problems, Success Factors, Obstacles, Challenges, Difficulties, Failure, Success. Additional peer-reviewed articles were also sourced using Google Scholar to increase the diversity and scope of papers identified in our search. Both qualitative and quantitative research was reviewed. No limitations were applied as a result of country of study and/or educational level; accordingly literature from all learning domains, i.e. higher education, vocational training, and corporate training, were included in our review. All papers were written in English and were available from peer reviewed or open sources. The search timeline was limited to between 1990 to 2016; since the existence of the world wide web was deemed essential to most modern e-learning solutions. In the second step of our sorting process, the authors reviewed the title, abstract, introduction, and conclusion for each article. Articles that were found not to be related to e-learning implementation barriers were discarded. Articles that focusing only on e-learning systems algorithms, coding, or protocols were discarded.

After the initial screening, a total of 259 papers were identified. A list of 104 barriers were created, however it was observed that a number of identified barriers, despite using different terms, semantically expressed the same barrier. The authors studied all remaining papers, using hermeneutic phenomenology and content analysis to interpret the underlying coherence and structure from the textual object of study (Taylor,1976; Hsieh & Shannon,2005). Literature advised using the following questions to analyse artefacts: How are barriers defined? What is the data population? What is the experimental context? What are the boundaries of the analysis? What does paper conclusion infer? By coding the inference categories, and by removing duplications, 68 unique barriers to e-learning implementation were defined (see tables 1-4 for barrier definitions, descriptions, and literature links). Barriers identified in multiple papers were also highlighted (see

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tables 1-4 AUTHOR column), which allows the authors to demonstrate overlap in existing literature.

Table 1: Barriers in literature related to E-learning: Technology

BARRIERS	AUTHOR	DESCRIPTION
1.Technology infrastructure	Davie & Wells,1991; Soong et al.,2001; Wild et al.,2002; Little,2003; Vrasidas,2004; Surry et al.,2005; Voogt,2009; Goyal et al.,2010; Meyer & Barefield,2010; Purohit & Bhagat,2010; Waycott et al.,2010; Shelton,2011; Teo,2011; Alshwaier et al.,2012; Chang'ach, & Sang,2012; Guy,2012; Kipsoi et al.,2012; Qureshi et al.,2012; Reeves & Li,2012; Alsabawy et al.,2013; Graham et al.,2013; Nwabufo et al.,2013; Gutiérrez-Santiuste & Gallego-Arrufat,2016; Güllü et al.,2016; Ozudogru & Hismanoglu,2016	Refers to the hardware, software, facilities, and network capabilities within the college/institution.
2.Technical support	Venkatesh,2000; Soong et al.,2001; De Freitas & Oliver,2005; Pagram & Pagram,2006; Sife et al.,2007; Nwabufo et al.,2013; Poon & Koo,2010	Unavailability of technical staff and lack of facilities to perform various activities (installation, operation, maintenance, network administration and security).
3.Bandwidth Issue And Connectivity	Ali,2004; Homan & Macpherson,2005; Poon & Koo,2010; Mahanta & Ahmed,2012; Reilly et al.,2012; Nor & Mohamad,2013; Gutiérrez-Santiuste & Gallego-Arrufat,2016; Vencatachellum, & Munusami, 2006	Slow speed of Internet and high internet traffic during e-learning experience.
4.Software and interface design	Swan,2004; Andersson & Grönlund,2009; Kwofie & Henten,2011; Marzilli, et al.,2014	Less user friendly software and interface design during e-learning experience.
5.Compatible technology	Koller et al.,2008; Gudanescu,2010; Marzilli, et al.,2014	Incompatibility of content with a variety of learning management systems/technology.
6.Poor quality of computers	Radijeng,2010	Low quality computers that freeze frequently and outdated computer systems.
7.Virus attacks	Nikoi & Edirisingha,2008; Qureshi et al.,2012; Prakasam,2013; Shonola & Joy,2014	Virus attacks on e-learning systems during e-learning experience.

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Table 2: Barriers in literature related to E-learning: Individual

BARRIERS	AUTHOR	DESCRIPTION
8.Prior knowledge	Hölscher & Strube,2000; Brusilovsky,2003; Paul & Chen,2003; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Student having background knowledge related to course.
9.Student Motivation	Bates,1990; Pintrich & De Groot,1990; Ostwald,1992; Mason & Weller,2000; Alexander,2001; Wu & Hiltz,2004; Pagram & Pagram,2006; Johns & Woolf,2006; Andersson & Grönlund,2009; Lanzilotti et al.,2009; Blignaut & Els,2010; Kwofie & Henten,2011; Miliszewska,2011; Bozkaya & Kumtepe,2012; Yoo et al.,2012; Medárová et al.,2012; Hepworth & Duvigneau,2013; Nwabufo et al.,2013; Alajmi, 2014; Callinan,2014; Gutiérrez-Santiuste & Gallego-Arrufat,2016;	Students' Motivation on the basis of their skills, attitudes, interest, behaviour and activity.
10.Technological difficulty	Schrum & Hong,2002; Arbaugh,2002; Thurmond et al.,2002; Ocak,2011; Pituch & Lee,2006; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Students facing technological difficulty in using e-learning technologies.
11.Technology experience	Schrum & Hong,2002; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Students lacking technology experience in solving problems and accomplishing basic tasks.
12.Awareness and attitude towards ICT	Becking, et al.,2004; De Freitas & Oliver,2005; Inglis,2007; Klasnić et al.,2008; Anwar & Niwaz,2011; Bozkaya & Kumtepe,2012; Nagunwa & Lwoga,2012; Alajmi,2014; Nwabufo et al.,2013	Students lacking awareness of internet skills and reluctance of students in taking responsibility for their own e-learning.
13.Computer literacy	Eisenberg & Johnson,1996; Fyfe,2000; Sharma,2003; Andersson & Grönlund,2009; Kwofie & Henten,2011; Nor & Mohamad,2013; Karaman, Kucuk, & Aydemir,2014	Lack of computer literacy in students.
14.Perceived usefulness and ease of use perceptions	Venkatesh,2000; Wong, Nguyen, Chang, & Jayaratna,2003; Cantoni et al.,2004; Lu & Chen,2007; Liao, Liu et al.,2011; Digión & Sosa,2012; Tao et al.,2012	Students' intentions to carry on e-learning lifelong and his/her usage behaviour of ICTs.
15.Students Support	Galusha,1998; Elango et al.,2008; Lewis & Chen,2009; Chen,2009; Stansfield, et al.,2009; Yaghoubi et al.,2008; Anohina-Naumeca & Grundspenkis,2012	Support provided by students in successful implementation of e-learning system.
16.Computer anxiety	Wiksten et al.,1998; Venkatesh,2000; Piccoli et al.,2001; Sun et al.,2008; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Students' early misperceptions about the ease of use of an e-learning system.
17.Sense of isolation due less face to face interaction	Bates,1990; Galusha,1998; Daugherty & Funke,1998; Campbell et al.,2000; Schott et al.,2003; Vonderwell,2003; Sweeney et al.,2004; McInnerney & Roberts,2004; De Freitas & Oliver,2005; Tham & Werner,2005; Jensen et al.,2009; Anwar & Niwaz,2011; Chatzara et al.,2012; Reynolds et al.,2013; Callinan,2014; Muhammad et al.,2015	Absence of face to face/social interaction between individual learner and instructor endorsing sense of isolation.
18.Conflicting priorities	Andersson,2008; Andersson & Grönlund,2009; Kwofie & Henten,2011	Time devoted to e-learning causes priority conflict.

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19.Social support	Andersson & Grönlund,2009; Kwofie & Henten,2011; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Support from family and employers for e-learning, conducive environment and devoid of distraction during e-learning sessions.
20.Social loafing	Rutkowski, Vogel et al.,2002; Koller et al.,2008; Wheeler et al.,2008; Gudanescu,2010; Loh & Smyth,2010; Ryu & Parsons,2012	Students working less diligently because of the relative absence of instructor- learner and learner-learner interaction.
21.Student's economy	Andersson & Grönlund,2009; Iqbal & Ahmad,2010	Financial difficulty for taking up e-learning courses.
22.Academic confidence	Andersson,2008; Andersson & Grönlund,2009	Academic experience and qualification of student.
23.Self-efficacy	Joo et al.,2000; Andersson & Grönlund,2009; Liaw,2008; Bozkaya & Kumtepe,2012; Maki & Charalambous,2014; Gutiérrez-Santiuste & Gallego-Arrufat,2016; Ozudogru & Hismanoglu,2016	Student's confidence in using e-learning technologies and believe in completion of e-learning course.
24.Lack of ICT skills	Carr,1999; Voyler & Lord,2000; Oliver,2001; Jarvis & Szymczyk,2010; Qureshi et al.,2011; Qureshi, Ilyas, Yasmin, & Whitty,2012; Nagunwa & Lwoga,2012; Gutiérrez-Santiuste & Gallego-Arrufat,2016	It includes training in multimedia related skills and Impact of technology on learning.
25.Family commitments	Schott et al.,2003	Family commitments taking up most time and resources of the e-learners
26.Work commitment	Schott et al.,2003	E-learners giving excuse of their work commitments for skipping exams, assignments etc.
27.Student readiness	McCausland,2005; Goyal et al.,2010; Ünal et al,2013	Students possessing inconsistent E-learning readiness over time, among institutions or instruments.
28.Response to change	Jager & Lokman,1999; Song & Keller,2001	Students' slow response to changing e-learning.
29.Inequality in access to internet connectivity	Mackintosh,2005; Salaway et al.,2008; Gudanescu,2010; Okine et al.,2012; Farid et al.,2014	Inequalities in access to the internet & few people have internet connection.
30.Inequality in Access to technology	Nwabufo et al.,2013; Anderson et al.,2005; Salaway et al.,2008; Pegrum,2009; Gudanescu,2010; Kipsoi et al.,2012; Guy,2012; Pegrum, et al.,2013; Dudeney et al.,2013	Inequality of access to the technology itself by all the students.
31.Technophobia	Nwabufo et al.,2013	Students' having afraid of operating e-learning systems/technologies.
32.Cost of using technology	Sambrook,2003; Andersson & Grönlund,2009; Nor & Mohamad,2013; Becker et al.,2013; Callinan,2014;	Students facing high cost of using technologies.
33.Individual Culture	Pratt,1991; Alavi & Leidner,2001; Kolb,2005; McCausland,2005; Chroust,2007; Economides,2008; Joy & Kolb,2009; Azer & El-Sherbini,2011; Adeoye,2012	Student's overall individual culture distresses attitude towards distance learning. Each individual have different learning style and expectation, which should be consider while designing e-learning.

