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Research and innovation in teaching and learning are prime topics for the *Journal of Instructional Technology and Distance Learning* (ISSN 1550-6908). The Journal was initiated in January 2004 to facilitate communication and collaboration among researchers, innovators, practitioners, and administrators of education and training involving innovative technologies and/or distance learning.

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In its first twelve years, the Journal logged over twelve million page views and more than two million downloads of Acrobat files of monthly journals and eBooks.

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Editorial

Academic Journals - 5

Donald G. Perrin

Having established Peer Review is an imperfect system, it is useful to determine where errors may occur.

Of the thousands of journals available, the topic may be of interest to few or none of these. In an effort to find the “right” journal, many researchers fall victim to predatory publishers that make wild promises, extort high cost, and do not perform.

The reliability of planning, execution and interpretation of the data varies from one researcher or research group to another. Flaws in design of the experiment, errors in collection and processing of data, and bias to prove or disprove some issue may lead to incorrect results. Also, the drive to be accepted by a top journal may encourage researchers to falsify data or hype their results.

Peer review, in which a paper is checked by eminent educators or scientists before publication is not a safeguard. Unpaid reviewers seldom have the time or inclination to examine a study enough to unearth errors or flaws. Sometimes the review task is assigned to research assistants or graduate students. Editorial staff sometimes do reviews - a practice should be strictly avoided. Recently irregularities or fraud have been found in the peer review process causing respected journals to retract the papers involved.

Journal editors play an important role in selecting what is to be published. Editors want to build readership. They tend to choose papers “of greatest interest to their readers” which may mean selecting studies that make the sexiest claims. If there are ten studies on the same topic and only one claims significant results, that study is the one most likely to be published. This in turn provides a biased opinion for the readership that may be difficult to correct. If Journal editors assign studies to reviewers, they may also add bias based on the nature and competence of the chosen reviewer.

Academic institutions use publication as a criterion for retention, tenure, and promotion. They research the quality and practices of journals used for publication. Cabell’s and major publishers set up whitelists, graylists, and blacklists to identify the quality of review and publication and separate out predatory publishers.

The journal you are now reading receives frequent calls from universities to inquire about our referee procedure and acceptance rates. This is due diligence for their own selection procedures and quality. This journal also receives calls from other publishers when they discover the researcher submitted the paper to more than one publisher – a no-no that is prompted by slow response or lack of communication from one or both publishers.

There are numerous studies searching for improvement or replacement of peer review as the yardstick for publication of research. For example, Peer review versus editorial review and their role in innovative science in Theoretical Medicine and Bioethics, October 2012, Volume 33, Issue 5, pp 359-376 states:

Peer review is a widely accepted instrument for raising the quality of science. Peer review limits the enormous unstructured influx of information and the sheer amount of dubious data, which in its absence would plunge science into chaos. In particular, peer review offers the benefit of eliminating papers that suffer from poor craftsmanship or methodological shortcomings, especially in the experimental sciences. However, we believe that peer review is not always appropriate for the evaluation of controversial hypothetical science. We argue that the process of peer review can be prone to bias towards ideas that affirm the prior convictions of reviewers and against innovation and radical new ideas. Innovative hypotheses are thus highly vulnerable to being “filtered out” or made to accord with conventional wisdom by the peer review process. Consequently, having introduced peer review, the Elsevier journal Medical Hypotheses may be unable to continue its tradition as a radical journal allowing discussion of improbable or unconventional ideas. Hence we conclude by asking the publisher to consider re-introducing the system of editorial review to Medical Hypotheses.

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Editor's Note: The origins of the term "Instructional Technology" date back to a meeting between Charles Hoban and James Finn in 1961. They determined that *audiovisual* did not adequately describe emerging technologies such as language labs, programmed instruction, computers, instructional systems, and innovations that would emerge in the future. The most frequently quoted definition for that period was in the introduction to a 1970 book, *To improve learning: an evaluation of instructional technology* edited by Sidney G. Tickton with the staff of the Academy for Educational Development, Inc. Fifty years later we continue to make changes to this definition to incorporate new discoveries, innovations and applications.

Redefining instructional technology: A contemporary approach

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USA

Abstract

In this position piece, outdated descriptions of instructional technology are challenged and a more contemporary label and definition of this rapidly expanding field are offered. Through revisiting what has generally characterized technology for education and performance improvement, a modern outlook is justified. The term *integrative systems design*, which allows for growth and management, is defended as to more accurately represent the parameters of present-day instructional technology.

Keywords: integrative systems design, instructional technology, educational technology, instructional design and technology, instructional design, systems design, instructional systems, performance improvement

Introduction

The use of technology for education and performance improvement is relatively young, regardless of the label it is given. As professionals continue to grow in and with this field, they help bring about changes that conversely broaden and narrow the field at the same time. These changes leave room for broad interpretation of what and how the field is defined (Aziz, 2013). For a clearer picture of what characterizes technology for education and performance improvement, it is helpful to look at the history of those areas, as well as the direction in which practitioners are currently moving. The landscape of what has been accomplished in the area to date, and the hope for what is possible, creates a more concrete atmosphere for those practicing and studying in the field.

Labeling the field

It is most appropriate to begin with labeling the field; if there is no label, there can be no definition. The term we offer to represent the theory, practice, and study of technological media and processes used to increase knowledge or performance is *integrative systems design*. Each of these words must be considered individually to understand the true meaning of the label.

Integrative

Integrative, a form of the word *integrate*, was chosen as an adjective to describe to what extent designers do their job. Others have argued that the use of the term *integrated*, also derived from the word *integrate*, when referencing technology for education meant systematic (Reiser, 2018b). The term *systematic* is defined as "methodical in procedure or plan" ("*Systematic*", 2017). In contrast, the root word *integrate* is defined as "to form, coordinate, or blend into a functioning or unified whole; to unite with something else" ("*Integrate*", 2017). The definitions of these two terms reveal very different meanings. Thus, the authors maintain that use of any form of the term *integrate* does not suggest a systematic system, nor should it.

The term integrative is used to suggest the unification of multiple former subsections of technology for education under the branch of integrative systems design. Many different terms have been used to describe the work of a designer, but as the field shifts from technology as a medium to technology as a process (Reiser, 2018b), it is helpful to integrate several similar, relevant subfields under one main label. Instructional design and human performance theory are two processes that work together to achieve a similar purpose. Both of these subsections use evidence based practices; have goals, standards, and ethics; use systemic or systematic approaches to design; and complete evaluations of design (Foshay, Villachica, & Stepich, 2014). Instructional technology also uses scientific principles to engage in human learning (Chyung, 2008). True design advances both learning and performance (Boling & Smith, 2018). This integration under one label allows for designers to engage in a design process that is uniquely their own and meets the specific and principal needs of the organization.

Systems

Systems was chosen as a noun to illustrate where designers complete their work. As part of the label, the term systems reveals that the field takes a systems design approach to all design processes. In integrative systems design, systems is used when visualizing how the sum of all parts is greater than the part itself. In organizations where design is being utilized, the focus is not on individuals, but on how one step can affect the bigger picture (Chyung, 2008). The methods used in this field take a holistic approach, focusing on the organization as a whole, not just the individual elements (Foshay et al., 2014). Systems was also chosen as a neutral identifier of where designers do their jobs; the word does not assume business or education industry, but all systems.

Design

Design was chosen as the verb to describe the typical undertakings of designers. An instructional designers job may involve the creation of training workshops, blended tutorials, online training, collaborative learning spaces, job aids, performance evaluations, etc. (Aziz, 2013). Design does not start with creation, however. It encompasses planning, creation, and implementation of all necessary aspects. The word design is appropriate to use because designers are required to use both science and art to build an aesthetically pleasing, yet effective, learning environment for the organization or individual (Sharif & Cho, 2015). All functions and components of the learning environment must be designed, including the physical and virtual environment, strategies, content, and assessments.

Definition

From the early definitions that focused on instructional media to the most recent definitions that were affected by the human performance movement, the field of technology for education has seen many changes (Reiser, 2018a). Under the suggested label integrative systems design, an updated viewpoint on the field can be defined as:

The study and application of systemic processes to create effective messages through the analysis of knowledge and performance gaps, design and implementation of instructional and non-instructional media, and evaluation of learning and performance outcomes using ethical standards, scientific principles, and creativity.

This definition is comprised of key words and phrases intended to evoke specific meanings, which warrants an explanation as to their inclusion.

Systemic process

Integrative systems design is classified as a *systemic process*, not a *systematic process*, to indicate the preferred systems approach to design. In the past, systematic process was a widely used term to describe the field of integrative systems design. However, some organizations did away with the phrase to invoke a more free design and implementation process (Reiser, 2018a). The intent is the

same here. In the International Board of Standards for Training, Performance, and Instruction (IBSTPI) standards, the use of systems thinking is an essential competency, but systematic processes are not mentioned (Koszalka et al., 2013). A systematic process is not inherently negative; it implies a methodical, step-by-step plan that focuses on clear objectives (Chyung, 2008). In some situations, a rigid design plan may be beneficial or necessary. However, practitioners run the risk of not considering comprehensive solutions under this model. Secondly, systematic design does not allow for a design to reach the individual needs of each learner (Saettler, 2004). Richey (1994) reports that systematic models assume a cause and effect relationship between steps in the design process. A systemic model, on the other hand, promotes creativity and flexibility depending on the unique variables within the organization (Richey, 1994), which is necessary to adequately meet the needs of the field (Sharif & Cho, 2015). The role of a design professional should be adaptable, dependent on the needs of the organization (Sharif & Cho, 2015). Concurrently, a systemic approach considers the impact an output might have on the organization as a whole, not just the output's impact on the individual (Bishop, 2014; Chyung, 2008).

Creating effective messages

Instructional message design focuses on how the use of various digital media and management systems can effectively transmit instruction for a particular learner in a particular situation (Bishop, 2014; Saettler, 2004). Instructional message design can serve as the bridge between learning theory and design practice. Based on communication theory, instructional message design provides designers with the scientific principles necessary to implement the communicative process. A poorly designed message will simply not be effective, regardless of the medium (Bishop, 2014). An increase in communication theories after World War II posited the communication process as a more integral component to systems design (Reiser, 2018b). More modern views reveal the medium as one part of the overall systemic design, not an isolated element (Saettler, 2004). In design, communication is a foundational skill that designers must master to meet the standards published by the IBSTPI. Designers should “communicate effectively,” write clear messages, deliver effective presentations, “use active listening skills,” and “use appropriate message and visual design principles” (Koszalka, et al., 2013, p. 24). The goal of effective communication should be to help learners internalize new information (Bishop, 2014).

Analysis of knowledge and performance gaps

One of the responsibilities of a designer is “analyzing the need for providing instruction” (Chyung, 2008, p. 6). IBSTPI’s competencies recognize the use of data collection tools, the ability to describe the learning problem and identify learner characteristics that have an impact on design, and other relevant abilities as essential competencies for a designer (Koszalka, et al., 2013). Integrative systems design is not meant to be prescriptive or overly methodical; therefore, common frameworks such as ADDIE and the HPT model are not suggested under this definition. Instead, designers use their own personal design approach based on “values, belief structures, prior experiences, knowledge and skills” (Tracey & Boling, 2014, p. 656). However, certain steps are still integral to the design process to ensure a successful outcome. While the task of analysis may look different, even minimal, for designers utilizing their own process style, some component of analysis is common in most situations (Tripp & Bichelmeyer, 1990). While instructional designers are mainly known for applying formulaic needs analysis, human performance technologists are generally interested in determining the cause of the problem. Perceptive designers understand the importance of using both of these thought processes to help create an effective design (Foshay et al., 2014).

Design and implementation of instructional and non-instructional media

The process of designing and implementing training media is a main responsibility of a designer (Chyung, 2008). The design and implementation of media used to convey a message is known as

instructional development (Chen, 2011). The main objective of integrative systems design is to close knowledge and performance gaps, while improving organizational performance (Chyung, 2008). The human performance movement and acceptance of the constructivist learning theory helped add non-instructional resources into many educational technology definitions (Resier, 2018b). Instructional materials were discovered to be ineffective on their own, and in many cases, additional instruction was required. This problem allowed non-instructional media to gain popularity in training programs (Chyung, 2008). Developing instructional materials in multiple formats and revising instructional and non-instructional resources based on evaluations are essential standards for designers (Koszalka, et al., 2013). The analysis of instructional and performance issues are only one component to the design process; an integrated systems design view also recognizes a designer's ability to create artifacts that meet the needs of unique learners (Saettler, 2004).

Evaluation of learning and performance outcomes

When an increase in math and science education was revealed as an ineffective method to close the space race between the United States and Soviet Union, the need for formative and summative evaluations of training programs was identified (Reiser, 2018a). The evaluation of the design package and the learning outcomes is a main responsibility of the designer (Chyung, 2008). Learning is not simply defined by an increase in knowledge. Learning requires that the learner apply their knowledge to achieve a "consistent change in human performance" (Driscoll, 2018, p. 52). The integrative design process uses learning theories as a background for application in practice. During the design process, learning theories reveal how scientific principles can be used to solve problems and increase performance (Thompson-Sellers & Calandra, 2012). The specification of both learning and performance outcomes within the definition is an attempt to combat the antiquated notion that learning is only equivalent to knowledge. The IBSTPI competencies include five essential standards relevant to evaluation, including preparing and implementing summative and formative assessments and revising the design based on evaluation feedback (Koszalka, et al., 2013).

Ethical standards, scientific principles, and creativity

The last part of the definition contains identifying characteristics that reveal how the integrative design process should be conducted. Any type of designer, whether labeled as an instructional designer, human performance technologist, or some other title that encompasses the duties of integrative design, should abide by the standards and code of ethics attributed to the field (Foshay et al., 2014). IBSTPI records that designers follow the professional, but also organizational, codes of ethics when working as a designer (Koszalka, et al., 2013). The increase of digital technology within integrative systems design presents unique issues. As part of the technology systems era, designers must agree to engage in ethically sound practices that will promote social justice (Bradshaw, 2003).

Integrative systems design can utilize the scientific principles of learning theory, design process, motivation, andragogy, and other significant areas without having to label itself as a science (Boling & Smith, 2018). Several essential standards for design, as developed by IBSTPI, refer to the use of applying motivational, message and visual, interaction design and interactive learning principles to meet the competencies of a designer (Koszalka, et al., 2013). The process of design is empirical in nature, and therefore must be based in scientific principles. When analyzing performance gaps, formative and summative feedback generates data that can be used to redesign or maintain the design package (Chyung, 2008). An increase in scientific regulations as it relates to the design process eliminates the ability for designers to be creative and use their own judgement. Systematic models are built out of the belief that design should be a scientific field

(Boling & Smith, 2018). The root of technology, *techne*, is translated to art, craft, and skill (Saettler, 2004), revealing that technology as a process is not meant to be scientific.

Designers are not simply teachers or coders or even learning experts. Designers operate as change agents for individuals and organizations. As change agents, designers create experiences that have the ability to transform the practice of individuals and organizations (Tracey & Boling, 2014). This process of designing as a change agent takes more skill than simply knowing the scientific principles of the learning sciences. Designers who truly act as change agents must be innovative and combine their knowledge of technology, systems, design, the learners and organization with creativity to create an engaging training that will increase performance (Liu, Gibby, & Quiros, 2002). Creativity in design is not just an extra step, but a “critical driver” that enhances the learner experience (Boling & Smith, 2018, p. 326). While the IBSTPI competencies do not directly address creativity as an essential competency, the standards do address continuing professional development and improving knowledge and skills relevant to design (Koszalka, et. al, 2013). Increased creativity can allow designers to be more adaptable to unique demands in the field (Sharif & Cho, 2015).

