INTERNATIONAL JOURNAL

OF

INSTRUCTIONAL TECHNOLOGY

AND

DISTANCE LEARNING

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International Journal of Instructional Technology & Distance Learning

Vol. 13. No. 3 & 4.

ISSN 1550-6908

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Editorial

Academic journal publication
Donald G. Perrin

The Internet changed the nature of academic publishing. Printed journals were expensive to produce because of the hours of human effort required for editing and preparation for publication. Add to this the high overhead cost for printing technology, especially when only small numbers are printed. Personal computers and the web provided a fast low-cost alternative for production and distribution. It made it possible for any person or group to become a publisher. However, the result was often inferior because office staffs and academicians rarely have the time or the skillsets to manage, preview, select articles and referees, edit, copy-write, layout, proof-read, publish, approve and maintain high quality in research based publication on a month-by-month basis. Some organizations maintain publication by external funding. Many that attempted to produce their own journals now subcontract this activity to professional publishers.

Publishers and academic groups need each other. The academic community produces innovation, theory, research, praxis, articles for publication, referees, and demands of their profession. The cost is absorbed by the academic community except for research funded by grants or donations. Publishers must be paid to manage edit, produce and distribute on the web. The nature of the process and product means that, despite the benefits of technology for replications and distribution, journals are a manual craft-based product that is expensive and time consuming to produce.

As costs increase, academics have expressed concern about time and work they expend when the publisher has copyright and profits from its services to libraries and individual users. Users must pay for access, resulting in privatization of knowledge. Researchers are demanding open access; publishers say this is not affordable. Academics claim publishers make more than 33% profit on their submissions. They are demanding rights or payment for authors and referees. In the case of federally funded research, the courts have insisted on open access one year after publication. Publishers are experimenting with alternative business models. For example, some publishers will provide open access in return for a payment by the researcher.

The economic model is not the only aspect for change. The quality of referee work, the way in which items are selected for publication, and even the criteria for what is good research are all under scrutiny.

Referees are often chosen from elite researchers to enhance the reputation of the journal. These are busy people and they are not paid for what they do. There is no guarantee that they will always do a thorough job. Thus, poor or erroneous research can get through the system. Even with a rubric, different reviewers give different evaluations of an article or research paper. Add to this the editor deciding which articles to publish. What is interesting to our readers? What is new? What advances theory? What is immediately valuable to practitioners? With several items on the same topic, will I publish the one with significant and even unexpected results? (Why were other similar studies not significant?)

Assuming the researcher has done a thorough job, the one with hype is more likely to be published. Older statistical methods are popular because people (think they) understand them. Many reviewers and editors accept null hypotheses and p-factors that do not give reliable results. Sample sizes may be too small or not truly random. Correlations may have nonsensical. It is not surprising that, in social science and medical research where there are a large number of uncontrolled variables, research results frequently cannot be replicated in a future study.

With economic pressures, changes in technology, methodology, theory and practice, and our inability to make truly objective decisions, there is room for change and improvement in the quality of research published in professional journals. On the one hand we need economic models that will sustain publishers, professional associations and journals. We need to provide open access to research and education communities to build on existing knowledge. And we need ways for academia and publishers to work together to achieve to even higher standards of academic research and publication.

Interaction behaviour of students with teachers in email for open and distance learning

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India

Abstract

The Open and Distance Learning (ODL) system is mediated through technology and is witnessing transformation. The effectiveness of teaching under the ODL depends on the potential and scalable capacity of the mediating technology. The advent of Information and Communication Technology (ICT) has brought vivid changes in delivery of teaching-learning through the ODL mode. Email messages facilitate asynchronous communication between students and the teachers for individualized support. It easily fits into the daily work schedule of students and teachers. The teachers have been using email mode for mass mailing to communicate the same information to all the students. The use of individual email messages has brought academic, cultural and procedural changes under the ODL system.

This is an exploratory study, based on review of email messages exchanged between the students and the teachers over a period of fifteen months, to understand potential of email to facilitate academic, personal and administrative communication under the ODL system. Quantitative and qualitative techniques have been applied to examining messages exchanged between students and teachers. The study reveals that students have used email messages for social interaction and resolution of administrative problems apart from having academic interaction with teachers. It was observed that female students wrote lengthier email messages and wrote more formal messages when compared to male students to communicate with their teachers. It confirms that these activities take a significant amount of the teacher's time. A quick response improves the learner's retention and positive feelings about the University. The outcome of this study will guide in implementing email mode to better serve the pedagogical, social and administrative requirements of students. Geographically dispersed students and teachers can be better connected with appropriate usage of email messages.

Keywords: distance education, open learning, student-teacher interaction, content analysis, email, academic interaction, social interaction, asynchronous communication.

Introduction

Academic programmes delivered through the Open and Distance Learning (ODL) are no longer confined to self-paced learning mediated through printed Self-Learning Instructional Materials. Other interventions introduced by ODL include - periodic feedback on studies and assignments, and frequent student-to-student and student-to-teacher interaction to narrow the transactional gap between the student and the teachers (Moore, 1993). Clark and Feldon (2005) acknowledged the importance of interactions between the teacher and the students in improving retention of students in the programme. Salmon, 2005; Gonzales and Sujo de Montes (2001) slammed the effectiveness of Information Communication Technology (ICT) in improving interactivity and feedback mechanism of the ODL system. The Computer Mediated Communication (CMC) has been instrumental in delivery of instructional resources, improving interactivity between students

and the teachers, and inducing peer group support among students. Crystal (2001) asserted that computer mediated language is the fourth and the latest medium of communication developed in the history of the human race. It is the responsibility of educators to examine credibility of these claims and understand the proper usage of various ICT tools in delivery of education.

Online learning mode has emerged as a result of applications of the CMC in delivery of education. Richardson and Swan (2003) defined online learning as a virtual class that delivers courses, information and facilitates interaction mediated through internet, without the physical presence of instructors or other students. The effectiveness of the online learning mode in continuing education has convinced educators to consider it as an integral part of everyday teaching at University level education (Erika and Anne, 2008). Online learning offers numerous instruments to facilitate interaction between geographically dispersed teachers and students. Institutions have been using email, discussion forums, chat and web conferencing to improve social and academic interactivity and extended peer group discussions among isolated students (Chanmin Kim, 2008). Email has become the prime instrument for interaction among students and teachers in the ODL mode (Stefan Hrastinspi, 2008; 'O' Neill and Colley, 2006). Students and teachers can use email mode with minimal training and at their convenience. Dean Sittig (2003) termed email as the first killer application of the Internet. O'Neill and Colley (2006) noticed that email mediated interaction between the students and the teachers had expanded beyond instructional supports as it was being used for contact between the students and the staff and to resolve administrative issues. Isbell and Cote (2009) suggested that sending personalized email messages to struggling students, expressing concern and offering additional instructional support, could lead to improvement in performance.

The inclusion of email mediated learning by higher education institutes has encouraged email solutions providers to offer their services either free-of-cost or at economical rates to higher education institutions to enhance interactivity between teachers and students and facilitate peer group activities. These organizations see this as an opportunity to promote their products among the younger generation by making them habitual of using their products. For example, Mirapoint has been offering email solutions at very low cost to more than 200 academic institutions around the world. Similarly, Gmail, Hotmail and other popular email service providers have been offering email message solutions to higher education institutions at low cost. Email services at the Indira Gandhi National Open University are being managed by the Google Corporation.

This paper deliberates on pedagogical, social and administrative relevance of email mediated interaction between the students and the teachers under the ODL mode. The nature and volume of email mediated interaction between the teachers and the students reflects on pedagogical relevance and acceptability of the email mode as an instrument for interaction. The content analysis of messages exchanged between the students and the teachers helps in understanding students' perceptions and experiences with emails.

Literature review

The conventional distance education system involves learning in an environment where students and teachers are separated in terms of distance and time (Keegan, 1990). A major component of the research literature on the ODL system is devoted to understand and obviate these transactional gaps (Moore 1989 and Bates 2005).

Wagschal (1998) claimed that online technology induces dynamic forces in distance education by providing a new and interactive means to overcome the transactional gap between teachers and students. Harworth (1999) appreciated that email mediated communication, under ODL, is obviating the transactional gap between teachers and students. Email is one of the prime means of interaction under the ODL system due to its easy operation, anytime use, easy to fit in daily

schedule and quick transmission of messages. (O'Nell and Colley 2006; Madeline, Ricky, Tracy, Grady and Emil 2005; Vitalicy, 2008; Naney and Chaohua, 2007; Jane Sunderland, 2002; Waldeck, Patricia and Timothy, 2001; Yu and Yu, 2002). Waldeck, Patricia and Timothy (2001) applauded email mediated interaction between teachers and students as an efficient, economical and frequently used communication channel. Moran and Hawisher (1998) claimed that email's speedy transmission of messages and resultant rhythms of response provided a sense of immediacy.

Clingerman and Bernard (2004); Atamian and DeMoville (1998) reported improvement in intimacy between the students and the teachers, when interaction was mediated through email. Email mediated messages are more personal and individual (Ng, 2001; White, 2000; Waldeck, Patricia and Timothy 2001). Tali Heiman (2008) perceived that email from teachers improved the sense of belongingness among students. Yu and Yu (2002) conceived that frequent exchange of messages from the teachers to the students through the email mode improved the perceptions among students towards online learning and contributed for the betterment of relationship between the students and the teachers. However, Woods (2002) failed to notice this association in frequency of exchange of messages between the students and the teachers mediated through email and favourable perception of students toward student-teacher relationships.

D'Souza (1992) emphasized that email mode created a non-threatening two-way communication link between the students and teachers, and enhanced students' ability to express themselves more freely to teachers. Catherine and Diane (2003) noted that students had better control over interaction when it was mediated through email. Yu and Yu (2002) claimed that email mediated interaction between the students and the teachers contributed to the cognitive growth of students and construction of the online society.

Laurillard (2002) envisaged change in roles of teachers under the online learning environment. One of the prime responsibilities of teachers, as identified by her, was to extend academic and personal supports to students through email. Robert, Lynne and James (2005) further précised her concept by stating that teachers used email mainly to make announcement, clarify doubts related to course materials, invite students for interaction, convey status of students' performances, supervise learning activities and build social relationships. Similarly, they noted that students sent email to teachers mainly for course related issues i.e. seeking clarification on doubts related to instructional resources, tips to solve assignment exercises, request for appointment, excuses for the delay in submission of replies for assignments, express concern over low grade, contest the grade or request to send grade status. Grunberg and Armellini (2004) appreciated the potential applications of emails in sharing professional resources and information. Waldeck, Patricia and Timothy (2001) found that students sent email to teachers for three main reasons i.e. for procedural clarification; efficiency of communication; personal and social causes.

Jane Sunderland (2002) categorized email messages from the students to teachers, under the distance education mode, into three broad categories to explain the purposes of sending mails to teachers, i.e. 'telling about', 'asking for' and 'other' categories. The messages under the 'telling about' category were about informing progress, plan for research, usages of email itself and expressing feelings. The messages under the 'asking for' category included seeking advice on coursework, thesis, other learning events; requesting an extension of time for submission of assignments; upgrading profile; confirmation or permission from teachers. The messages under the 'other' category included a range of social interactions; thanking; apologizing; expressing good wishes; inviting, suggesting and other topics not directly related to the studies. Ferguson (2010) identified major reasons encouraging students to interact with teachers were to share thoughts and views; access tutors; avoid isolation; ask for supports; get tips for solving assignments; and seek up-to-date information and peer group support. O'Neill and Colley (2006) also reported potential issues such as suggestions to solve assignments, arrangement for meetings,

provision of feedback on work and advice on submission of works to those who could not submit on time. Offir, Ingrid, Joseph and Arkady (2005) categorized students-teacher interactions under distance education into five categories, i.e. social, procedural, expository, explanatory and cognitive interactions. Thus, the research literature affirms the competency and capabilities of email in mediating interaction between the students and the teachers for developing professional attitude apart from mediating cognitive, social and personal interactions.

The research literature acknowledges the role of email in sending individualized messages to each students as well as same message to a batch of students through the mass mail system. Joshi and Saxena (2005) acknowledged the effectiveness of email supported mass-mail in sending reminders and advices to students under the distance learning system, in Indian context. Visser (1998) recommended for mass mailing to avoid wastage of time involved in writing and delivering individualized messages. Huett, Kalinowski, Moller and Huett (2008) claimed that mass mails contributed in improving the retention rate. Visser, Plomp, Arimault and Kuiper (2002) noted no difference in the motivation of groups of students, who were sent mass mails versus other group, in which the personalized messages were sent to the learners. They recommended using mass mails instead of writing individual mails to students, as the latter approach consumes lot of teachers' time.

The researchers have cautioned that email based academic supports require careful planning. The *ad hoc* inclusion of email would result in more negative than positive ones. Teachers should not be swayed by marketing hypes of Learning Management System (LMS) solution providers. Salmon (2000) noted low effectiveness of web mediated academic interaction. Alexander, Zhao and Underwood (2002) found that half of the email messages had course related information and this medium was mainly used in delivering assignment rather than encouraging collaboration and discussion among students. Card and Horton (2000) observed that students cited more literature and incorporated other works, rather their own experiences, in answering assignment exercises submitted through emails. Madeline, Ricky, Tracy, Grady and Emil (2005) noted that email mediated interaction between teachers and students suffered from long delays in response from teachers and this delay leads to escalation in anxiety among students.

Some researchers have expressed balanced opinions about the effectiveness of email mediated interaction between students and teachers. Robert, Lynne and James (2005) highlighted positive and negative consequences of email mediated interaction between the students and the teachers. Positive consequences noted by them included close acquaintance with students, encourage student interactions and improve teaching. The negative consequences were poor performance of the students in assignment exercises, relationship between the teachers and the students did not improve and fewer face-to-face interactions between students and teachers. The extent of positive and negative impacts relies on appropriateness of blending email in delivery of learning.

Alvarez (2005) emphasized that the interaction under the online learning was conceptually very strong; however the online learning was not yet practically perfect. Chain Min Kim (2008) made an appeal to researchers to investigate email mediated interaction between students and teachers to make perfect embedding of it in specific learning context. Mishra (2008) emphasized exploring what really works and what does not under the web based learning environment in the Indian higher education scenario. Thus, there is need for systematic research to understand academic relevance of email mediated communication in distance education (Duran, Kelly and Keaten, 2005). This study attempts to bridge the gap in pragmatic and conceptual understanding about the potential of email mediated interaction between students and teachers under the ODL system.

Context and background

Indira Gandhi National Open University (IGNOU) is an apex institution under the ODL system in India, known for instrumenting innovative technology in delivery of education through the distance mode. IGNOU is the first Open University in India having applied pedagogical aspects of the web technology extensively. IGNOU introduced three academic programmes under the web based learning environment in July, 1998. Since then the University has been using the web in extending academic and administrative support to students. In early stages, inclusion of the web was discrete and confined to delivery of specific learning events, mainly in professional and advanced levels education. Later, the scope of web based delivery was expanded; now it is being used in delivery of the entire programme over the web. The University classified these programmes as online programmes. IGNOU was offering 18 academic programmes in the year 2010 at Research, Masters, Bachelors, Diplomas and Certificates and appreciation levels in different disciplines through the online mode. The implementation of the online mode at the University is evolutionary rather based on any prescribed policy.

The Post-Graduate Diploma in Food Safety and Quality Management (PGDFSQM) is one of the online programmes of the University with a minimum duration of one year for successful completion is selected for this study. It is a popular online programme, having good enrollment. The programme was being offered through SAFE (Safe and Assured Food E-Learning) platform www.ignouonline.ac.in/safe. This programme aims at imparting professional skills in food safety and quality management. It was launched in January, 2009 and the programme has been offered annually since then.

This programme is offered simultaneously through traditional ODL mode; therefore curriculum structures, assessment of students' performance and delivery style under the online version are over-shadowed by traditional academic structure and delivery styles. The delivery mechanism for the online version of the programme differs slightly from that of traditional ODL system. The delivery under the online mode is enriched with inclusion of web-based support in delivery of instructional materials, counselling, formative assessment (assignments), feedback, individual support and peer group discussion. Assignments are communicated through email and instruction materials in digital formats. Assignments are made available on the web site as downloads; however, access to these resources over the web is restricted to the students registered for the online mode. A discussion forum and chat tools are instrumented on the programme web-site for peer group discussion among students registered for the online mode.