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Table 3: Barriers in literature related to E-learning: Pedagogy

BARRIERS	AUTHOR	DESCRIPTION
34.Faculty effort	Black,1992; Miller & Schlosberg,1997; Surry et al., 2005; Inglis,2007; Bailey & Card,2009; Meyer & Barefield,2010; Teo,2011; Pegrum, et al.,2013; Teo & Wong,2013; Güllü, et al.,2016	Lack of effort and support being put by faculty members in use of e-learning.
35.Faculty development	Willis,1994; Higgs,1997; Sife et al.,2007; Inglis,2007; Kaleta et al.,2007; Collopy & Arnold,2009; Lareki et al.,2010; Lim et al.,2011; Reilly et al.,2012; Yaakop,2015	Lack of training and development in faculty and limited change in teaching methodology of faculty in response to ICT developments.
36.Lack of ownership	Forman & Nyatanga,2002; Ertmer,2005; Mayo eet al.,2005; Omwenga,2006; Sife et al.,2007; Naismith,2007; Chua,2009; Masalela,2011; Qureshi et al.,2011; Duveskog et al.,2014	Faculty not taking ownership of successful implementation of e-learning technologies and lack of interest in meeting e-learning challenges.
37.Lack of feedback	Hiemstra,1994; Andersson & Grönlund,2009; Guy,2012	Faculty putting little effort in giving feedback, making students drop out or fail.
38.Quality Course Content	Tricker et al.,2001; Drago et al.,2002; Saadé,2003; Ali,2004; De Freitas & Oliver,2005; Stahl et al.,2006; Picciano & Seaman,2007; Rhode,2009; Voogt,2009; Veeramani,2010; Meyer & Barefield,2010; Masoumi,2010; Mtebe & Raisamo,2014	Course content having less quality in terms of interactivity.
39.Engaging Students Online	Ali,2004; Lester & Perini,2010; Guy,2012	Faculty facing difficulty in engaging students online.
40.Pedagogical model	Burge & Lenksyj,1990; Andersson,2008; Kwofie & Henten,2011; Bozkaya & Kumtepe,2012; Ngimwa & Wilson,2012; Parrish et al.,2012; Pegrum et al.,2013; Güllü, et al.,2016; Govender & Chitanana,2016	Use of instructor/learner centred approach in teaching.
41.Localization of content	Pagram & Pagram,2006; Hylén,2006; Andersson,2008	Lack of Customisation/Adaptability of course content according to local culture, language and religious beliefs.
42.Flexibility in delivery mode	Gibson & Graff,1992; Andersson,2008	Lack of student empowerment concerning the decisions related to taking exam, selection of medium of content delivery, etc.
43.Course content	Kelly,1990; Saadé,2003; Ivergård & Hunt,2005; Inglis,2007; Voogt,2009; Lester & Perini,2010; Kwofie & Henten,2011; Ozudogru & Hismanoglu,2016	Lack of relevance, accuracy of course content and misalignment of course content with future employers' need.
44.Faculty Training	Trippe,2002; Kosak, et al.,2004; Muir-Herzig,2004; Keramidas et al.,2007; Gulati,2008; Eliason & Holmes,2010; Ray,2009; Kipsoi et al.,2012	Lack of teaching material and courses for teachers in the fields of learning technology.
45.Lack of Credibility	Gudanescu,2010; Kwofie & Henten,2011	Less likely to hire someone with a TBL certificate unless provided by an accredited institution.
46.Additional time needed to communicate with students	Arabasz et al.,2003	Increased communication time principally on e-mail.
47.Insufficient computers	Mokhtar,2005; Park & Son,2009; Radijeng,2010; Tedre et al.,2010; Nagunwa & Lwoga,2012; Nwabufo et al.,2013; Qureshi et al.,2012	Few computers available as compared to the number of students.
48.IT skills of Faculty members	Hackley,1997; Levy,2003; Darabi et al.,2006; Lopes,2007; Gulati,2008; Iqbal & Ahmad,2010;	Weak IT skills of faculty members.

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	Radijeng,2010; Nawaz & Khan,2012; Webster et al.,2014	
49.Hard to access digital libraries	Berryman,2004; Sana & Mariam,2013	Problems faced in having access to digital libraries.
50.Cost of multimedia learning materials	Sambrook,2003; Attwell,2004; Elloumi,2004	Cost of producing high quality multimedia learning materials.
51.Mode of delivery	Gibson & Graff,1992; Saadé,2003	Barriers related to mode of delivery selected for E learning.
52.Weak Learning Management System	Timmerman & Kruepke,2006; Pratas & Marques,2012; Güllü, et al.,2016	Learning management systems lack interactivity and have vague features.
53.Reliability of online measuring instrument	Inglis,2007; van't Hooft,2008; Oh & Park,2009; Arnold,2014	Lack of reliability of online assessment process.
54.Lack of top-level commitment	Tusubira & Mulira,2004; Shaikh,2009; Marshall,2010; Ocak,2011	Insufficient support from top-level management.
55.Material accessibility	Roy & Raymond,2005	Reach of student to material.
56.Pre-course orientation	Frank, Kurtz, & Levin,2002; Ashby,2004	Lack of Pre course orientation sessions by instructor.
57.Tutor support counselling sessions	Ashby,2004	Lack of support/counselling sessions conducted by instructor.
58.Absence of real-time feedback	Davie & Wells,1991; Arbaugh,2002; Thurmond et al.,2002; Kim et al.,2005	Students lacking immediate/prompt response from instructors to get answer of the query.
59.Less focus on technical requirements of Content	Kay,2006; Alvan et al.,2013	Technical requirements of course content available online (e.g. size of web pages, font, colours, quality of images) are not met.
60.Faculty's acceptance of e-learning technologies	Weaver et al.,2008; Teo,2011; Ocak,2011; Parrish et al.,2012	Teachers' lacking Technology Acceptance.
61.Level of knowledge of teacher	Sharma,2003; van Leusen & Millard,2013; Marzilli, et al.,2014; Dogan,2015	Teachers lacking grip on course content while delivering an e-learning session.

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Table 4: Barriers in literature related to E-learning: Enabling Conditions

BARRIERS	AUTHOR	DESCRIPTION
62.Administrative support	Garrison & Kanuka,2004; De Freitas & Oliver,2005; Sife et al.,2007; Boezerooij et al.,2007; Cook et al.,2007; Holt & Challis,2007; Inglis,2007; Weaver et al.,2008; Jara & Mellar,2009; Czerniewicz & Brown,2009; Ocak,2011; Mahmoodi-Shahrebabaki,2014; Gutiérrez-Santiuste & Gallego-Arrufat,2016	Lack of administrative support in crafting e-learning related policies, incentives and resources. Institutional policy and organisational culture are crucial to the way e-learning is adopted or embedded in universities.
63.Setup Cost/Limited Funds	Timmerman & Kruepke,2006; Selim,2007; Sife et al.,2007; Sun & Cheng,2007; Andersson & Grönlund,2009; Liu et al.,2009; Kukulska-Hulme,2009; Gudanescu,2010; Tedre et al.,2010; Kwofie & Henten,2011; Kipsoi et al.,2012; Callinan,2014; Marzilli, et al.,2014; Dogan,2015	High cost of setting up the e-learning system and unavailability of low-cost ICT alternatives.
64.Security	Brown & Snow,1999; Ong et al.,2004; Cárdenas & Sánchez,2005; Sharples et al.,2005; Aïmeur et al.,2007; van't Hooft,2008; Pachler et al.,2009; Stahl et al.,2009; Gudanescu,2010; Traxler,2010; Veeramani,2010; Mircea & Andreescu,2011; Zamzuri et al.,2011; Bryer & Chen,2012; Levy et al.,2013; Saxena & Yadav,2013; Yang et al.,2013	Openness of e-learning systems challenging security of personal information of students/staff/faculty.
65.Language Barrier	Sharma,2003; Ali,2004; McCausland,2005	Lack of conversion of e-learning content in other languages.
66.Rules and regulation	Valcke,2004; Traina et al.,2005; Selwyn,2007; Andersson & Grönlund,2009; Kwofie & Henten,2011; Güllü, et al.,2016	Surety that all relevant laws are taken into consideration while crafting policies related to e-learning to prevent government regulations. Limitations in national and institutional policies and management practices.
67.Load shedding of electricity	Pedrelli,2001; Hussain,2007; Sangi,2008; Voogt,2009; Nagunwa & Lwoga,2012; Sana & Mariam,2013; Nwabufo et al.,2013	Problems related to Power cuts, power fluctuations and Power distribution while having e-learning experiencing.
68.Ethical barriers	Olt,2002; Scanlon,2003; Baruchson-Arbib & Yaari,2004; Foulger et al.,2009; Pachler et al.,2009; Staats et al.,2009; Stahl et al.,2009; Bozkaya & Kumtepe,2012; Esposito,2012; Bryer & Chen,2012; Sana & Mariam,2013; Levy et al.,2013; Pegrum et al.,2013; Egi et al.,2014; Bhat & Shetty,2015; Muhammad et al.,2015	Lack of written permission from participants and absence of maintaining confidentiality by the e-learning services providers.