As evidenced, decades of rapid growth in instructional technology created a booming field, but resulted in broad and often inconsistent interpretations of its scope (Aziz, 2013). The term integrative systems design, and subsequent definition, are thus offered as a contemporary characterization of the domain that showcases the ongoing modernization of instructional technology. This translation provides a clear direction of technology for education and performance improvement, which is pertinent not only to its growth, but its continued success.

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Editor's Note: This is a well-planned and carefully executed study to determine factors crucial to the adoption of social media for educational use in Jordan. Researchers in other regions should conduct studies identify critical factors for local adoption and broaden the scope of these findings.

Social networking sites: how do youth spend their time? An empirical study using logistic regression

Yazn Alshamaila
Jordan

Abstract

Along with the exponential increase in internet and smart device usage, social networking sites (SNSs) have gained popularity due to their attractive features. The youth of most societies are adopting SNSs at high rates and spending increased amounts of time using them compared to other websites. The time spent on SNSs could reach more than 1 hour a day; therefore, it is important to study how young people's exposure to these sites impacts their lives. In Jordan, 90% of adult internet users are active on SNSs, a percentage that surpasses many emerging and developed countries, thus positioning Jordan at the center of this study. This study integrates the uses and gratifications theory (UGT) and the technology acceptance model (TAM) theory to delve deeper into the phenomenon of SNS usage.

A survey discussion was used to collect firsthand information from a youth sample and 213 subjects took part in a field survey to investigate the influence of a series of possible decision elements, including perceived ease of use and benefits. The perceived benefit construct was measured through the UGT and included elements such as entertainment, opinion expression, social interaction through joint groups, and finally information seeking. The results indicated that youths' intention to continue SNS use was affected mainly by the entertainment factor. Some significant associations were observed and their implications discussed. Moreover, this study explored the notion of social media platforms, breathing new life into UGT, the decades-old theory of communication that illustrates how people use traditional media.

Keywords: youth, SNSs, UGT, TAM, entertainment

Introduction

The increased use of social networking sites (SNSs) has attracted the attention of many researchers seeking to understand the rationale of this increased SNS usage. These days, SNSs are easily available to most people. For example, Facebook reported approximately 1.4 billion active daily users and 2.13 billion active monthly users at the end of 2017 (Facebook, 2017). In fact, SNSs have begun to occupy an essential role in individuals' lives, as well as taking up a significant amount of their time. People use SNSs for several purposes, which vary depending on the user. Besides information seeking and entertainment, SNSs are used for academic purposes, communication, and sharing ideas. Several studies consider SNSs to be learning tools for sharing information, interacting with others, and expressing opinions (Lambic, 2016; Mason, 2006; Selwyn, 2009; Tapscott & Williams, 2010). In his study, Lambic (2016) found a positive relationship between the use of Facebook as a learning aid and student performance. In a survey that included 40 countries, Poushter (2016) found that youths were the dominant users of SNSs. The report also highlighted the fact that, in Jordan, 90% of adult internet users were active on SNSs, a percentage that surpasses many emerging and developed countries (e.g., Malaysia [85%] and the UK [66%]).

Internet usage changes depending on the role of the media user, including their personal and social habits (Ruggiero, 2000). The diversity with which media is used is supported by the uses and gratifications theory (UGT). This argument was buttressed by Ruggiero (2000), who stated that the advent of new media and computer-mediated technologies have both revived the UGT and provided a new wave of scholarship. Yet it is not enough to merely identify youth as the major users of social media without investigating their motivations. Therefore, the UGT will be used as the base for this study because it not only helps establish the exponential growth of internet use among youth but also assists in analyzing their rationale for using social media (Whiting & Williams, 2013). In addition, adopting the UGT is ideal for social media studies because it helps put new forms of mass media in perspective in relation to old media. One of the outstanding characteristics of traditional media, which is also its greatest limitation, is the limited choices for users. New social media, in contrast, offers users multiple choices, including information searches, games and entertainment, self-expression, and community through joining pages, groups, and so on. The UGT focuses on explaining users' needs and their corresponding Feelings of gratification. However, there are limited studies to support the UGT in relation to social media, and there is a call for more research in this area. According to Dunne, Lawlor, and Rowley (2010, p. 48), "The internet, and more specifically SNS, constitute newer media formats, with their own defining characteristics, which are ripe for examination under the theoretical lens of UGT theory." Therefore, this research aims to integrate TAM as a base for investigating individual behavior with the UGT to build a better understanding of how youth (especially heavy users spending more than 1 hour a day on social media) use social media to achieve satisfaction.

Background

Theoretical background: Merging TAM and UGT

Technology Acceptance Model (TAM) is one of the core theories that explains how users come to accept and use technology (Chen & Tan, 2004; Dillon & Morris, 1996). The TAM's main concept is that a user's behavioral intention related to IT adoption and usage is determined by two factors: perceived usefulness (PU) and perceived ease of use (PEU; Hong, Thong, & Tam, 2006). The TAM has been widely applied and validated in different research contexts, including e-business (e.g., Gefen, Karahanna, & Straub, 2003; Luthfi & Dhewanto, 2013) and information system adoption (e.g., Kim, Ferrin, & Rao, 2008). Engagement with social networks relies on the user's acceptance of disseminated information, and according to TAM theory, this acceptance is based on the perceived ease of use and usefulness of the sites. Anita and Williams (2013) argued that the perceived ease of use and perceived usefulness of a social site or website determine the standpoint of the system usage and predict behaviors related to specific information technology.

The use and the gratification theory is an audience-centered approach to understanding mass communication (Severin & Tankard, 2001). The main assumption of this theory is that people seek out media to fulfill their needs, leading to their ultimate satisfaction (Lariscy, Tinkham & Sweetser, 2011; Whiting & Williams, 2013). In the past, the UGT has been applied and validated in a number of research contexts, including some studies that indicated received gratification was a good predictor for media use and recurring media use (Kaye & Johnson, 2002). The UGT has also been applied to the study of politics and the dissemination of political messages (McLeod & Becker, 1974). With the evolution of the internet, researchers have proposed that traditional models such as the UGT may still be valuable for studying the internet and new media communication (Kuehn, 1994; Morris & Ogan, 1996). Scholars such as Whiting and Williams (2013), have argued that the UGT could be used as a theoretical base to investigate internet usage. However, the emergence of social media technology has changed people's usage of mass media because it differs in both form and context. According to Slot and Frissen (2008), new features of media usage have arisen in the Web 2.0 era, encouraging a more interactive environment compared to traditional media, where users are simply consumers. Based on its importance in

communication literature, the UGT is considered relevant to the study of social media technology. Researchers Dunne et al. (2010), Whiting and Williams (2013), and Urista, Dong, and Day (2009) have suggested that engagement with social networks like Facebook provides users with potential social needs they could benefit from, such as joining social groups and pages for communication and connectivity. Moreover, social networks could provide content gratification that can be exemplified as a main source of information. Other sources of gratification include entertainment and self-expression. It could be argued that young people use SNSs heavily to fulfill or gratify their need for social connection. These factors can be considered as perceived usefulness for users, and therefore we merge them with the other essential element of TAM theory: perceived ease of use.

Research model and hypotheses

Figure 1 presents this study's research model based on the TAM and UGT theories. The model is based on the UGT's exclusion of social media's usefulness and ease of use. In other words, it explores a number of factors that influence the continued excessive use of social media, such as information seeking, communication through pages and groups, self-expression, and entertainment.

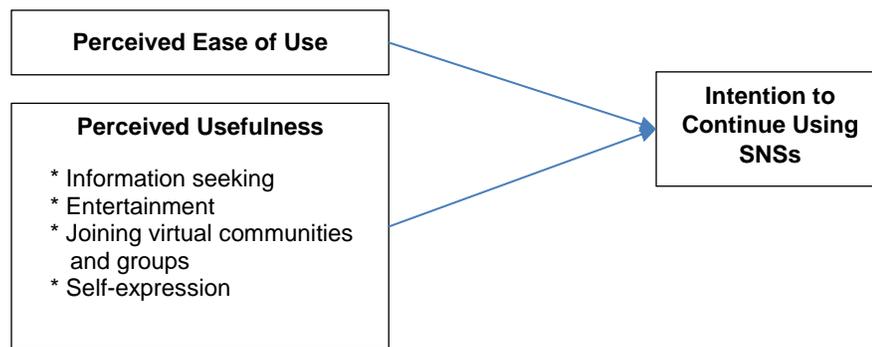


Figure 1. Research model: merging TAM and UGT.

Perceived ease of use

Perceived ease of use (PEOU) is defined as “the degree to which a person believes that using the system will be free of effort” (Davis, Bagozzi, & Warshaw, 1989, p 320). Gangarharbatha (2009) believed that PEOU is connected with internet self-efficacy when related to SNS. Thus, if the “interface” is easy to use then users' interest in SNS will increase (Gangarharbatha, 2009). Researchers have suggested that ease of use is a major attribute of B2C e-commerce (Qiu & Li, 2008), electronic health records (Angst & Agarwal, 2009), mobile banking (Yang, Chye, Fern, & Kang, 2015), and e-government (Wangpipatwong, Chutimaskul, & Papasratorn, 2008). Saadé and Kira (2009) believed that students develop an interest in e-learning when the system used is perceived as easy. Dhume, Pattanshetti, Kamble, and Prasad (2012) found that PEOU affects students' preferences of second life (SL) adoption, whereas Tantiponganant and Laksitamas (2014) argued that students' behavioral intentions to use SNSs and their attitudes toward social media were affected by PEOU. Thus, the following hypothesis is proposed:

H1: Perceived ease of use will have a positive effect on youth's heavy continued use of a social networking service.

Self-expression

New features of media use have arisen in the Web 2.0 era. Through SNS interaction, users can express opinions and ideas with their friends, family members, and other people (Whiting & Williams, 2013). For instance, SNSs such as Facebook and Twitter have recently become conduits for shaping and sharing people's opinions, especially in the political spectrum, as evidenced by recent elections in France, the United States, and Germany, among other nations. As a result, many pollsters have learned to tap into people's opinions to form a public opinion, which could be defined as the cumulative preference (opinion) of individual citizens (Anstead & O'Loughlin, 2014). Most people, especially youth, have adopted social media as a means of sharing social and civic opinions with others because SNSs offer a friendly platform to discuss certain issues in a comfortable environment. Therefore, SNSs protect the youth from hiding their views on many issues because they might be perceived as not widely shared (Hampton, Goulet, Rainie, & Purcell, 2011). Additionally, pages dedicated to a given topic on social media platforms offer minority groups a venue to freely share their opinions, widening public engagement and adding new perspectives daily to live issues (Hampton et al., 2011). With the increasing prevalence of the internet in SNSs in Arab countries, the youth in particular are trying to influence regional politics by voicing their opinions through social media (Beaumont, 2011). After reviewing the studies of Beaumont (2011), Whiting and Williams (2013), Anstead and O'Loughlin (2014), and Cole (2014), the following hypothesis is proposed:

H2: Self-expression will have a positive effect on youth's heavy continued use of a social networking service.

Information seeking

Many social media users use their SNS profiles to search for information (Duggan, 2015). Some of the information they seek is related to work, education, events, and online shopping, among other topics. Therefore, SNSs provide users with opportunities to educate themselves and gain further knowledge, enabling them to learn new things (Hamat, Embi, & Hassan, 2012). For instance, Lenhart, Purcell, Smith, and Zickuhr (2010) found that more than a third of youths on SNS platforms are interested in information on health. According to Abu-Shanab and Al-Tarawneh (2013), youths benefited from SNSs because they perceived them as a tool for academic advancement, not just as a mere communication tool. This means that learners can be receptive to SNSs in academics. By properly equipping educators and integrating social networks in academics, students can learn to easily relate without coercion, motivating the extensive usage of SNSs (Doghmi & Al-Shalabi, 2013). YouTube is a social networking site that functions as a new platform for communication and collaboration and can be used as an effective academic tool to develop and enhance education (Corbeil & Corbeil, 2011). According to the Pew Research Center, one's level of education is profoundly affected by internet usage. Its study found that 96% of Jordanians within the learning bracket were active internet users, whereas less-educated Jordanians accounted for 41% of internet users. Accordingly, the following hypothesis is proposed:

H3: Information seeking will have a positive effect on youth's heavy continued use of a social networking service.

Joining virtual communities and groups

Social media gives users options to create and join virtual communities based on a common interest. These communities contain groups of individuals who share common interests, goals, and ideas over the internet (Kim, Lee, & Kang, 2012). Youths use SNSs to join groups and find useful

discussions related to their interests. Anita and Williams (2013) affirmed that youths use social networks for interaction and communication, with 88% using them for the latter function. In contrast, Williams and Merten (2008) showed that a majority of youths, especially introverted ones, perceive social media as a platform for building social relations through multiple interactions in chat rooms, which motivates their extensive usage of SNSs. They concluded that social media's anonymity, flexibility, multiple interactions, languages, and medium influence both extroverted and introverted people to build social ties through communicating with other subscribers around the world. These functions give people the opportunity to interact with others from different fields, cultures, religions, and ethnicities. In the case of education, youths may also join groups on Facebook and other social media platforms to share and explore different information related to their studies. Accordingly, the following hypothesis is proposed:

H4: Joining virtual communities and groups will have a positive effect on youth's heavy continued use of a social networking service.

Entertainment

People use SNSs to fill their free time by engaging in an activity. Social media users enjoy sharing personal online diaries, images, and videos through weblogs (blogs) where others are encouraged to comment (Kuss & Griffiths, 2017). Besides weblogs, users can enjoy unlimited entertainment through content communities on video-sharing sites. Moon and Kim (2001) found that enjoyment is a key factor for a user's acceptance of the internet. Elkaseh and Fung (2016) established the need for enjoyment, which motivates the extensive use of SNSs. This implies a significant increase in entertainment and SNS subscribers. The most shared content on these platforms are videos, PowerPoint presentations (Slideshare), and photographs (Instagram; Kuss & Griffiths, 2017). Additionally, some SNSs offer subscribers a virtual gaming environment, where they can build alter ego avatars to compete with online players. Therefore, SNS users have unlimited access to different content, including videos, texts, photographs, and games for repeated leisurely enjoyment. Some youthful subscribers are believed to use social media for passing the time (Elkaseh & Fung, 2016). This study incorporates entertainment in addition to the assumption that excessive SNS usage gives one a sense of happiness and fulfillment. Thus, the following hypothesis is proposed:

H5: Entertainment will have a positive effect on youth's heavy continued use of a social networking service.

Research methodology

Survey procedure and measurement development

Youth are the backbone of every society, and they are believed to be the majority users of social networking sites (Poushter, 2016). This research project thus drew study samples from college students. The research framework was validated using Jordan as the geographical site for the empirical investigation. The surveys were directly disseminated as an online form. Of the 227 recipients who agreed to participate in the study, 213 responses were found suitable for analysis. To confirm the measures have construct validity, both convergence and discrimination were assessed. Item constructs were adapted from previous studies. The wording was modified to fit the social media context and then refined through a pilot study. The instrument was pretested with a number of undergraduate students enrolled in a social media course at a leading information technology school. They were asked to check the validity, readability, and completeness of the instrument. Small changes involving the format and wording of the questions were made. Each questionnaire item was scored on a 5-point Likert-type scale (ranging from strongly disagree to

strongly agree). The author of the paper attended each class and gave a short presentation on the research objectives and aims and the survey questions. The questionnaire included mainly scaled questions. Convergent and discriminant validity were evaluated using principal component factor analysis (PCA; see Table 1).