An Induction programme of two hours duration is held for students at the start of the academic calendar to make them familiar with learning styles and ethos desired for the online mode. The induction programme focuses on imparting self-learning skills, explaining online learning strategy, guidance on project work, schedule and pedagogical relevance of various learning events/activities. Students are encouraged to participate in peer group activities and interact with other students using email, discussion forum and chat tools. The induction programme is crucial for retention of students who are new to the ODL based online mode of education. This induction programme is delivered simultaneously through satellite and web to ensure maximum participation of students.

The learning activities in each academic programme at the University are managed by the individual teacher, designated as the Programme Coordinator for that programme. Names and email addresses of Programme Coordinators of all academic programmes are available on the web site of the University. A number of aspirants for admission approach the Programme Coordinators to seek further details about the academic programmes of their interest. The investigation of these unsolicited emails received from admission seekers, to the Programme Coordinator of the PGDFSQM programme, is one objective of this study.

The Programme Coordinator of the PGDFSQM programme has been using email as one of the instruments in meeting interaction needs of the students, informing the schedule of various learning events, delivering learning resources and monitoring the progress of students. The students approach the Programme Coordinator through email to get individual support on academic, personal and administrative issues.

The Programme Coordinator and administrative staff engaged in delivery of the PGDFSQM programme have been sending email messages to communicatethe same information to all of the students. These messages have been sent to leave written reminders with students about the schedule of various learning activities/events, its academic relevance, procedure to participate, prerequisite, if any, for participation in activities referred in the email.

The messages sent to the enrolled learners started with an enthusiastic tone, explaining the purpose of sending that message followed by schedule and relevance of the learning events, procedure to participate and academic goals to be achieved. These messages encouraged students to participate in learning activities and remain in the main stream of delivery for the programme. The last segment of the messages usually ends with enlightening students on alternative ways to approach teachers and administrative staff to get further details about the activity referred in the message. Thus messages sent to the learners enrolled are a blend of advice on administrative and academic issues with a dosage of encouragement.

Objective of the study

The student-teacher interaction is a crucial variable in appraising learning and attitudinal outcomes under the ODL system (Offir et al, 2005). Low and Dugmore (2009) emphasized on investigation of email mediated interaction to understand learning experience as discussion threads of email messages are developed over time, thus researcher can avoid the snapshot response, that would be obtained from interview and questionnaire based research instruments.

The objectives of the study are:
- to understand nature of academic and administrative supports sought by students from teachers through email understand the ODL system with progress of study in a batch;
- to identify factors encourage students to write email to teachers;
- to stipulate change in monthly volume of emails from students with progress of study in a batch to understand workload on teacher in responding these mails;
- to understand problems faced in delivery of a professional academic programme having practical components with the support of professional laboratories, which are neither involved in teaching nor employed by teachers; and
- to understand gender difference in way of addressing the teacher through email.

The hypotheses addressed in this paper are:
1) There is no difference in lengths of messages (number of words) posted, through email, by male and female students to the teachers, and

2) There is no difference in ways of addressing to the teachers in messages posted through email, by male and female students.

Methodology

This study is designed as a preliminary exploratory survey, based on secondary data, to understand interaction patterns cultivated over a period of time between the students and teachers.

The interaction through email grows naturally rather being driven by researchers or stakeholders with specific purposes for conducting research. Low and Dugmore (2009) recommended for the content analysis of messages exchanged between target groups to understand evolution in interaction behaviour over the time. The source of data for this study is based on messages exchanged through email mode between prospective/enrolled students and the Programme Coordinator from December, 2009 to February, 2014.

This time-frame covered an entire cycle of the programme, which was initiated with enrollment of students and concluded with award of diploma to the successful students. The long timeframe for the collection of messages ensures extensive coverage of key issues that emerged at various stages of programme. Qualitative and quantitative research techniques have been applied for analysis of data.

Jeong (2003) and Hou, Chang and Sung (2009) advocated for the quantitative analysis of messages exchanged between students and teachers to understand the discussion behaviour. Joshi and Saxena (2005) used quantitative technique to analyze email messages exchanged between students and teachers under the ODL system in Indian scenario to understand interaction pattern and profile of students who preferred to communicate with their teacher through email. Yoo and Alive (2002) recommended quantitative analysis of the messages in terms of number of messages and length of messages. The quantitative analysis has been performed to understand behaviour and patterns in student-teacher interaction mediated through email in terms of measurable data such as average length (no of words) of messages, numbers of messages posted by the male and female students, average response time to students' queries, and numbers of messages posted by students in each month, and change in workload on teachers in replying to these emails.

The qualitative analysis of messages is based on the content analysis research technique. The content analysis helps in categorization of messages to identify major issues under the student-teacher interaction. Hsieh and Shannon (2005); and Seale (2003) acknowledged the relevance of the content analysis research methodology in understanding views of stakeholders. De Wever, Schellens, Valcke and Van Keer (2006); and Stubbs and Delamont (1986) also recommended content analysis and systematic categorization of messages exchanged between the students and the teachers to understand experience and prime requirements of students.

Gunawardena, Lowe and Anderson (1997) further elaborated a procedure for content analysis and advised researchers to treat single message as an independent entity for analysis, while conducting content analysis of messages. Thus an individual message exchanged between students and Programme Coordinator through email is treated as a single independent entity for the qualitative investigation in this study. This approach facilitates unitizing, though it may not account for a variety of elements within a multi issues in a single message.

The content analysis is based on meaning of content of messages rather on the ways contents are structured and language style of messages. The email messages from the students were classified in mutually exclusive categories. Each message is placed exclusively in a single category, depending on major issues covered in that mail. The content analysis of the texts of messages probed the dynamic context, which encouraged the students to approach teacher through email. This research approach explores in detail the gap between expectations of students and its realization under the online education mode. The content analysis also reflects on frequency and nature of academic, administrative and personal issues disturbing studies.

Inferential statistics techniques are applied to understand gender differences in writing emails to teachers. The gender of students is treated as independent parameter, and way of addressing to teacher is treated as dependent parameter for statistical investigation.

Content analysis approach

Despite sincere efforts, the authors of this paper did not come across any published research work reporting utilization and effectiveness of email mediated interaction between the students and teachers on the basis of content analysis under the ODL system in India. Therefore, content analysis of email messages was conducted into two stages. The inductive research approach was adapted for the content analysis in the first stage, due to lack of relevant research evidence and guidance on classification of messages. The inductive content analysis approach investigates relevance of various factors actuating students-teacher interaction through email, as being highlighted in the research literature. In the current study, 20% of the messages archived in each month in the period of investigation were selected through random sampling approach, in the first phase of analysis for inductive content analysis. The outcomes of the inductive content analysis approach included identification of the major factors that encouraged interaction between the students and the teachers in the current scenario. The categories evolved in the first phase were used to device an instrument for content analysis at the second phase of the study for the classification of messages exchanged between the students and the teachers. Thus, the instrument applied for categorization of messages at the second phase of the content analysis is a true representative of the research literature and the context under investigation.

Two experts performed the coding and classification of the messages independently during the second phase of the content analysis. These experts were briefed by the researchers about the objectives and methodology of the study, prior to their involvement in categorization of messages. The Cohen Kappa score of the inter-rater agreements of coding of messages was 0.81. Researchers deliberated with the experts on messages, which were placed in different categories by them, to minimize their differences in classification. The experts achieved consensus on coding of some of disagreed cases. The Cohen Kappa score of the inter-rater agreements reliability raised to 0.87 after resolving the conflicts; the remainder of the messages that were still coded in different categories by experts were dropped from the analysis. The Cohen Kappa score of inter-rater agreement is high due to pooling of high percentage of messages in few categories; definition and coverage of each category was highly specific, and this left little chance for the individual coder to place the same message in a different category. Thus, inductive content analysis and review of research literature at the first phase was successful in designing a highly reliable instrument for classification of messages for the second phase of the content analysis.

Demography of students

The study analyzed email messages received by the Programme Coordinator of the PGDFSQM programme from the students enrolled in January, 2010 academic cycle and admission aspirants, during the period of investigation. 250 students were enrolled in the target group of the study, out of which 162 students were male (65%). 182 students were residing in urban areas, 56 in rural areas and one student in tribal area of the country. Six students hailed from abroad. Rural and tribal areas of the country have been still struggling with the digital divide phenomena, thus area of residence is a vital attribute of the students' profile to understand their accessibility and competence in using ICT applications. The age range of participants was from 21 to 38, with median age of 26. The open admission policy of the ODL system caters to the educational needs of the diversified population.

Sixty two per cent (62%) of the students were employed in food industries or allied sectors at the time of admission. Most of the employed students resided in metropolitan cities as food chains or their employers are concentrated in the cities. The food processing units linked with these food chain outlets are situated in the rural areas in close proximity to cities. These students enjoy an ICT friendly environment. The student's demographic profile and job experience may not have direct statistical impact on nature of their participation in email mediated interaction with the teachers. However, these parameters express the level of exposure of the students to the ICT and

email mediated communication. The students residing in metropolitan cities and employed in food chains have good exposure to applications of ICT and internet in managing day-to-day life and office.

However, application of web in delivery of education might be new to most of the students irrespective of extent of exposure of email and ICT in their personal and professional life.

Analysis and discussion

Three hundred forty eight (348) messages were received from the students or aspirants for admission, 321 messages were sent to them from the mailbox of the Programme Coordinator during the period of investigation, i.e. 1st December 2009 to 28th February, 2011. Thus, 769 messages were exchanged between the students and the teachers in the time span of the fifteen months; and the average works out to 51 messages per month. This is an average on the programme coordinator's side, i.e. he reads/replies about 51 messages in a month. The students, who are passive and silent learners, just received messages from the programme coordinator sent through mass-mail; others got individual replies for messages sent by them. The Programme Coordinator responded to 92.1% of messages received from the students. Some messages received in the last two weeks of the investigation period were yet to be replied to at the time of coding of messages. Some messages from studentss were either appreciation of learning resources/events or expressing thanks/acknowledgment for support received from the Programme Coordinator. The Programme Coordinator felt that such messages need no reply. 198 male students and 64 female students approached the Programme Coordinator through email. 75.6% of students, who approached the Programme Coordinator through email, were male students, however; the proportion of male students in the batch was 65%. Thus, the participation of the female students in email interaction was less as compared to the male students.

The research literature raises the concern about the time devoted by the teachers in sending individual reply to students' email messages. Bender, Wood and Vredevoogd (2004) claimed that faculty devoted more time on individual student under distance education than time devoted on individual students under face-to-face classroom environment. Zhau, Alexander, Perreault, Waldman and Truell (2009) acknowledged the importance of personalized feedback to students through email under distance education; however they also expressed concern over increase in volume of work of teachers in replying to individual email messages of the students. Table 1 consolidates the number and nature of messages posted by the students and indicates whether teachers' time is devoted in answering either many email messages from few students or few email messages from large number of students.

Table 1
Number of messages posted by individual student

Number of messages posted by individual student	Male Students		Female Students		Total
	Number	%	Number	%	
One message	170	*76.0*	54	*24.0*	224
Two to three messages	20	*71.0*	9	*29.0*	29
Four to Five messages	4	*82.4*	1	*17.6*	5
More than 5 messages	4	*100.0*	0	*--*	4
Total	198	*76.6*	64	*23.4*	262

Four male students sent more than five messages; five students (four males and one female) sent four to five messages; 29 students (20 males and 9 females) sent two to three messages and 224 students sent only one message to the Programme Coordinator. Thus, 84.9% of students who had interacted with the Programme Coordinator through email sent only one message. Table 1 reflects that the Programme Coordinator devoted most of the time in replying to a few email messages from large number of students rather replying frequent email messages from a few students. Thus, the Programme Coordinator was successful in approaching large number of students through email mode. The teacher's time was effectively utilized in catering to needs of a large number of students. The students, who had sent one or two email messages raised specific queries in their emails. They did not continue interaction once they received satisfactory responses to their queries, although the Programme Coordinator was prompt in replying to queries of the students. This finding is against the established belief that the quick response to students' emails can result in prolonged interaction. The continuity of interaction relies on purpose of interaction, power relationship and rapport between the sender and receiver. However, prompt replies from the institution ensure affiliation between institution and students. Students tend to feel personally attached to the institution and the Programme Coordinator when there is timely action on their concerns. Most students sent only one email message. Thus, students were successful in expressing their queries in written form in the first instance. Similarly, the Programme Coordinators resolved student queries in the single instance and thus email mediated interaction between the students and the teacher is effective and efficient in resolving queries of the students.

The maximum number of email messages from an individual student was nine received from an admission seeker working in a Gulf country. Later, he joined the programme. Admission seekers and students from abroad approached the Programme Coordinator frequently through email mode as these students either failed to locate nearby Partner institutions (PIs) of the IGNOU, which are engaged for offering academic and administrative support to the international students or admission seekers, or could not get adequate information from the existing PIs. The difference in time zones of the students and the Programme Coordinator and expensive international tariff for telephone calls might have encouraged students residing abroad to use email mode to approach the Programme Coordinator.

Factors for sending emails to the programme coordinators

Classification of messages through content analysis is based on Bales Interaction process Analysis (1950) (IPA). This scheme is extensively used for classification of messages in closed group interaction. The IPA classifies messages into following categories a) social-emotional, b) positive reaction, c) attempted answers d) ask for opinion & suggestion, and e) negative reaction. The IPA was revised and adopted for the content analysis during the second phase of the study. Messages were classified into eight categories and each category consisted of several sub-categories.

Table-2

Classification of messages from the students to the Programme Coordinator

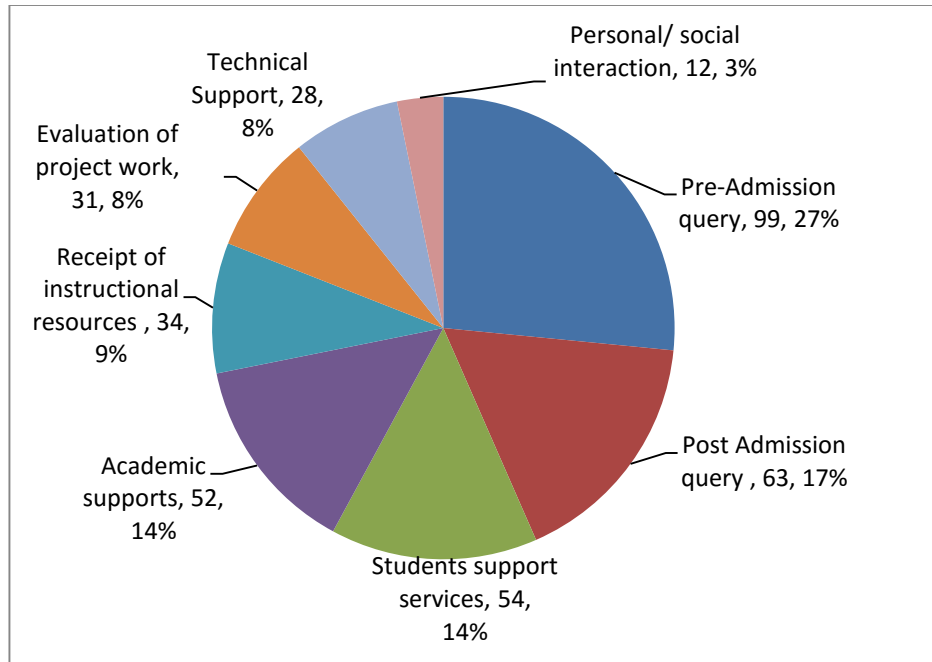| Category	Issues Covered/Sub-Categories	No. of messages in sub-category	No. of messages in category	% of total messages in each category
Pre-Admission query	Recognition of online mode for advanced study and employment, Eligibility, procedure and schedule for admission, Venue of contact programmes for theory/ practical components, other courses in offer in food safety disciplines, mode of payment of tuition fee for students residing abroad	99	99	26.9
Post Admission query	Delay in confirmation of admission	39	63	16.9
	Seeking clarification on admission procedure after submission of admission form	24		
Receipt of instructional resources	Delay in receipt of instructional materials	21	34	7.2
	Instructional materials is received partial/ wrongly	4		
	Course materials is not uploaded on the web-site	9		
Students support services and delivery of practical component	Permission for taking examination or submitting assignments, when students failed to appear in scheduled examinations/ assignments	6	54	14.5
	Request for Change in Venue of practical component	15		
	Query about schedule of practical; counselling and assignment	13		
	University Changed venue for practical without consent of students	3		
	Schedule of Practical component not adhered to by centre resulting in delay and clash in schedules of counselling and practical	13		
	Delay in declaration of results of summative assessment (Term-End Exam)	4		
Evaluation of project work	Procedure for submission of synopsis	6	31	8.3
	Seeking guidance on drafting of synopsis and scheduling research plan.	7		
	Seeking help in identifying supervisor and topic for project	7		
	Delay in evaluation of synopsis and project	11		
Academic supports	Pedagogy of online mode; delivery of practical components through distance	15	52	13.9
	Seeking help in understanding difficult contents of study materials	12		
	Seeking list of reference books and open-source resources for advanced study	8		
	Appreciation or acknowledgement for high quality of course materials, learning activities or other supports	3		
	Suggestions to improve delivery of programme	4		
	Seeking further details on contents delivered through counselling	3		
	Seeking advice for solving assignment exercises	7		
Personal/ social interaction	Share personal problems affecting studies	8	12	3.2
	Students introduce himself/herself to initiate social interaction	4		
Technical Support	Technical assistance to participate in online events.	6	28	7.5
	Password is lost	2		
	Failed to upload documents needed to complete the admission formalities due to format incompatibility	6		
	Layout of contents is distorted or partially visible in specific web-browsers	7		
	Could not update his/her profile on the website	2		
	Contents of the web site are not updated for a long time.	7		
Total			**373**	**100.0**

Figure 1: Classification of messages received by students

Figure-1 depicts messages received by category. Three hundred seventy three (373) messages were classified into eight categories to summarize factors that encouraged the students to send the email messages to the Programme Coordinator. Each category is further apportioned into sub categories. The maximum number of messages (26.9%) was placed under the pre-admission category. The Admission seekers desired to know about eligibility, procedure and schedule for admission under the online mode and venue for delivery of practical component nearest to their home/work place. The analysis of queries from the admission seekers affirms that student community has numerous doubts and misconceptions about pedagogical relevance of the online delivery mode in the job market and advanced studies. The students raised doubts about the recognition of online delivery mode in job market and its parity with the conventional education system. The students desired to know about delivery mechanism for inducting practical and hand-on-training based learning events under the online mode. Whether these components would be delivered entirely through virtual mode without physical presence at laboratory/field? Poor understanding of pedagogy of the online mode and concerns about recognition of degree in the job market are some of the major discouraging factors for the online mode. The students with such doubts/misconceptions might be compelled to join online mode in absence of viable alternatives to pursue continuing knowledge and skill development in areas of their interests without disturbing professional and personal life.

