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Utilization of Information Technology as Instructional Support in Higher Education – A Case Study

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ABSTRACT

Despite significant increases in the growth of online education, a review of research reveals few studies of faculty perceptions of the use of technology in classrooms in higher education. Research can explore and illuminate how to bridge the gap between faculty perceptions and institutional goals and objectives for online programs. The study at hand presents the views of full-time and adjunct faculty across the colleges, both on- and off-campus, and the online community, at the University of La Verne, a private Tier II doctoral degree-granting institution located in Southern California.

Keywords: information technology, higher education, instructional technology

PURPOSE

In the Fall of 2015 a survey was conducted at the University of La Verne requesting the participation of all full-time and adjunct faculty members who taught at least one course during academic years 2013-2014 and 2014 to the present, inclusive of all University of La Verne colleges and campuses. The purpose of the survey was to determine University of La Verne faculty's perceptions of the use of, barriers to, attributes of, and effects on student learning outcomes resulting from academic virtual instruction in the classroom. The significance of the study is to

share the confidential aggregated results from the survey with the University of La Verne's community to better serve student learning and faculty instruction and to add to the body of knowledge on the subject in the field of higher education.

RESEARCH INSTRUMENT

A survey questionnaire was disseminated among the faculty at the University of La Verne to determine faculty perceptions of the use of virtual technology in the classroom. The open-ended research questions were regarding:

1. Faculty experiences in using virtual technology in the classroom in higher education.
2. Barriers to the use of virtual technology in the classroom in higher education.
3. Attributes of the use of virtual technology in the classroom.
4. Effect of the use of virtual technology in the classroom in higher education on student learning outcomes.

This study's research questions were designed to encourage faculty to share their experiences, including perceived barriers, attributes, and effects on student learning outcomes, using virtual technology in the classroom as it relates to achieving human learning within the framework of constructivism. The survey responses were coded and themed to facilitate a comparison of the results with those of studies presented in the review of the literature.

The following section describes the underlying theory base of online learning which frames the literature review and serves to inform the research question selection for this study.

THEORY BASE OF ONLINE LEARNING

Constructivism is explained by Kinnucan-Welsch (2010, p. 216, para. 3) as:

> … a departure, and some would argue a radical departure, from theories of knowing and learning that had dominated the discourse until the 20th century. Proponents of constructivism challenged the view of knowledge as an independent reality from the knower and suggested instead that the individual engages in constructing representations of the world that are generated through processes described by various theories such as adaptation, social interaction, and the interplay between thought and language. Constructivism, as a theory of learning, has played an important role in educational reform, both in terms of how instruction is designed and implemented in classrooms, preschool through college, and in terms of design of educator preparation. The influence of constructivism can be seen in discipline-specific references to instruction as well as classroom instruction from both a general perspective and specific disciplinary perspectives.

Jonassen and Carr (2000, p. 188-189) explain constructivist theory as:

Mindtools represent a constructivist use of technology. Constructivism is concerned with the process of how we construct knowledge. How we do that depends on what we already know, which depends on the kinds of experiences that we have had, how we have organized those experiences into knowledge structures, and what we believe about what we know.

Constructivist approaches to learning strive to create environments where learners actively participate in the environment in ways that are intended to help them construct their own knowledge rather than having the teacher interpret the world and ensure that students understand the world as they have told them. In constructivist environments like mind-tools, learners are actively engaged in interpreting the external world and reflecting on their interpretations. Mindtools, function as formalisms for guiding learners in the organization and representation of what they know. …learning with mindtools depends 'on the mindful engagement of qualitatively upgrading the performance of the joint system of learner plus technology'.

Constructivism is identified as one of the major the underlying theories in human learning in general and distance learning in particular (Bolliger & Wasilik, 2009; Bradshaw & Hinton, 2004; Dass, Dabbagh, & Clark, 2011; Jonassen, Davidson, Collins, Campbell & Hagg, 1995; Liu & Matthews, 2005; Menchaca & Bekele, 2008; Roberge & Gagnon, 2014). Constructivism contributes to modern pedagogical approaches supporting the faculty member's role as a facilitator in creating a learning environment that is collaborative, reflective, learner-centered, and task-based (Baran, Correia & Thompson, 2013; Dass et al., 2011; Honebein, 1996; Shenk, Moore, & Davis, 2004; Simmons, Jones, & Silver, 2004).