Table 1
Measurement of variables in the conceptual model

Construct	Operational measure	Number of items	Item code	Factor loading	Cronbach's alpha	Sources: Adapted from
Perceived ease of Use	Multi-items	3	PEOU1	.857	0.81	Lee & Suh (2013); Kwon & Wen (2010)
			PEOU2	.783		
			PEOU3	.701		
Information Seeking	Multi-items	3	INFO1	.813	0.78	Mazman & Usluel (2010); Sánchez, Cortijo, & Javed (2014)
			INFO2	.777		
			INFO3	.654		
Entertainments	Multi-items	3	ENT1	.826	0.84	Lin & Lu (2011)
			ENT2	.769		
			ENT3	.769		
Joining virtual Communities and Groups	Multi-items	3	JG1	.839	0.81	Sánchez, Cortijo, & Javed (2014)
			JG2	.742		
			JG3	.718		
Self-Expression	Multi-items	3	SE1	.921	0.87	Whiting & Williams (2013); Sánchez, Cortijo, & Javed (2014)
			SE2	.860		
			SE3	.823		

Participants

Table 2 illustrates the key characteristics of the sample. The sample comprised 213 Jordanian youths, 39% male and 61% female. The collected cases included 183 students who use SNSs for more than 1 hour per day, representing 85.9 % of the cases, and 30 students who use SNSs for less than 1 hour per day, representing 14.1% of the cases. Another feature of the sample was the number of contacts; 57 students had more than 700 contacts, whereas 93 had between 200 to 700 contacts, and 63 students had 200 or less contacts. When it comes to membership with an SNS, most students had a year or more of experience. The number of students who had a year or more of experience is high in comparison with students who had just a month or less of experience and 1 to 11 months of experience. The detailed demographic data is provided in Table 2.

Table 2
Sample demographics

Characteristics	Options	Frequency	Percent
Gender	Female	130	61%
	Male	83	39%
	Total	213	100%
Experience with social network sites	1 month or less	3	1.4
	1 year or more	202	94.8
	1-11 months	8	3.8
	Total	213	100%
Number of contacts on social network sites	100 or less	22	10.3
	101-200	41	19.2
	200-700	93	43.7
	More than 700	57	26.8
	Total	213	100%
The average time using social network sites (minutes per day)	Less than 60 minutes	30	14.1
	More than 60 minutes	183	85.9
	Total	213	100%

Results

The statistical analysis undertaken included hypotheses testing, scale reliability testing, and multicollinearity tests. For scale reliability testing, most of the variables in the study were composed of Likert-type items. Hence, Cronbach's coefficient alpha was used to measure the consistency of the multiple-item scale. Although researchers suggest 0.8 as a good value for Cronbach's alpha (Hair, Anderson, Tatham, & William, 1995), a value of more than 0.7 is considered an acceptable level (Nunnally & Bernstein, 1994). The results obtained for Cronbach's alpha are presented in Table 1. They suggest that most constructs exhibited strong internal reliability.

Multicollinearity occurs when two or more independent variables are highly correlated (Pallant, 2007). It is recommended that the absence of multicollinearity should be investigated before regression is interpreted. Tabachnick and Fidell (2007) suggested that if two independent variables are correlated at 0.70 or higher, they may suffer from multicollinearity, which is not the case in this study. Based on the results presented in Table 3, multicollinearity does not appear to be a problem.

Table3
Correlation matrix

	Constant	SE	ENJ	PEOU	JG	INFO
Constant	1.000	-.506	-.414	-.332	-.479	-.260
SE		1.000	.058	.069	.239	-.155
ENT			1.000	-.161	.109	-.089
PEOU				1.000	-.324	.025
JG					1.000	-.218
INFO					-.218	1.000

Logistic Regression:

Regarding the research objectives for this project, binary logistic regression functions as an appropriate method of analysis for examining youths' choice behaviors. This is because this method helps in determining the dependency of a dichotomous variable from other independent variables. Usually, the dichotomous variable is an event that can occur or not. In this case, this event refers to whether a youth is a heavy user of SNSs (coded as 1) or not (coded as 0). The questionnaire opens with a question about whether participating youths use SNSs more than 1 hour a day or not. This is a dichotomous variable indicating heavy adoption versus non-heavy adoption. For hypotheses testing, a multivariate analysis (logistic regression) was applied to assess the relationships among the variables simultaneously (Everitt, 2003) and test the hypothesized model. Out of five hypotheses, only one is supported by the results. In the context of SNS usage, entertainment increases the intention for continuous SNS usage among youths (H5) with p values of 0.000. The remaining factors were not significant.

Table 4:
Analysis of SNS adoption among youth- Logistic regression

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. EXP(B)	
							Lower	Upper
Self-Expression (SE)	.659	.344	3.676	1	.055	1.933	.985	3.793
Entertainments (ENT)	2.074	.481	18.593	1	.000	7.958	3.100	20.430
Perceived ease of Use (PEOU)	.414	.483	.735	1	.391	1.513	.587	3.901
Joining virtual Communities and Groups (JG)	.983	.542	3.286	1	.070	2.672	.923	7.730
Information Seeking (INFO)	.757	.442	2.930	1	.087	2.132	.896	5.072
Constant	-15.320	3.192	23.042	1	.000	.000		
-2 Log likelihood	80.538a							
Cox & Snell R Square	.353							
Nagelkerke R Square	.634							

Notes: *Variables are significant at the 0.05 level of significance

Table5:
Predictive accuracy of the model

Observed	Non-heavy adoption	Heavy adoption	Percentage Correct
Non-heavy adoption	18	12	60.0
Heavy adoption	6	177	96.7
Overall percentage			91.5

Discussion

Perceived ease of use and self-expression are not found to be significant factors for predicting heavy ongoing usage of SNSs in this study. Regarding perceived ease of use, this finding is distinguished from previously published studies (Alshamaila, Papagiannidis, & Li, 2013; Qiu & Li, 2008; Yang, Chye, Fern, & Kang, 2015) that suggest ease of use is an essential determinant of IT innovation usage, and that social networking site features—being relatively user friendly—encourage user adoption. However, the insignificance of perceived ease of use might be due to youths' lack of concern about this factor, either because they grew-up using these sites and it is a guaranteed feature for them or because they use these sites for many hours a day. Most SNSs have very similar basic features, such as making personal profile, messaging services and connecting with other people; which make this factor not a significant aspect for adoption, especially for youths. This is in agreement with the findings of Lee (2009), Taylor and Todd (1995), and Chan and Lu (2004), which show that perceived ease of use of IT innovation has an insignificant effect.

The present result from the analysis regarding self-expression is inconsistent with that of Howard and Hussain (2013), which suggests that SNSs give people an alternative means of not only communicating but also mobilizing social movements. This could not be achieved by traditional media. Arab youths in general are concerned about the extent to which they can express their opinions regarding political issues. In fact, the key events in recent years related to the Arab Spring started on social media platforms, which makes the continuous usage of these sites for self-expression regarding conflict a tricky issue. Given the nature of SNSs as an open space for addressing controversial issues, it seems that Jordanian youths do not consider them the right place to express their opinions. Obviously, the desire for self-expression could attract youth to SNSs to some extent, but it does not appear to be a major factor for continuous heavy usage.

Entertainment and enjoyment was found to be a significant factor for extensive SNS usage by youths. Entertainment on SNSs creates a space for youth that encourages them to spend long hours on these sites. Obviously, an enjoyable and uplifting atmosphere for interaction and pleasure has a stronger impact than utilitarian benefits. SNS applications and various games with exciting storylines and pleasurable experiences reinforce the influence of usage and further strengthen its stickiness (Lin & Lu, 2011). This result is consistent with other studies (Sledgianowski & Kulviwat, 2009) and suggests that the attraction of entertainment supports an increased tendency toward continuous SNS usage by youth.

Joining virtual groups and seeking information were not found to be significant factors for predicting youth's heavy usage of SNS either. Virtual communities provide subscribers a chance for social interaction with other individuals who share common interests, goals, and ideas via the internet (Kim et al., 2012). However, it seems that these activities attract youths to some extent, but not to the level of extended usage time. Therefore, this quantitative study shows that joining groups is not a sufficient reason for heavy SNS usage among Jordanian youths. This finding differs from some published studies (Sánchez, Cortijo, & Javed, 2014), which suggest that joining

virtual communities is a primary reason for SNS adoption among youths, who use these groups to enhance their social identities.

Information seeking is another important UGT factor. Many studies (Asemah, 2011; Whiting & Williams, 2013) have demonstrated that information seeking is positively related to media adoption. The results of this study show that for the youths in the Jordanian community, information seeking is not considered a significant factor for heavy SNS users. It is rather surprising that young users who spend extensive time using SNSs are not benefiting from the available information. One explanation could be that when youths start using SNSs, they are more attracted to entertainment activities, taking time away from the available sources of information provided by the SNS. The SNS may waste the user's time, not allowing an opportunity for information seeking. In contrast, youths may simply perceive information on SNSs as unreliable and inaccurate. Thus, they choose official websites and academic journals or formal news sources for specific kinds of information related to their studies or local news.

Managerial implications

This study identified issues related to youth's intentions for SNS use that have not been previously addressed, despite their importance. This paper represents a pioneering study of this field in Jordan, a country with one of the highest percentages of SNS usage among emerging and developed countries (Poushter, 2016). The regression analysis revealed that enjoyment is the strongest motivation for youth's continuous heavy use of SNSs, whereas placing the other factors at minimum percentages makes them insignificant. These findings suggest that, in general, entertainment is the most important determinant of heavy SNS usage among youths, thus overshadowing any other benefits that could be provided. The findings of this research provide insights for educational managers because properly merging SNS use with the educational field is a priority.

Vrocharidou and Efthymiou (2012) stated that research related to SNS usage in educational fields is lacking. Thus, further analysis should be conducted on building an engaging educational SNS platform for students. To successfully integrate the technology with teaching and learning strategies, educators must have a good level of experience with social media (Vie, 2008). These findings have significant implications regarding the importance of raising awareness among youth about SNS use. Youth should be aware of the educational benefits of SNSs, such as Google's collaboration tool, which allows students to create shared learning groups or work on assignments using shared Google documents.

In addition, youth around the world are using SNSs and taking an active stance on social issues. Thus, the current data highlights the need for guidance and responsible self-expression for youth who voice their opinions on social issues through SNSs. They must be educated about the presence of false information in SNSs, its danger, and how to detect it. In Jordan, the Ministry of Youth highlights the importance of developing Jordanian youths' knowledge, skills, and values while enabling them to manage the latest developments effectively and efficiently. One of the ministry's chief tasks, as acknowledged on its website, is drawing up policies and executive plans to ensure youth participation in the social and cultural fields of society. This vision depends on youth self-expression regarding social, political, and cultural issues, which can be easily established on SNSs. Thus, youth should be educated on how to effectively use SNSs to express their opinions in a well-organized and diplomatic manner. This effort could develop youth's self-confidence and promote their effective and fruitful engagement on social issues.

Academic implications

This study aims to build a new framework by integrating two key theories, the TAM and UGT, and apply them in new contexts. The purpose of the integration is to ensure a stable theoretical development. As a result, this model will contribute to the emerging literature on social media, especially youth's usage. Even though the TAM has proved its capability for explaining behavioral intention, as shown in many previous studies, it includes just two variables: perceived usefulness and perceived ease of use (Lee, 2009). However, there are several other factors that influence a user's behavioral intention that are not included, such as those found in the UGT. The results of the integration of both the TAM and UGT theories have shown that this kind of integration has strong explanatory power. In addition to this, it may pave the way for more technology model integrations. For instance, internet banking adoption research has created a new model by integrating the TAM and TPB (Theory of Planned Behavior) models (Lee, 2009). This integration may encourage other acceptance models to create new, more powerful versions that can function better as one combined model.

In addition, SNS adoption has been well-investigated (Gilok, Choi, & Hyewon, 2013; Khorana, 2015). Perceived usefulness has only shown a single construct. Lee (2009) called for detailed usage of TAM constructs. For instance, in this study, using perceived usefulness as a single construct does not reflect the reasons behind youth's heavy usage of SNS services. Therefore, in this study, perceived usefulness is divided into four parts to provide a deeper understanding of SNS usage. However, significant factors remain in the perceived usefulness facets of adoption. Investigating the TAM model constructs in detail would be a fruitful area for further work in technology adoption behavior studies.

Conclusions and directions for future research

The purpose of the current research is to develop an extended TAM with a UGT model to investigate and explain the reasons that motivate youth to use SNSs heavily. The suggested model utilizes several factors to investigate SNS usage. The findings of this proposed model have shown its validity in predicting the intentions of youth related to SNS usage. In regard to the geographical dimension, this study was limited to the Hashemite Kingdom of Jordan. Thus, it may be inappropriate to generalize the findings to youths in other countries; therefore, future empirical studies and investigations in other countries are required. If future research is organized as a dispersed sample, generalizability will be possible. Web-based surveys were used because collecting a large number of samples using an alternative survey modality and random sampling methods would be expensive. The findings have a number of important implications for future study. Researchers can examine SNS adoption by different community segments. Gender can also be investigated qualitatively or quantitatively. This research model concentrates on the relationships among the constructs in this study, and the variables are not comprehensive. They were chosen to represent the key factors that affect youth adoption of SNSs. Other important factors (e.g., network externality and innovation) have been excluded. Further work should be undertaken to investigate these factors via other statistical techniques, such as structural equation modeling.

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Editor's Note: This study was to assist in the design and implementation of discussion boards on open and distance learning (ODL). Initial implementation was conducted with voluntary participation and no credit. It provided a wealth of useful information for successful integration of discussion boards to enhance learning.

Assessment of discussion board in promoting social and academic learning in open and distance learning: an empirical study

Sunil Kumar
India

Abstract

The major constraints of distance education include social isolation of students and poor understanding of the pedagogy of Open and Distance Learning (ODL) system, these have been resolved with peer group interaction among geographically dispersed students. Discussion Board has an edge over other web-mediated instruments in facilitating peer group interaction due to convenient and easy use in asynchronous mode. Discussion board has become common medium for peer group interaction in ODL; however, understanding of its pedagogical relevance in the discussion board is limited. This study provides insight into contributions of discussion board in imparting social and academic peer group interaction. This empirical study explains interaction patterns on discussion boards by analyzing messages posted by students enrolled at the postgraduate level using the ODL system. Quantitative research methodology based on descriptive statistical analysis and qualitative research methodologies based on content analysis were applied in this empirical study. The content analysis is principally based on Bales Interaction Process Analysis (IPA). The outcomes of the study indicate that students are able to connect socially and emotionally with class mates through discussion board. The scope of discussion boards in content learning is meager. Still, few students are engaged in collaborative learning and explored field applications of theoretical knowledge acquired during the study. Students instrument problem-solving learning approach on the discussion board. Students respond immediately whenever contents of messages are relevant to their learning and working. Most students make positive contributions on discussion boards; their messages enrich knowledge and encourage others to participate on discussion board in a fruitful manner. The volume of messages with positive contributions improve as the course progresses.

This study will help teachers and education administrators to understand the pedagogical relevance of discussion boards in Massive Open Online courses (MOOCs), how to implement discussion boards for peer group learning, and how to stimulate social and emotional interactions. This study will provide insight in designing instruments to evaluate contributions of students on discussion board based on a content analysis approach.

Keywords: Discussion Board, peer interaction, asynchronous communication, social interaction, web forum, web mediated learning

Introduction

Freitas, Morgan and Gibson (2015) perceived the bright scope of Massive Open Online Courses (MOOC) in higher education and foresaw that University would consider MOOC as an integral component of everyday teaching and instruction. Massive Open Online Courses (MOOCs) have revolutionized Open and Distance Learning (ODL) systems. These systems open in true sense and cross boundaries of Institutions, states and nations by enrolling students and delivering learning, with the support of teachers and resource persons, across the globe. MOOCs have been instrumental as Web tools for peer group interaction among geographically dispersed teachers and

students using internet tools such as e-mail, discussion board, Twitter, blog, chat and web conferencing. The asynchronous communication feature of the discussion board makes it popular for peer discussion. It becomes integral component of MOOCs being offered through popular web portals such as EDX, Coursera, Udacity, etc. Teachers and administrators in Open and Distance Learning (ODL) systems have instrumented the discussion board to facilitate peer group interaction and to eliminate the feeling of social isolation of individual student. Students can read and reply messages at their convenience at any time and any place. Students get adequate time for critical reflection on messages posted by others. The discussion board contributes in inducing professionalism, teamwork, tolerance and positive attitudes in addition to enriching knowledge and eliminating feelings of isolation. Participants are enriched with personal and professional experiences of peers in understanding applications of theoretical knowledge acquired in the course. Nowadays, the majority of students use social networking sites in day to day life; they can easily adapt it in their academic life managed and guided by their teachers.