The queries about admission procedure and expressing concerns over delay in confirmation of admission were other major factors which encouraged the students to send email messages. Students sought interventions by the Programme Coordinator in resolving the administrative problems faced by them in getting enrolled in the programme. The emails messages in the first two categories were sent before the commencement of academic activities. 44 % of total messages were sent for these purposes. Muilenburg and Berge (2005) reported that the administrative problems were the most common issues under the online learning environment; they recommended for immediate action on problems faced by the students to retain their interest. Prospective students must be guided about admission procedure through advertisement, web-site and PSCs in pre-admission phase.

Centres delivering practical/counseling support are interface window between the students and the University and offer on the spot support. These Centres are known as Programme Study Centres (PSCs). Students' email reflected that most of these centres have been underperforming in facilitating students. The PSCs failed to provide sufficient information about admission procedure and generic details about scope of programme; students were usually recommended to contact the Programme Coordinator even for obtaining minor information. The PSCs did not help the students in identifying a supervisor for the project work, advice on selection of topic for the project, research methodology and schedule for conducting project work. PSCs reschedule practical/counseling session as per their convenience result in clash in schedules of practical and interactive video counselling sessions organized by the University. Students were forced to skip either a practical or counseling session although both the activities are integral components of the programme. Some students reported that they missed practical sessions as PSCs arranged these in working days, despite of University advice arranging practical and counseling sessions only on holidays and weekends to minimize taking students from their workplace.

The National Accreditation Board for Testing and Calibration Laboratories (NABL) approved food testing commercial laboratories have been functioning as PSCs for scheduling counseling and practical sessions. Supporting students is not the prime responsibility of the PSCs. Some of these centres concentrate only on their core business interests and treat facilitating practical/ counseling of students as a means to generate additional revenue. Students remain at the periphery and cannot get adequate support from such PSCs. Staff of PSCs, who were engaged in counselling, were practitioners and were able to demonstrate the practical counseling sessions effectively. However, they were limited in conducting theory counseling sessions as they were not teachers by profession. The University should strengthen the coordination in various units engaged in delivery of the support services to the students. The University should frequently conduct induction programmes for the staff of PSCs to impart skill and knowledge desired for teachers in the online distance mode. The Programme Coordinator should create a database of experts who are willing to supervise students in project work and share this database with the students. The University should carefully identify PSCs who are really interested in supporting the students.

Muilenburg and Berge (2005) reported that technical snag was one of the main constraints of the online learning mode. The technical problems can close down the online education system if unattended for a long time. Kedar, Baruch, and Gruvgald (2003) advocated immediate action on technical problems faced by students; otherwise it would have a negative impact on the student's satisfaction. Carswell and Venkatesh (2002) noted positive association between the students' perception about relevance of technology in education and their performance. 7.5% of messages sought help from the Programme Coordinator to resolve technical problems that emerged while surfing the class web-site. Some courseware web-pages were not displayed correctly by browsers other than Internet Explorer, or were blocked by the web-browsers due to display and security policies of web browsers or preferences laid for the browser by the students. The induction programme for newly joined students offers necessary guidance to customize preference and security of web-browsers for uninterrupted display of courseware. The technical staff of the University involved in providing web support should ensure that the contents of web-pages are displayed correctly on popular web browsers. Dynamic web frames, which invoke false security threats in some browsers, should be replaced with simplified web frames. The Academic staff should frequently update contents on the web-site to foster a sense of aliveness.

Lovelock and Wright (1999) perceived students' complaints as a formal expression of dissatisfaction with any aspect of services offered by the University. About 16% of messages were complaints about poor student support services. These complaints reflected frustration among students, mainly due to failure of the University in offering services and support promised

at the time of admission. The delay for the University to act on student complaints might propagate negative feeling among the student community and discourage prospective students to join the University (Lovelock and Wright, 1999). Singh (1988) noticed that students desired prompt actions on their complaints by the University:

- Rectification of the errors, compensation in terms of money and psychology;
- Express dissatisfaction with poor services offered to him/her, seek immediate intervention of teachers to improve services;
- Complain to third party to seek interventions, or
- Negative communication to friends, relatives and society.

Administrative problems were frequent, but confined to a few domains. The teachers should treat these issues as concern of the entire class rather complaints of individual students. Hence, a copy of solutions to frequently reported problems/complaints encountered by the students should be forwarded to all the students in the course and uploaded in Frequently Asked Question (FAQ) section of the web-site. The solutions and guidelines on frequently reported complaints in the FAQ section of the web site are very helpful for students who are reluctant or hesitate to report problems to the teachers due to lack of intimacy or confidence.

Sometimes, the students used abusive or threatening language for expressing his/her displeasure with delivery of the programme. The writers of these abusive messages remained hidden under the mask of distance. These students were at least concerned that the teacher would have a negative impression about them after reading their abusive mails. Students in classroom situation normally avoid interactions that would damage their relations with teachers. Students rarely, or don't dare to, use abusive language in the face-to-face learning environment. These students failed to establish personal rapport with teachers and institutions.

Problems relevant to the PSCs in the first instance were sent to the Programme Coordinator instead of making an appeal to the concerned PSCs to take corrective measures. The Programme Coordinator forwarded such messages to the concerned PSCs to initiate corrective measures on the complaint. The problems directly related with PSCs could have been resolved easily and in short time, if the students would have approached the PSCs directly. The reporting of complaints to higher authority, which needs to be reported to the PSCs, reflects either students were not aware of complaint redressal mechanism or deliberately they approached higher authority to cut short the grievance redressal mechanism. The Programme Guide covers many of these aspects and should be well covered. The students should be advised on whom to contact to resolve specific kinds of problems during the induction programme.

Fourteen percent (14%) of the messages sought academic support from the Programme Coordinator. The major academic support sought by the students were help in understating specific contents of the study materials, references for further study, tips for solving assignment exercises, selection of appropriate topic for the project, guidance on layout and structure of synopsis, project research methodology and schedule of the project work. The students sought academic support from the Programme Coordinator only when they had failed to get adequate support from the PSCs, i.e. very few students approached the programme coordinator for academic support. Thus, exchange of email messages between students and teacher on academic issues made substantial contribution in cognitive development of students, especially when PSCs failed to deliver requisite academic support.

About 64% of the admission seekers were employed in food processing industries or allied sectors. The employed admission seekers usually faced frequent transfer in place of work as outlets of food-chains and food processing industries are spread widely. These students reported that they could not join the courses being offered through the conventional mode due to round the

clock inevitable commitments at work and frequent transfer at the workplace. IGNOU's student support network is spread across the country so that the employed students can continue their studies despite frequent transfers from one place of work to another place of work. The Practical and Theory counseling sessions are held during weekends so that student can attend these sessions with minimal interruptions in job/home responsibilities. The students just need a computer and internet connectivity to participate in the learning events offered through web. These factors encouraged employed admission seekers to join the programme and realize their dreams.

A few of these admission seekers did not have any formal academic qualification in the discipline of food and nutrition; however, they gained basic knowledge in the discipline while working in this sector. These students desired to know whether knowledge gained through work experience would be sufficient to get enrolled in the programme. Thus, the online mode and open admission policy of the University are successful in meeting academic needs of this diversified group of learners. The eligibility criteria for admission should be more flexible so that admission seekers without formal education in a relevant discipline, that have gained knowledge by working in the field, can also join the programme and have enhance growth in their career after acquiring formal qualifications in the food processing sector. 15% of admission seekers were pursuing other courses while making query for admission. Such students were in the final semester of their studies and wanted to continue advanced study either after completion of the current course or pursue both programmes simultaneously. Few admission queries were raised by relatives or friends of admission seekers. Most of these admission seekers were extremely busy with responsibilities at home/work-place and their well-wishers were concerned about their professional growth. The findings of the study suggest that social interaction with the teacher was another driving force for sending email messages to teachers. Thus, email media contributed in shrinking the social transactional gap between the teachers and students. It is one of the major concerns of the ODL system. The social interaction induces a feeling of belonging among students with institution and teachers and improves retention of students in courses offered through ODL mode (Kember, 1995).

Time taken in replying to messages

The time lag between sending a message and getting a reply back through an instrument inevitably affects uses of that instrument in facilitating interaction. The interaction instrument becomes live and sensitive with a short time lag between sending a message and getting its response. In a study to understand the impact of response time on student performance, Northrup (2002) calibrated teacher's response time to student's email messages as the second most rated interactive indicator. Long time lag between sending a message and getting its reply diminishes the chance of realizing a truly connective discourse (Hans and Kerst, 2002). Russo and Campbell (2004) noted that timely replies to the students' queries, message tone and style affected the participations of the students in interaction. The message tone of the Programme Coordinator while replying to student queries was mild and encouraging. Messages from the students who received replies from the Programme Coordinator within 24 hours, for instance queries related to academic support; schedule and procedure for submission of assignments; status of evaluation of assignments, synopsis or project; and guidance on project, etc. were resolved by the Coordinator within a day or two. Prompt replies from the Programme Coordinator might have encouraged the students to continue interaction with the Programme Coordinator whenever they are in need of support. Replying to messages that demanded action by the PSCs took a slightly longer time. However, the Programme Coordinator immediately sent an acknowledgment of the receipt of the queries to students, while forwarding mails to the concerned PSCs for further necessary action on students' queries.

Pattern of volume of emails sent by students

The Table-3 reflects month-wise numbers of email messages received by the Programme Coordinator from the students, during the period of investigation. The Programme Coordinator received 348 email messages within 15 months.

Table-3
Numbers of messages from the Students to the Teachers

Month	Dec'09	Jan'10	Feb'10	Mar'10	Apr'10	May'10	Jun'10	Jul'10	Aug'10	Sep'10	Oct'10	Nov'10	Dec'10	Jan'11	Feb'11	Total
No.	3	7	3	15	24	12	10	28	19	41	55	23	56	25	27	348
%	0.9	2.0	0.9	4.3	6.9	3.4	2.9	8.0	5.5	11.8	15.8	6.6	16.1	7.2	7.8	100

The Programme Coordinator received on an average 23 messages per month. The maximum numbers of messages were received in the December, 2010 and it was closely followed by October month. 111 messages, 31.9% of total messages, were received during these two months. An academic session of the PGDFSQM programme concludes in December each year. The, academic activities are in full swing; students are very active and eager to complete all learning events in the stipulated time to become eligible for award of the Diploma. This might be one of the reasons for high numbers of messages in the October, i.e. close to award of the Diploma. Fewer messages were received during the first three months of the academic session i.e. from January to March. Most of the queries during that period were regarding administrative issues with the programme. The numbers of queries from aspirants for admission to the programme were uniform across all the months during the period of investigation. It was observed that the volume of messages with academic queries rose gradually with advancement of the session.

Table 3 reflects large variations in the number of messages received across months; therefore assessment of utilization of teacher's time in replying to messages of the students should be drawn on the basis of time devoted for this purpose over a long span of the time, e.g. workload on monthly basis. However, large variation in numbers of messages over the months requires for monthly monitoring of the volume of the messages to keep track of students' academic and administrative needs.

Length of messages and gender

Jose, Mireia, Silvia and Patricia (2001) perceived positive association in length of messages and verbal fluidity. Punyanunt and Hemby (2006) noted gender differences in perceptions and uses of email messages. The female students were more frequent in checking their mail boxes and they frequently used shorthand in the messages directed to the teacher. They further stated that the male students were more likely to use emotions in emails and preferred emailing only when they couldn't meet someone in person. Siti and Intan (2001) noted that female students wrote lengthier messages when interacted through email. However, Herring (1994) and Jose, Mireia, Silvia and Patricia (2001) noted lengthier messages from the male students.

This study examined differences in writing skills of the male and the female students in terms of length of messages and way of addressing to the Programme Coordinator. The length of message is measured in terms of number of words used in the main body of message. The formal addressing to the Programme Coordinator and ending segments of messages are not counted in the length of messages.

Table-4
Length of messages written by the male and the female students

Length of messages	Male		Female		Total	
	Number	%	Number	%	Number	%
More than 100 words	32	12.0	9	11.1	41	11.8
More than 50 but less than 100 words	136	50.9	34	42.0	170	48.9
Less than 50 words	99	37.1	38	46.9	137	39.4
Total	267	100	81	100	348	100

The average length of messages sent by the students to the Programme Coordinator was 64 words. The lengthiest message had 324 words, which was written by a male student. The average length of replies sent by the Programme Coordinator to students was 87 words. The research literature criticized inclusion of email in facilitating individual support to students as teachers need to devote lot of time in reading and replying to individual messages received from students. However, the Table 4 indicates that the messages from the students and replies by the Programme Coordinator are very concise. Reading and replying to these messages did not take much time. Students had also ensured correctness on sentences. There were hardly any grammar and spelling mistakes. Well structured sentences further reduced the reading time. The difference in the lengths of messages sent by male and female students was statistically examined with the independent T-test (Table-5 and 6).

Table-5
Descriptive statistics of length of messages written by male and female students to the Programme Coordinator

Gender of students	No. of messages	Mean length of messages (number of words)	Standard deviation in length of messages	Standard error in length of messages
Male	267	63.6	33.646	2.05908
Female	81	65.8	36.674	4.07492

The average length of messages written by female students was more than that of written by the male students. The high value of standard deviations in length of messages written by the female students reflects higher variation in length of messages sent by them. High number of messages from males was also responsible for low value of standard deviation in length of messages written by them.

Table-6
T test examining difference in lengths of messages written by male and female students

Levene's Test for Equality of Variances (F)		Significance	t-test on means in lengths of message written by males and females	df	Sig. (2-tailed)
Equal variances assumed	0.105	0.747	0.632	346	0.528
Equal variances not assumed			0.603	123.64	0.547

The level of the significance of the Levene's test value indicates no statistical difference in variance in lengths of messages of both the groups. Female students wrote lengthier messages (number of words).However, the value of independent t-test in Table-6 also confirms no significant difference in length of messages written by the male and the female students.

Herring (1994) asserted that the male students and the female students enjoy distinctive ethics in writing and addressing teachers in messages sent through emails. The difference in ways of addressing the Programme Coordinator among female and male students is reflected in Table-7.