PROPOSED TIPEC FRAMEWORK

The majority of existing research (see tables 1-4) focuses on specific barriers and/or considers barriers from a fine focus (e.g. concerning teachers/students/administrator perspectives). Although this focus is crucial to managing systems development and research experimentation, stakeholders need to maintain a contextual awareness of how activity fits in context of general literature. A combined multi-dimensional framework, incorporating all e-learning implementation success barriers, is needed to help practitioners and researchers contextualize their current/future activities.

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The most extensive summary of e-learning barriers (to date) was presented by Andersson and Grönlund(2009), which considered 60 articles related to the area of e-learning barriers, and divided barriers thematically into four conceptual categories: Technological, Course related, Individual, and Context related issues. Although many of our 259 papers fitted within the Andersson and Grönlund framework, numerous did not fit into any of the defined categories. Accordingly, the TIPEC framework was proposed, to facilitate the structuring of all e-learning barrier research into Technological, Individual, Pedagogical barriers and Enabling conceptual categories (see figure 1).

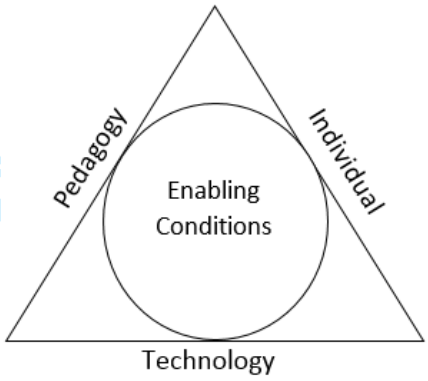

Figure 1. TIPEC framework – Structuring Technological, Individual, Pedagogical barriers and Enabling Conditions.

The 'Technological' category, in the Andersson and Grönlund (2009) framework, contained four barriers, i.e. Access, Cost, Software and Interface Design, and Localisation. Our review identified seven barriers that related specifically to Technology: Technology Infrastructure, Technical Support, Bandwith and Connectivity Issue, Software and Interface Desgin, Compatible Technology, Poor Quality of Computers, and Virus attack. Although unique barrier names were revised, to adapt for changes in type and use of education technology, definition and inclusion of a 'Technology' conceptual category (barriers relating to technology concepts and components within the E learning system) was deemed to be of value – see Table 1 for full details concerning barriers 1 – 7.

Andersson and Grönlund mentioned twelve barriers relating to the individual; with 8 barriers relating directly to the student, i.e. Motivation, Conflicting priorities, Economy, Academic confidence, Technological confidence, Social support (support from home and employers), Gender and Age. Teacher related barriers found by Andersson and Grönlund(2009), i.e.

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Technological Confidence, Motivation and Commitment, Qualification and Competence and Time, were placed within the Pedagogy category of our proposed model, which means that only 8 individual student focused barriers remained. The authors, however, identified many additional individual barriers (with scope of individual barriers restricted to student related barriers) including: Prior Knowledge, Computer Anxiety, Social Loafing, Awareness and Attitude Towards ICT, Student's Support, Student's Individual Culture, Computer Literacy. In total the proposed TIPEC framework contained twenty-six unique barriers relating to the individual student – see Table 2 for full details concerning barriers 8 – 33.

Andersson and Grönlund's 'Course related issues' framework category included: Curriculum, Pedagogical Model, Subject Content, Teaching and Learning Activities, Localisation, Flexibility, Support provided for students, and Support provided for faculty. Course related issues, as a category, did not however facilitate consideration of all unique barriers highlighted in our literature review. Accordingly, we proposed the use of the term 'Pedagogy' as an umbrella concept; encapsulating both teaching methodology and faculty/staff related barriers. Although our Pedagogy category (concerning barriers related to teaching methodology, faculty, supporting staff, and course content) included Andersson & Grönlund's 'course related issues', it also amalgamates twenty additional barriers identified from our review – see Table 3 for full details concerning barriers 34 – 61.

Interestingly some unique barriers were identified that do not relate to any category discussed within the Andersson and Grönlund framework. It was noted that these barriers do not fit within any single category, yet instead support multiple categories, e.g. administrative support. As a result a new central category, entitled 'Enabling Conditions', was added for barriers that impact all three other specific dimensions (see figure 1). Enabling Conditions(barriers that have an overall impact on multiple T/I/P categories) include: Administrative support, Limited funds, Security, Rules and regulation, Language Barrier, Load shedding of electricity and Ethical issues - see Table 4 for full details concerning barriers 62 – 68. In the TIPEC framework 'Cost' is considered under the title 'Limited funds' within the Enabling Conditions category. Figure 2 presents the TIPEC framework, which acts as a conceptual framework consolidating research; helping researchers and practitioners contxtualise their research, and understand the interplay between implementation success barriers.

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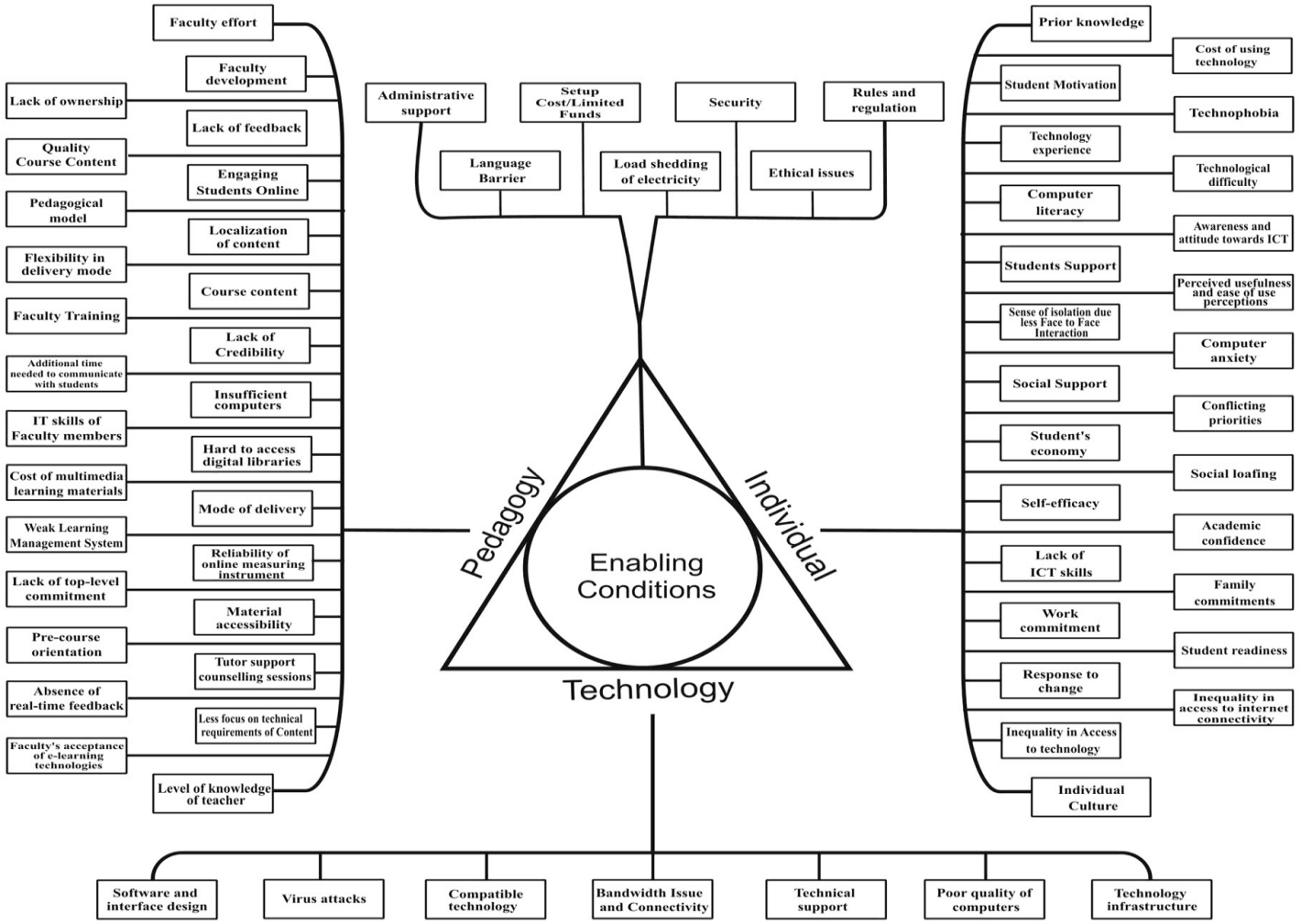