Nami and Marandi (2013) argued that discussion board is a well-established tool for social interaction; still it is new for imparting peer-based constructive learning. Academic institutions are not clear about pedagogical role of discussion board in learning, so thematic knowledge about pedagogy of discussion board evolved through personal experience, it would certainly have contributed in improving learning experience; however such knowledge is individual and is driven from perceived assumptions. Cutting edge educational technology itself could not ensure fruitful learning results until it is pedagogically embedded into curriculum and the teaching-learning process (Hill, Domizi et al, 2007). Domakin (2013) advocated integration of discussion boards in curriculum for active participation of students. There is need for systematic research to understand strength of discussion board in imparting social, emotional, academic and logistic support in academic environment (Mark, 2014), which may be best understood by analyzing evolution of group interaction on discussion board as this interaction grows naturally, rather than being driven by researchers in controlled environment to meet research objectives (Mearns and Jacobs, 2009). This paper examined evolution of peer interaction held on discussion boards among students enrolled in six courses under ODL system. This study applied qualitative and quantitative research methodologies.

The study will help in understanding contributions of the discussion board in promoting social and emotional interaction, constructive learning, and extending technical and logistic support. Teachers would have a better understanding about their roles in promoting learning through discussion board and able to guide and evaluate participations of students. The content analysis instrument applied in this study for classification of discussion board messages may help teachers to design scales and instruments for monitoring and evaluating student contributions on discussion boards.

Literature review

Vygotsky (1978) a renowned philosopher and researcher in human communication slammed relevance of social interaction in the learning process. Doolan and Gilbert (2017); Nami and Marandi (2013) asserted that social interactions facilitates learning by bridging the gap between learners' actual and potential levels of development. However, it is a challenging task for distance educators to establish social interaction among geographically dispersed students. Discussion board has been successful in mediating social interaction among geographically dispersed students under the ODL system (Liyana and Scot 2011). Song and McNary (2011) and Milne (2007) acknowledged the contribution of discussion board in promoting academic and social interaction. Kim, Lee, and Kim (2014) observed that social interaction is simplified with discussion board due to no constraints of space and time. The lesser constrained environment in discussion board leads to more self-exposure, less guarded and more divergent opinions and potentially more conflicting

ideas that encourage constructive learning. The discussion board helps in improving argumentative power of participants (Noroozi, Weinberger, Biemans, Mulder and Chizar, 2013).

Asynchronous feature of the discussion board provides adequate time for critical reflection on others' ideas/views (Deborah, 2015; Matthew, Felvegi and Callaway, 2009; Carr 2008). Dengler (2008) noted that students were able to understand field applications of theoretical knowledge gained in course on discussion board. Domakin (2013) argued that discussion board provides an opportunity for collaborative cognitive learning. Dietz-Uhler and Hurn (2013); Jianhong, John and Lou (2013) noted positive association between student performance and participation in web mediated communication. Tosti (2017); Kim, Rueckert, Kim and Seo (2013) claimed students have a better learning experience with active teacher participation in the discussion board.

Siebert and Spaulding-Givens (2006) challenged the claims being made about effectiveness of the discussion board to induce deep learning and insisted that discussion board in the academic environment was used merely to share information, rather engaged in deep learning. Krsak (2007) expressed concern over academic dishonesty in discussion boards; there is lack of originality in contribution/ideas as students cited more literature and incorporated others published works rather expressing their personal experiences/ideas in messages. Salmon Gilly (2000), pioneer in digital learning for the last 30 years, noted low effectiveness of web mediated peer group discussion for academic purposes; he criticized the way the discussion board is embedded in the learning process rather than questioning the pedagogical viability and capability of discussion board. Domakin (2013) claimed that discussion board is conceptually strong for imparting learning; yet it is practically perfect. Liyan and Scot (2011) noted improvement in participation of students in discussion board with its proper integration in curriculum. Naney & Chalohua (2007) asserted that articulated inclusion of discussion board in curriculum can produce positive learning impacts hence effectiveness of discussion board depend on understanding of its pedagogy and proper integration in the learning process. There is a need for systematic research on integration of discussion boards into the learning process. Sonja (2010) claimed that conducting research on the discussion board is complex as messages on discussion board are usually directed to a group of participants as a whole and generate a variety of responses by many participants. Students behave differently while having interaction in public rather in private. Students desiring broad acceptability from classmates may not feel comfortable in challenging other ideas publically on a discussion board (Naney & Chaohua, 2007). Such students reserve their words and carefully articulate ideas to avoid dishearten feelings of others while posting messages on discussion board.

Ravichandra and Kaur (2012) noted teachers could not evaluate contributions of students on discussion board in absence of a proper instrument and scale; they recommended a instrument based content analysis technique as most appropriate for this purpose. Durairaj and Umar (2015) endorsed that content analysis is an effective technique to understand cognitive process and evaluate participations of discussion board students. Pena-Shaff and Nicholls (2004) applied content analysis to evaluate contribution of discussion board in the construction of knowledge by classifying messages into following categories: question, reply, clarification, interpretation, conflict, ascertain, consensus building, judgment, reflection and support. Wang and Kang (2006) conducted the content analysis of written messages exchanged by students and noted the presence of students in terms of academic, social and emotional dimensions on the discussion board. Students expressed social presence by interacting on generic issues, publishing their profile and interests, and inviting others with similar academic and professional backgrounds to join interaction. Students expressed academic presence by reflecting critically on others' messages on topics/practical sessions of the course; proposing new ideas; extending academic supports in solving assignments, explaining tough components of the curriculum and expressing knowledge in the discipline. The emotional presence of students was expressed by expressing emotions or responding to the emotions of others. Wang and Kang (2006) claimed that students' learning is

improved when their participation in peer group discussion is a blend of social, academic and emotional traits. Kirschner and Erkens (2013) identified three elements in computer supported peer group interaction i.e. pedagogical, social and technical elements. Wang, Yang, Miaomiao, Kenneth, Carolym (2015) classified messages of students on discussion board in three major categories i.e. Active, Constructive and Interactive. Brinton et al. (2013) classified messages on discussion board into three categories i.e. small-talk; course logistics and course specific. Hemphill and Hemphill (2007) instrumented content analysis on manuscript of messages posted on discussion board by students and noted participation of students at four levels of cognitive process initiated with triggering of events when a problem is identified or recognized; followed by exploration, when inconsistency or dissonance among ideas are found; integration of ideas from previous phrases through construction of meaning and negotiation; and finally concluded with resolution of the problem through critical reflection and discourse. Mark (2014) applied a content analysis research approach based on practical enquiry framework and classify cognitive messages into a) triggering events b) exploration c) integration and d) resolution. Roughly 90 % of total messages are from non-cognitive and integration categories. Liyan and Scot (2011) applied content analysis and noted frequently types of postings on discussion board are “Inform- Suggest” and “Explain/Clarify”. Jian Wong, Pursal, Divinsky and Jansen (2015) applied Bloom’s Taxonomy to classify cognitive messages of discussion board into six categories i.e. remembering, understanding, applying, analyzing, evaluating and creating.

Context and background

The food safety and quality management discipline has been emerged as one of highly employable sector in recent years at national and International levels due to growing awareness about Food Safety and Quality Management. The Post Graduate Diploma in Food Safety and Quality Management (PGDFSQM), a vocational programme, launched by Indira Gandhi National Open University, offers rewarding career opportunities in food processing and food safety sectors for unemployed youths. It supports continuing updating of knowledge and skills for unemployed youths and in-service professionals. Good enrolment in this vocational programme reflects the high demand for workforce in this sector and contribution of this programme in meeting that demand at the local, regional, national and international levels.

This programme was simultaneously introduced in online as well as traditional ODL modes in 2009. The programme in the online mode has been delivered through a self-designed and managed web platform (www.ignouonline.ac.in). The curriculum comprises 70% theory and 30% practical components, it includes five courses in theory and three practical courses along with one project. Each course and project is assigned equal weight in awarding certificates to successful students.

Students across India as well as few from the Middle Eastern countries were enrolled in the online mode. Most of the students are employed in food processing industries, food quality laboratories or fast-food outlets chains. These students are well acquainted with applications of internet and social networking sites in professional and social life.

Online delivery strategy is blends traditional ODL and online learning techniques to integrate good features of both systems to improve credential of the degree in the job market and improve convenience and quality in learning. Academic and Administrative supports to individual students is mediated through e-mail, SMS and web. Teaching/counseling supports are mediated through web, radio and satellite. Continuous assessment of students’ performances in the form of home assignments is delivered online and summative assessment in the form of Term End Examination is held at designated centres in traditional paper–pen mode under the supervision of examiners to ensure high reliability. Similarly, study materials are distributed in printed as well as in digital form. Student-teacher and student-student interactions are managed in blended approach

(synchronous and asynchronous) through e-mail; discussion board; chat; SMSs, web conferencing; tele conferencing and Interactive Radio counseling.

An induction programme for newly enrolled students at the beginning of session explains pedagogy of the ODL, perceived contributions of discussion board and other web mediated communication tools, peer interaction and learning. Teachers encourage students to join discussion board for seeking/extending support; adding information/knowledge to the group, and participating in academic debates and social interaction.

Discussion board, hosted on the Course web site (www.ignouonline.ac.in) is the prime instrument for peer group discussion. Discussion is closed and confined to students and teachers of the PGDQSFM programme. Outsiders cannot read and participate in the discussion. Each student is assigned a unique user name and password by the university to validate their identity on the discussion board. The participation in the discussion board is voluntary; students are not assigned any grade points for their contributions on discussion board.

Teachers is anchor of the discussion board, however students have freedom to add new threads whenever they feel that issues they raised have not been covered in existing threads. There is no maximum limit on numbers of words (length of) in messages, but messages do not support embedding and attaching of graphic, picture or any other kinds of objects. Messages are not edited by the anchor before publishing on the discussion board; thus students enjoy autonomy expressing their own views and opinions on topics under debate and introducing new topics on the discussion board.

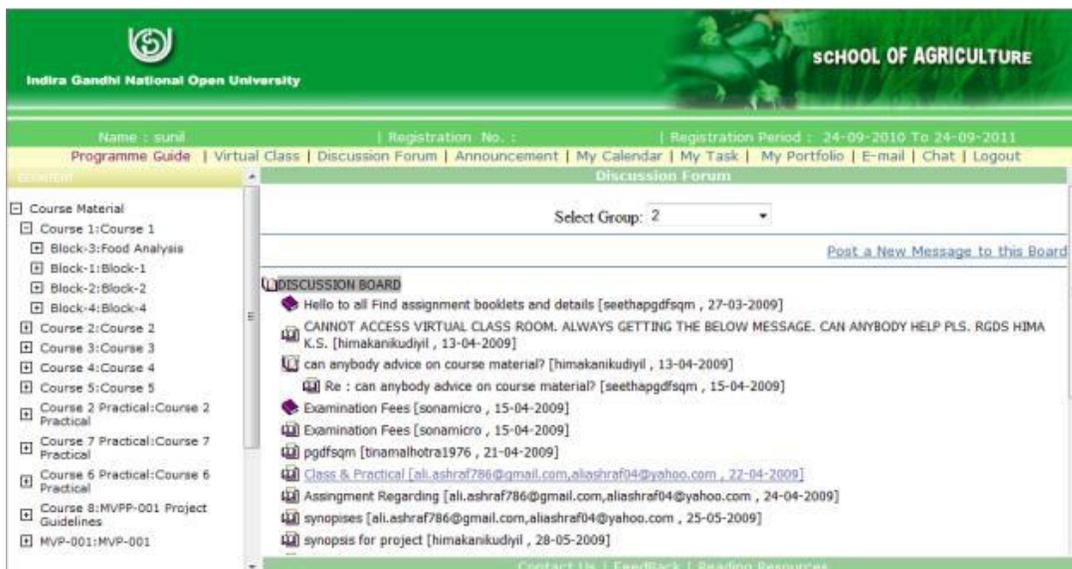


Figure 01: Screenshot of Discussion Board

Research objectives

- To understand contributions of discussion board in facilitating social and academic interaction under distance education.
- To understand contributions of discussion board in extending course logistics, technical and procedural supports,
- To identify types of messages and encourage participation of others on discussion board.
- To formulate an instrument for content analysis to understand contributions of individual students and abstract views/opinions/knowledge/thoughts on discussion board.

- To understand evolution of peer interaction on discussion board with course progress.
- To quantify participation of students in discussion board in terms of numbers of messages, length (numbers of words) of messages, lengths of threads, monthly volume of messages.

Research methodology

This paper analyzed messages posted by students enrolled in Postgraduate Diploma in Food safety and Quality Management (PGDFSQM) on the discussion boards available on the website. The university introduced a new discussion board for each class enrolled in this programme. This study analyzed messages posted in six discussion boards. A long timeframe for capturing of messages enabled the researcher to analyse and understand diversification in views and opinions across six batches of students. Researcher is able to identify issues persisting across the batches. The long timeframe permits generalization of findings of this study.

Qualitative and quantitative research methodologies were applied on all messages posted in six discussion boards. The strength of one research approach substantiated inherent weaknesses of other research approaches. The quantitative research methodology is based on descriptive statistical analysis in terms of number of messages, numbers of threads, thread length, length of messages (average numbers of words) and monthly volume of messages

Number of messages and length of messages reflect extent of participation of students in discussion board. Students, who realize the pedagogical relevance of discussion board in learning, would post frequent messages. Length of messages (numbers of words) expresses willingness of participants to devote time to reflect on the views and opinions of other students. Length of threads quantifies students' reflection and sensitivity for concerns of the group. Length of thread also helps in identifying issues which triggered reactions from large numbers of students.

Quantitative analysis of messages explaining the extent of participation on discussion board could not reveal the purpose of participation of students; therefore the researcher conducted qualitative analysis of messages posted on discussion boards. The qualitative analysis based on content analysis of manuscript of messages posted on six discussion boards was done to understand purposes of sending messages. Content analysis helps in understanding wideness of coverage of issues on discussion board. Challenges in designing an instrument to gather and analyse content include definition of indicators, criteria for classification, generation of coding scheme, training of coders and time to conduct the research (Mark, 2014).

Each message is treated as single unit of analysis and content analysis classified messages on the prominent manifest meaning of messages. The coding scheme for the content analysis is principally based on Bales Interaction Process analysis (IPA), first published in 1950. This taxonomy is frequently instrumented in explaining participants of a small group in discussion by classifying messages on idea communicated through messages. The IPA taxonomy broadly classifies messages into two categories i.e. (i) 'Expressive Integrative Social Emotional Area' and (ii) 'Instrumental Adoptive Task Area'. Messages under the 'Expressive Integrative Social Emotional Area' are not directly related to task assigned to group, it mainly involve social and emotional interactions. Messages in this category are further classified as 'Positive reaction' and 'Negative reaction', whereas positive contributions improve cohesiveness and encourage further participation of others, while negative contributions discourage and crash interaction on discussion board.

Messages under the 'Instrumental Adoptive Task Area' are confined to tasks assigned to group; these messages are further classified as 'Asking question' and 'Attempting Answers', messages in each class are further classified as 'Positive' and 'Negative'. The Bales IPA is contextually modified in this study. The modified instrument retained the classification of messages proposed

by Bales; apart from adding a new class 'Procedure of learning and Technology'. The category covers messages on procedures of learning under ODL and technical snags in delivery of learning. Messages in this class are further classified as Positive and Negative. Messages providing helpful information to fix technical errors and understand administrative procedure of ODL are treated positive.