Table-7
Addressing styles of the male and the female students
in messages sent to the programme coordinator

Gender		Way of addressing to teacher/ Programme Coordinator			Total
		No salutation	Dear	Sir	
Female	No. of messages	2	15	64	81
	% within Gender	2.6	18.4	78.9	100
Male	No. of messages	27	33	207	267
	% within Gender	10.2	12.2	77.6	100
Total	**No. of messages**	**29**	**48**	**271**	**348**
	% within Gender	**8.4**	**13.7**	**77.9**	**100**

Table-7 reflects that most of the students were formal in addressing and expressing regards to the Programme Coordinator, while writing email messages to him. However, the addressing styles of the group of students under observation, among themselves on the discussion board were not so formal. Thus, students were more formal in addressing messages to the teachers rather to others in the peer group. The difference in addressing styles in messages posted to the Programme Coordinator and those posted to the peer group reflects the differences in approach of the students in addressing messages to the individual and to the group. The students are more formal in addressing email messages to the individual rather to group. Guiller and Durndell (2006) observed that the genders power differences evidenced in face-to-face communication were transferred into the online environment also. The male students, in large numbers, wrote messages without formal addressing to the Programme Coordinator. The informal addressing to teachers blurred the power boundaries between the teachers and the students, particularly when mature students are meeting with teachers in person.

The association between gender and ways of addressing teachers is statistically examined with the Chi-square test (Table-8).

Table 8
Chi-Square Test in reference to association between genders
and addressing style to teachers

Statistical tests	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.083	2	.048
Likelihood Ratio	7.196	2	.027
N of Valid Cases		348	

The level of significance of the chi-square test value reflects remarkable association between gender and ways of addressing to the teachers. The female students are more formal and polite in

addressing to the teachers. The formal addressing in email messages reflects on relative power, relationship, distance and degree of imposition (O'Neill and Colley, 2006; Catheren and Mayer, 2003). Holmes (1995) remarked that submissive social roles of women could be held responsible for this behaviour.

Conclusion

The web-based learning environment has brought fundamental changes in roles of teachers under the ODL system. The pedagogy under the traditional ODL mode is based on self-learning instructional material and partially guided by counsellors. Teachers are also involved in development of curriculum, instructional material, assignments and monitoring the programme. Teachers are also associated in delivery of the induction programme at the beginning of the academic session. The teaching becomes more guided in the web based learning environment. Teachers are at the nucleus of the support network and lead most of the learning events over the web. Email messages extend academic and administrative support to the group as well as to the individual. The findings of the study affirm the potential of email in instrumenting academic interaction between the learner and teacher. Thus, the University should look beyond the traditional role of the email messages for informing students about the schedule of learning events and delivery of learning resources. Email can also be used to resolve academic and administrative problems and extend social interaction.

Email is a vital instrument for one-to-one interaction, in asynchronous mode, between students and teachers in the Open and Distance Learning system (ODL). The outcome of this study reaffirms the potential of email in facilitating interaction between students and the teachers. The communication interactions between students and teachers and counselors in ODL have become more dynamic and guided. Prompt delivery of messages and quick responses have make this mode interactive in which only one person can articulate at a time. Email as a mediation tool not only improves effectiveness of communication, it fosters a fundamental change in the interaction behaviour and frequency. Email messages have become short, frequent, and full of shortcuts and icons to express feelings. Students are more formal when they share their personal problems with the Programme Coordinator. Some students may use harsh language beyond what is normal in face-to-face communications. This calls for more responsibility and accountability of the Programme Coordinator and University in running the programme under ODL.

A few students expressed displeasure with quality of services offered by the University and demanded immediate intervention and support from the Programme Coordinator for resolving administrative and procedural problems faced by them. The displeasure of students highlighted the gap between students' expectations and experiences in the programme. This gap is a true assessment of effectiveness of the delivery mechanism and the University should be committed to minimize this gap. The frequently occurring problems reflect on the gray areas of the delivery mechanism. Teachers can improve the effectiveness of services by paying special attention to these gray areas. This step can improve retention of the students in the programme by making learning more convenient. One reason for delayed action on students' complaints was caused by addressing complaints to other than ombudsman. The students were not aware about grievance redressal mechanism. Students should be enlightened on grievance redressal in the induction programme, Programme Guide and Frequently Asked Question (FAQ) segment of the website.

The writing styles of male and female students differ in sending email messages to the teachers. The female students wrote slightly lengthier messages. However, the difference in lengths of messages sent by the males and females was not statistically significant. The female students were more formal in the way they addressed their teachers. The difference in addressing styles of the male and female students was statistically significant. Precise details about utilization of email messages in instrumenting interaction between the students and the teachers can be obtained by

repeating similar kinds of studies in other disciplines with different compositions of gender population and learning scenarios.

This research was an exploratory study, restricted to analysis of the archive of messages exchanged between students and teachers. There was no opportunity to contact the students to further clarify meaning and purposes of posting email messages to the Programme Coordinator and their satisfaction with the response of the Programme Coordinator. This limitation narrows the scope of this study.

The content analysis of texts of messages exchanged between students and teacher shows that most emails in the pre-admission session are seeking information about eligibility, schedule and procedure for admission and location of centres for delivery of practical and counseling. Such email can be automatically replied by an intelligent auto reply email system. Further study can be taken to devise an intelligent auto reply email system that can classify messages and decide whether emails can be responded to automatically or whether they need to be forwarded to teachers for further interaction with students. This system will be able to reply about 30 % of emails automatically without intervention of teachers/administrator of the university and able to reduce workload on teachers. The auto reply email system will be very helpful for mega open universities, situated in highly populated countries, receiving thousands of email every week from students.

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Editor's Note: This paper goes beyond the ordinary as it builds a rubric or framework for using social media to support self-regulated learning. It demonstrates the advances using each new level of learning made possible by Web 2.0 – personal information management, social interaction and collaboration, and information aggregation and management.

Facilitating personalized learning landscape integrating "Web 2.0" technology: a view from heutagogical perspective

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Abstract

The rapid explosion of 'Web 2.0' technologies ushers in an emerging platform where both instructors and students find interest to use these in the learning process. Emerging 'Web 2.0' technologies such as blogs, wikis, social bookmarking applications as well as social networking sites like *MySpace*, *Twitter, Friendster,* and *Facebook* are experienced as more social and personal. Web 2.0 offers a portfolio that facilitates a Heutagogical learning approach i.e., *self-determined learning* by optimizing learner-generated content, learners' self-directedness in information discovery and learners' autonomy of personalized learning spaces. This situation of technology-enhanced self-directed learning environments is known as *'techno-heutagogy'.* Behind such standpoint, this article is based on an extensive review of the current literature and research. It discusses the role of Web 2.0 in supporting personalized learning approaches and attempts to analyze it from the viewpoint of Heutagogy. In addition, this paper investigates the affordances of Web 2.0 and a discourse of emerging trends in Web 2.0 services and technologies supporting the learning ecologies that heighten formal and informal learning opportunities and harness the learners' autonomy and self-direction in personal learning trajectories. This study also adds a unique dimension in innovative pedagogical models concerned with the theoretical underpinnings of how web tools herald a potential and fertile environment for personalized networked learning.

Keywords: Heutagogy, self-determined learning, personalized learning environments (PLEs), social networking, participatory learning, pedagogy, Web 2.0

Fig. 1: A tag cloud (a typical Web 2.0 phenomenon) presenting Web 2.0 themes

(Courtesy: https://commons.wikimedia.org/wiki/File:Web_2.0_Map.svg#/media/File:Web_2.0_Map.svg)

Introduction

At this turn of the tech-savvy global village, Web technology is revolutionizing modern education through engaging the hearts and souls of learners in a participatory media connected environment. Blogs, Wikis, Podcasts, and other powerful Web tools for classrooms are examples for teachers and educators who are at the forefront of bringing today's learning technologies into their schools

and to their students for task-based learning practice. To integrate Web 2.0 as a participatory medium into teaching is a touchstone for any teacher at any level who is interested in the learner-centric pedagogy that social media enables. Web 2.0 - the term refers to the second generation of the World Wide Web – is characterized especially by the change from static web pages (HTML) to dynamic or user-generated content. This is facilitated by the growth of social media applications to collaborate and share information online. Examples of Web 2.0 technologies include Blogs, Wikis, social sites such as Facebook and MySpace and content sharing sites such as Flickr, del.isio.us and so on. Using web-based interactive tools, teachers and students can learn more, create more, and communicate better. The new ecology of learning makes the assumption that learning is multidirectional and multimodal. It is interesting to mention here that "…in higher education, the usage of Web 2.0 technologies has the capacity to accelerate the pace of advancement in knowledge building and sharing but with unforeseeable consequences and outcomes. In such an environment the academic is not in control, universities are not as able to restrict the learning to those enrolled, and rights to collaboratively determined knowledge are uncertain. Web 2.0 heralds a new age of uncertainty…" (Nagy & Bigum, 2007, p. 82). Under the tutelage of such auspicious prospects for digital learning technologies, the present study explores the terrain of web 2.0 applications that support and accelerate heutagogical, i.e., *self-determined* personalized learning platform where students' interests, aptitudes, and issues and opportunities within their own communities, can form the basis for learning.

Managing one's own personal learning is an ongoing process based on self-awareness, reflection, goal setting, and defining a course of action. The development of autonomous skills and attitudes is improved by individuals in their self-directed learning by taking "… full advantage of social Web and Web 2.0 affordances" (Maina & González, 2016, p. 82). In perceptively, current views of learning with regard to teacher-centered teaching practices are obsolete and do not adequaely address learners' needs to thrive in the workplace. That's why, a more self-directed and self-determined learning environment is desirable, where students can take control of their own learning, make connections with peers, and produce new insights and ideas through inquiry. Thus, to keep pace with the learner-centred content creation processes, "the renewed interest in heutagogy is, and has *emerged,* due partially to the ubiquitousness of Web 2.0, and affordances provided by the technology. Web 2.0 offers an environment that supports a heutagogical approach, most importantly by supporting the development of learner-generated content and learner self-directedness…" (Blaschke , 2012, pp. 56-71).

Figure 1. Interactive user-generated Web 2.0

Web 2.0- a reality, heralding personalization of learning

The present era is maneuvering the rapid explosion of technologies that facilitate the creation of communities in which people come together to collaborate, learn and build knowledge. The new affordances of Web 2.0 tools like weblogs (blogs), RSS, wikis, media sharing applications, and social networking sites boost informal conversation, dialogue, collaborative content generation, and the sharing of information, giving learners access to a vast array of ideas and knowledge. In

such digital world with high connectivity and ubiquitous demand-driven learning, it is high time to re-evaluate our idea of pedagogy so that learners can be active participants or co-producers rather than passive consumers of content. Consequently, the instructional approach can facilitate learning as a participatory, collaborative and social process supporting personalized learning. In fact "social software tools such as blogs, wikis, social networking sites, media sharing applications and social bookmarking utilities are also pedagogical tools that stem from their *affordances* of sharing, communication and information discovery. An affordance is an action that an individual can potentially perform in their environment by using a particular tool" (as cited in McLoughlin & Lee, 2007, p. 666). At this turn of digitalized environments, it is highly potential to address "...the needs of today's diverse students, enhancing their learning experiences through customization, personalization, and rich opportunities for networking and collaboration" (Bryant, 2006). The emergent new demand driven personalized dynamic learning needs can be facilitated by Web 2.0 applications like blog/ *Wiki/MySpace, or Facebook* that *"...emphasizes active participation, connectivity, collaboration and sharing of knowledge and ideas among users*" (McLoughlin & Lee, 2007, p. 665). In fact, the proliferation of learning technologies, Personalized Learning (PL) emerges through web tools and social media applications as well as in the resurgence of learning guild innovations. In this regard, it is important to cite that in British Columbia and elsewhere in North America, the Ministry of Education plans *"...to emphasize personalized learning in its implementation in K-12 schooling in the coming year. Some BC schools ... are already successfully pioneering personalized learning options for students. These mainly reflect the Differentiated and Learner-Motivated approaches. In the United States, various school districts...are orienting to supporting and implementing Differentiated Learning* (Maser, 2014). Similarly, in China, according to education expert Yong Zhao, Educating Creative and Entrepreneurial Students, the country is moving to overhaul its rigidly standardized education system in favour of a much more personalized approach (Maser, 2014).

So, learning has to be a *personalized* - not just a standardized - experience. Learners have to feel in charge of their own learning. They need to know what they are doing, and they can control the pace of their learning. They need to "get involved in it" for having a sense of learning flow and progress through instant feedback along the way (not just at the end of the course).

Methodology

This article stands on an extensive review of the relevant literature and research available on personalization of learning and environment, technology-enhanced self-determined collaborative learning, and heutagogical approaches. The review of the literature first highlights definitions of personalization of learning and environment, Self-directed learning (SDL) and heutagogy, underlining technology-driven heutagogical practice to harness personalization of learning landscape. The analytical study of review also investigates the role of learning technologies (web 2.0) in particular *social media* in formulating personalization of learning from a heutagogical viewpoint. To this end, some models and illustrations of instructional design elements and social media that support heutagogical practices are also analyzed and discussed.

Personalization of learning

Personalised learning is about tailoring the pedagogy and learning support to meet the needs of individual learners. Hence, in a personalised learning environment, the learning objectives and content as well as method and pace, may vary from student to student (as cited in Ng, 2015, p. 45). Prain and others who specialize in innovative pedagogy enabled by digital technologies, spell out "Personalising learning" based on the principle that students have rights and capacities as learners for self-realisation/self-actualisation that can be addressed by flexible approaches to curricular structure and developmental sequences, thus reducing constraints/hindrances/blockers implied by assuming student abilities and needs are best addressed through standardised age-

based curricula. The grounds for enacting personalised learning are based on the assumption that teachers and students are able to co-produce and self-regulate learning through shared decisions around roles, practices, values, and mutual responsibilities. Our view of personalising learning is therefore not based on a principle of unfettered student freedom and unconstrained deliberative choice, but rather one of productive constraint on student focus and activity" (Prain, et al., 2015, p. 13). Consequently, the idea of "personalizing learning" calls for reversing the "logic" of education systems so that the system is built around the learner, rather than the learner being required to fit with the system. This requires us to deploy resources for learning (teachers, time, spaces, technology) more flexibly to meet learners' needs. It also requires us to think about the *new* resources that may be needed, beyond those traditionally thought of in the schooling system, and to think about how best to support learners' access to those resources (Bolstad & Gilbert , 2012, p. 3).

Seemingly, the personalized learning approach can be coined as 'heutagogy'- self-determined learning. Actually, it is a pedagogical approach that aligns well with the use of social media. Heutagogy is the study of self-determined learning, which places responsibility for the learning path in the hands of the learner and where the learner is 'the major agent in his or her own learning (Prain, et al., 2015). Therefore, the relevance of heutagogy as an approach is partially due to the adoption of social media within education, as the affordances of social media support a heutagogical educational approach (McLoughlin & Lee, 2007). So, it is indeed, the emergence of Web 2.0 technology enhances the formation of personalised learning space.

Self-directed learning

Self-directed learning (SDL) is an important aspect of personalization of learning. It refers to the ability of a learner to prepare for his/her own learning, to take the necessary steps to learn, manage and evaluate the learning and provide self-feedback and judgment. "Within transformational learning, learning occurs along a self-directed path; as the learner matures and reflects on life experiences in relation to his or her self-perception, beliefs, and lifestyle, the learner's perspective is adjusted and transformative learning can occur" (Mezirow, 1997). Actually, the relentless pursuit and quest for learning to be 'student centred' has been possible with the integration of social software into learning design. It enables immersing students in a learning domain offering them a sense of ownership and control over their own learning and career planning. McLoughlin and Lee, in this reference, point out that "The learning experiences that are made possible by social software tools are active, process-based, anchored in and driven by learners' interests, and therefore, have the potential to cultivate self-regulated independent learning. A self-regulated learner is able to execute learning activities that lead to knowledge creation, comprehension and higher order learning (Stubbé & Theunissen, 2008) by using processes such as monitoring, reflection, testing, questioning and self-evaluation" (as cited in McLoughlin & Lee, 2010). These instances reflect that Web 2.0 tools support collaborative and self-directed personalised learning environment where peer learners/visitors can reflect, comment, share and manage the learning goals.