Figure 2. 68 barriers in TIPEC framework (Technology, Individual, Pedagogical, and Enabling Conditions)

CONCLUSION

Literature concerning the e-learning systems implementation success is extensive, however to date no framework effectively consolidates literature concerning the interplay of e-learning system implementation barriers. The proposed TIPEC framework aims to structure literature concerning e-learning implementation barriers, by undertaking an in-depth qualitative review of e-learning literature; dated between 1990 to 2016. By aligning the findings of 259 articles, from multiple learning domains (i.e. higher education, vocational training, and corporate training), the authors identify 68 unique e-learning implementation barriers; categorized using four TIPEC concept categories (i.e. Technology, Individual, Pedagogical, and Enabling Conditions) adapted and extended from the work of Andersson and Grönlund (2009). Accordingly, the TIPEC framework is proposed to help contextualize current domain activity and support key education stakeholders better understand the barriers that impact e-learning implementation success.

Although considerable effort was made to include a wide range of articles, the authors do not claim the TIPEC framework to be 'static', 'finished' and/or 'exhaustive'. The TIPEC framework is based on qualitative analysis of validated literature, so the authors appreciate a need, over time, to quantitatively evaluate, and systematically adapt, TIPEC structures; i.e. to highlight new factors and/or propose changes between factors. Whilst developing the TIPEC framework the authors noted a shift in the literature away from a focus on technological barriers, towards a wider range of TIPEC dimensions. If updated regularly, or personalised within a specific learning domain, identified changes will help stakeholder understand variation in the importance of implementation barriers as a result of changes in education technology/infrastructure/government policy etc. The authors, suggest development of a practical questionnaire, to support quantitative evaluation of the TIPEC framework; i.e. to help stakeholders consider and explore how barriers are contextually relevant. The authors suggest that, over a range of studies, multiple statements should be tested for each barrier, to ensure that only statements that effectively cross-load are used in the final practical questionnaire; supporting identification of issues within both e-learning systems implementation and reengineering.

Much additional work is required to maximize the practical application of the TIPEC framework, however identification of the unique 68 barriers, and the structuring of these barriers in T/I/P/EC

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(Technology, Individual, Pedagogy & Enabling Conditions) categories, aids education stakeholders by highlighting current critical e-learning barriers. The framework helps in highlighting implementation success barriers, from both academic and commercial e-learning studies, and acts as a conceptual framework consolidating identified research (to date); allowing researchers and practitioners to appreciate the interplay of implementation success barriers.

Information Technology & People

References

Adeoye, B. (2012). Culturally different learning styles in online learning environments: A case of Nigerian university students. Learning Tools and Teaching Approaches through ICT Advancements,226.

Aïmeur, E., Hage, H., & Onana, F. (2007). A Framework for Privacy-preserving E-learning. Trust Management IFIP International Federation for Information,223-238.

Alajmi, M. (2014). Predicting The Use of A Digital Library System: Public Authority for Applied Education and Training. International Information & Library Review,46(1-2),63-73.

Alavi, M., & Leidner, D. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. MIS Quarterly,107-136.

Alexander, S. (2001). E-learning Developments and Experiences. Education and Training,43(4/5).

Ali, A. (2004). Issues & challenges in implementing e-learning in Malaysia. Retrieved January,18,2008.

Alsabawy, A., Cater, S., & Soar, J. (2013). IT Infrastructure Services as A Requirement for E-Learning System Success. Computers & Education,69,431-451.

Alshwaier, A., Youssef, A., & Emam, A. (2012). A new Trend for E-learning in KSA using educational clouds. Advanced Computing: An International Journal(ACIJ),3(1),81-97.

Alvan, A., Ranjdoust, S., & Talebi, B. (2013). The Study of E - Learning Challenges in Primary Schools from the Viewpoint of Teachers in Julfa Region. MAGNT Research Report,416-419.

Anderson, T., Annand, D., & Wark, N. (2005). The search for learning community in learner paced distance education, Australasian Journal of Educational Technology,21(2).

Andersson, A. (2008). Seven major challenges for e-learning in developing countries, International Journal of Education and Development using Information and Communication Technology,45-62.

Andersson, A., & Grönlund, Å. (2009). A conceptual framework for e-learning in developing countries, The Electronic Journal of Information Systems in Developing Countries,1-16.

Anohina-Naumeca, A., & Grundspenkis, J. (2012). Concept Maps as a Tool for Extended Support of Intelligent Knowledge Assessment. In Proceedings of the 5th International Conference on Concept Mapping. Malta.

Anwar, M., & Niwaz, A. (2011). Experience of E-Learning in Pakistan: Perceptions and Suggestions of Graduates Students. International Journal of Academic Research,373.

Arabasz, P., Pirani, J., & Fawcett, D. (2003). Supporting e-learning in higher education, Impact and challenges of e-learning. EDUCAUSE,39-47.

Arbaugh, J. B. (2002). Managing the on-line classroom. The Journal of High Technology Management Research,13(2),203-223.

Arnold, S. D. (2014). Assessing Student Learning Online. Digital Systems for Open Access to Formal and Informal Learning,83-100.

Information Technology & People

Ashby, A. (2004). Monitoring Student Retention in the Open University: Definition, Measurement, Interpretation and Action. The Journal of Open, Distance and e-Learning,65-77.

Attwell, G. (2004). E-Learning and Sustainability. The University Of Bremen, Lefo Learning Folders Project.

Azer, M., & El-Sherbini, A. (2011). Cultural challenges in developing e-learning content. International Journal of Emerging Technologies in Learning(iJET),6(1).

Bailey, C., & Card, K. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. The Internet and Higher Education,12(3),152-155.

Baruchson-Arbib, S., & Yaari, E. (2004). Printed versus Internet plagiarism: A study of students' perception. International Journal of Information Ethics,1(6),29-35.

Bates, A. T. (2005). Technology, e-learning and distance education. Routledge.

Bates, A. (1990). Interactivity as a criterion for media selection in distance learning. In Annual Conference of Asian Association of Open Universities. Jakarta, Indonesia

Bates, A. (1990). Third Generation Distance Education: The Challenge of New Technology. Educational Resources Information Centre.

Bayne, S. (2015). What's the matter with 'technology-enhanced learning'? Learning, Media and Technology,40(1),5-20.

Becker, K., Newton, C., & Sawang, S. (2013). A learner perspective on barriers to e-learning. Australian Journal of Adult Learning, 53(2), 211.

Becking, D., Betermieux, S., Bomsdorf, B., Birgit, F., Heuel, E., Langer, P., & Schlageter, G. (2004). Didactic profiling: supporting the mobile learner. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,2004,(1),1760-1767. Chesapeake, Association for the Advancement of Computing in Education.

Bell, M., Martin, G., & Clarke, T. (2004). Engaging in the future of e-learning: a scenarios-based approach. Education+ Training,296-307.

Berryman, J. (2004). E-government: Issues and Implications for Public Libraries. The Australian Library Journal,53(4),349-359.

Bhat, A. & Shetty, S. (2015). Higher Education-Ethical Issues and Challenges. Nitte University, Higher Education: Special Emphasis on Management Education.

Black, E. (1992). Faculty Support for University Distance Education. International Journal of E-Learning & Distance Education,7(2),5-29.

Blignaut, A., & Els, C. (2010). Comperacy Assessment of Postgraduate Students' Readiness for Higher Education. The Internet and Higher Education,13(3),101-107.

Boezerooij, P., Wende, M., & Huisman, J. (2007). The Need for E-Learning Strategies: Higher Education Institutions and Their Responses to a Changing Environment. Tertiary Education and Management,13(4),313-330.

Information Technology & People

Bozkaya, M., & Kumtepe, E. (2012). A Content Analysis of TOJET(2008-2011). Turkish Online Journal of Educational Technology,11(2),264-277.

Brown, I., & Snow, C. (1999). A proxy approach to email security. Software:Practice and experience,1049-1060.

Brusilovsky, P. (2003). Adaptive navigation support in educational hypermedia: The role of student knowledge level and the case for meta-adaptation. British Journal of Educational Technology,487-497.

Bryer, T., & Chen, B. (2012). Investigating instructional strategies for using social media in formal and informal learning. The International Review of Research in Open and Distributed Learning,13(1),87-104.

Burge, E., & Lenksyj, H. (1990). Women studying in distance education: Issues and principles. International Journal of E-Learning & Distance Education,5(1),20-37.

Campbell, M., Gibson, W., Hall, A., Richards, D., & Callery, P. (2000). Online vs. face-to-face discussion in a web-based research methods course for postgraduate nursing students. International Journal of Nursing Studies, 750-759.