Adding to this class is justified by the emphasis laid by Gina, Patricia, Jacquelyn and Aimee (2015) on integration of subject knowledge with pedagogy of online learning and knowledge of technology for effective learning under online mode, hence they advocated for inclusion of fifth dimension in comprises of messages on technology and learning practice of online mode in the Bales Interaction Process analysis (IPA) to understand participation of students in discussion board.

Systematic coding and classification of messages on a predefined scale of classification of messages adopted from Bales Interaction Process analysis is done by two coders. The inter-raters reliability (Cohen's kappa score) between two coders was 0.87. Differences between two coders were resolved before finalizing coding of the manuscript of the discussion boards for analysis.

Analysis and discussion

There are 163 messages posted on six Discussion Boards by the students, teachers and technical staff engaged in delivery of PGDFSQM. Table 1 indicates descriptive analysis of messages posted on discussion boards.

Table 1
Descriptive analysis of messages posted on the discussion boards

Numbers of messages	No of words in Shortest Message	No of words in Largest Message	Mean length of messages (No of words)	Median length of messages (No of words)	Mode length of messages (No of words)	Std. Deviation of length of messages (No of words)
163	4	76	22.4	18	18	14.5

There is wide gap in numbers of words in the shortest and the longest messages with the shortest message having only four words and the longest message having 76 words. The high value of the Standard Deviation of length of messages also indicates high variation in lengths of messages on the discussion board. The gap in values of mean and medium parameters of lengths of messages indicates that most of the students wrote short messages and very few wrote lengthy message resulted in higher value of mean with respect of median. Students frequently used shortcuts and abbreviations in writing messages thus students were able to convey details in few words. Frequently used shortcuts/short-abbreviation in SMS and social networking sites are now become common in peer group interaction in academic environment. Students remained casual and informal in writing messages on academic discussion board, as they were while writing messages on social networking sites.

Table 2
Numbers of messages in different Discussion boards

Discussion board Title	Numbers of threads	Numbers of threads without any response from following students	Maximum length of thread (Numbers of messages)	Total numbers of messages	Active period (months)
2011	12	8	4	22	9
1107	5	2	3	10	5
20132	10	7	9	21	8
1	43	32	4	52	6
2	18	12	4	28	4
3	23	17	3	30	4

The maximum numbers of messages are in the Discussion Board with title '1'; with 52 messages, followed by 30 and 28 messages in discussion boards with titles '3' and '2' respectively. University introduced a new discussion board with enrolling of students in a new batch; however titles of discussion board do not reveal identity of the batch. The time gap in posting of first and last messages in specific discussion board is reflected as 'Active period' of that discussion board in the last column of Table 2. There was overlapping in periods of activation of different discussion boards thus students from the same batch unintentionally get involved in different discussion groups and joined discussion board meant for earlier batches in absence of guidance from university and poor nomenclature of title of discussion board; however students gradually moved to discussion board having maximum participation of their batch mates. It is natural tendency to join discussion board having maximum participation from colleague.

There is no association in period of activation and numbers of messages posted on discussion board, for example, discussion board titled '1' survived for six months has 52 messages; on an average 8.6 messages in each month; discussion board titled '1107' survived for five months has only 10 messages; on an average only two messages in each month.

The maximum participation in the discussion board was from the first batch; Students of this batch posted 80 out of 163 total messages all the discussion boards posted by six batches of students across; thus half of the messages were posted by the first batch. Students of the first batch frequently faced teething problems with online learning system. Students shared concerns and sought assistance to resolve these problems. Successive batches were not so frequent in making complaints about poor delivery of learning. Thus, feedback received by teachers on discussion board has contributed in improving delivery of learning.

Teachers and technical staff of IGNOU posted 17 messages, thus contributed 7.3% of messages posted on discussion board. Judith and Greg (2015) noted that teachers' contribution on discussion board was 21 %. Lim and Cheah (2003) noted that participation of teachers on discussion board varied from 2.8 % to 10.5 % of total messages depending on extent of intervention is desired thus researchers have differences in opinions on extent of participations of teachers on discussion board. Contribution of the teachers on discussion board in current study was in the range suggested by Lim and Cheah (2003). Low participation of teachers on discussion board is expected in current study as Participation in discussion board is voluntary having no credit value in certification and learners were in-service professional competent in managing their study independently.

Nature and quantity of messages on the discussion board

The instrument for content analysis is principally based on Bales Interaction Process Analysis (IPA) taxonomy of closed discussion in a small group is given in table 3.

Table 3
Taxonomy of instrument for content analysis

Category of messages	Positive	Negative
Socio-emotional areas	Self-disclosing of personal information and interests Welcoming colleague Encouraging participation Releasing tension Expressing solidarity Cohesiveness (Addressing group as we/our) Acknowledging contributions of others Expressing emotions Feeling of altruism	Expressing passive rejection Responding just for formality Creating tension Showing antagonism Expressing individualism (personal pronounce)
Asking questions	Raising novel questions directly related to study Raising indirect questions to encourage debate Sharing problems faced in the field Sharing doubts in study materials Asking opinion/suggestion	Asking irrelevant questions Raising new thread for issues already under discussed in other threads Condemning others for asking questions Repeating the same questions in panic
Attempting answer (low level learning)	Quoting study materials with justification to answer questions Using examples and personal experience to justify their opinion/suggestion Adding important points Suggesting links to relevant educational resources Raising rational points to develop debate Adding relevant suggestions/opinions/points helping in answering Giving orientation Clarifying doubts in study materials	Hinting false/trivial leads Expressing passive acceptance of answer Expressing Disagreement without justification Condemning new ideas Cutting and pasting others replies Giving shallow answer Giving answer full of prejudice and assumptions Failing to defend answer Confusing response Withholding help Irrelevant answers Repeating what is already said
Reflecting critical/evaluating other suggestions Suggesting applications of knowledge Linking suggestions/opinions with personal experience to explain field applications		Squashing and let down others Debating in vacuum Forced assertion Doing analysis with prejudice Drawing conclusion without consolidating discussion in thread

Category of messages	Positive	Negative
Concluding potential solution from opinion and suggestions posted in that thread Consolidating/summarizing ideas of thread		
Procedure and technology	Sharing knowledge on the pedagogy of ODL system Sharing procedural details for registration; submission of assignment; project work; Sharing knowledge/information to resolve technical problems	Criticizing/blaming university for personal shortcomings Providing wrong/misleading information about procedure Causing panic by spreading rumors about poor quality of learning Under ODL and hard marking in examination Doing advertisement/marketing of software rather suggesting cracks for technical error.

Adopted from: Bales Interaction Process analysis (IPA), first published in 1950

Each message defined by its manifest message contributes one point to predefined category to which that message belong; when a message raised more than one issues than one point is added to each category. The demarcation of contributions as positive or negative is very thin, when students attempted to address issues indirectly or justified their replies with personal experience having little relevance to curriculum. Such messages, some time, resulted in diverting attention although these contributions helped learners by adding new thoughts and having better understanding of practical aspects of knowledge. Similarly, it is difficult to treat indirect but relevant questions under 'Asking question' class as negative. Research counted such messages in positive category.

Table 4
Contents analysis of messages posted on Discussion Board

Category of messages	Numbers of messages				Total
	Positive		Negative		
	No	%	No	%	
Socio-emotional interaction	35	83.3	7	16.7	42
Asking questions	29	69.0	13	31.0	42
Attempting answer (low level learning)	23	74.2	8	25.8	31
Integration and analysis (high level learning)	11	78.6	3	21.4	14
Procedure and technology	144	91.7	13	8.3	157
Total	242	84.6	44	15.4	286

Students messages on discussion board are classified into five categories i.e. with maximum participation in "Procedure and technology" having 54.9 % of total messages. It is followed by participants of students in "Socio-emotional interaction" and "Asking questions" with ease category with 14.7 % of total messages in each category. There were 242 messages (84.6 %) in positive categories; rest 15.4 % messages were in negative category. The maximum positive participations was in "procedure and technology" with 91.7 % of messages under this category; whereas 69.7 % of messages under "asking question" are positive. The highest numbers of negative messages were under "asking questions", students raised questions not relevant to study

and procedures in delivery of learning. Most of the students were new to web mediated ODL system; a number of students sought clarification on the pedagogy and procedures of the ODL system and help for resolving technical snags in getting connected in web conferencing or availing multimedia components of study materials/exercises.

42 messages (14.7%) were classified as socio-emotional interaction. Students under the ODL never get opportunity to meet their class-mates in person, thus discussion board is successful in extending social and emotional interaction. Students initiated social interaction by revealing their identity, sharing their academic/professional backgrounds and making appeal to others to join social and academic deliberations. The profile of students usually includes academic qualification, work experience, places of work and residence. Students never shared information about their family members and friends to maintain a gap between social and academic circles. Students willing to interact in private outside discussion board exchanged mobile numbers and e-mail in the first two weeks. Student's desire private interaction with others having similar academic or professional backgrounds or living near to their home/work place at time and place convenient to both class mates. Students preferred to have social interaction with likeminded people or other having similar academic/professional backgrounds. The contributions of discussion board in delivery of learning are minor in this study as discussion board is not an integral component of learning. 31 messages were under 'Low level learning' and 14 messages were in 'High level learning' classes.

Purposes of peer group interaction on discussion board changed with progress of course, in the initial phase of a batch for example just after the admissions, the interaction was mainly confined on social and emotional traits. Students interested in social interaction responded positively to initial messages. Students, who are new to distance education, in the initial phase of study expressed anxiety and emotional stress due to lack of affiliation with university and poor realization of class-mates and teachers in virtual environment. Discussion board acted as ice-breaker and supports and emotions of others calmed down anxiety and students were able to realize affiliation with university and felt presence of class-mates and teachers in virtual world. Discussion board gradually focused on academic issues, once students were able to connect socially and able to resolve their queries regarding learning procedure and pedagogy of ODL, although contributions of students were low in academic debates. Few students initiated academic debates on the discussion board however threads raising academic issues were not able to survive for long due to poor responses of students.

Extent of participation of students

The study applied communication network approach to understand extent of participation of students. There were 163 messages on the discussion board posted by 78 students, thus 169 out of 247 students never posted any message. 68 % of students were either passive readers or completely ignored the discussion board. 48 students (19.4%) posted only one message. There were only 16 students posted more than two messages on the discussion Board, thus most of the active participants posted one or two messages on the discussion board. Participation in discussion board was not a compulsory component of curriculum thus low participation was expected.

A number of students exchanged their mobile numbers and e-mail address on the discussion board with intention to engage in private interaction thus extent of social and academic interaction was much higher than interaction held on discussion board and discussion board built trust and intimacy.

Table 5
Frequency of posting of messages by individual students on discussion board

Number of messages	Numbers of students	% of total students	Number of messages
9	1	0.4	9
8	1	0.4	8
7	1	0.4	7
5	2	0.8	10
4	3	1.2	12
3	8	3.2	24
2	14	5.7	28
1	48	19.4	48
0	169	68.4	
Sub total	247		146
Numbers of messages by teachers and technical staff			17
Total	Messages		163

Tables 2 and 5 indicate that almost one third of messages (78) did not get any response from others, 14 messages got only one response and very few messages counted on finger had long thread, thus students responded selectively; whenever a student raised common concerns; other students corroborated these concerns by posting messages in that thread hence threads of messages rising common concerns were lengthier.

This study is delimited by exclusiveness of sample and context of conducting the study, thus findings of the study have contextual relevance and cannot be generalised. Blue collar jobs and tech-savvy attitude of the students in this study encourage their participation in discussion board. Further studies needs to be taken with students from other disciplines, profession and socio-learning background. Studies in heterogeneous learning cultures would enable in generalizing interaction behaviour of students on discussion board.

Conclusion

The participation of students in discussion board in this study is self-guided and voluntary, therefore many students had completely ignored or were passive participants in discussion board. Few students; who had realized pedagogical and social relevance of discussion board were active on discussion board. The participation was blend of social, academic and emotional traits although the scope of discussion board was restricted in academic trait. The academic discussion was principally based on problem solving pedagogy to resolve problems faced in fields, exercises of home assignment and understand complex and tough components of study materials. Students shared professional experiences and academic knowledge to resolve academic issues faced by others.

Discussion board has been effectively instrumented for extending course logistic and procedural supports. Students, with prior learning experiences under the Open and Distance Learning (ODL) having better understanding of pedagogy of the ODL have extended supports in course logistic, conducting practical and field work. The participation of students was more in threads seeking help for fixing frequent technical snags, expressing concern on quality of learning, shortcomings in procedural and logistic supports. Discussion Board provided feedback to teacher's technical snags and shortcomings in delivery of programme and unable the university to improve academic supports and delivery of learning by consolidating and resolving issues raised frequently on discussion board.

The importance of peer group discussion cannot be ignored for inclusive developments of students under the ODL system. Students in this study are adult professionals and good practitioners of social networking sites, still they could not achieve perceived academic benefits of discussion board in absence of proper guidance and motivation from teachers. Discussion board should be integral component of curriculum and participation of students should be under the supervision of teacher. Teachers as an anchor can play role of ice-breaker to overcome hesitation and building intimacy among geographically dispersed students under the ODL. Teachers should help students in developing skills to participate in social, emotional and academic interactions by encouraging them to ask novel questions and justifying their stands remain positive, respond to other postings, express social and emotional bondage and respect other privacy.

Students were informal in addressing their class-mates and writing style was causal with frequent mistakes in grammar and spelling. English is not native language of students. Students with poor writing skills in English may hesitate in posting messages even others who post messages, may keep it short and usually fail to express their views/opinions. Freely available web-browsers' plug-in suggesting appropriate use of grammar and lessen spelling mistakes may be embedded in discussion boards having participations from non-native English countries.

Title of thread in discussion board catches attention of participants. Sometimes, students, who were desperate for immediate help failed to draw attention as they could not carefully articulate title of the thread. There were numbers of split threads on the discussion board caused when same issue is simultaneously discussed in different threads; other scenario of split thread is caused when members raised entirely different issues. The split thread resulted in diluting of debate, diverging attention and immature killing of important threads before concluding. Teacher should minimize splits in threads by deleting/shifting erratic messages in appropriate threads and advising students to keep messages on topic under discussion.

The study noted that interaction in the initial phase was formal and ceremonial due to poor intimacy among participants, students developed intimacy with initial participants in social and emotional interaction. Students gradually understand what type of contributions on discussion board provide better recognition and acceptance from others Frequency of messages with positive contributions improved under 'Attempting answer' and 'Integration and Analysis' classes increased with developing of intimacy. Students were involved in high order learning on discussion board with progress of course. Students reserved their feeling while challenging ideas of others in anticipation of being rejected for expressing strong feelings/opinions with others. Students were engaged in peer group discussion still preferred to have one to one interaction in private and also expressed willingness to meet batch mates from nearby areas.

Teachers' role as anchor of discussion board is key to imparting learning and social interaction through discussion board. Students generally treated teachers' comments on discussion board as final verdict or concluding remark; usually there was no further discussion in thread, having remark of teachers. Teacher's role should not be confined to conclude/summaries discussion rather he should foster academic discussion by challenging ideas of students, adding new

information/knowledge, appreciating and acknowledging valuable contributions of students. Well-articulated messages from teachers would encourage participation of students in discussion board and ensure achievement of perceived benefits.

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Editor's Note: As we adopt technologies to improve efficiency and lower cost, we should ensure that the change is beneficial for all students. If we have more than one option available – such as face-to-face or distance learning – we can choose the option that will be most effective for each student. This research comes up with specific recommendations for the student populations and subject matter used in this study.