There is a variety of definitions as to what SDL is all about and going through all of them I found that Knowles has been very articulate in the way he defined SDL:

> *"In its broadest meaning, 'self-directed learning' describes a process by which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18).*

In self-directed learning (SDL), individuals select, manage and assess their own learning activities. In fact, learner self-direction refers to those individual characteristics that lead to taking

control and self-responsibility for personal learning what is theoretically defined as **andragogy** (Self-Directed Learning). This issue underlines a shift in academia from *Teacher-Directed Learning* to *Self-Directed Learning.*

The role of the educator in an andragogical approach is that of tutor and mentor, with the instructor supporting the learner in developing the capacity to become more self-directed in his or her learning. The instructor shows learners how to find information, relates information to the learner experience, and places a focus on problem-solving within real-world situations (McAuliffe et al., 2008, as cited in Blaschke, 2012). Thus, learning activity enters into the fold of Personalized Learning - a suite of approaches to nurturing and inferring a level of personal learning passions with educator's support customizing learner readiness and cultural sensitivity. In fact, SDL involves initiation of personally challenging activities and developing personal knowledge and skills to pursue real-life challenges successfully. The central focus of SDL is a way to self-improvement, personal development and the development of character. Students who are self-directed learners might display some of the following behaviours:

1. Ownership of Learning, 2. Extension of Own Learning and 3. Management and Monitoring of Own Learning (LLC, 2015). Figure 3 is a graphic that sheds more light on the elements of self-directed learning.
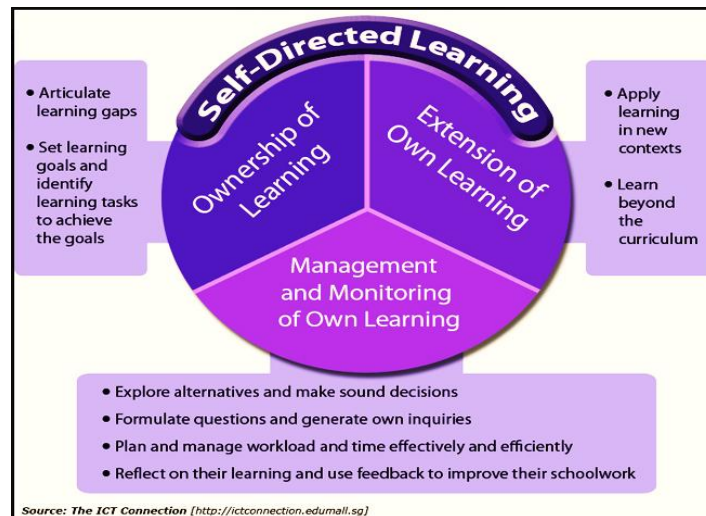
Fig. 3 SDL Learning construction Heutagogy (Self-Determined Learning)

Hase and Kenyon define heutagogy as the study of self-determined learning (Hase & Kenyon, 2000). The heutagogical approach can be viewed as a progression from pedagogy to andragogy to heutagogy, with learners likewise progressing in maturity and autonomy (Canning 2010). More mature learners require less instructor control and course structure and can be more self-directed in their learning while less mature learners require more instructor guidance and course scaffolding (Canning and Callan 2010). Web 2.0 and social media have played an important role in generating new discussions about heutagogy within higher education. Learning 2.0 supports a heutagogical approach by allowing learners to direct and determine their learning path and by enabling them to take an active rather than passive role in their individual learning experiences. A pivotal concept in heutagogy is that of double-loop learning and self-reflection. In double-loop learning, learners consider the problem and the resulting action and outcomes in addition to reflecting upon the problem-solving process and how it influences the learner's own beliefs and actions. Double-loop learning occurs when learners "question and test one's personal values and assumptions as being central to enhancing learning how to learn (as cited in Hase S., 2009, pp. 45-46).
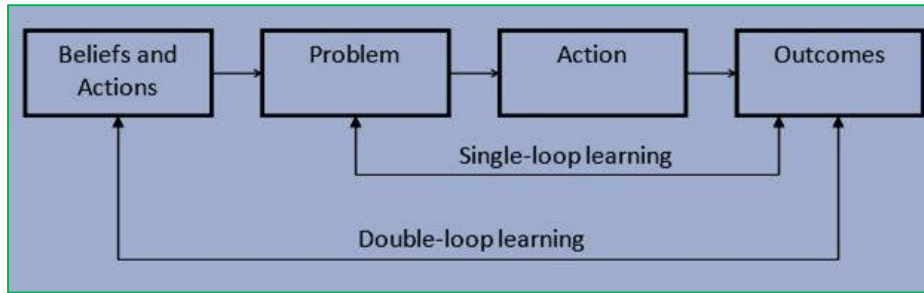
Fig. 4 Double-loop learning
Eberle & Childress, 2005, as shown in Eberle, 2009, p183

In the heutagogical approach, empowering students' learning is potentiality one of the chief motifs through creating learner-generated content supported by Web 2.0 tools. Heutagogy applies a holistic approach to developing learner capabilities, with learning as an active and proactive process, and learners as "the major agent in their own learning, which occurs as a result of personal experiences" (Hase & Kenyon, 2007a, p. 112). Opportunities for students to use the internet to acquire, share, and collaboratively develop "learner generated content" shift the locus of control from "teacher as expert" to "guide and collaborator" in the learning process. Heutagogy differentiates from andragogy or self-directed learning. This approach in learning has laid "…emphasis on developing capability, self-reflection, and metacognition or an understanding of one's own learning process, double-loop learning, nonlinear learning and teaching processes. Table 1 describes the basic principles that form heutagogic design" (as cited in Blaschke & Hase, 2016, pp. 27-28).

Table 1
The principles and prospects of heutagogic learning

Principles	Description	References
Learner-centered and learner-determined	The role of human agency in learning is a fundamental principle. The learner is at the center of all heutagogic practice. The learner is self-motivated and autonomous and is primarily responsible for deciding what will be learned and how it will be learned and assessed.	Hase & Kenyon (2000, 2007, 2013b), Hase (2009), Deci and Flaste (1995), Deci & Ryan (2002), Long (1990), Pink (2009)
Capability	The capability is characterized by the following: being able to use one's competencies in unfamiliar as well as familiar circumstances, learner self-efficacy, communication, creativity, collaboration (teamwork), and positive values.	Cairns (1996, 2000), Stephenson & Weil (1992), Gardner et al. (2008), Hase & Kenyon (2000, 2003, 2007)
Self-reflection and metacognition	Within heutagogy, it is essential that reflection occurs in a holistic way. This translates to the learner reflecting not only what she or he has learned, but also the way in which it has been learned—and understanding how it is learned (metacognition).	Schön (1983, 1987), Mezirow & Associates (1990), Blaschke & Brindley (2011)
Double-loop learning	Double-loop learning requires that learners are both psychologically and behaviorally engaged. They reflect on not only what they have learned, but also the way in which this new knowledge and the path to learning have influenced their values and belief system.	Argyris & Schön (1978), Eberle & Childress (2009), Eberle (2013)
Non-linear learning and teaching	As learning is self-determined, the path to learning is defined by the learner and is not established by the teacher. As a result of learners' choosing their own path, learning happens in a nonlinear format.	Peters (2002)

Conceptualizing Personal Learning Environments (PLEs) and practices

Personalized learning provides a unique, highly focused learning path for each student. Individual attention from instructors isn't feasible in traditional educational models with large numbers of students, and personalized learning is intended to use IT systems and tools to tailor learning experiences based on student strengths, weaknesses, and pace of learning. Technologies including analytics, adaptive learning, digital courseware, and others underlie personalized learning, which builds a "profile" of each student and makes continual adjustments to learning paths based on student performance" (Feldstein, Hill, & Cavanagh, 2015). Personal Learning Spaces like Facebook, LinkedIn, Academia.edu, following in Twitter and links between personal blogs typically deliver means to assert identities such as profiles, as well as authentication that provides trust in such identities and relationships. The development of an individual identity as a person, a student of a particular subject, a class member, a group participant, or a learning community member depends on productive relationships with others when learners contribute to activities such as large and small-group discussion, debates, academic and sporting teams, group projects, musical ensembles, school community decision-making, and teamwork around small or large school-based or broader community projects. This technology-driven personal learning style develops from heutagogic perspective.

Personal Learning Environments (PLEs) are spaces for the modern learner to create, explore and communicate (Dalsgaard, 2006, p. 2). While they include and respond to new technology tools, PLEs are characterized as an approach to learning rather than a set of applications (Initiative, 2009, p. 1). Attwell's (2010) definition summarizes the essential characteristics of PLEs:

> "PLEs are made-up of a collection of loosely coupled tools, including Web 2.0 technologies, used for working, learning, reflection and collaboration with others. PLEs can be seen as the spaces in which people interact and communicate and whose ultimate result is learning and the development of collective know-how. A PLE can use social software for informal learning which is learner driven, problem-based and motivated by interest - not as a process triggered by a single learning provider, but as a continuing activity" (Attwell, 2010).

Within this perspective, a Personal Learning Environment could be seen as the representation of knowledge, skills, prior learning and a set of tools for interaction with peers to accomplish further tasks. A PLE is developed from tools or artifacts which support learning and knowledge in different ways for different purposes; represent the underpinning knowledge structures of different artifacts and share by supporting individuals in their learning and knowledge through networking by creating a collaborative learning environment. According to Conole (2008), "students are mixing and matching different tools to meet their personal needs and preferences, not just relying on institutionally provided tools and indeed in some instances shunning them in favor of their own personal tools" (as cited in Attwell, 2010). The above-stated information avowedly manifests that PLEs facilitate a platform of effective personal learning shores through networked connections with peers, friends, teachers, or parents. In fact, PLE is an extension of knowledge building space for the self-determined learners.

A framework for Personal Learning Environments (PLEs)

"Learning is personalized when learners are motivated to learn because they view the learning task or experience as engaging and meaningful. Learning is likely to be meaningful when there is a good fit between individual learner needs, interests, capacities, and the demands or level of the learning activities…. Learning is personalized when it promotes in learners a sense of their individual capabilities and interests….Learners are likely to view their learning as personalised and meaningful through relational connections with peers, teachers and parents" (Prain, et al.,

2015, p. 14). From socio-cultural perspectives, meaningful learning for students depends on successful participation in culturally valued activities (Moje, 2007). Perkins proposed a framework of twenty-first century learning spaces which clearly placed the individual learner at the center of the teaching and learning process, as shown in Figure 5. In conjunction with the desired new knowledge and ways of working, the learner drove the learning agenda where the digital technology, digital pedagogy, and twenty-first century learning spaces are dependent elements meeting the individual needs (Perkins, 2009).
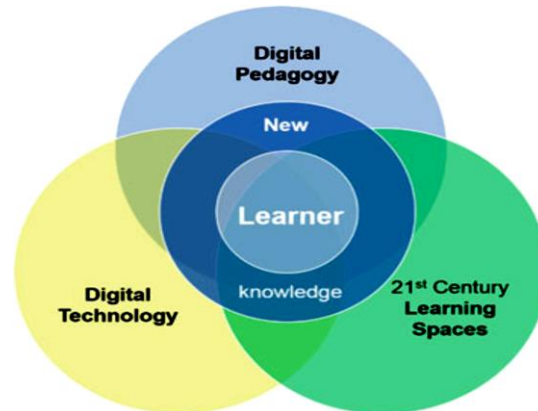
Figure 5 Framework for considering 21ˢᵗ-century learning spaces

Interestingly, the technology-enhanced learning space intersection is a dynamic platform, where digital technologies have enabled online 21ˢᵗ century spaces for networked learning communities, blogs, wikis, discussion boards, RSS, chat, podcasts, virtual worlds and even Twitter, to name a few. From a learning technology perspective, "personalized learning can be defined as adapting learning designs to account for individual differences or according to contexts and situations" (Kinshuk & Chen, 2011).

Social media and personal learning environments (PLEs)

Outline for using Social Media to support Self-Regulated Learning (SRL) in Personal Learning Environments (PLEs)

Personalised Learning Environments (PLEs) optimize potential platforms for both integrating formal and informal learning and fostering self-regulated personal learning. Social media can facilitate the creation of PLEs that help learners aggregate, share the results of learning achievements, participate in collective knowledge generation, communicate and manage their own meaning making. A PLE is a new construct in the e-learning space that is premised on social media and steadily gaining ground in the eLearning field as an effective platform for student learning. PLEs are built on externally hosted Web 2.0 tools and services designed to support higher education faculty and instructors in scaffolding student self-regulation skills. To organize PLEs, a pedagogical framework has been formulated using social media based on the levels of interactivity that social media tools enable. These levels are: (1) personal information management, (2) social interaction and collaboration, and (3) information aggregation and management, as shown in Table-2 (as cited in Dabbagh & Kitsantas, 2011, pp. 4-5):

Table 2:
A framework for using Social Media to support self-regulated learning in Personal Learning Environments (PLEs)

	(Level-1) Personal information management	(Level-2) Social *interaction* & collaboration	(Level-3) Information aggregation and management
Blogs	Instructor encourages students to use a blog as a private journal to set learning goals and plan for course assignments and tasks	Instructor encourages students to enable the blog comment feature to allow for instructor and peer feedback enabling basic interaction and sharing	Instructor demonstrates how to configure a blog to pull in additional content and how to add the blog to RSS aggregation services
Wikis	Instructor encourages students to use a wiki as a personal space for content organization and management	Instructor encourages students to enable the wiki's collaborative editing and commenting features for feedback	Instructor demonstrates how to view a wiki's history to promote student self-evaluation of their learning across time
Google Calendar	Instructor encourages students to use Google Calendar for personal planning	Instructor encourages students to enable the calendar sharing features to allow feedback and collaboration to complete course tasks	Instructor demonstrates how to archive personal and group calendars to promote student self-evaluation regarding time planning and management
YouTube or Flickr	Instructor encourages students to use Flickr or YouTube to set up a personal media archive related to course content	Instructor encourages students to enable the sharing feature of the media archive and join similar media archives created by peers	Instructor demonstrates how to aggregate media from several media archives to refine their personal archive
Social networking sites	Instructor encourages students to create an academic and career profile on LinkedIn	Instructor encourages students to connect to online communities related to their professional goals	Instructor asks students to engage in self-reflection with the goal to restructure their profile and social presence
Social Bookmarking	Instructor encourages students to use a social bookmarking tool (e.g., Delicious) to organize course content	Instructor encourages students to collaborate with other classmates and create a shared list of bookmarks related to a specific learning topic or project	Instructor asks students to self-reflect on their personal and group bookmarks to enhance the desired learning outcome

Ostensibly, the above framework manifests the patterns of learning methodologies and sensibilities reflected in the varied approaches to Personalized Learning Spaces listed above and emerging through technology and social media applications as well as in the resurgence of learning guild innovations underlining learners' 21st century skills. Thus, such contributing perspective, illustrates how Web 2.0 and e-portfolios enhance and support personal learning in the heutagogical approach. To have self-determined learning space, students need to create e-Portfolios. Some examples of personalized learning space are cited below:

Creating e-portfolios and websites

An educational portfolio refers to a purposeful collection of students' work that demonstrates their efforts and achievements in an area of course work or curriculum. When a collection of work is displayed online, the portfolio is called an e-Portfolio. Hence, an educational e-Portfolio is a collection of student-created digital artifacts that reflect the mastery of intended learning outcomes. e -Portfolios are hosted online on a variety of platforms. Platforms that are available at no cost to host students' e-artefacts include, just a few to name here:

- Weebly,
- Wix,
- Yola,
- Wordpress,
- Wikispaces, and
- GoogleSite.

These platforms become personalized learning spaces for the students. Online e-Portfolios are easy to update (e.g. add, delete or modify the digital learning artifacts) and maintain in a timely fashion. A portfolio collection can be a physical collection to "shows-off" the student's best work such as written essays, completed tests, laboratory reports, project work, artwork, and 3D models. It can also contain digital objects such as a video or digital presentation created by the student. E-Portfolios can be used at all levels of schooling.

In order to create a flexible learning environment, social media tools can provide much better learning environments where students' group collaborative learning takes place. Such interactions are not predictable in the individual learning domain. According to Veletsianos (2010, p.33), emergent technologies are "tools, concepts, innovations, and advancements utilized in diverse educational settings to serve varied education-related purposes". To personalise learning, educators suggest students to open e-portfolios like- blogging platforms (e.g., **WordPress**), **Twitter** (a micro-blogging platform), and **wiki software** (e.g., **PBworks**) to stimulate students' engagement in the classroom and in collaborative projects that support the creation, editing, and management of knowledge content.

Portfolios serve to promote self-directed learning fostering metacognition and providing a means for the students to connect learning that is demonstrated in a variety of learning artifacts. With the interactivity and flexibility of technology, an e-Portfolio is a lifelong creation of an individual. All these are the examples that underpin the potential personal learning passions and environments supported by web 2.0 tools.