Cantoni, V., Cellario, M., & Porta, M. (2004). Perspectives and challenges in e-learning. Journal of Visual Languages & Computing,333-345.

Cárdenas, R., & Sánchez, E. (2005). Security challenges of distributed e-learning systems. Advanced Distributed systems,328-344.

Carr, J. (1999). The Role of Higher Education in the Effective Delivery of Multimedia Management Training to Small and Medium-Sized Enterprises. Educational Technology & Society

Chatzara, K., Karagiannidis, C., & Stamatis, D. (2012). Emotional Interaction in e-Learning. Research on e-Learning and ICT in Education,253-265.

Chen, M. (2009). An evaluation of the ELNP e-learning quality assurance program. Journal of Educational Technology & Society,12(1),18-33.

Chroust, G. (2007). Software like a courteous butler–Issues of Localization under Cultural Diversity. In Proceedings of the 51st Annual Meeting of the ISSS-2007, 51(2).

Chua, A. (2009). The dark side of successful knowledge management initiatives. Journal of Knowledge Management,13(4),32-40.

Collopy, R., & Arnold, J. (2009). To Blend or Not to Blend: Online and Blended Learning Environments in Undergraduate Teacher Education. Issues in Teacher Education,18(2),85-101.

Cook, J., Holley, D., & Andrew, D. (2007). A stakeholder approach to implementing e-learning in a university. British Journal of Educational Technology,38(5),784-794.

Czerniewicz, L., & Brown, C. (2009). A study of the relationship between institutional policy, organisational culture and e-learning use in four South African universities. Computers & Education,53(1),121-131.

Darabi, A., Sikorski, E., & Harvey, R. (2006). Validated competencies for distance teaching. Distance Education,27(1),105-122.

Information Technology & People

Daugherty, M., & Funke, B. (1998). University faculty and student perceptions of Web-based instruction. Journal of Distance Education,13(1),21-39.

Davie, L., & Wells, R. (1991). Empowering the learner through computer-mediated communication. American Journal of Distance Education,5(1),15-23.

De Freitas, S., & Oliver, M. (2005). Does E-learning Policy Drive Change in Higher Education? Journal of Higher Education Policy and Management,27(1),81-96.

Digión, L., & Sosa, M. (2012). Communicability and Usability for the Interface in e-Learning. Advances in New Technologies, Interactive Interfaces and Communicability,165-175.

Dogan, T. (2015). Integrating Field of Communication to the Distance Education(DE). Identification, Evaluation, and Perceptions of Distance Education Experts,17.

Drago, W., Peltier, J., & Sorensen, D. (2002). Course content or the instructor: Which is more important in on-line teaching? Management Research News,25(6/7),69-83.

Dudeney, G., Hockly, N., & Pegrum, M. (2013). Digital literacies. Harlow: Pearson.

Duveskog, M., Sutinen, E., & Cronje, J. (2014). Design milieux for learning environments in African contexts. British Journal of Educational Technology,45(4),5.

Economides, A. (2008). Culture-aware collaborative learning. Multicultural Education & Technology Journal,2(4),243-267.

Egi, H., Ozawa, S., & Mori, Y. (2014). Analyses of comparative gaze with eye-tracking technique for peer-reviewing classrooms. In Advanced Learning Technologies(ICALT),2014 IEEE 14th International Conference on,733-738.

Eisenberg, M., & Johnson, D. (1996). Computer skills for information problem-solving: Learning and teaching technology in contex. ERIC Clearinghouse on Information and Technology.

Elango, R., Gudep, V., & Selvam, M. (2008). Quality of e-learning: An analysis based on elearners' perception of e-learning. The Electronic Journal of e-Learning,6(1),31-44.

Eliason, S., & Holmes, C. (2010). Reflective practice and inquiry in professional development for online teaching. Journal of Online Learning and Teaching,6(2).

Elloumi, F. (2004). Value chain analysis: A strategic approach to online learning. Theory and practice of online learning,61.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? Educational technology research and development,53(4),25-39.

Esposito, A. (2012). Research Ethics in Emerging Forms of Online Learning: Issues Arising from a Hypothetical Study on a MOOC. Electronic Journal of e-Learning,10(3),315-325.

Farid, S., Ahmad, R., Niaz, I., Itmazi, J., & Asghar, K. (2014). Identifying perceived challenges of e-learning implementation. In First International Conference on Modern Communication & Computing Technologies.

Flores, R., Ari, F., Inan, F., & Arslan-Ari, I. (2012). The Impact of Adapting Content for Students with Individual Differences. Educational Technology & Society,251-261.

Information Technology & People

Forman, D., & Nyatanga, L. (2002). E-learning and educational diversity. Nurse Education Today,22(1),76-82.

Foulger, T., Ewbank, A., Kay, A., Popp, S., & Carter, H. (2009). Preservice teachers' perspectives about ethical issues in social networking. Journal of Research on Technology in Education, 42(1),1-28.

Frank, M., Kurtz, G., & Levin, N. (2002). Implications of presenting pre-university courses using the blended e-learning approach. Journal of Educational Technology & Society,5(4),137-147.

Fu, J. S. (2013). A critical literature review and its implications. International Journal of Education and Development using Information and Communication Technology,9(1),112.

Fyfe, S. (2000). Collaborative learning at a distance. In Flexible futures in tertiary teaching. Proceedings of the 9th annual teaching learning forum,2-4. Perth, Australia.

Galusha, J. (1998). Barriers to learning in distance education. ERIC,1-23.

Garrison, D., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. The internet and higher education,7(2),95-105.

Gibson, C., & Graff, A. (1992). Impact of adults' preferred learning styles and perception of barriers on completion of external baccalaureate degree programmes. Journal of Distance Education,39-51.

Govender, D., & Chitanana, L. (2016). Perception of Information and Communications Technology(ICT) for Instructional Delivery at a University: From Technophobic to Technologically Savvy. African Journal of Information Systems,8(2).

Goyal, E., Purohit, S., & Bhagat, M. (2010). Factors that affect information and communication technology usage: A case study in Management Education. Journal of information technology management,21(4),38.

Graham, C. R., Woodfield, W., & Harrison, J. (2013). A framework for institutional adoption and implementation of blended learning in higher education. The internet and higher education,18,4-14.

Gudanescu, N. (2010). Using modern technology for improving learning process at different educational levels. Procedia-Social and Behavioral Sciences,2(2),5641-5645.

Gulati, S. (2008). Technology-Enhanced Learning in Developing Nations. International Review of Research in Open and Distance Learning,1-16.

Güllü, F., Kuusik, R., Shogenov, K., Laanpere, M., Oysal, Y., Sözcü, Ö., & Parlak, Z. (2016). An Analysis and Comparison of Adoption of E-learning Systems in Higher Education by Lecturers at Largest Universities in Estonia and Turkey. Baltic Journal of Modern Computing,4(3),428-440.

Gutiérrez-Santiuste, E., & Gallego-Arrufat, M. (2016). Barriers in computer-mediated communication: typology and evolution over time. Journal of e-Learning and Knowledge Society,12(1),107-119.

Guy, R. (2012). The use of social media for academic practice: A review of literature. Kentucky Journal of Higher Education Policy and Practice,1(2),7.

Hepworth, M., & Duvigneau, S. (2013). An Investigation into the Development of an Institutional Strategy to Build Research Capacity and Information Literate, Critical Thinking, Independent

Information Technology & People

Learners in Three African Universities. In Worldwide Commonalities and Challenges in Information Literacy Research and Practice,86-92.

Hiemstra, R. (1994). Computerized Distance education: the role of facilitators. Educational Technology,179.

Higgs, J. (1997). Barriers to the Effective Use of Technology in Education. Journal of Educational Computing,17(4),385-395.

Hölscher, C., & Strube, G. (2000). Web search behavior of Internet experts and newbies. Computer networks,337-346.

Holt, D., & Challis, D. (2007). From policy to practice: One university's experience of implementing strategic change through wholly online teaching and learning. Australasian Journal of Educational Technology,23(1),110-131.

Homan, G., & Macpherson, A. (2005). E-learning in the corporate university. Journal of European Industrial Training,29(1),75-90.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative health research,15(9),1277-1288.

Hussain, I. (2007). A study of students attitude towards virtual education in Pakistan. Turkish Online Journal of Distance Education,69-79.

Hylén, J. (2006). Open educational resources: Opportunities and challenges. Proceedings of Open Education,49-63.

Inglis, A. (2007). Approaches taken by Australian universities to documenting institutional e-learning strategies. ICT: Providing choices for learners and learning, Proceedings ACILITE,419-427.

Iqbal, M., & Ahmad, M. (2010). Enhancing quality of education through e-learning: the case study of Allama Iqbal Open University. Turkish Online Journal of Distance Education,11(1).

Ivergård, T., & Hunt, B. (2005). Towards a learning networked organisation: human capital, compatibility and usability in e-learning systems. Applied ergonomics,36(2),157-164.

Jager, A., & Lokman, A. (1999). Impacts of ICT in education. The role of the teacher and teacher training. The European Conference on Educational Research,22-25. Lahti, Finland.