Mode of delivery and students' academic performance: Evidence from a higher education institution in developing Oceania

Ronald Ravinesh Kumar and Arvind Patel

Fiji

Abstract

The paper examines the impact of the mode of delivery of education on first-year accounting students' academic performance, at a higher education institution in developing Oceania. We use the ordinary least squares (OLS) and quantile regressions to examine the relationship between academic performance and the mode of study. The OLS results indicate no statistically significant difference in students' performance when the mode of delivery of education is through face-to-face or distance. However, results based on the quantile regression show that students who are generally weak as noted from the low entry marks, perform better when they study via face-to-face mode. On the other hand, students with strong academic ability as noted from above average entry marks show no significant difference between the modes of studies. The results therefore indicate that for above average group of students, independent learning can be promoted and encouraged. However, for students with below average entry level marks, it is recommended that face-to-face mode of study is emphasized. Thus, institutions which are focusing on different mode of delivery should also consider the academic strength of the students to ensure optimal results as a higher education provider.

Keywords: pre-degree accounting knowledge; first-year university accounting; face-to-face learning; distance learning; Oceania.

Introduction

The landscape of knowledge delivery is changing. A number of higher education providers are offering courses and programs via multiple modes, mainly face-to-face, distance and online. Education offered via distance mode has close links to online education. On one hand, the distance education brings education to students, on the other hand, there is obviously lesser interaction with the instructors and the institutional environment. It must be noted that for a virtual learning platform to be highly effective, there needs to be a good technology infrastructure. This is to ensure virtual and real time interaction between student and teachers.

Some institutions offer virtual courses as open source, where students in any part of the world can participate as long as they have good internet connectivity. Therefore, the availability and accessibility of technology can breach the gap between students studying via face-to-face and distance learning. However, the universities offering courses through online mode need to ensure that there is a readily available internet connectivity for the students. Unfortunately, this is not always the case in for many higher education institutions, and the developing Pacific Island countries, especially in Oceania, are no exception. Where internet connectivity is poor, education through face-to-face and distance mode becomes a popular choice.

The distance education mode is important especially when students cannot afford on-campus (face-to-face) offered courses or are remotely located from the center. Given the nature of distance education, it is often expected or assumed that students are independent learners and have the necessary strategies of learning at their disposal. However, nothing can be further from the truth.

In this paper, we focus on the first-year accounting students. We examine the impact of education offered via face-to-face and distance mode on the students' academic performance.

Several studies in accounting have investigated the determinants of academic performance of accounting students at universities (Hartnett et al, 2004; Jackling and Anderson, 1998; Rohde and Kavanagh, 1996; Simons et al., 1995; Park et al., 1994; Keef, 1992; Keef and Hooper, 1991; Clark and Schwartz, 1989; Eskew and Faley, 1988; Farley and Ramsay, 1988; Keef, 1988; Mitchell, 1985; Hicks and Richardson, 1984; Bergin, 1983; Baldwin and Howe, 1982). Most of these studies focus on the individual student characteristics or study environment, where such factors like pre-degree accounting knowledge, work experience, general academic ability, gender, enrolment status, cognitive ability, student anxiety and language background, are considered. A study by Bryant et al. (2005) provide an excellent review of distance education in relation to accounting. The study concludes that all survey reports and indicators point towards an increasing trend in distance education (U.S. News & World Report, 2004). However, what is missing in most of the studies is the mode of study, which can have significant impact on students' academic performance.

The growing trend of universities to offer education through distance can be an option for students to consider. However, both the students and the institutions must realize that the mode of education can be a decisive factor in students' academic progress and hence have implications on the reputation of institutions.

Our study answers an important question of whether students' academic performance differs when the mode of study is taken into account. Our sample is from a leading university in a developing country in Oceania. Within caveats, our results can be generalized to higher education institutions which are offering courses through these two modes, and possibly to other business related courses. The findings are mostly relevant to institutions which are geographically spread, and constrained by poor technology infrastructure and connectivity.

The rest of the paper is set out as follows. In Section 2, we discuss various methods of delivery in higher education. Section 3 is on data, method and models. In Section 4, we present the results, and finally, in Section 5, we draw conclusions.

Academic performance and the method of delivery of accounting education

Distance education has been an important educational delivery method for many years. Keegan (1980, 1996, 2002), indicates several factors that create the demand for a distance education. Among these include: (a) notable form of separation of teacher and learner, (b) organizational structure and planning to support distance students, (c) availability and use of technical media, (d) provision of two-way communication, and (e) an absence of group learning. The distance education model proposed by Bryant et al. (2005) show the links and relationships of the various components and indicates a direct relationship between communication media and students' academic performance.

The impact of the mode of delivery on students' academic performance is an important issue. Studies have shown that higher education institutions invest heavily in education technologies and students spend considerable amount of resources in acquiring supporting technologies for educational purposes (Bryant et al. 2005; Swift et al. 1997, 85). However, there is a perception that education delivered through distance mode is of inferior quality (Asif and Raouf, 2013). Such a perception is based on the observation that in the case of face-to-face mode, students can effectively interact with the instructors and peers and hence benefit from regular delivery of classes.

Knowledge about the effects of the mode in which education is delivered and its effects on student academic performance is important for the students, educational institutions and accounting profession in general. It is expected that students will make choices about the form (mode of delivery) and place (location and institution) of education based on criteria such as cost, time, employment and commitments, among other things. Subsequently, examining student characteristics that influence the choices between modes of study is important (Biner et al. 1995). Notably, if the quality of education differs according to the delivery mode, professional bodies must be made aware so that a review can be done and the acceptability of education for accreditation purposes is reviewed and reconsidered. Additionally, the outcomes on quality have further implications for educators in terms of reviewing the effectiveness of methods used in teaching.

Distance education

Distance education can be synonymous to correspondence education (Filipczak, 1995). The correspondence schools have traditionally offered education based on printed booklets, a number of written instructions for student and teachers, mode of interactions, and a set of assignments.

Our study is situated within the Interaction Theory (IT), which is based partly on Communication Theory (Shannon and Weaver 1949) and Equivalency Theory (ET) (Simonson et al. 2002). The IT comprises three elements: (a) a recognition of all types of interaction (learner-content, learner-instructor, and learner-learner); (b) a message transmission as interaction; and (c) an interplay of social and psychological connections (Roblyer and Wiencke 2003). Moreover, the theory posits that increased levels of interaction between an instructor and learner leads to increased levels of student achievement and satisfaction (Roblyer and Wiencke 2003).

A reinforcing theory proposed by Holmberg (1989) posits that raising the levels of student motivation increases students' learning pleasure. When a student believes that the teacher is genuinely interested in his/her learning, the student's motivation to succeed is heightened. The increased motivation then leads to higher performance and higher student satisfaction. It is important to highlight that the instructor-learner interaction is an important element in establishing the level of motivation, which can be enhanced when the distance and speed of communication between a student and the teacher is reasonable. Hence, when there are high levels of interaction, students feel that instructors are more committed and this improves the level of motivation for a student.

The ET on the other hand, posits that learners should experience similar outcomes, regardless of the environmental conditions (Simonson et al. 2002). Thus, a student who completes a course through distance mode in an isolated home environment and a student who studies in a traditional classroom setting, are expected to have the same degree of knowledge (equivalence). The ET recognizes that the method of attaining the knowledge may be different, but the outcome should be equivalent (Keegan 2002).

The IT and ET can be reconciled when we consider ET to accommodate instructor-student interaction albeit in different forms. For example, electronic communication, internet, video conferencing, and other telecommunication devices that facilitate communication and interaction are extensively used in distance education, this can lead to equivalent outcomes. However, the level and quality of interaction using electronic devices can vary. Several authors show a positive link between interactivity and student learning (Roblyer and Wiencke 2003; McIsaac 1999). They argue that interaction in distance education courses helps the learning process and fosters a collaborative and supportive environment, which in turn leads to higher cognitive processing amongst other learning improvements (Milheim 1995).

Media comparison studies

The IT and ET theories have been examined within the context of media comparison studies. Early studies compared face-to-face mode to other forms for delivery such as films, radios, and videos, among other things, using mainly the experimental methods (Lockee et al. 1999). Research into media comparison studies has been conducted on the notion that face-to-face interaction provides superior learning experience to distance delivery modes. In a face-to-face delivery mode, students and instructors can supplement verbal communication with body language for more effective transmission of content and feedback, the latter having an added advantage of being instantaneous. There is also an element of peer interaction in a face-to-face mode. However, a number of studies provide conflicting views regarding the effectiveness of instructional delivery in different modes (Clark 1983; Clark 1994a, 1994b; Kozma 1994, Morrison 1994; Reiser 1994; Lou et al., 2006). Using accounting as a subject, Seay and Milkman (1994) compared face-to-face and interactive television (ITV) delivery mode and noted that students enrolled in the course offered via ITV delivery mode significantly outperformed students in the face-to-face delivery mode. The study also indicates that while students were impressed with the ITV delivery mode, they were unsure if they would do another course in this mode. Rankin et al. (2003) examines international students' academic performance in an introductory accounting course. They find that international students studying via face-to-face mode performed significantly better than the international students in the distance mode. However, there were no significant differences in the academic performance for domestic students opting for face-to-face and/or distance mode of study. Therefore, given the theoretical discussions based on IT and ET, and the assumption that greater instructor-learner interaction occurs in face-to-face compared to distance delivery mode, we assert that the academic performance of face-to-face students in first-year university accounting is expected to be superior to that of students who study through the distance mode.

Control variables

Several studies consider whether pre-degree accounting knowledge is related to difference in the academic performance of students in first-year university level accounting courses. While some (Bergin (1983), Baldwin and Howe (1982) and Keef (1988, 1992)), find no significant difference in academic performance between students who studied accounting in high school and those who did not, others (Rohde and Kavanagh (1996), Keef and Hooper (1991), Eskew and Faley (1988), Farley and Ramsay (1988), Mitchell (1985), and Hartnett et al. (2004)) note a significant difference between the two groups. Furthermore, studies that investigated the effect of entrance qualifications on student performance in first-year university level accounting courses concluded that higher entrance qualifications lead to better performance in first-year University accounting students (Hartnett et al., 2004; Eskew and Faley, 1988; Hicks and Richardson, 1984).¹

Other variables, such as pre-degree work experience in accounting, other high school subjects, entrance requirements, age, gender, enrolment status, cognitive ability, anxiety and student origin, have shown mixed results. Studies by Clark and Schwartz (1989), Simons et al. (1995), Park et al. (1994), and Jackling and Anderson (1998) show no significant impact of gender on student performance. Hartnett et al. (2004) note that students who were less anxious, studied part-time and had work experience in accounting perform better after controlling for their ability (Jackling and Anderson 1998). While these studies examine a number of variables, the majority conclude pre-degree studies in Accounting and general academic ability favor higher grades.

¹ Auyeung and Sands (1992) report that secondary school accounting course assists students with the initial university accounting course. Furthermore, the study concludes that the tertiary entrance score is less significant than secondary school accounting as a predictor.

The following characteristics are noted in our sample: (a) the study and text materials used for the first-year accounting course are the same for both face-to-face and distance modes; (b) students in both modes of study have access to the same class-share to access the same learning resources and could access the Web-CT (Web Course Tools) technology;² (c) same instructors coordinate and teach the course in two semesters in a year; (d) all students have access to email facilities and faculty members are required to attend to email queries on a regular basis; (e) students in both modes of study are required to do the same mid-term and final-exam papers; and (f) exam in both modes are held at the same locations throughout the region. As part of the data collection, the institution and the students are assured that their identity will not be part of any reported results.³ A total of 973 (453 face-to-face mode and 520 distance mode) students enrolled for the first-year accounting course. are key determinants of success for students in introductory accounting subjects.

Data, method and modeling strategy

Data

The data was collected from a repository of a higher education institution in one of the leading education institutions in a developing country in Oceania.⁴ The institution offers a number of courses in two different modes. The institution uses English as the medium communication. The students can study first-year university level accounting either through face-to-face or distance mode. The course durations for both modes are 14 weeks. Students studying through face-to-face mode receive a two-hour lecture and a two-hour tutorial per week, can consult tutors in person, and easily access resources like the library, internet labs and other facilities. The students studying through distance mode have a one-hour satellite tutorial every fortnight to supplement the print-based materials that are supplied when they enroll and pay their fees. The following characteristics are noted in our sample: (a) the study and text materials used for the first-year accounting course are the same for both face-to-face and distance modes; (b) students in both modes of study have access to the same class-share to access the same learning resources and could access the Web-CT (Web Course Tools) technology;⁵ (c) same instructors coordinate and teach the course in two semesters in a year; (d) all students have access to email facilities and faculty members are required to attend to email queries on a regular basis; (e) students in both modes of study are required to do the same mid-term and final-exam papers; and (f) exam in both modes are held at the same locations throughout the region. As part of data collection, the institution and students are assured that their identity will not be part of any reported results.⁶

² WebCT is an online proprietary virtual learning environment system that is licensed to education institutions for e-learning and played a significant role in virtual learning and is considered the world's first widely successful course management system for higher education

³ Moreover, the authors' contend that over the years, there has been no substantial changes in the two mode of studies and therefore, the findings are relevant both relatively matured and new and emerging higher education institution, which are noted to follow similar model of education, in the region.

⁴ The authors' sincerely thank the institution for giving access to the student data. The identity of the institution and the students are kept anonymous.

⁵ WebCT is an online proprietary virtual learning environment system that is licensed to education institutions for e-learning and played a significant role in virtual learning and is considered the world's first widely successful course management system for higher education

⁶ Moreover, the authors' contend that over the years, there has been no substantial changes in the two mode of studies and therefore, the findings are relevant both relatively matured and new and emerging higher education institution, which are noted to follow similar model of education, in the region.

Table 1
Final grade distribution of first-year university accounting students

Grade	Mark Range	Mode of student		Total	Percentage
		Face-to-Face	Distance		
A+	79.5+	-	1	1	0.10
A	74.5-79	6	6	12	1.24
B+	69.5-74	4	8	12	1.24
B	64.5-69	26	17	43	4.42
C+	59.5-64	57	34	91	9.36
C	49.5-59	195	118	313	32.20
D	39.5-49	63	88	151	15.54
E	0-39	90	142	232	23.86
EX	N/A	12	105	117	12.04
Total		453	519	972	100.00

Source: Authors' compilation using student database provided by the Institute

A total of 973 (453 face-to-face mode and 520 distance mode) students enrolled for the first-year accounting course.

The university records give all the information for results of the first-year accounting course. Table 1 presents the final grade distribution of the course results for students in the face-to-face and distance modes. As noted, 36.4 percent of the face-to-face mode and 64.6 percent of distance mode students failed to meet the pass grade (C or better).⁷ All other data is collected from students' personal files and identification details are coded to maintain anonymity.

A student who repeated the course is dropped from the dataset, since he/she has received more training than the first-timers and is likely to confound the control variable with respect to pre-degree accounting knowledge. A student who is awarded an "EX" grade (implying she did not sit for the final examination) is removed from the sample because the "EX" grade does not reflect the true academic performance. Moreover, we excluded students who obtained pre-degree qualifications from sources other than the standard national exams conducted at the secondary schools because it is understood that other sources such as mature entrants or a student completing pre-degree at a technical institute would have different academic experience. Finally, we exclude students who have no pre-degree performance data. This process of elimination and data refining gives a total of 505 (Table 2) observations and the final sample consists of all students who completed secondary schools and are in their first-year university accounting studies either through the face-to-face or the distance mode.

⁷ 'C or better' refers to grades B and A, respectively.