The contrast between teacher-centered and content-centered learning was examined in several works (Entwistle, Skinner, Entwistle & Orr, 2000; Kember, 1997; Samuelowicz & Bain, 1992; Trigwell, Prosser, & Waterhouse, 1999; Trigwell, Prosser, & Taylor, 1994). Jonassen et al. (1995, p. 20) found that, "…the most important issue in designing constructivist environments is authenticity, the extent to which the environment faithfully reflects the ordinary practices of the culture."

Student-centered approaches to online instruction are grounded in constructivism (Bolliger & Wasilik, 2009) and embrace "social learning", sometime referred to as "communities", including those created in discussion board environments. The attributes of social learning or learning communities are regarded in the literature as being important to student success (Agosto, Copeland, & Zach, 2013; Menchaca & Bekele, 2008; Shenk et al., 2004). Successful attainment of student learning objectives have been positively correlated with faculty satisfaction (Fredericksen, Pickett, Swan, Pelz, & Shea, 2000; Hartman, Dziuban, & Moskal, 2000).

Research shows that most faculty members are motivated to use technology in the classroom and teach online courses based on intrinsic rewards such as feelings of self-actualization (Bunk, Rui, Smidt, Bidetti & Malize, 2015; Rockwell, Schauer, Fritz, & Marx, 1999; Shea, 2007). Faculty report they are intrinsically motivated by opportunities to develop new ideas, use new technology, and generally improve their teaching expertise (Betts, 1998; Bunk, et al., 2015; Schifer, 2000; and Shea, 2007), but most faculty were influenced by the desire to better serve students (Betts, 1998; Bunk et al., 2015; Hiltz, Shea & Kim, 2007; Maguire, 2005). A notable counterpoint, however,

was faculty who believed they were forced to use technology to teach online were demotivated, reporting deprivation of face-to-face interaction and the opportunity to experiment with the online technology, and insufficient time to develop online courses as detriments (Bolliger, Inan, & Wasilik, 2014; Shea, 2007).

SUMMARY OF LITERATURE REVIEW

As online education continues to grow, research studies, on the perceptions of faculty using technology and teaching in the online environment, remains limited. Studies have revealed that faculty is intimidated by the use of technology in classrooms. Some of the underlying causes contributing to reluctance on the part of faculty to use technology in the classroom include lack of institutional support for faculty development and training, absence of reliable and robust technology and applications, and insufficient support for students enrolling in online courses. Coupled with these issues is the perception of faculty of a lack of structure and policy at institutions for governing and guiding the use of technology in the classroom. Some of the benefits of online instruction that faculty have identified include accessibility for students any time, any place, and, some perceive an increase in student participation and engagement in online environments as well as equal or greater learning outcomes in online courses as compared to face-to-face courses.

METHODOLOGY

The data collection and analysis methods are presented in this section. A discussion of the population and study design are presented.

Survey Population

Participants were identified from University of La Verne's human resource records for faculty (full-time and adjunct) who have taught at least a single course (face-to-face, online, or hybrid) during the period 2013-2014 and fall 2015 at any University of La Verne campus location (the main University of La Verne campus, regional campuses, law school campus, or online campus). The total number of full-time and adjunct faculty identified and emailed the survey by Human Resources was 1,368. The survey was disseminated to the survey population on November 16, 2015 with two subsequent reminder emails. The survey requested faculty to complete and return their responses to the primary researcher by November 30, 2015.

Study Design

This research study was designed as a descriptive qualitative case study yielding some minor quantitative data based on demographic and faculty instructional profile information. Qualitative research concerns itself with how a phenomenon is lived or experienced. Moreover, researchers who use qualitative designs and methods are interested in how people make meaning and sense of experiences in their everyday lives (Merriam, 1998). To gain a thorough understanding of a phenomenon, case study design focuses on "process rather than outcomes, in context rather than a

specific variable, in discovery rather than confirmation" and findings can be used to make recommendations in policy and practice (Merriam, 1998, p. 19). As Merriam (1998, p. 29) states:

> "…Unlike experimental, survey, or historical research, case study does not claim any particular methods for data collection or data analysis. Any and all methods of gathering data from testing to interviewing can be used in a case study, although certain techniques are used more than others."