Jara, M., & Mellar, H. (2009). Factors affecting quality enhancement procedures for e-learning courses. Quality Assurance in Education,17(3),220-232.

Jarvis, H., & Szymczyk, M. (2010). Student views on learning grammar with web-and book-based materials. ELT journal,64(1),32-44.

Jensen, M., Mondrup, F., Lippert, F., & Ringsted, C. (2009). Using e-learning for maintenance of ALS competence. Official journal of european resuscitation council,903-908.

Johns, J., & Woolf, B. (2006). A dynamic mixture model to detect student motivation and proficiency. In Proceedings of the National Conference on Artificial Intelligence,163. Cambridge, London

Information Technology & People

Joo, Y., Bong, M., & Choi, H. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and internet self-efficacy in web-based instruction. Educational Technology Research and Development,5-17.

Joy, S., & Kolb, D. (2009). Are there cultural differences in learning style? International Journal of Intercultural Relations,33(1),69-85.

Kaleta, R., Skibba, K., & Joosten, T. (2007). Discovering, designing, and delivering hybrid courses. Blended learning: Research perspectives,111-143.

Karaman, S., Kucuk, S., & Aydemir, M. (2014). Evaluation of an online continuing education program from the perspective of new graduate nurses. Nurse education today,34(5),836-841.

Kay, R. (2006). Evaluating strategies used to incorporate technology into preservice education: A review of the literature. Journal of research on technology in education,38(4),383-408.

Kelly, M. (1990). Course creation issues in distance education. Education at a distance: From issues to practice,77-99.

Keramidas, C., Ludlow, B., Collins, B., & Baird, C. (2007). Saving your sanity when teaching in an online environment: Lessons learned. Rural Special Education Quarterly,26(1),28.

Kim, K. J., Liu, S., & Bonk, C. (2005). Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. The internet and Higher Education,339-341.

Kipsoi, E. J., Chang'ach, J., & Sang, H. (2012). Challenges facing adoption of information communication technology(ICT) in educational management in schools in Kenya. Journal of sociological Research,3(1),18.

Klasnić, K. et al. Quality parameters for the e-learning Omega system, Proceedings of the ITI 2008 30th International Conference on Information Technology Interfaces, 2008. 519-526

Kolb, D. (2005). The Kolb learning style inventory version 3.1: Self-scoring and interpretation booklet. Boston, MA: Hay Group Transforming Learning.

Koller, V., Harvey, S., & Magnotta, M. (2008). Technology-based learning strategies. Washington: Social Policy Research.

Kosak, L., Manning, D., Dobson, E., Rogerson, L., Cotnam, S., Colaric, S., & McFadden, C. (2004). Prepared to teach online? Perspectives of faculty in the University of North Carolina system. Online Journal of Distance Learning Administration,7(3).

Kukulska-Hulme, A. (2009). Will mobile learning change language learning? ReCALL,21(02),157-165.

Kwofie, B., & Henten, A. (2011). The advantages and challenges of e-learning implementation: The story of a developing nation. WCES-3RD World Conference on Educational Sciences,13-14. Istanbul, Turkey: WCES.

Lanzilotti, R., Montinaro, F., & Ardito, C. (2009). Influence of Students' Motivation on Their Experience with E-Learning Systems: An Experimental Study. Universal Access in Human-Computer Interaction. Applications and Services,63-72.

Lareki, A., de Morentin, J., & Amenabar, N. (2010). Towards an efficient training of university faculty on ICTs. Computers & Education,54(2), 491-497.

Information Technology & People

Lee, B., Yoon, J., & Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. Computers & Education,53(4),1320-1329.

Leem, J., & Lim, B. (2007). The current status of e-learning and strategies to enhance educational competitiveness in Korean higher education. The International Review of Research in Open and Distance Learning,8(1).

Lester, J., & Perini, M. (2010). Potential of social networking sites for distance education student engagement. New Directions for Community Colleges,150,67-77.

Levy, S. (2003). Six factors to consider when planning online distance learning programs in higher education. Online Journal of Distance Learning Administration,6(1).

Levy, Y., Ramim, M., & Hackney, R. (2013). Assessing ethical severity of e-learning systems security attacks. The Journal of Computer Information Systems,53(3),75.

Lewis, D., & Chen, E. (2009). Factors leading to a quality e-learning experience. Online Education and Adult Learning. New Frontiers for Teaching Practices: New Frontiers for Teaching Practices,101.

Liao, H., Liu, S. H., Pi, S., & Chou, Y. (2011). Factors Affecting Lifelong Learners' Intention to Continue Using E-Learning Website. New Horizons in Web-Based Learning,112-119.

Liaw, S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning. Computers & Education,51(2),864-873.

Lim, C., Chai, C., & Churchill, D. (2011). A framework for developing pre-service teachers' competencies in using technologies to enhance teaching and learning. Educational Media International,48(2),69-83.

Lin, C. (2010). Analysis of the e-learning innovation process in higher education. Doctoral dissertation, University of Nottingham.

Little, B. (2003). Achieving high performance through e-learning. Industrial and Commercial Training,203-207.

Liu, S., Liao, H., & Pratt, J. (2009). Impact of media richness and flow on e-learning technology acceptance. Computers & Education,52(3),599-607.

Liu, Y., Han, S., & Li, H. (2010). Understanding the factors driving m-learning adoption: a literature review. Campus-Wide Information Systems,27(4),210-226.

Loh, J., & Smyth, R. (2010). Understanding students' online learning experiences in virtual teams. Journal of Online Learning and Teaching,6(2),335-342.

Lopes, C. (2007). Evaluating e-learning readiness in a health sciences higher education institution. In IADIS International Conference ELearning.

Lu, T., & Chen, X. (2007). Usability Assessment of an E-Learning Courseware for Basic Cataloging. Human-Computer Interaction. HCI Applications and Services,198-207.

Mackintosh, W. (2005). Can you Lead from Behind? Critical Reflections on the Rhetoric of E-Learning, Open Distance Learning, and ICTs for Development in Sub-Saharan Africa(SSA). In A. Carr-Chellman, Global prespective on e-learning:Rhetoric and reality,179-197.

Information Technology & People

Mahanta, D., & Ahmed, M. (2012). E-Learning Objectives, Methodologies, Tools and its Limitation. International Journal of Innovative Technology and Exploring Engineering,46-51.

Mahmoodi-Shahrebabaki, M. (2014). E-learning in Iran as a developing Country: Challenges ahead and possible solutions. International Journal of Research in Education Methodology,788-795.

Maki, C., & Charalambous, K. (2014). Cyprus public secondary general education school administrators' self-perceived competence and challenges in using ICT for administrative and managerial purposes. In World Conference on Educational Multimedia, Hypermedia and Telecommunications,14(1),3366-3376.

Marshall, S. (2010). Change, technology and higher education: are universities capable of organisational change? Australasian Journal of Educational Technology,26(8).

Marzilli, C., Delello, J., Marmion, S., McWhorter, R., Roberts, P., & Marzilli, T. (2014). Faculty attitudes towards integrating technology and innovation.

Masalela, R. (2011). Implementing e-Learning at the University of Botswana. Online Journal of Distance Learning Administration,14(2).

Mason, R., & Weller, M. (2000). Factors affecting students' satisfaction on a web course. Australasian Journal of Educational Technology,16(2).

Masoumi, D. (2010). Critical factors for effective eLearning. Goteburg University.

Mayo, N., Kajs, L., & Tanguma, J. (2005). Longitudinal Study of Technology Training to Prepare Future Teachers. Educational Research Quarterly,29(1),3-15.

McCausland, S. (2005). The Conditions Which Facilitate and Challenge Online Support Staff's Services for Web-Based College Courses: A Case Study. Calgary: Doctoral dissertation, University of Calgary.

McInnerney, J., & Roberts, T. (2004). Online learning: Social interaction and the creation of a sense of community. Journal of Educational Technology & Society,7(3),73-81.

Medárová, V., Bures, V., & Otcenásková, T. (2012). A review of obstacles to successful e-learning deployment in SMEs. *Journal of Innovation Management in Small & Medium Enterprises*, *2012*, 1.

Meyer, J., & Barefield, A. (2010). Infrastructure and administrative support for online programs. Online Journal of Distance Learning Administration,13(3).

Miliszewska, A. (2011). Reflections on a Trial Implementation of an E-Learning Solution in a Libyan University. Issues in Informing Science and Information Technology,61-76.

Miller, I., & Schlosberg, J. (1997). Guide to distance learning: Graduate education that comes to your home. New York: Kaplan Books.

Mircea, M., & Andreescu, A. (2011). Using cloud computing in higher education. Communications of the IBIMA,2011,1-15.

Mokhtar, I. (2005). Education in the information age–a preliminary study of the changing roles of school teachers in Singapore. Educational Research for Policy and Practice,4(1),27-45.

Information Technology & People

Mtebe, J., & Raisamo, R. (2014). A model for assessing learning management system success in higher education in sub-saharan Countries. The Electronic Journal of Information Systems in Developing Countries,61.

Muhammad, A., Ahamd, F., & Shah, A. (2015). Resolving Ethical Dilemma in Technology Enhanced Education through smart mobile devices. International Arab Journal of e-Technology,4(1),25-31.