Social media application –a focus on personal learning passions

Web 2.0 technologies, especially social media platforms transform the LMS paradigm enabling "the creation of personal and social learning spaces to support more learner-centered 'personalized' education systems (as cited in Dabbagh & Kitsantas, 2011, pp. 1-6). In this connection, Hilton (2009) points out that "higher education is being challenged by perceptions that Web 2.0 technologies (social media in particular) are empowering students to take charge of their own learning resulting in what some interpret to mean that there is no arbiter of their knowledge, work, publication, or thinking" (Hilton, 2009), and herein **Heutagogy** is the term applied to this situation, where self-determined learning is the key motto. Application of social media into the class as educational aids is one way to bridge the gap between the students' lives outside the class and their lives inside educational institutions. Incorporating technology in learning namely *blogs*, a world most students are very familiar with, where they can create collaborative and self-directed world of learning with the "...use of participatory technologies and online social networks to share, reflect upon, critique, improve, validate, and further their scholarship" (Veletsianos & Kimmons, 2012, p. 768). Blogs are one of the most representative tools of Web 2.0. They offer flexibility, adaptability, and integration with other tools. "The act of interactivity and sharing of knowledge was found to be the most recurring practice through using blogs in the different studies that I have looked at" (Davies & Merchant, 2007). So, it is imperative to imply that social software namely, blogs can promote teaching and learning immersing students in engaging relevant and real-world activities.

Opportunities for personalized pathways

Personalized learning has the potential to extend the benefits of individualized learning pathways on a large scale. Personalization can involve shaping students' learning pathways in ways that support their needs and interests, open and expand each learner's experiences and offer them chances to think about whom they might like to become and what they might like to do in their lives beyond school. Some promising outcomes of PLEs are:

1. **Learner-centred portfolio:** Identification of learning outcomes, processes, and skills acquisition.

2. **Socialising the reflective: blogs, social networks, and wiki:** personal reflection has been socialised by web 2.0 technologies in a variety of formats. Perhaps the best known is the 'blog,' a web-based log or journal in which an author's postings (text, sound, images, video, or weblinks) become visible online to others who can engage with them by posting comments in response to the author's entries. The social networking sites, famously Facebook and MySpace, can be seen as elaborations of this format into more tightly-knit and manageable communities of reflective users.

3. **Socialising the expressive: media design, sharing, and publication:** Typically, expressive activity with digital material has become a realistic ambition for users, and the activity has been socialised through the growth of internet outlets that permit sharing, publication or broadcasting. These sites allow the posting of user-generated content, most famously in silos for video, photographs, sketches, and slideshows.

4. **Socialising the exploratory: Syndication and recommendations:** an individual's exploratory activity has also been socialised by web 2.0 technologies. Syndication involves some portion of a website being made available to users by their subscribing to a 'feed' that automatically delivers requested material and updates to their browsers. Web 2.0 socialises this by integrating data on selections that users make online. Internet book traders such as Amazon.com will capture the titles that their individual users browse. When a user selects a title, the trader can trace the selections of other users who have browsed that title and make them visible, thereby creating recommendations.

5. **Web 2.0 underpinning learning concepts:** Exercise of learning practice through playful, expressive, reflective or exploratory aspects of knowledge building is likely to find web 2.0 tools and services a powerful resource. Web 2.0 impacts on four principal dimensions of the learner's experience: Two are broadly social in nature- i. collaboration, ii. Publication and two are more cognitive- iii. Literacies and iv. Inquiries.

In addition, in a time of hectic schedules and ever increasing expectations, the teachers reframe their instruction to focus on the skills students need to succeed in the digital age. PLEs pertain to "… the philosophy of mutually maximizing collective intelligence and cooperative learning style added value for each participant by formalized and dynamic information sharing and creation" (Martindale & Dowdy, 2010).

Literature review

This section of this research encompasses some literature that incorporates how web 2.0 tools support in mushrooming personalised learning environments (PLEs) optimizing an effective platform for student learning. Martindale and Dowdy (2010) underscore that PLEs are an outcome of the tools that social media has provided learners enabling them to create, organize, and share content (Martindale & Dowdy, 2010).

To Zimmerman (2008), independent learning or self-regulated learning refers to the degree to which students are metacognitively, motivationally and behaviourally active participants in their own learning processes. Godwin-Jones spells out "...the advantages of using blogs as a writing tool are: encourages feedback and represents both writing and reading activity; critical analysis and encourages articulation of ideas and opinions; offers opportunities for collaborative learning; provides an environment in which students can develop skills of persuasion and argumentation; creates a more student-centered learning environment; and offers informal language reading" (Jones, 2006).

In heutagogical approach, Web 2.0 tools support students to collaborate and share resources, participate in collective knowledge generation, and manage their own meaning making. In line with heutagogical approach, such a learning portfolio is mentioned below by Jesus and Moreira in their research digest, See Fig. 6, (Jesus & Moreira, 2008):
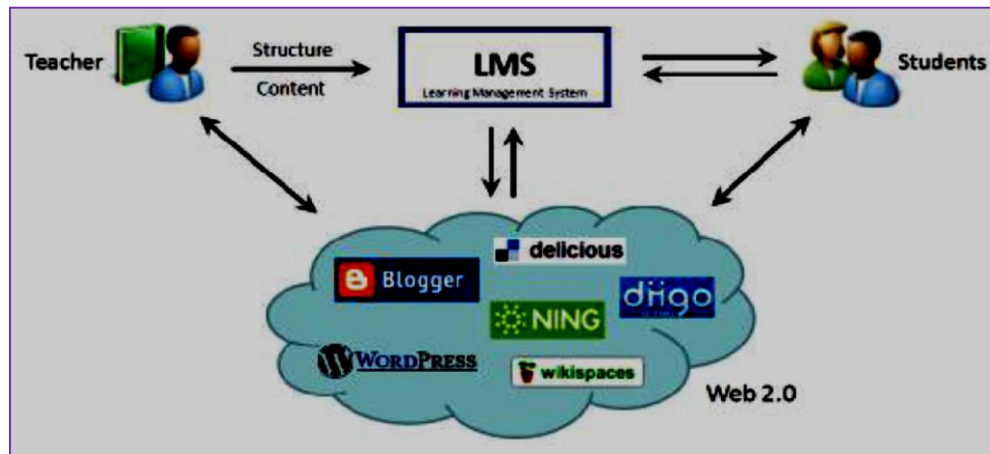
Fig. 6 Web 2.0 applications in Learning Management System (LMS)

Interestingly, referring to this context, it can be cited that students can "…publish their own writings, discuss group assignments, peer review each other's work, collaborate on projects and manage their digital portfolios" (Churchill, 2009).

A digital portfolio promotes creative writing through teaching responsible public writing. "A good deal of this change is the result of new technologies, such as the iconographic, text, and screen-based modes of interacting with automated machinery; "user-friendly" interfaces operate with more subtle levels of cultural embeddedness than interfaces based on abstract commands" (GROUP, 1996). It is indeed, this change is also the result of the new social relationships of social networking platform. New technologies generate new literacies that become important to our lives in an age of global information. We believe that we are on the cusp of a new era in literacy research, one in which the nature of reading, writing, and communication is being fundamentally transformed. These activities reflect the Heutagogical learning paradigm.

The Heutagogical approach enables learners to take responsibility to decide which tools to use and what contributions and connections to make on an ongoing basis. Within PLEs, a learner gains control as he/she makes individual choices about the technologies he/she uses in alignment with his/her personal needs style of learning, preferences, context or changing interests (as cited in Hicks & Sinkinson, 2015, p. 7). By engaging with components of his/her PLEs, the learner participates and engages in 'purposeful tinkerings that often form the basis of situated understanding' (Brown and Adler 2008, p. 30). In this way, a learner constructs and manages an individually designed and self-reflective learning environment rather than one that is modeled on the teacher or institution.

PLEs enable a learner to pool all of his/her learning experiences, whether these are workplace, academic or civic experiences. This brings 'together sources and contexts for learning hitherto separate' to form a comprehensive record that he/she may use to find patterns, connections or contradictions in his/her learning experiences (as cited in Hicks & Sinkinson, 2015).

The Personalized learning approach can be coined as 'heutagogy'- self-determined learning. The relevance of heutagogy as an approach is partially due to the adoption of social media within education, as the affordances of social media support a heutagogical educational approach (McLoughlin & Lee, 2007). So, theoretically, using social media like blogs for a personalized learning process can seem to be sound and contributing. Above all, heutagogy emphasizes learner-centeredness and the development of learner capabilities, which need to be developed 'as a complementary set of attributes to competency' in order to create a culture of lifelong learning (Gardner, 2008, p. 257).

Discussion and conclusion

This paper, based on varied information, discussed hypotheses that PLE as a dynamic space for the learners, facilitates personal reflection on the tasks and further assists in the representation of prior knowledge, skills and experiences. In this context, experiences are seen as representing performance or practice. Such an approach to the design of a Personal Learning Environment (PLE) can bring together the everyday evolving uses of social networks and social media with pedagogic theories to learning. The literature on PLEs and emerging technology-driven pedagogies reflects students' personal needs-oriented learning pathways. Digital technologies widen access to information, open up new ways of learning and provide opportunities for communication, collaboration, participation and the acquisition of skills. The trends comprising technologies, pedagogies and strategies illustrate a whole landscape of choices for autonomous learning in the digital era. Technology affordances have multiplied and simplified opportunities for learning optimizing, personal needs, choices, and the creation of new horizon of learning paths and footings. This situation of learning 2.0 portrays the core of heutagogical approach.

Web 2.0 and social software characterize learner's autonomy as a persistent involvement and deliberate choice underlining their personal learning needs and interests. According to Bolstad & Gilbert, technology that prioritizes autonomous learning can be articulated in the following characteristics:

Setting individual goals.
- Selecting appropriate and accurate materials according to their own learning styles.
- Selecting activities according to their learning objectives.
- Selecting learning methods and techniques.
- Establishing self-pacing within external constraints.
- The conditions for monitoring progression.
- Adopting an active approach vis-à-vis their responsibilities over the learning process, and
- The predisposition to take risks…." (as cited in Bolstad & Gilbert , 2012, p. 82).

The personalization of learning is addressed in formal and informal self-directed learning taking "…full advantage of social Web and Web 2.0 affordances" (Maina & González, 2016, p. 82). This type of technology-enhanced learning and accentuates students' personal learning guilds. This approach in teaching/learning underscores web 2.0 –a reality and heutagogy is a norm and form of this practice. The diverse literature reviews and data analyses affirm that heutagogical approach heightens personalization of learning, makes learners as self-responsible, and offers them ownership of learning. Web 2.0 and social media optimize the PLEs and heutagogical

learning trends - a tailored learning program for each student according to his or her needs and interests.

In the PLEs, a teacher works as a facilitator, motivator, co-learner or coach rather than an authoritative figure in front of the classroom. These changing roles mark a significant transition from traditional learning to the personalized self-directed learning paradigm. So, in reality, Web 2.0 and social software in the heutagogical learning domain facilitate/optimize individual learners

- to communicate, collaborate and build a community online,
- to share ideas, syndicate, reuse or remix,
- to learn from and capitalize on the behavior or knowledge of the people of other cultures through developing intercultural communication,
- to have easy access to equipment and materials,
- to be actively involved independently or cooperatively,
- to practice, make mistakes and take risks,
- to satisfy natural curiosity and be inspired to learn, and
- to develop them socially, intellectually, emotionally, physically and aesthetically.

In the final analysis, it is obvious that learning becomes ubiquitous. This ubiquity implies a special capacity for flexibility and adaptation to different contexts. Whereas in a traditional classroom, the teacher is the main source of information and students are required to stay in the same place and participate simultaneously in the same activity. From a learning technological viewpoint, learning needs to take place in a wide *variety of settings*, not just at school or in a classroom, but in new contexts. Besides space changes, temporal changes and ubiquitous computing, learning can be scheduled around one's personal styles, habits and preferences. Learners should be treated as individuals with differences in terms of personal learning styles. Personalisation is, therefore, very important. Technology has promoted this shift in the perception-of-learning paradigm to support differences among learners' style because everybody does not have the same approach to learning and, therefore, personalization is required.

Web 2.0 heralds new forms of learning and learners. Personalized Learning is, in reality, a suite of approaches to nurturing learning. To personalize students' learning, they need broader skills known as the 4Cs include creativity, communication, collaboration and critical thinking than the 3Rs to operate in the 21st century. So, Personalized Learning is identified as a future destination because it facilitates learners to discover their own passions, their own interests and talents as well as it changes the way we see ourselves. Likewise, it will help catalyze the potential for this generation of young minds being the responsible member of the personalized learning guilds. So, let's seize the moment and fruits of learning 2.0 for an effective personal learning landscape where bumps and detours are part for the course.

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Editor's Note: This is the first step on something that needs to be studied across institutions and courses and in much greater detail. We need data on first LMS experiences with both platforms. We need to explore transition problems in both directions. We need explicit details about likes and dislikes, difficult and easy, how different faculty and students use these products, technical problems experienced and under what conditions. We need to see the list and priorities for bugs fixes for all software. We are accustomed to applications like Microsoft office that has been tested on hundreds of thousands of users prior to release. Unfortunately we do not have this level of support for educational products, resulting in computer crashes and loss of time, data and productivity for faculty and for students.

Faculty opinions on Moodle versus Blackboard

Page Varnell
USA

Abstract

How do faculty feel about the features of Moodle compared Blackboard (Bb)? Do faculty feel that Moodle is an effective Learning Management System (LMS)? Management professionals at many colleges are transitioning to LMSs, such as Moodle, for reasons such as lower costs, faculty and student preference, and greater outreach. The purpose of this study was to explore faculty perceptions of the features of Moodle compared to Blackboard (Bb). Ten (77%) of the faculty felt that Moodle met their instructional needs. Twelve (92%) of the faculty felt that Moodle was beneficial to utilize with students.

Introduction and background

How do faculty feel about the features of Moodle compared Blackboard for distance learning (DL)? Do faculty feel that Moodle is an effective LMS? Results on satisfaction with Moodle for both faculty and students have varied in several studies. Martin-Blas and Serrano-Fernadez implemented Moodle to supplement their physics course and found that the students who used Moodle received higher marks than those who did not (Martin-Blas & Serrano-Fernandez, 2009). However, Carvalho, Areal, and Silva (2011) found that more students had a preference for Bb than Moodle. Payette and Gupta (2009) found that 74% of students felt Moodle was better than Blackboard as an LMS. However, this same study found that only 35% of full-time faculty felt Moodle was better than Blackboard whereas 80% of part-time faculty preferred Moodle. Payette and Gupta also found that 90% of students felt Moodle was easy to use, whereas only 42% faculty felt Moodle was easy to use. Unal and Unal found that "it can be concluded that in almost every module or function comparison that was made, Moodle was favored by course participants over Blackboard" (Unal & Unal, 2011, p. 19).

An LMS, such as Moodle, can be effective at accommodating complex learning activities with ease of use (Barr, Gower, & Clayton, 2007). Some faculty believe that an LMS can help facilitate learning effectiveness. However, there are some researchers who argue that LMSs merely support educators with the administration and dissemination of course material. Good LMSs should also include collaboration, interaction, and participation (Barr et al., 2007). An effective LMS should reduce difficulties such as deficiency of system dependability, absence of connectivity, insufficient hardware and software, and lack of technical support by providing a manageable and accessible format. This structure permits educators and learners to work with minimal assistance. Faculty that utilize Moodle effectively can minimize these problems because the LMS was created for ease of use and faculty independence (Barr et al., 2007).

The majority of LMSs, such as Blackboard, are constructed to be faculty oriented and deliver the course content to learners. In contrast, Moodle is an LMS that is designed around the social constructivist theory (Moodle, 2012). This theory of instruction implemented in online learning has students involved in actively constructing new knowledge. Students are also involved by

explaining what they have learned to others. Moodle adopts a more subjective stance to knowledge creation (Barr, Gower, & Clayton, 2007).

The North Carolina Community College System (NCCCS) published a study called the Open Source Collaborative: Moodle Assessment Report. The study concluded that Moodle was a viable alternative to Bb. Moodle is considered the most cost effective solution related to licensing, hosting and cost per DL student. Moodle does not require licensing fees. Also, vendor hosting for Moodle is considerably less than other LMSs. The results of NCCCS study were that there was a 72% cost decrease when a college migrated entirely to the Moodle LMS (Randall, Sweetin, & Steinbeiser, 2010). The results of this study prompted many of the 58 state supported community colleges in North Carolina to examine transitioning to Moodle from Bb.