Table 2
Data elimination conditions

	Face-to-Face	Distance	Total
Total number of students enrolled	453	519	972
Students getting “EX” grade (not sitting final exam)	12	105	117
Repeating students	22	31	53
Students entering from other sources	106	96	202
Students with no pre-degree performance data	34	61	95
Total sample size	279	226	505

Source: Authors’ compilation using student database provided by the Institute

Method

We use two methods for analyses. First, we use the ordinary least squares (OLS) technique which gives robust results in the presence of large data set with the assumption of homogeneity, constant variance and normally distributed errors. Another method is the quantile regression, which is useful when empirical results are likely to be affected by the limitations of the OLS technique, such as inefficient or biased estimates. While the distribution of the data may be skewed, the conditional mean is likely to be influenced by the outliers to become non-representative. Koenker and Hallock (2001) highlight that the estimated coefficients by the quantile regression function can explicate the conditional medium functions among variables. When data are asymmetrical, the estimates of conditional medium function generated by the quantile regression approach is not affected by the outliers and hence are more representative than the results from the OLS technique. When the sample data are more symmetrical, although the estimates produced by quantile regression and OLS techniques will be similar, the quantile regression is able to estimate observed points outside the central location.

Following Buchinsky (1998), and assuming $(y_i, x_i), 1, \dots, n$, where n is a sample of the population, y_i is the dependent variable and x_i is the vector of explanatory variables, a simple quantile regression model can be written as:

$$RESULT = x_i \beta_{\theta} + u_{\theta_i} \quad (1)$$

where $x_i \beta_{\theta} = Quant_{\theta}(y_i / x_i)$ and $Quant_{\theta}(y_i / x_i)$ refers to the conditional quantile of y_i , conditional on the vector of the explanatory variables x_i , and $\theta \in (0,1)$. It is assumed that

$Quant_{\theta}(\mu_{\theta_i} | x_i) = 0$. The quantile regression estimates are achieved by minimizing the weighted sum of the absolute value of the errors (Bedard 2003). In other words, the θ^{th} conditional quantile regression estimator for beta is obtained by:

$$\min_{\beta} \left[\sum_{\{i: y_i \geq x_i \beta\}} \theta | y_i - x_i \beta | + \sum_{\{i: y_i < x_i \beta\}} (1 - \theta) | y_i - x_i \beta | \right]. \quad (2)$$

The main benefit of quantile regression is that it allows for the impact of explanatory variables on the dependent variable to be analyzed along the total distribution of a data sample. Buchinsky (1998) points out two other advantages of the procedure. First, as quantile regression is based on a weighted sum of absolute deviations, the approach gives a robust measure of location on the distribution scale. In turn, this ensures that the estimated coefficients on the explanatory variables are not sensitive to outlier observations in the data sample. Second, when the error term in the regression is of a non-normal distribution, the estimates obtained from quantile regression may be more valid than those obtained using OLS.⁸

Model

As a first step, we analyze the data using the OLS model (equation (3)):

$$RESULT = \beta_1 ACCTNG + \beta_2 OVERALL + \beta_3 STDYMODE + \varepsilon \quad (3)$$

where, *ACCTNG* refers to pre-degree accounting final exam score; *OVERALL* is the pre-degree overall final-year performance measured by adding the student marks obtained in English, Math, Accounting and one other top ranked subject mark. Each subject carries a maximum of 100 marks and hence the total mark attained is out of 400 marks. In our sample, students in the secondary school took four subjects for the year-end examination. These are English and Math as compulsory subjects and two other subjects of their choice to complete the final assessment grading. All students who enrolled in accounting as a major at the university has accounting as a choice subject in their secondary completion and hence accounting is included in assessing the final overall pre-degree academic ability; the *STDYMODE* refers to the mode which the students choose to study in their first-year university accounting education. A dummy variable is assigned where 0 indicates face-to-face mode and 1 indicates distance mode; the *RESULT* refers to the performance of the students in the first-year university accounting and is the raw score of final marks with a maximum of 100 marks; and ε is the error term.

Results

OLS regression

Table 3 presents the descriptive statistics of the dependent variable (*RESULT*). As noted, the mean *RESULT* for the face-to-face mode is 56/100 (standard deviation of 9.9) and distance mode is 46/100 (standard deviation of 12.0) for the distance mode. For the combined sample, the mean *RESULT* is 51/100 (standard deviation of 11.9). Table 4 presents the results of a simultaneous test of the main hypothesis as well as the control variables using equation (3). The overall analysis of variance shown at the bottom of Table 4 indicates that the estimated equation (3) is highly significant at the 1 percent level with an F-statistic of 105.5. These estimated results indicate a 38.7 percent of the variation (derived from the adjusted R-square) in the students' performance (*RESULT*) is explained by the independent variables included in the model.⁹ However, we note that the mode of study (*STDYMODE*) is not statistically significant (t-statistic = -1.285, p = 0.200) within the conventional 1-10 percent levels. The control variables, students' background in accounting (*ACCTNG*: t-statistics = 7.09, p < 0.01) and their overall marks attained

⁸ For various extensions of this quantile regression approach see Buchinsky (1998) and Eide and Showalter et al. (2002).

⁹ The independent variables, *ACCTNG* and *OVERALL*, are expected to show a high degree of correlation since *ACCTNG* is included in *OVERALL* to determine the overall students' academic ability. The test results indicate that multicollinearity is not a serious problem. None of the VIF values in the model is greater than 5, the last condition index is less than 30 and no dimension has more than one variance proportion greater than 0.50 (Tabachnick and Fidell 2001).

in high school (which includes English and Math) (*OVERALL*: t-statistic = 5.57, $p < 0.01$) are both positive and statistically significant. This indicates that the pre-degree accounting knowledge and the overall academic ability of the students (based on the main subjects, English and Math) are key determinants of the first-year university accounting students' academic performance.¹⁰ In this regard, a student who has completed high-school level accounting course and attained higher marks in English and Math subjects is expected to perform relatively better in the first-year university level accounting course than those who have scored lower marks in the two subjects or has never studied accounting in high school.

Table 3
Descriptive statistics

Study mode	Mean	Std. Deviation	N
Face-to-face	55.7	9.9	279
Distance	46.0	12.0	226
Total	51.3	11.9	505

Source: Authors' compilation using student database provided by the Institute

Table 4
OLS Regression results: dependent variable (*RESULT*)

Predictor	Hypothesized Sign	Coefficient	t-statistic	Significance
<i>Constant</i>		7.316**	2.011	0.045
<i>STDYMODE</i>	+/-	-1.332	-1.285	0.200
<i>ACCTNG</i>	+	0.369***	7.093	0.000
<i>OVERALL</i>	+	0.080***	5.569	0.000

ANOVA

Source	DF	SS	MS	F-stat	p-value
Regression	3	27456.366	9152.122	105.527	0.000
Residual Value	501	43450.731	86.728		
Total	504	70907.097			

Notes: Model $R^2 = 38.70$ percent, Adjusted $R^2 = 38.40$ per cent.
** and *** refer to 5% and 1% level of statistical significance.

Source: Authors' compilation using student database provided by the Institute and SPSS

Quantile regression

Table 5 presents the results of quantile regression analysis for five separate quantiles. The results from the quantile regression indicate that the impact of the independent variables on first-year

¹⁰ The conclusion is reasonable because with the background in English and Math, students have better aptitude for analytical subjects like accounting.

university level accounting marks varies across the grade distribution. The pattern in Table 5 indicates that the estimated t-statistics for *STDYMODE* increases over the quantile distribution, from -2.92 (Q10) to 0.74 (Q90) and the p-value from 0.004 (Q10) to 0.459 (Q90). This trend indicates that at the lower quantiles (Q10 and Q25), *STDYMODE* is a significant factor affecting student academic performance, and students enrolled in the face-to-face mode outperform students enrolled in the distance mode. In the middle and upper quantiles (Q50, Q75 and Q90), *STDYMODE* is not statistically significant, indicating that there is no difference in students' performance between face-to-face mode and the distance mode. The control variables, *ACCTNG* and *OVERALL* display a consistent pattern across all the quantiles, indicating that both are positive and highly significant. Hence, *ACCTNG* and *OVERALL* have a significant positive impact on students' academic performance in first-year university accounting, similar to the results obtained from the OLS estimation. The tests of equality in Table 6 indicate that there is a significant difference in a student's academic performance in Q10 and Q25 compared to all other quantiles. However, there is no significant difference between Q50, Q75 and Q90. As noted, in Q10, the *ACCTNG* mean is 54.6 and the *OVERALL* mean is 210; in Q25, the *ACCTNG* mean is 59 and *OVERALL* mean is 230; in Q50, the *ACCTNG* mean is 67.0 and *OVERALL* mean is 254; in Q75 the *ACCTNG* mean is 68 and *OVERALL* is 264; and in Q90, *ACCTNG* mean is 81 and *OVERALL* = 301.¹¹ Hence, Table 5 shows that the students with lower (Q10 and Q25) pre-degree accounting, and the two compulsory subjects (English and Math marks) are likely to benefit from studying through face-to-face mode whereas students' performance will not vary much if they are in at least the 50th quintile, which means students in these quintiles have scored high marks in their pre-degree accounting and the two the compulsory subjects.

TABLE 5
Quantile Regression

MODE (Face-to-face versus Distance) is the dependent variable (*RESULT*)

Predictor	Q10		Q25		Q50		Q75		Q90		
	t-stat	p-val									
<i>Constant</i>	0.0892	0.929	1.526	0.128	1.290	0.198	1.061	0.289	3.747	0.000	
<i>STDYMOD.</i>	-2.923	0.004	-2.802	0.005	0.473	0.637	1.185	0.236	0.741	0.459	
<i>ACCTNG</i>	2.502	0.013	6.643	0.000	5.879	0.000	6.572	0.000	6.605	0.000	
<i>OVERALL</i>	2.774	0.006	3.295	0.001	4.529	0.000	4.965	0.000	2.885	0.004	
Summary Statistics (MEAN)											
<i>RESULT</i>	28.8		40.4		51.9		61.9		72.1		
<i>ACCTNG</i>	54.6		59.1		67.0		67.8		80.6		
<i>OVERALL</i>	210.0		230.0		254.0		264.0		301.0		

Notes: *MODE* = is the way in which the students study first-year university accounting, 0 = face-to-face and 1 = distance; *ACCTNG* = is the pre-degree accounting final exam scores out of 100 marks; *OVERALL* = is the pre-degree overall final-year performance, measured by adding English, math, accounting plus 1 best subject giving a total which is out of 400 marks. *Source:* Authors' compilation using SPSS

¹¹ Note that the *OVERALL* mark is out of 400 and *ACCTNG* mark is out of 100.

TABLE 6
ANOVA - Tests for equality of coefficients across quantiles

Quantile	Q10		Q25		Q50		Q75	
	F-test	p-val	F-test	p-val	F-test	p-val	F-test	p-val
Q10	-	-	-	-	-	-	-	-
Q25	2.815	0.038	-	-	-	-	-	-
Q50	5.263	0.001	3.769	0.010	-	-	-	-
Q75	4.732	0.003	3.981	0.008	1.211	0.305	-	-
Q90	4.998	0.002	3.060	0.027	0.372	0.774	0.813	0.483

Source: Authors' compilation using SPSS

Conclusion

The paper sets out to explore the relationship between students' academic performance in the first-year university accounting course and the mode of delivery. Data from a higher education institution in the developing Pacific Island Country is collected and analyzed. The medium of communication for the institution is English and therefore, students and instructors are expected to interact in English language. The institution provides courses at undergraduate and graduate levels through face-to-face mode, and most of the undergraduate courses, including accounting subjects, are also offered through distance mode.

For analysis, we used the OLS and Quintile regression methods. Based on the OLS results, the findings indicate that the mode of delivery (face-to-face and distance mode) has no statistically significant impact on a first-year university-level accounting students' academic performance. The results from both methods uniformly support the importance of students having prior knowledge of accounting and attaining high overall marks which includes English and Math as compulsory subjects as decisive to students' academic performance in the first-year university level accounting course.

Interestingly, the results from the Quintile regressions show significant variation in the modes of study for students who attained low marks in their pre-degree accounting course and/or overall marks from their high school; these students are in the 10th and 25th quintile. The variations vanish in the upper quintiles indicating that students who attain higher overall marks and/or have pre-degree accounting exposure prior to enrolling in the first-year accounting course are relatively indifferent to the modes of delivery.

The study thus highlights that mode of delivery impacts the academic performance of first-year university-level accounting students, especially when a student has below average mark and/or no accounting background prior to enrolment. In such cases, our analyses recommends that students take the course delivered via face-to-face mode. Higher education providers that intend to offer and/or already offer courses through distance mode need to consider the impact of modes of delivery on a student's academic performance. Since prior academic performance influences first-year academic performance, it is crucial to consider this factor when advising and/or enrolling students in different modes of study.

On the other hand, students who demonstrate good academic performance at the secondary level can be given the option to enroll through distance mode. Therefore, above-average students can be given the option to study through distance learning, especially if they are privately or self-funded students. The overall cost of studying via distance is generally cheaper than face-to-face delivery.

In terms of improving the academic performance of students, irrespective of the mode of delivery, the instructors should provide effective learning pedagogy (such as formative assessment), remedial programs and necessary support for students (Yorke, 2003).

The findings are important and relevant for a number of higher education institutions who share similar characteristics at least in terms of the modes of delivery, courses and program. However, care must be taken not to overly generalize the outcomes for a number of reasons.

First, the study was conducted based on the data collected on students in one higher education institution and hence the findings cannot be generalized across all universities.

Second, the study considered the first-year accounting students enrolled in both modes, and therefore generalization across other courses and levels cannot be made. It is also possible that the validity of grades can be examined to gain further insights into students' academic performance (Rexwinkel, Haenen and Pilot 2011; Bailey et al. 2016).

Third, the study excludes the possibility of a combination of different levels of interaction between students and instructors, and types of technology used to deliver the course in the two modes which can possibly influence the quality of education delivery and the academic performance (Asif, Raouf and Searcy 2013).

Finally, it is understood that while student scores and their respective mode of study capture a realistic picture of student performance, an experimental study cannot truly replicate all possible combinations of different delivery modes. Therefore, future research can consider including students who gain entry into the first-year university (accounting) program by completing courses at entry levels through institutions which aim to provide technical/vocational, bridging/foundation, or the mature student programs (Tinto 1975; 1998).

Other important factors which can be explored includes academic integration of students, perceived reputation of the institution, internationalization, proximity of the students to the campus (Bart et al. 2012), specific approaches used in teaching, transition of students from high school to a higher education institution (Brinkworth et al., 2009), and types of feedback provided by instructors as early intervention measures (Trigwell et al., 1994, 1999; Brinkworth, 2009).¹²

In any case, if a higher education institution wishes to promote distance (or online) learning, it is essential that characteristics of distance learners, such as the levels of self-motivation, ability to structure one's own learning (Hardy and Boaz, 1997), previous experience with technology (Richards and Ridley, 1997), a good attitude toward the subject matter (Richardson, 2007), and learning and temperament styles (Aragon et al. 2002; Gibson and Graff, 1992; Dille and Mezack 1991), support the mode of study. For education planners, the manner in which course curriculum and materials are organized and delivered needs to be aligned to support and promote effective learning, even for students who enter with low marks.

The study does not imply that distance education can be a substitute for face-to-face education. For efficient operation and institutional success which embodies student success, the academic strength of students need to be considered. Findings of the study are relevant, timely and applicable for higher education institutions in developing countries. It is important that higher education institutions consider revisiting the entry requirements and have experienced academic counselors to guide students into appropriate mode of study.

¹² Trigwell et al (1994) identifies five different approaches to teaching: teacher-focused strategy with (1) intention of transmitting information to students, (2) intention that students acquire the concepts of the discipline, (3) teacher/student interaction strategy, student-focused strategy aimed at students: (4) developing their conceptions, and (5) changing their conceptions.