Muir-Herzig, R. (2004). Technology and its impact in the classroom. Computers & Education,42(2),111-131.

Nagunwa, T., & Lwoga, E. (2012). Developing eLearning technologies to implement competency based medical education: Experiences from Muhimbili University of Health and Allied Sciences. International Journal of Education and Development using Information and Communication Technology,7-12.

Naismith, L. (2007). Using text messaging to support administrative communication in higher education. Active Learning in Higher Education,8(2),155-171.

Nawaz, A., & Khan, M. (2012). Issues of technical support for e-Learning systems in higher education institutions. International Journal of Modern Education and Computer Science,4(2),38.

Ngimwa, P., & Wilson, T. (2012). An empirical investigation of the emergent issues around OER adoption in Sub-Saharan Africa. Learning, Media and Technology,37(4),398-413.

Nikoi, S., & Edirisingha, P. (2008). What can we learn from a WoLF? Mobile learning lessons from an HE in FE project. Association for Learning Technology Annual Conference. Leeds.

Nim Park, C., & Son, J. (2009). Implementing computer-assisted language learning in the EFL classroom: Teachers' perceptions and perspectives. International Journal of Pedagogies and Learning,5(2),80-101.

Nor, M., & Mohamad, A. (2013). Challenges in Accepting the E-Learning System: The Case of E-Learners from Different Backgrounds of Study. 3rd International Conference For e-learning & Distance Education,1-14.

Nwabufo, B., Umoru, T., & Olukotun, J. (2013). The Challenges of E-Learning in Tertiary Institutions in Nigeria. International conference the future of education

Ocak, M. (2011). Why are faculty members not teaching blended courses? Insights from faculty members. Computers & Education,56(3),689-699.

Oh, E., & Park, S. (2009). How are universities involved in blended instruction? Journal of Educational Technology & Society,12(3),327-342.

Okine, R., Agbemenu, A., & Marfo, J. (2012). Access to Internet Connectivity: The Major Bottleneck to the Adoption of Technology-Enabled Education.

Oliver, R. (2001). Assuring the quality of online learning in Australian higher education. Proceedings of 2000 Moving Online Conference,222-231.

Olt, M. (2002). Ethics and distance education: Strategies for minimizing academic dishonesty in online assessment. Online journal of distance learning administration,5(3).

Information Technology & People

Omwenga, E. (2006). Pedagogical issues and e-learning cases, School of Computing and Informatics,1-11.

Ong, C., Lai, J., & Wang, Y. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. Information & management,41(6),795-804.

Ostwald, M. (1992). The Application of Problem Based Learning to Distance Education. World Conference of the International Council for Distance Education. Bangkok, Thailand: ERIC.

Ozudogru, F., & Hismanoglu, M. (2016). Views of Freshmen Students on Foreign Language Courses Delivered via E-Learning. Turkish Online Journal of Distance Education,17(1),31-47.

Pachler, N., Bachmair, B., & Cook, J. (2009). Mobile learning: structures, agency, practices. New York: Springer Science & Business Media.

Pagram, P., & Pagram, J. (2006). Issues in e-learning: A THAI Study. EJISDC,1-8.

Park, S. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. Educational Technology & Society,150-162.

Parrish, M., Klem, J., & Brown, D. (2012). A Comparison of Traditional Learning Theories With Learning Styles and Cultural Values of Native American Students. Ideas and Research You Can Use,1-9.

Paul, R., & Chen, S. (2003). Individual differences in web-based instruction-an overview. British Journal of Educational Technology,385-392.

Pedrelli, M. (2001). Developing countries and the ICT revolution. Luxembourg: European Parliament.

Pegrum, M. (2009). The future of digital technologies in education. UWA publishing.

Pegrum, M., Oakley, G., & Faulkner, R. (2013). A study of the adoption of mobile handheld technologies in Western Australian independent schools. Australasian Journal of Educational Technology,29(1).

Picciano, A., & Seaman, J. (2007). A survey of U.S. school districts administrators. USA: Sloan-C.

Piccoli, G., Ahmad, R., & Ives, B. (2001). A research framework and a preliminary assessment of effectiveness in basic IT skills training. MIS Quarterly,401-426.

Pintrich, P., & De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic. Journal of Educational Psychology,33-40.

Pituch, K., & Lee, Y. (2006). The influence of system characteristics on e-learning use. Computers & Education,47(2),222-244.

Põldoja, H., Väljataga, T., Laanpere, M., & Tammets, K. (2014). Web-based self-and peer-assessment of teachers' digital competencies. World Wide Web,17(2),255-269.

Poon, W., & Koo, A. (2010). Mobile learning: the economics perspective. International Journal of Innovation and Learning,7(4),412-429.

Prakasam, A. R. (2013). Enhancing cloud based E-learning using knowledge sharing system. E-learning,84(9).

Information Technology & People

Pratas, E., & Marques, V. (2012). Adaptive e-Learning Systems Foundational Issues of the ADAPT Project. Computational Intelligence and Decision Making Intelligent Systems, Control and Automation: Science and Engineering,429-438.

Pratt, D. (1991). Conceptions of self within China and the United States. International Journal of Intercultural Relations,15(3),285-310.

Qureshi, I., Ilyas, K., Yasmin, R., & Whitty, M. (2012). Challenges of implementing e-learning in a Pakistani university. Knowledge Management & E-Learning,310-324.

Qureshi, Q., Nawaz, A., & Khan, N. (2011). Prediction of the problems, user-satisfaction and prospects of e-learning in HEIs of KPK, Pakistan. International Journal of Science and Technology Education Research,2(2),13-21.

Radijeng, K. (2010). Open access in institutions of higher learning in Botswana. World library and information congress: 76th IFLA General conference and assembly,10-15.

Ray, J. (2009). Faculty perspective: Training and course development for the online classroom. Journal of Online Learning and Teaching,5(2),263-276.

Reeves, T., & Li, Z. (2012). Teachers' technological readiness for online professional development: evidence from the US e-Learning for Educators initiative. Journal of Education for Teaching,38(4),389-406.

Reilly, J., Vandenhouten, C., Gallagher-Lepak, S., & Ralston-Berg, P. (2012). Faculty Development for E-Learning: A Multi-Campus Community of Practice(COP) Approach. Journal of Asynchronous Learning Networks,16(2),99-110.

Reynolds, K., Becker, K., & Fleming, J. (2013). Contemporary Challenges in E-learning. Workforce Development,269-282.

Rhode, J. (2009). Interaction equivalency in self-paced online learning environments: An exploration of learner preferences. The International Review of Research in Open and Distributed Learning,10(1).

Roy, A., & Raymond, L. (2005). e-Learning in support of SME. In Proceedings of 5th European Conference on E-Learning,383-388.

Rutkowski, A., Vogel, D., Van Genuchten, M., Bemelmans, T., & Favier, M. (2002). E-collaboration: The reality of virtuality. Professional Communication, IEEE Transactions on,45(4),219-230.

Ryu, H., & Parsons, D. (2012). Risky business or sharing the load? Social flow in collaborative mobile learning. Computers & Education,58(2),707-720.

Saadé, R. (2003). Web-based educational information system for enhanced learning, Journal of Information Technology Education,2(1),267-277.

Salaway, G., Caruso, J., & Nelson, M. (2008). The ECAR study of undergraduate students and information technology 2008. EDUCAUSE Center for Applied Research. Colorado: Boulder.

Sambrook, S. (2003). E-learning in small organisation. Technical Education and Industrial Training,506-516.

Information Technology & People

Sana, A., & Mariam, H. (2013). Use of Information and Communication technologies in E-learning System of Pakistan-a comparison study. International Journal of Computer Science and Electronics Engineering,528-533.

Sangi, N. A. (2008). Electronic assessment issues and practices in Pakistan. Learning, Media and Technology,33(3),191-206.

Sarawak, M. (2004). Transforming Knowledge into Wisdom Holistic Approaches to Teaching and Learning. 27th HERDSA Annual Conference,252. Australia: Higher Education Research and Development Society of Australia.

Saxena, A., & Yadav, R. (2013). Impact Of Mobile Technology On Libraries: A Descriptive Study. International Journal of Digital Library Services,1-13.

Scanlon, P. M. (2003). Student online plagiarism: how do we respond? College Teaching,51(4),161-165.

Schott, M., Chernish, W., Dooley, K., & Lindner, J. (2003). Innovations in Distance Learning Program Development and Delivery. Online Journal of Distance Learning

Schrum, L., & Hong, S. (2002). From the Field: Characteristics of Successful Tertiary Online Students and Strategies of Experienced Online Educators. Education and Information Technologies,5-16.

Selim, H. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. Computer & Education,396-413.

Selwyn, N. (2007). The use of computer technology in university teaching and learning: a critical perspective. Journal of computer assisted learning,23(2),83-94.

Shaikh, Z. (2009). Usage, acceptance, adoption, and diffusion of information and communication technologies in higher education. Journal of Information Technology Impact,9(2),63-80.

Sharma, R. (2003). Barriers in using technology for education in developing countries. World Conference on Education for All,512-516. Browse Conference Publications.

Sharples, M., Taylor, J., & Vavoula, G. (2005). Towards a theory of mobile learning. Proceedings of mLearn 2005,1(1),1-9.