Topic and purpose

In many institutions, administrators are choosing to transition to a new LMS, such as Moodle, which is more cost effective, provides additional tools for faculty and student utilization, and is student preferred. When the college in this study decided to transition to a new LMS, the administration did not believe that the impact for faculty during this LMS migration would be significant. Therefore the administration did not provide incentives, course release time, or additional financial support to faculty during the LMS migration. This resulted in faculty not being prepared to utilize the features of Moodle and the courses not being completed before the semester began. Faculty had to learn the new LMS, Moodle, in addition to their other normal duties. There was minimal instructional design and technical support for the instructional initiatives related to the LMS transition. Faculty were not required to attend training on how to make the Moodle course pedagogically sound or how to utilize the tools effectively.

Literature review

The diffusion of innovation theory applies to faculty participation in relation to their technology use, their attitudes toward technology and DL, and their adoption of innovations. According to this framework, individuals, and even entire organizations adopt innovations at different rates and play different roles in the adoption process. Rogers (2003) identified specific roles in the adoption process which includes innovators, early adopters, laggards, change agents, and opinion leaders. Innovators and early adopters are quick to take on and investigate innovative resources such as high tech tools. However, we also have a majority who accept an innovation much later in the process or who may resist adopting new technology altogether.

According to Rogers (2003), "diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system" (p.5). According to Rogers, when change is being adopted, there are steps in the innovation decision making process that must be experienced. These steps include knowledge, persuasion, decision, implementation, and confirmation. The decision stage is critical because that is where an individual, group, or in this case a faculty member, will choose to adapt or reject an innovation (Rogers, 2003).

Faculty professional development is an essential consideration when enacting any innovation. According to Hall (2013), innovation adoption by the whole will require initial success by users. Ongoing reporting of *achievements* by faculty will further enhance opportunities to engage and energize the majority. The perceived usefulness, ease of use, and risk minimization are three factors that are necessary for obtaining acceptance by the majority. It should be noted that there are some faculty members who will never adopt new learning technologies or new LMSs regardless of the nature of enticements (Hall, 2013).

Training needs

Wong and Huang (2011) examined the effects of LMS quality and user acceptance on organizational learning. They determined that the more users are content with DL; the more organizational learning will be improved. Wong and Huang, also concluded that employees will be more attentive in using DL if the system can offer them useful information and is highly functional. Both of these factors may increase employee satisfaction. In order to improve the use of the LMS, it is vital that DL training needs be aligned with the daily operations of employees. In addition, an intuitive user interface should be provided to make it easy for the faculty to use DL technology for learning. The researchers concluded that an LMS's quality has a positive effect on the acceptance and use of elearning technology. The LMS's quality also has a positive effect on organizational learning effectiveness. The acceptance and use of an LMS plays a full mediating role in the relationship between the LMS's quality and the organizational learning effectiveness. Therefore, when implementing DL, college administrators should manage both the LMS and the quality of the elearning (Wong & Huang, 2011).

Chang, Shen, and Zhi-Feng Liu (2014) found that training was a significant issue for instructors who have and have not delivered courses via DL. Instructors who taught online with sufficient training scored their instructional practices higher than those with little or no training. Thus, it is important to note that repetitive training programs such as basic computer skills are not adequate for the professional development of DL instructors. In addition, facilitating student's participation is what faculty identified as their greatest training need when instructing DL courses. Therefore, training in course design should be incorporated into faculty development programs related to DL. Training will promote teacher empowerment in addition to practical administrative and technology support (Chang et al., 2014).

Design and methodology

The purpose of this study was to explore faculty perceptions of the features of Moodle compared to Blackboard. A phenomenological research design was utilized in an effort to identify and examine the perceptions of faculty who transition to a new LMS, Moodle. A phenomenological approach was chosen because it can be utilized to examine perspectives and gain insight into situations or circumstances of faculty regarding their perceptions during an LMS transition (Leedy & Ormond, 2014). The goal of this study was to gain a comprehensive understanding of how faculty perceived Moodle compared to Bb and identify what faculty liked and disliked about Moodle.

Setting, sample and population

A community college located in the Southeast of the United States was the setting of this study. The college is an equal admission, two campus, associate-degree granting public institution. The college offers students associate degrees, diplomas, and certifications in liberal arts, career and workforce development programs. Approximately 3,000 curriculum students and 10,000 continuing education students are served annually. The general population of the study was the current full time faculty at the college, who transitioned courses from Blackboard to Moodle between August 2009 and December of 2013. This college was chosen for this research because it transitioned completely from Bb to Moodle. Purposeful sampling was used to interview 13 of the 72 full time faculty members at the college. Purposeful sampling means that the researcher selects participants and sites for the study based his expert judgment that is typical of the population (Singleton & Straits, 2009).

Current full time faculty who had transitioned a course from Bb to Moodle from 2009-2013 were contacted via email and asked to participate in the study. These interviews, consisting of faculty with different experiences, resulted in an extensive study of the perceptions faculty had about Moodle compared to Bb. This sample included experienced and inexperienced DL faculty.

Experienced faculty, for this study, meant the faculty member had taught DL courses for the college for at least three years. The viewpoint of inexperienced faculty was critical to get an accurate depiction of the case. Inexperienced faculty, for this study, meant faculty who had not delivered DL courses for a minimum of at least two years.

Thirteen faculty were interviewed at the college during a two-week period. For each faculty participant, in-person interviews were scheduled at a mutually agreed upon time. Once transcribed, each interview was sent to the faculty participant as a password protected file, for member checking. Furthermore, an external auditor assessed the findings, interpretations and conclusions to ensure they were supported by the data.

Results

Ten (77%) of the faculty participants stated that Moodle met their instructional needs. Two (15%) faculty participants stated that Moodle did not fulfil their instructional needs as well as Bb. One faculty participant referenced Moodle as only an assistance to her instruction. Research by Bolliger and Wasilik (2009) suggested that faculty satisfaction is an important factor of quality in online courses. Institutional barriers such as problems with technology, workload issues, and adequate compensation can have a negative impact on faculty. During the interviews, faculty were asked if they were satisfied that Moodle met their instructional needs. Faculty Participant 1 stated "the reason I like it (Moodle) is that you can do so many things with it and it is open." Faculty may use Moodle and other assortments of teaching approaches to enhance student learning. The internet is no longer just a means of gathering information for faculty and students. The internet has developed into an essential educational venue where interpersonal and social relationships can be established or fostered (Shang-Shang, 2010). Participant 10 also had positive things to say regarding Moodle and instruction. She said:

> Yes, I think it is a good product. I think, as much as I didn't want to make the transition and I wanted to stay in Blackboard, it's a lot more …. But I actually like it better than Blackboard. It's a better product in my expectation, and it can do what I want it to do.

A recent study by Hsu and Chang (2013) revealed that perceived convenience, perceived ease of use, and perceived usefulness are three vital determinants of attitude toward using Moodle. However, perceived ease of use is the most substantial determinant that directly affects attitude. The conclusions also show users' continuance intentions for using Moodle are not a consequence of users' perceptions about how simple it is to use the system or about how the system will help users in their learning process (Hsu & Chang, 2013). The findings of Hsu and Change support the comments provided regarding the features that work in Moodle. For example, Participant 3 stated "you can see exactly what type of object (you are trying to choose)." A summary of the faculty comments on the features that work well in Moodle are provided in the table below:

Table 1
Faculty Responses about What Works Well in Moodle Compared to Bb

Faculty Participant	Features that Work Well in Moodle
Participant 1	Locking down the syllabus quiz
Participant 2	Assignment Feature
Participant 3	More interactive than BlackBoard Ability to imbed videos and I like new availability to lock it down and force them to take their attendance verification I structured my modules better in Moodle Gives them (faculty) a holistic view of whatever the topic is they are working on More interactive than BlackBoard I think from the student aspect it probably easier
Participant 4	Lots more flexibility and lots more options It's always been a stable system Since we have Respondus, tests have been fairly easy to put together
Participant 5	Nothing
Participant 6	Utilizing TurnItIn I love that I can do that immediately without extra step of having to add each paper myself.
Participant 7	I think there are a lot more features that Moodle has in comparison to BlackBoard
Participant 8	Nothing
Participant 9	I think it does very well.
Participant 10	Embedding of videos works well in Moodle As long as students don't use Internet Explorer, Moodle seems to be stable I like that I can track exactly what a student has done, what click they have made in Moodle the testing works well
Participant 11	Gotten better with when you remove a student I like the way that we lock down now the syllabus
Participant 12	Features that Work Well in Moodle Moodle makes it easier for students to access materials It helps with the discussions we have I think it is easy to manage as far as arranging things on the page for students to see and organizing where I have assignments and where they need to go, what they need to do I like the fact that they have labels there where you can organize particular sections You can customize it to fit your language and the way you want to present things to student Because of the flat way that Moodle is set up, you can get to things quicker and easier
Participant 13	Copying things from semester to semester, It seems to be working a lot better with that I like the online grading within an online assignment It seems to be easier to backup and restore a course I love the maneuverability within Moodle I have not used any html in Moodle The fonts seem to be a whole lot prettier and just more intuitive. You don't get the junky mix of a serif and sans serif and stuff like that

Additionally, faculty were asked in the interviews about the features of Moodle when compared to Bb. They were also asked what features they believed worked well and what did not work well. Twelve (93%) of the faculty stated particular opinions and examples regarding which features did not work well within Moodle. The table below captures the information stated by the faculty in regards to the features of Moodle when compared to Bb. Faculty openly discussed the advantages

and disadvantages of using Moodle. The features of an LMS are essential to faculty because these tools help to provide instruction that is comparable to learning in a face-to-face classroom.

Table 2
Faculty Comments on Features That Do Not Work Well in Moodle

Faculty Participant	Faculty Comments on Features that Do Not Work As Well in Moodle Compared to Blackboard
Participant 1	Nothing
Participant 2	Blackboard looked neater - Looks kind of like a Facebook page It looks messy to me Grade book confusing - Trouble with different browsers
Participant 3	To grade the forms it is horrendous It is hard to see each student's work individually It is harder to control what the students see I think the grade book could be more user friendly I think it is hard to grade You only see a certain amount of people and so much of it at a time You have to scroll with your computer screen and scroll within Moodle itself and it requires a lot of back and forth to grade an assignment and forms
Participant 4	Forums are not as easy to use I've just now have gotten a handle on grade book since we started
Participant 5	Difficulty with grade book Difficult to look across (the screen). In Blackboard we could pull up a screen that we could see Faculty Comments on Features that Do Not Work As Well in Moodle Compared to Blackboard It also seemed to be easier to set up for us with the different types of grading we had going on based on whether it was clinical lab or classroom time A lot of extra work in saving and printing things Once you figure something you have to figure out how it works in the next version
Participant 6	I am still not comfortable with grade book Discussions were miserable to grade It is not an open discussion. The grading, I just really do not like. I cannot get feedback the way I used to do in Blackboard In Blackboard if I wanted to make a comment to a student I just did it right there but now if I make a comment to a student I have to write it out by hand and after I finish the whole thing, then I can go into the grade book and write it out I do not like the discussion In order to adjust any grades you have to go all the way down and scroll all the way over, it is awful
Participant 7	Trying to identify grades
Participant 8	It does not look user friendly Getting my students on Moodle and teaching them how to use it can sometimes be a chore
Participant 9	The forums. They are awful to grade
Participant 10	The discussion boards in Blackboard I liked better than in Moodle
Participant 11	Blackboard was more versatile There was more flexibility with Blackboard
Participant 12	The journal in Moodle doesn't really work the way that I like to use journals There is extensive scrolling back and forth
Participant 13	There are challenges with grading offline assignments in Moodle I think there are still some additional tools we need to get better at

Faculty were given the opportunity to expand on what features they were satisfied with and why, as well as, features that did not work well. With an online learning format, "the tools, the format of the materials, the way of communicating and the time of interaction are different from the conventional classroom teaching environment" (Chen, 2013). Eleven (85%) faculty mentioned how cumbersome the grade book was to manage. Six (46%) faculty also mentioned how difficult the forums (also referred to as discussions) were to manage and grade. According to Zhang and Xu (2011), compatibility plays a significant role in acceptance of replacement technologies. The more users consider a replacement technology as being compatible with legacy technology the more likely they will accept it. The grade book and forums in Moodle were not considered compatible with Bb. Participant 13 stated that the features and usability of Moodle were "still a little cumbersome." Participant 12 stated "I am mostly satisfied with it (Moodle). There are some things with the new Moodle that I am still figuring out, and that's a little bit frustrating. But, for the most part, I am satisfied." Another faculty stated there were some usability issues. Participant 5 stated that:

> We are having difficulty with the grade book because of the number of students. We can only view so many at the time. It is really difficult to look across whereas in BlackBoard we could pull up a screen that we could see. It also seemed to be easier to set up for us with the different types of grading we had going on based on whether it was clinical lab or classroom time.

Zhang and Xu (2011) suggested that when faculty can compare the replacement technology being provided with the legacy technology, the learning curve is lowered. Knowledge is extended to the new tool by pointing out the explicit similarities to the faculty member. It is also important to highlight the differences and improvements offered by the new technology tool or LMS. Focusing on the new can help users understand the benefits of replacing a legacy system or technology and ease their user resistance. The researchers also suggested that when replacement technologies are being chosen, to look for technologies that are compatible with what they are currently using. Compatible technologies will encourage adoption among stakeholders (Zhang & Xu, 2011).

Designing and providing instruction with Moodle

During the interviews, faculty were asked specifically what impact did the transition to Moodle have on designing and providing instruction. Six (46%) faculty believed that Moodle enhanced their experience with designing and providing instruction. Six (46%) of the faculty referenced that Moodle was more interactive, flexible, and easier manage, and offered more features than Bb. Seven (54%) of the faculty had varying responses regarding the impact to designing and providing instruction. Each instructor discussed some impact when designing or providing instruction except for Participant 4.

According Voakes, Bean, and Ogan (2003), most educators believe they are learning new technologies continually. While faculty appreciate the technical support they receive from staff, they also believe they need more assistance in learning new technologies. (Voakes, Bean, & Ogan, 2003). Faculty referenced throughout this study that they were continuing to learn the new LMS and that the new LMS had changed multiple times since it was adopted in 2009. Moodle has various versions that continue to change. These updates would be in the form of enhanced interfaces and features. Those enhancements required faculty to learn to utilize new items in the LMS, which added additional burdens to them.

Seven (54%) of faculty stated that Moodle was either more reliable or stable than Bb. Bb was hosted off site via the company Blackboard. Moodle was hosted off site via the company Remote Learner. Three (23%) faculty specifically stated that a positive benefit to meeting the instructional needs of all stakeholders was the stability that the LMS Moodle provides. In addition, four (31%) faculty mentioned reliability of Moodle when compared to the difficulties experienced utilizing

Bb. Many educators view the adoption of new technology as a positive, but for other educators is a contributor to stress (Voakes et al., 2003). Bb's past unreliability at the college caused significant stress for the faculty and students. Therefore, Moodle was chosen because Bb was not meeting the needs of the faculty or students due to poor performance. Participant 10 stated "it's a lot more stable (than Blackboard)." Participant 4 stated "It's (Moodle) always been stable and doesn't crash and burn for 36 hours like Blackboard used to. But there were some tricky bits that took a while to get used to."

During the transition from Bb to Moodle, all faculty in this study had to prepare their materials for the new LMS Moodle. Participant 12 stated:

> I do not know if it's really changed my quality of instruction. In some ways, I guess because Moodle is easier to navigate than Blackboard. Then yeah, I guess it did make it easier for the student to be able to access materials I was trying to make it more user friendly for the student, (which) made it easier for me to be able to design my course.

Faculty Participant 2 stated:

> I think the impact is that it takes up more time loading documents, and figuring out how to load them, and figuring out how to make your grade book correct. And that time is taken away from innovative and creative ideas in instruction.

Faculty Participant 4 did not believe it affected his design and instruction at all. He stated that:

> Not really much because I've been using kind of the same general scheme for my online classes for the last 5 years or so. So basically I just had to take what I already had and move it because I'm using the same kind of grading pattern, and the same testing sequences, and things like that.

Faculty participant 1 stated:

> I think it makes instruction a lot better. Instead of having a textbook the students get the opportunity to review the entire course. They get the opportunity to go in and do certain things, work projects, get instant feedback, they do not have to wait for me to grade it, and I have always felt that immediate response to a student is better than waiting two or three weeks and having to get a phone call and it has not been done. It prompts me to do it in a timely manner so I can give feedback to the students and let them know that you either understand it or you do not.

Do faculty feel it is beneficial to utilize Moodle?