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Editor's Note: How do you define course quality? How do you define academic performance? And to what extent does course quality impact academic performance? This study attempts to relate course quality to academic performance, but there may be variables that impact the outcome that cannot be identified or cannot be controlled. This study is an excellent first attempt and answers many of those questions.

Impact of course quality on student academic performance

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Abstract

Quality was thought to be an important factor in the delivery of online courses. Quality is defined as "a high level of value or excellence" by Merriam Webster (Quality, 2016). Through this research, a quality pre-assessment in the business, economics, entrepreneurship, and marketing courses was conducted, course corrections initiated through an intervention, and a post-assessment of the quality in the same courses was conducted. Data was compared to student grade point average (GPA) data to see if improvement has been made in the average grade level. Quality was measured using a Course Quality Rubric which scored quality in various categories including announcements, syllabus, lessons, assignments, and tests/quizzes. This study was an attempt to document the effects of quality within an online learning environment on performance of the student.

Keywords: Student engagement, forum quality, student performance, distance learning, forums, discussion boards, discussions, online learning.

Introduction

Quality is a difficult concept to define and in the online environment educators have been trying to define it for years. One popular definition extends the dictionary definition given by the Quality Matters (QM) initiative which explores quality in eight different categories:

1. Course overview and introduction
2. Learning objectives
3. Assessment and measurement
4. Instructional materials
5. Course activities and learner interaction
6. Course technology
7. Learner support
8. Accessibility and usability (Quality Matters, 2017)

Based on this definition, the researchers developed their own rubric to measure the overall quality of courses within four academic disciplines: Business Administration, Economics, Entrepreneurship, and Marketing. Courses were pre-assessed, updated, and then post-assessed. The student performance was then evaluated to note any differences. Findings and recommendations are provided as well as suggestions for future research opportunities.

Literature review

Most research found to date is focused on online learning and student outcomes, student satisfaction, faculty knowledge, or course design. A gap exists with specific focus on the quality of the course and student academic performance. While course design has been linked to course quality, a paucity of research exists with student academic performance.

Freemana, et al (2014) found significance with exam scores improving (approximately 6%) in Science, Technology, Engineering & Math (STEM) courses which have included active learning, versus traditional lecturing in face-to-face courses. In addition, those students with traditional lectures were 1.5 times more likely to fail than students in active learning classes. Their study brings to question the use of traditional lectures for today's students. While the study is not focused with online students, the same concept can be applied; lectures which are not "traditional" text or PowerPoint based, but instead are engaging and interactive, delivered in the online medium and serve to increase the quality of the course.

Gallien and Omen-Early (2008) noted that students who received personalized feedback were more satisfied and performed academically better than students who received collective feedback. In particular, online learning and teaching involves a shift from oral to written communication (Picciano, 2002). This shift away from oral dialogue and nonverbal cues toward a dependence on written communication poses several interesting challenges for instructors who have spent a majority of their teaching careers in the traditional face-to-face classroom (Picciano). The concern is if instructors have the skill set to communicate and articulate their points in a concise manner through words and not in an oral manner. In simplest terms, educational feedback is "any message generated in response to a learner's action" (Mason & Bruning, 1999, p.1).

Learning how students recognize a successful online course experience can provide suggestions for instructors and students to promote successful characteristics and improve learning outcomes (Rodriguez, Ooms, & Montanez, 2008) and ultimately increase student retention. A student's idea (whether novice or experienced online learners) may be influenced by several factors including course characteristics, instructor characteristics, and student characteristics.

Course characteristics contribute significantly to a *successful* online course. The study did not define the term successful and it is implied that the researchers only looked at student's perceptions of their own success. (Song, Singleton, Hill, and Koh, 2004) The instructional design of a course was shown to impact student's perceptions of a successful online course. A course containing clearly stated objectives and expectations contributed to the success of a course. Song et al. also noted that providing students a communication medium such as office hours, discussion groups, or messaging to interact with the instructor for guidance and clarification is also a contributing factor.

Course flexibility and the opportunity to allow students to learn in different ways are also important when considering the needs of the students. Classrooms which offer different modes of learning such as labs, multimedia, compressed video, and group projects accommodate varied student learning needs. Fike (2008) found that the degree of flexibility built into a course impacted student success and their retention in a course. Student support must also be considered when viewing student success and retention. Kucuk, Genc-Kumtepe, & Tasci, 2010 and Patel & Rudd, 2012 noted that students who felt supported was a major factor impacting student success and retention with their online learning experience.

Instructor characteristics influence the delivery of a course and impact student satisfaction. Faculty who teach online must change from a traditional teaching pedagogy to an online teaching pedagogy. They must implement pedagogically sound online means of instruction and have the ability to motivate students who they will not see face-to-face (Palloff & Pratt, 1999, 2003).

According to Herber (2006), faculty responsiveness to student requests and questions impacted student satisfaction and their perception of a successful online course.

Student characteristics, including their level of experience with utilizing technology, the Learning Management System, multimedia, multimodal learning techniques, and the Internet contribute significantly to the successful learning experience (e.g., Alenezi, Karim, & Veloo, 2010; Chu & Chu, 2010; Kuo, Walker, Belland & Schroder, 2013; Ling & Wu, 2010). Palmer and Holt (2009) found that students' ability to communicate and learn online contributed to their satisfaction as an online learner ultimately contributing to retention.

Many institutions which have taken the initiative to offer online courses have realized student success and course quality remain at the forefront. Initially, online courses were designed in an isolated manner impacting a faculty member's time. Faculty with minimal experience and/or training may find it difficult and time consuming to design and develop online courses with multimodal facets. Daniel (2009) notes that courses are currently being designed in a shared process, which is referred to as an industrial model of labor division. Departments throughout the university, including Instructional Design, Technical Personnel, Instructors, and Subject Matter Experts all take part in course development. The Institute for Higher Education Policy has identified seven categories including institutional support, course development, teaching and learning, course structure, student support, faculty support, and evaluation and assessment. The Sloan Consortium's framework also proposes five pillars of quality: learning effectiveness, cost effectiveness, access, faculty satisfaction, and student satisfaction. These guidelines defined quality outcomes and having a student centered curriculum and customer oriented services. Academic performance has been related to course outcomes and course outcomes has been related to course quality. This research proposes to make the direct link with performance and quality.

Bowen, Chingos, Lack, and Nygren (2014) have identified that an interactive online learning environment should support learning outcomes, can improve educational productivity, and can reduce resources by integrating technology and systems into the active learning environment; but it lacks a link to academic performance. Their research, however, is not a supporter of the online environment and proposes a bias towards it. This study would also bring to light the fact that course quality is an important factor in online learning and may have a positive impact on student performance. Conflict still exists, as cited by Bowen, Chingos, Lack, and Nygren (2014), about the quality of online education. The nature of their writing seems to fit with the perception online education still has in the academic community. This study attempts to mitigate that conflict as well as demonstrate that quality, which is defined by the components of the course in online education, is linked to academic performance.

Research question and hypotheses

In this study, the main research question was: Does the level of course quality have a statistically significant impact on course level student grades? The following hypotheses were developed from the main research question.

*H*₁₀: A statistically significant difference does not exist between mean course level grades before and after the implementation of a course quality improvement initiative.

*H*_{1a}: A statistically significant difference exists between mean course level grades before and after the implementation of a course quality improvement initiative.

Sample

Course level student performance data and course quality ratings were obtained using a Course Quality Rubric shown in Figure 1 from the host institution’s databases and through

Course Quality Rubric		Status>>>		Outstanding
WEIGHT/ POSSIBLE POINTS	DESCRIPTION/ AWARDED POINTS	Needs Planned Improvement	Standard	Outstanding
		Needs to be addressed by programmatic goals 40%	Situation meets the current standard set by the University, but improvement will benefit the students. 80%	Course contains elements that all courses need to move toward. 100%
8%	ANNOUNCEMENTS	Announcements are not provided for faculty for at least one weekly or content is not meaningful.	Announcements are provided (1) weekly AND content is beneficial.	Multiple announcements weekly are provided to build community within the coursesite and/or incorporate various types of media.
8.0%	100%			X
15%	FORUMS	Forums are not used on a weekly basis (<7), or forums are not used as a means of assessing student's understanding of the learning objectives.	The learning objectives are being assessed in the forums and each week contains a forum discussion	The forums are utilized weekly and assess learning objectives but are also designed to stimulate critical thinking and engage student interaction through the use of multimedia or other creative methods.
15.0%	100%			X
5%	SYLLABUS	Two of the following are missing: ● Learning Objectives are written clearly ● Faculty section is provided and complete ● Late Policy is provided and is correct	One of the following is missing: ● Learning Objectives are written clearly ● Faculty section is provided and complete ● Late Policy is provided and is correct	None of the following are missing: ● Learning Objectives are written clearly ● Faculty section is provided and complete ● Late Policy is provided and is correct
5.0%	100%			X
25%	LESSONS	Two of the following are missing: ● Lesson is structured and meets the minimum requirements for quality lesson content ● Course evaluation/expectations are provided ● Learning description/objectives are provided or aligned	One of the following is missing: ● Lesson is structured and meets the minimum requirements for quality lesson content ● Course evaluation/expectations are provided ● Learning description/objectives are provided or aligned	All of the following are provided: ● Lesson is structured and meets the minimum requirements for quality lesson content ● Course evaluation/expectations are provided ● Learning description/objectives are provided and aligned
25.0%	100%			X
20%	ASSIGNMENTS	Two of the following are indicated: ● Assignments are missing ● Assignments do not map to objectives ● No variety of assignments is present	One of the following is indicated: ● Assignments are missing ● Assignments do not map to objectives ● No variety of assignments is present	None of the following are indicated: ● Assignments are missing ● Assignments do not map to objectives ● No variety of assignments is present
20.0%	100%			X
5%	TESTS & QUIZZES	Course contains assessments that are inappropriate (objective at the graduate level; essay in quantitative course, etc.)	Course contains appropriate assessments and they map to objectives OR course does not contain assessments	Course contains appropriate assessments, they map to objectives, but also uses this tool as a learning avenue for students with practice assessments, or other creative uses.
5.0%	100%			X
4%	RESOURCES/COMMON FOLDER (Static)	Course does not contain any outside materials in the Resource folder or Lessons area or only materials that are not useful learning tools (i.e. Powerpoints, templates, etc)	Course contains appropriate resources in the Resource folder or the Lessons area that support the learning objectives or weekly content. (i.e. Powerpoints, templates, etc)	Course contains a wealth of learning resources organized by lesson or by learning objective and the resources are integrated into the lesson content (i.e. Powerpoints, templates, etc)
4.0%	100%			X
5%	TEXTBOOK	Textbook edition is older than 2012		Textbook is 2012 or more recent edition
5.0%	100%			X
10%	USE OF TECHNOLOGY/MEDIA (Interactive)	Course does not contain any media elements such as images, videos, animations, sound clips, or other elements that would add dimension to the lesson content	Course is a standard course with very little media present throughout the course	Course uses media strategically to enhance learning throughout the course
10.0%	100%			X
3%	COPYRIGHT/COMPLIANCE	Course includes material that appears to be a copyright violation or is not 508 compliant	Course appears to be copyright and 508 compliant	Course includes elements that demonstrate that it has been reviewed for copyright and/or is adapted for 508 compliance (i.e. scripts, captions, etc)
3.0%	100%			X
100.00%				
Course Score:		100.00%		

Figure 1: Course Quality Rubric

Program Director assessment; the data collection period was for three months in the Winter of 2017 and three months in the Spring of 2017. Data was collected for thirty-four courses in four subject areas within the School of Business (Business Administration, Economics, Entrepreneurship, and Marketing). A nonrandom purposeful sampling process was used to isolate courses which scored with a beginning course quality level of $< .80$, which were then targeted for course quality improvement activities.

Presentation of findings

The main research question was: Does the level of course quality have a statistically significant impact on course level student grades? Table 1 provides the descriptive statistics for the difference in student course level performance. A paired t-test was performed to determine if the actions taken to improve overall course quality impacted student course grades. The outcomes are shown in Table 2.

Table 1
Descriptive statistics for difference in course level student grades

Mean	-0.160862712
Standard Error	0.263841435
Median	-0.012117086
Mode	#N/A
Standard Deviation	1.538446714
Sample Variance	2.366818291
Kurtosis	2.908955694
Skewness	-1.419345546
Range	7.336904762
Minimum	-5.128571429
Maximum	2.208333333
Sum	-5.469332199
Count	34
Confidence Level (95.0%)	0.536789435

Table 2
***t*-Test: paired two sample for means**

	<i>Winter Term</i>	<i>Spring Term</i>
Mean	8.935413804	9.096276516
Variance	1.805990299	1.592569738
Observations	34	34
Pearson Correlation	0.304182393	
Hypothesized Mean Difference	0	
<i>Df</i>	33	
<i>t</i> Stat	-0.609694652	
P(T<=t) one-tail	0.273119802	
<i>t</i> Critical one-tail	1.692360309	
P(T<=t) two-tail	0.546239603	
<i>t</i> Critical two-tail	2.034515297	

The outcome of the paired *t*-test indicated the mean difference in student grade (M = -.161, SD = .264, N = 34) was not significantly different than zero, $t(33) = -.61$, two-tail $p = 0.546$, providing evidence that the course quality improvement actions were not effective in changing student course level grades. A 95% C.I. about mean course grade is (-.698, .376). This provided evidence to accept the null hypothesis H_{10} that a statistically significant difference does not exist between mean course level grades before and after the implementation of a course quality improvement initiative.

Discussion

It is imperative that we impart some specific points regarding the results of the findings. A review of the purpose for pursuing the investment of quality in online education is foremost, followed by a reevaluation of key literary ideas brought forth earlier in the paper. We started by stating that quality was thought to be an important factor in student performance. Based on the data from this study, the researchers have demonstrated that this is not the case. In light of this, what basis do educators have then for pursuing investment in the quality initiative? Other elements may be affected by course quality—retention, persistence, and student satisfaction, for example. These elements were not considered in this study. In addition, other factors were not considered within the study such as student demographics, course level, student level, or faculty characteristics.

In the literature review, it was brought forth that course characteristics have been found to influence student perceptions of the successful online course. Course characteristics include such items as clearly stated objectives and expectations, office hours, means of communication, clearly written discussions, and other factors (Song, Singleton, Hill, and Koh, 2004). In this study, characteristics were examined such as forum viability, syllabus completeness, lesson usefulness and so on (refer to Figure 1). The quality of these characteristics in combination were not found to be components affecting student performance, however, the study did not measure student perception or satisfaction.

Conclusion and future research

Through this study, it was determined the improvement of course quality did not statistically impact student academic performance. Improving course quality to 80% and higher had a statically significant change in the course quality scores. It just did not have a statistically significant impact on student course grade. While this study focused on the short-term gain of a course quality intervention, it did not study long-term effects, such as retention in an academic program. It is assumed that students do not drop a course due to poor quality because they most likely need the course for program requirements. Subpar quality of a course would need to be egregious to effect student performance.

Future research should include determining at what point course quality intervention does make an impact, statistically, for short-term performance in a course. For instance, would the pre-course quality score need to be 60% or less for the intervention to have a statistically significant impact on student academic performance? Part of the quality aspects for this study included incorporating rubrics and grading criteria. This would ensure consistency in grading and would likely place downward pressure on grading overall. Additionally, future research would include a qualitative study about students' perception of the University as impacted by course quality. In the long-term, would course quality impact student retention?

A longer period of time for measuring pre-and post-quality scores would enable more data to be measured for significance. This study measured data three months prior to and three months after the intervention; 12 months prior to and 12 months after the intervention would provide more time and data. Additionally, this study was an aggregate of courses from the business, economics, entrepreneurship, and marketing areas and included all course levels, from 100 to 600. A future study is needed to study each academic discipline separately and to study by course level to determine if quality intervention is statistically significant at the undergraduate lower level (100, 200), undergraduate upper level (300,400), and graduate level (500,600).

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