Shelton, K. (2011). A review of paradigms for evaluating the quality of online education programs. Online Journal of Distance Learning Administration,14(1).

Shonola, S., & Joy, M. (2014). Learners' Perception on Security Issues in M-learning(Nigerian Universities Case Study). Exchanges, Warwick Research Journal,2(1),102-122.

Sife, A., Lwoga, E., & Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. International Journal of Education and Development using Information and Communication Technology,57-67.

Song, S., & Keller, J. (2001). Effectiveness of Motivationally Adaptive Computer-Assisted Instruction on the Dynamic Aspects of Motivation. ETR&D,5-22.

Soong, M., Chan, H., Chua, B., & Loh, K. (2001). Critical success factors for on-line course resources. Computer & Education,101-120.

Information Technology & People

Staats, S., Hupp, J., Wallace, H., & Gresley, J. (2009). An examination of academic dishonesty and students' views on why professors don't report cheating. Ethics & Behavior,19(3),171-183.

Stahl, B., Rogerson, S., & Wakunuma, K. (2009). The matter of emergent ethical issues in their development. In Future Computing, Service Computation, Cognitive, Adaptive, Content, Patterns,603-607.

Stahl, G., Koschmann, T., & Suthers, D. (2006). Computer-supported collaborative learning: An historical perspective. Cambridge handbook of the learning sciences,409-426.

Stansfield, M., Connolly, T., Cartelli, A., Jimoyiannis, A., Magalhães, H., & Maillet, K. (2009). The Identification of Key Issues in the Development of Sustainable e-Learning and Virtual Campus Initiatives. Electronic Journal of e-Learning,7(2),155-164.

Suleiman, J., & Watson, R. (2008). Social loafing in technology-supported teams. Computer Supported Cooperative Work,17(4),291-309.

Sun, P., & Cheng, H. (2007). The design of instructional multimedia in e-Learning: A Media Richness Theory-based approach. Computers & education,49(3),662-676.

Sun, P., Tsai, R., Finger, G., Chen, Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. Computers & education,50(4),1183-1202.

Surry, D., Ensminger, D., & Jones, M. (2005). A model for integrating instructional technology into higher education. British journal of education technology,327-329.

Swan, K. (2004). Learning online: A review of current research on issues of interface, teaching presence and learner characteristics. Elements of quality online education,5, 63-79.

Sweeney, J., O'donoghue, T., & Whitehead, C. (2004). Traditional face-to-face and web-based tutorials: a study of university students' perspectives on the roles of tutorial participants. Teaching in Higher Education,9(3),311–323.

Tao, Y., Cheng, C., & Sun, S. (2012). Alignment of Teacher and Student Perceptions on the Continued use of Business Simulation Games. Educational Technology & Society,15(3),177-189.

Taylor, C. (1976). Hermeneutics and politics. Critical sociology,153-193.

Tedre, M., Ngumbuke, F., & Kemppainen, J. (2010). Infrastructure, human capacity, and high hopes: A decade of development of e-Learning in a Tanzanian HEI. RUSC. Revista de Universidad y Sociedad del Conocimiento,7(1).

Teo, T. (2011). Modeling the determinants of pre-service teachers' perceived usefulness of e-learning. Campus-Wide Information Systems,28(2),124-140.

Teo, T., & Wong, S. (2013). Modeling key drivers of e-learning satisfaction among student teachers. Journal of Educational Computing Research,48(1),71-95.

Tham, C., & Werner, J. (2005). Designing and evaluating e-learning in higher education: A review and recommendations. Journal of leadership & organizational studies,11(2),15-25.

Information Technology & People

Thurmond, V., Wambach, K., Connors, H., & Frey, B. (2002). Evaluation of student satisfaction: Determining the impact of a web-based environment by controlling for student characteristics. The American journal of distance education,16(3),169-190.

Timmerman, C., & Kruepke, K. (2006). Computer-assisted instruction, media richness, and college student performance. Communication Education,55(1),73–104.

Traina, M., Doctor, D., Bean, E., & Wooldridge, V. (2005). Student code of conduct in the online classroom: A consideration of zero tolerance policies. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,2005(1),1855-1863.

Traxler, J. (2010). Will Student Devices Deliver Innovation, Inclusion, and Transformation? Journal of the Research Center for Educational Technology,6(1),3-15.

Tricker, T., Rangecroft, M., Long, P., & Gilroy, P. (2001). Evaluating distance education courses: the student perception. Assessment & Evaluation in Higher Education,26(2),165-177.

Trippe, A. (2002). Training for distance learning faculty. Distance Education Online Symposium,12.

Tusubira, F., & Mulira, N. (2004). Challenges and best practice recommendations based on the experience of Makerere University and other organizations. Universities – Taking a Leading Role in ICT Enabled Human Development,1-9.

Ünal, Y., Alır, G., & Soydal, İ. (2013). Students Readiness for E-Learning: An Assessment on Hacettepe University Department of Information Management,35-40.

Valcke, M. (2004). ICT in higher education: An uncomfortable zone for institutes and their policies. In Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference,20-35. Perth: ASCILITE.

van Leusen, P., & Millard, M. (2013). Developing Effective Relationships with Online Faculty-A Multiple Case Study. In World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,2013(1),2150-2158.

van't Hooft, M. (2008). Mobile, wireless, connected: Information clouds and learning. Emerging technologies for learning,3,30-46.

Veeramani, M. (2010). E-Learning: A conceptual framework. International journal of educational research and technology,1(2),20-24.

Vencatachellum, I., & Munusam, V. (2006). Barriers to effective Corporate E-Learning in Mauri Tius. http://www.ufhrd.co.uk/wordpress/wp-content/uploads/2008/06/1-1_vencatachellum_munusami.pdf

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. Information Systems Research,342-365.

Vonderwell, S. (2003). An examination of asynchronous communication experiences and perspectives of students in an online course: a case study. The Internet and Higher Education,6(1),77-90.

Voogt, K. (2009). E-learning course design in teacher design teams: Experiences in the Open University of Tanzania. 13th Biannual Conference for Research on Learning and Instruction in Amsterdam,1-16. Amsterdam.

Information Technology & People

Voyler, T., & Lord, D. (2000). Critical Success Factor in Online Education. The International Journal of Educational Management, 40(6),1282-1309.

Vrasidas, C. (2004). Issues of pedagogy and design in e-learning systems. In Proceedings of the 2004 ACM symposium on Applied computing,911-915.

Wang, Q., Zhu, Z., Chen, L., & Yan, H. (2009). E-learning in China. Campus-Wide Information Systems,77-81.

Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. Computers & education, 54(4),1202-1211.

Weaver, D., Robbie, D., & Borland, R. (2008). Designing a professional development program for online teaching. International Journal on E-learning, 7(4),759-774.

Weaver, D., Spratt, C., & Nair, C. (2008). Academic and student use of a learning management system: Implications for quality. Australasian Journal of Educational Technology,24(1), 30-41.

Webster, J., & Hackley, P. (1997). Teaching effectiveness in technology-mediated distance learning. Academy of management journal,40(6),1282-1309.

Wheeler, S., Yeomans, P., & Wheeler, D. (2008). The good, the bad and the wiki: Evaluating student-generated content for collaborative learning. British journal of educational technology, 39(6),987-995.

Wiksten, D., Patterson, P., Antonio, K., De La Cruz, D., & Buxton, B. (1998). The effectiveness of an interactive computer program versus traditional lecture in athletic training education. Journal of athletic training,33(3),238.

Wild, R., Griggs, K., & Downing, T. (2002). A framework for e-learning as a tool for knowledge management. Industrial Management & Data Systems,102(7), 371-380.

Willis, B. (1994). Enhancing faculty effectiveness in distance education. Distance education: Strategies and tools,277-290.

Wong, S. K., Nguyen, T., Chang, E., & Jayaratna, N. (2003). Usability Metrics for E-learning. On The Move to Meaningful Internet Systems 2003: OTM 2003 Workshops,235-252.

Wu, D., & Hiltz, S. (2004). Predicting learning from asynchronous online discussions. Journal of Asynchronous Learning Networks, 8(2),139-152.

Yaakop, A. (2015). Understanding Students' Acceptance and Adoption of Web 2.0 Interactive EduTools. In Taylor's 7th Teaching and Learning Conference 2014 Proceedings,127-136, Singapore: Springer.

Yaghoubi, J., Malek Mohammadi, I., Iravani, H., & Attaran, M. (2008). Desired Characteristics of Faculty Members and Students in E-Learning in Higher Education of Iran: Virtual Students' Viewpoint. Quarterly journal of Research and Planning in Higher Education,14(1).

Yang, F., Fang, Y., & Wang, S. (2013). E-learning privacy: perceptions of east asian students. Hybrid learning and continuing education,256-268.

Information Technology & People

Yoo, S., Han, S., & Huang, W. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: A case from South Korea. Computers in Human Behavior,28(3),942-950.

Zamzuri, Z., Manaf, M., Ahmad, A., & Yunus, Y. (2011). Computer security threats towards the e-learning system assets. Software engineering and computer system, 335-345.

Zengin, B., Arikan, A., & Dogan, D. (2011). Opinions of English Major Students about Their Departments' Websites. Online Submission,2(4),294-307.

Information Technology & People