During the interviews, faculty were asked how they reflected on the transition and if it was worth their time. They were also asked if they thought it was beneficial for their students. Twelve (92%) of the faculty expressed that Moodle was beneficial to utilize. It is important for the faculty to believe that the technology tool they are utilizing is beneficial. Ertmer and Ottenbreit-Leftwich (2010) suggest that opportunities be provided to faculty so that they can witness how the change will benefit their students prior to implementation. Faculty referenced that the transition was beneficial in several ways. Participant 1 stated "myself as an instructor benefited from it. I know the students benefited from it and the reason I say that is that Bb was a little cumbersome to work with and I am not a technology person." Participant 13 stated that

> Yes. I definitely think it is beneficial for students. The time that went into creating the course, I think was well worth it. The course I actually created I am now teaching for the first time. I created it for spring of 2012. And it still holds up pretty well. It's still pretty much the same course. It has some video; it has some other user features; but it definitely is better than the Blackboard course we had.

Faculty Participant 2 stated that "I think it's helpful for seated classes as well as online classes." Faculty Participant 5 also stated that "I think it is beneficial to students and they like it, especially if they don't know any difference."

Conclusion

This study adds new information to a body of literature on the perceptions of faculty who transition to Moodle from Blackboard. The majority of faculty felt that Moodle met their instructional needs. However, they also felt the Grade book and forums were difficult to utilize after originally utilizing Blackboard. These results are relevant to the field of education because many colleges and universities are considering migrating to a new LMS and utilizing new technologies by all of their faculty.

Limitations

The number of the sample utilized in this study is not the entire population at the college that transitioned a course from Bb to Moodle. Therefore, the findings may not represent the whole population, even though 13 faculty with representation from each of the centers in the college was interviewed. Since the entire faculty population was not represented, this may result in generalizability being difficult at other institutions. This study is also bound by the social context of the college, which has experience with both Bb and Moodle. Other colleges may not be transitioning from Bb to Moodle. They may be utilizing other LMSs. Specifically, the study only focused on full time faculty in all the academic centers at the college. Adjuncts were not interviewed. This study is also restricted in terms of its focus. The research only focused on the transition from Bb to Moodle as it pertains to full time faculty at the college. Other aspects of technology or technology tools were not explored. These other issues or technologies could have a direct influence on the impact to a faculty member during an LMS transition. Finally, it is also possible that the setting in each of the academic centers at the college differ from each other. These differences may have had a significant impact on the respondent's opinions about the impact to them.

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A study of undergraduate students' use of educational technologies

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Abstract

A qualitative study was conducted to investigate the use of technology by undergraduate students at a large public research university. Forty student interviews were conducted, 20 female students and 20 male students. Students were asked questions about their technology usage, such as: "How do you use technology for academic purposes," "What kinds of technological devices do you use," "What software and applications do you use?" Students' were also asked questions about the usage of technology in classrooms and the university's technology resources. The findings of this study indicate that a variety of commonly available technological tools such as email, web browsers, presentation software, learning management systems, and the internet are being used by undergraduate students and their instructors. Such usage is prevalent both inside and outside the classroom. Somewhat more specialized tools are used in different disciplines. Based on the findings of the study, the authors identify a similarity between a "gear" and technology use by faculty members and students.

Introduction

Colleges and universities in the US spend billions of dollars on educational technology every year. According to one estimate, in the year 2015, "U.S. Higher education institutions [were] expected to spend about $6.6 billion on IT" (IDC Research Inc., 2015). In many universities, students are also charged technology fees when they register for courses. Technology fees generate additional funding for universities, and such fees are generally used to upgrade and improve networks, hardware and software, and equip computer labs and smart classrooms (Mallette, 2002). As the technological landscape continues to change, newer technologies will compete for their share of the technology fee funds every year.

A question that comes to mind is whether such lavish spending is reflected in the use of technology on campus by students and faculty both inside and outside of the classrooms?

Purpose of the study

The purpose of this inductive qualitative study was to investigate:

- What kinds of technologies undergraduate students use to complete their course related work?

- What technologies do course instructors use?

- How aware are undergraduate students about the technological resources that are available for their use on campus?

In the section of the paper where the findings of this study are discussed, such findings will be related to the findings of other studies regarding the use of technologies for educational purposes.

The pilot study

After obtaining approval from the university's Institutional Review Board (IRB), seven undergraduate students were interviewed initially. Teijlingen and Hundley (2001) discuss many reasons why pilot studies should be conducted. The purpose for conducting this set of pilot interviews was to hone the interviewing skills of the researchers. During the pilot phase of the study the interviewers became comfortable with the idea of approaching students and asking them to participate in the study and be interviewed. The pilot study helped the interviewers to test the digital audio-recorder and become knowledgeable about how to use the recorder. The pilot study also helped the interviewers learn how and when to ask appropriate follow-up questions. As a result of the pilot, the interviewers learned that it was better to interview participants individually rather in small groups. The interviewers also learned that having a co-interviewer helped with the interview process, especially when it was time to ask follow-up questions.

Finally the pilot study also taught the researchers that they need to ask follow-up questions about the participants' majors. Participants in the pilot study did not divulge such information until a follow-up question regarding their majors was asked. The students who were interviewed during this pilot study were not included in the larger study.

Setting for the study

The study was conducted at a large public research university with an international charter. Located in the State of Florida, the university enrolls a diverse international student population. As of the Fall 2015 semester, about 54,000 students attended the university. Of this number over 39,000 were undergraduates. The remaining students are graduate students in different disciplines and professions.

Selection of study participants

Participants for the study were selected using a variation of the "mall-intercept" technique. Instead of approaching participants outside a shopping mall, the researchers approached undergraduate students outside the busy library on campus. The library is a building where students from diverse disciplines tend to visit and study. They also walk past the library to go from one class to another, to go to the student center building that offers a variety of food options, or to go to parking lots where they parked their cars. For these reasons, this location was selected as being an appropriate location for soliciting participation in the research study.

Potential participants were approached and asked if they would be willing to take part in the study. If participants consented to participate in the study, they were asked a series of questions and the interviews were audio recorded. The Institutional Review Board (IRB) approval memo and the verbal consent statement were shared with the participants before the start of the interviews. Using this approach, forty undergraduate students, twenty males and twenty females, were selected to participate in the study. The sample of participants constituted a sample of convenience.

The interview questions

The interviews were based on the following questions that were approved by the IRB:

- How do you use technology for academic purposes?
    - What devices do you use?
    - What programs do you use?
    - How do you use it, what do you do with it?
    - Where do you use it?

- Do any of your instructors use technology in class?
  - Which subject, what course?
  - How do they use it in the classroom?
  - Do they make you use it? How?
- Do you use technology resources provided by the university?
  - What resources do you use?
  - How do you use them (what purposes)?

Based on responses provided to the above approved questions, appropriate follow-up questions were asked by the interviewers. The purpose of asking follow-up questions was to clarify responses provided and also to encourage participants to elaborate on their responses.

Analysis of the data

All interviews conducted for this study were audiotaped. The researchers listened to the audiotaped interviews at least two times. Each audio taped interview was listened to by two researchers. Because the value of transcribing every word of audiotaped interviews has been questioned (Halcomb and Davidson, 2006) and because such transcription would not really have been useful for the purposes of this study, the researchers instead used the technique of listening to the audiotaped interviews.

Biklen and Bogden (1986) "recommend a two-step process" (p. 99) for coding text-based data. In this study the researchers listened to the audio taped interviews at least two times. After listening to each interview each researcher independently coded information about the devices and software applications that were mentioned by the interview participants. The researchers were primarily interested in identifying information that related to the purposes of the study and coded instances of the audiotaped data that related to the purpose of the study. The data coding was closely aligned to the purpose of the study.

Findings of the study

Devices used (both male and female students)

Information based on interviews of the twenty male and twenty female undergraduate students indicates that many devices were used in the courses that they completed. The devices that were mostly used included desktop computers, laptops, tablets, and smartphones. One of the male students mentioned that he used a gaming console to search the web for educational purposes.

The data collected for this suggest that there were no major differences among males and females in terms of devices that they used for academic purposes.

One of the participants, based on her knowledge of what is done in another university, offered the suggestion that students should be allowed to print "a certain number of pages per day" without having to pay printing charges. This suggestion makes sense because the university is already charging all students a technology fee every semester. Why should students have to pay for printing work related to their courses?

Software applications used for academic purposes (male and female students)

In this study a majority of the forty male and female students reported using more commonly available software tools such as Microsoft Word and PowerPoint, Email, web browsers and a learning management system that is widely used in the university.

The researchers inferred that all students used web browsers, because all of them reported that they used web-based services or resources. Their reported web activity included using email, the Blackboard Learning Management System (LMS).

YouTube, Chegg, Evernote, iConcentrate, BibMe, Quizlet, iBooks, Moodle, Notability, Khan Academy, Mathway, Course Hero, Prezi, StudyRoom, Dropbox, Wikipedia and Google Scholar and a few other software tools were reportedly used to a lesser extent.

The data shows that a majority of the students used technology to search for information and to do research using the web-based resources mentioned earlier.

Other uses of technology for academic purposes included taking notes, working on assignments, checking email, watching videos reading online content to understand concepts covered in courses.

Students also used the Blackboard online Learning Management System (LMS) to submit course related assignments.

No discernable differences were found between men and women regarding the use of technological tools.

Technologies used by course instructors (according to male and female students)

The use of projectors to present PowerPoint slides was mentioned by a number of students. iClickers (Interactive Response Systems) were also used by instructors. According to the participants, some of the instructors used videos in their classes. Online videoconferencing using Adobe Connect was another technology that was mentioned during the interviews. At least one instructor used her own personal website in her course. Another used NetBeans to help his students develop programming skills.

A male student stated, "I think no professors nowadays use a blackboard, I haven't seen a professor use a marker in like two semesters at least." When asked a follow-up question regarding the use of technologies in classes by students, the same participant said:

> I want to say yes, because, every aspect of life that integrates technology, in somehow, it gets better or easier or more efficient I just don't have any ideas right now on how integrating technology in education in the t would make it better.

In response to a follow-up question about the amount of technology professors at the university use in their classes, one of the male participants said

> "I feel like it's a good balance because you don't want to be in a completely tech-involved class...because maybe that is not the right fit for some people. Some people like to have textbook and paper and notebook instead of like typing and clicking."

One student in particular felt that sometimes professors use too much technology in the class. He indicated that using too much technology results in students having to learn the content by themselves instead of the professor teaching the content to the students.

Use of university resources (both males and females)

Students were also asked question about their use of technology resources available at and provided by the university.

Based on students' responses to this question, it can be concluded that they do use a number resources available at the university, such as computers and printers in computer labs, databases and other online resources that are available through the library website, and free Microsoft Office packages that the university provides for its students. Some students also borrow tablets, laptops and headphones.

Only one female participant stated, "I'm not really sure what resources are available, I've used the library once or twice but I honestly have my own devices to use."

Discussion of the Findings

Technology use by students and faculty is limited to a few tools

One of the findings of this study is that a majority of the students used a course or learning management system (CMS or LMS) for work related to their courses. This finding is supported by a study by Smith and Caruso (2010) who found that more than 90% of the students who participated in their study reported using a CMS.

A majority of the students in this study reported using a limited number of widely available software applications such as email, browsers, word processors, and presentation software. Imhof, Vollmeyer, and Beierlein (2007) reported similar findings regarding most commonly used applications: "For study-related computer activities, university students use word processing, email and Internet searches most frequently" (p. 2830). The use of a restricted set of technological tools by students has also been reported by Bullen, Morgan, and Quayyum (2011).

Most of the students who were interviewed in this study stated that faculty members also used readily available tools such as Power Point and Projectors. Based on the findings of his study, Selwyn (2007) also came to the conclusion: "Despite huge efforts to position information and communication technology (ICT) as a central tenet of university teaching and learning, the fact remains that many university students and faculty make only limited formal academic use of computer technology" (p. 83).

Differences in technology use by men and women not discernable

The researchers did not find any noticeable differences in technology use by men and women. This suggests that women are using technological tools as much as men. Both men and women in this study reported using tools such as browsers, email, course management systems and word processors for educational purposes. Such a finding is supported by Haywood et al (nd) who found that "Gender effects are small and generally declining" (np). Similar results have been reported by Bain and Rice (2006) who stated that "One of the major findings of the study was that gender differences in attitudes, perceptions, and uses of computers were not found to be significant" (p. 128). Lewis, Coursol and Khan (2001) have also reported findings that show no significant differences between men and women in the use of email and internet technologies for course related activities. This study also found no noticeable difference between men and women in the use of various devices such as desktop computers, laptop computers, tablets and smartphones.

Students do make use of resources provided by the university

Nearly all the students who were interviewed indicated that they used the resources that the university makes available for their use. Such resources included computers and printers in labs and also borrowing equipment from the library. Only one of the students who participated in the study stated that she was not aware of the resources provided by the university. She also mentioned that she owned the technological devices that she needed and used them.

A "Gear" analogy of technology use

Based on the findings of this study technology use can be likened to a "gear", which has a central part and a number of teeth on the edges. The primary technologies used such as Web browsers, email, PowerPoint and Word can be likened to the central part of a gear as shown in Figure 1. The central part of the gear represents the most widely used technologies while the teeth represent tools that are generally used in different disciplines. Some of the technologies are more

commonly used probably because the university makes them available to all students and faculty across all disciplines. Perhaps such technologies are also more appropriate for such wide ranging use because they meet the educational needs of most students and faculty.
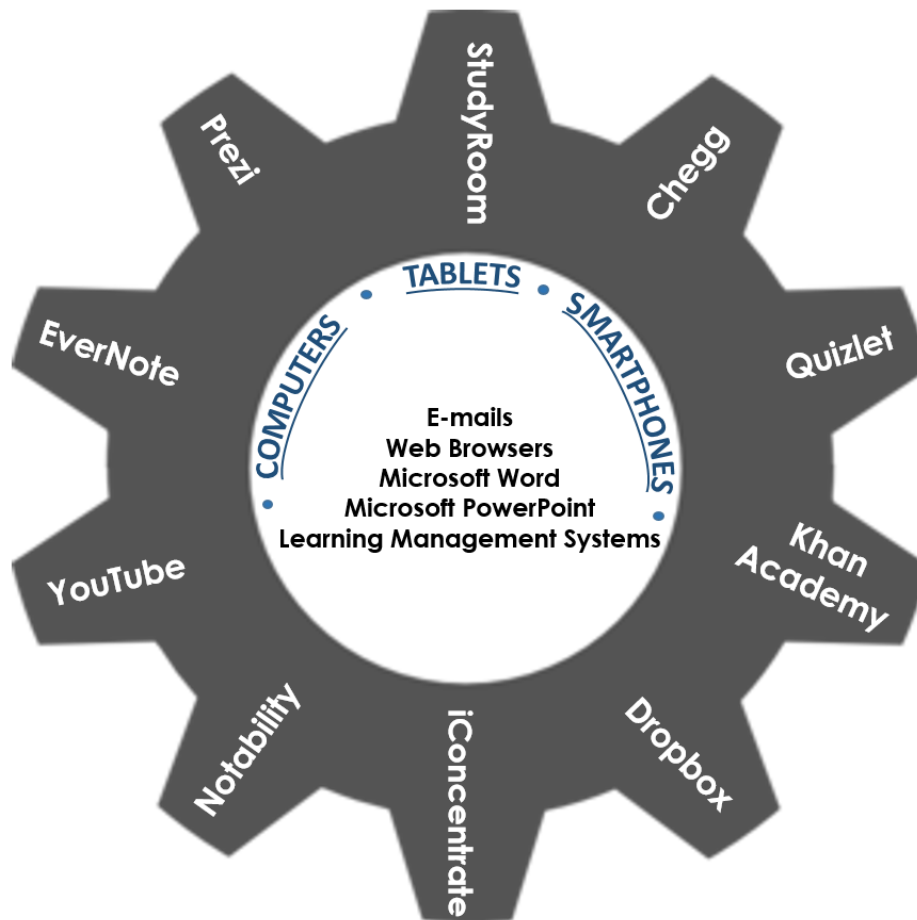

Figure 1. A "gear" analogy of technology use.
(NOTE: The public domain gear image in Figure 1 was obtained from http://www.clker.com/**)**

Conclusion

The major finding of this study was that students and faculty members at the higher education institution are using various technologies for educational purposes. Technologies do change and funds spent on technological tools are likely to increase in future years. These two factors necessitate continued research on how students and faculty members use technologies for educational purposes. Future studies that use different methods and incorporate larger samples of participants are likely to yield more insights into technology use for educational purposes by faculty and students.

The researchers also propose a "Gear" analogy of technology use. The model suggests that most faculty and students use similar and commonly available technological tools. Such usage is represented by the central part of the gear. The use of specialized tools that take place in different disciplines is represented by the teeth of the gear. It will be interesting to see if this model of technology use changes over time.

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