The survey questions are discussed in the Findings section. The collection of the data, analysis of the responses, and communication of initial survey results (survey process) were as follows:

Table 1: Study Milestone Schedule.

Milestone Schedule	Initiation	Completion
Survey Questionnaire to Participants	11-16-15	11-30-15
Data Compilation – Researcher	11-30-15	12-14-15
Final Report – Researcher	12-14-15	12-22-15

The final report to study participants, as described above, was comprised of the aggregated confidential results of the survey and, per the research study protocol, aggregated confidential results were communicated to participants. Key University of La Verne units received a final report in the format of a draft of this paper.

Benefits

The benefit of this study to individual and organizational stakeholders is the shared results of the survey which may be used to enhance student learning by optimizing the use of virtual technology in classroom instruction and to provide insights informing open dialogue among faculty and administration. Ultimately, the University may develop and implement institutional best practices in accordance with institutional objectives and goals which will lead to improved alignment of university goals and objectives in achieving student learning.

Logistics and Technology

The survey questionnaire and Informed Consent document were emailed to full-time and adjunct faculty (invitees) at their designated University of La Verne faculty email address by Human Resources. Names and emails of faculty were obtained from University of La Verne's Human Resource records for faculty (full-time and adjunct) who have taught a course(s) during the period (academic years) 2014-2015 and 2015 to present at the main La Verne campus, regional, law school, and online campuses. Invitees were asked to participate, and if interested, to complete the Informed Consent document before responding to the survey questionnaire.   The Informed Consent document and completed survey with participant responses were to be return-emailed to the primary researcher. The survey document was created in Microsoft Office Word 2007 to

optimize unlimited response capability to the open-ended survey questions with minimal technology challenges for participants.

Survey Response Rate

The survey population was comprised of a total of 1,368 faculty members, both full-time and adjunct faculty, on the main campus, regional campuses, online campus, and law school at the University of La Verne. Twenty-five participant responses were received, resulting in a response rate of approximately 2% (.018) which is not statistically significant (Miller & Salkind, 2002). "…Statistical significance addresses the question: 'Assuming the sample data came from a population which the null hypothesis is (exactly) true, and given our sample statistics and sample size(s), is the calculated probability of our sample results less than the acceptable limit (P) imposed regarding a Type I error?'" (Miller & Salkind, 2002, p. 385). However, as offered by Nulty (2008), in the context of education and teaching, when the objective is to obtain feedback, any return rate of surveys is important. Adequate response rates for research which can provide statistical significance are ideal, but, "…if even one response that provides information which can be used…the survey's purpose has, at least in part, been served and the response rate is technically irrelevant…. (p. 306)

Data Analysis

Emailed survey responses were assigned arbitrary numbers for purposes of analyzing the data to provide participant confidentiality. Responses were then analyzed and themes were identified. Majority and minority views were identified from the themes generated by the survey responses of faculty regarding the use of virtual instruction in the classroom.

FINDINGS

This section presents the findings associated with the analysis of the data. The findings provide insights into the research questions and the demographic and instructional profile information of faculty participants at the University of La Verne.

Open-ended Questions

Participants were not required and did not all elect to respond to all survey questions. Calculation of majority and minority views was determined by 50% or more of participant responses to a specific question signifying a majority view and 50% or less of participant responses signifying a minority view.

Below each of the four open-ended survey questions inquiring about faculty experiences, barriers to, and desired attributes of the use of virtual technology in the instruction of classes at the University of La Verne, and, faculty members' views of the effect of the use of virtual technology

to instruct classes on student learning outcomes is presented with the themed majority and minority views.

Question 1: Describe your experience using virtual technology to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences.

There was no clear majority view(s). Minority responses were fragmented but the two predominant minority views were: (1) Faculty reported *good experiences* using virtual technology (Blackboard and/or WebEx) in the classroom with minimal issues cited. They found value in creating virtual student learning communities resulting in increased student participation, greater access for students to course offerings, and relevance to student learning and applying the use of technology in the classroom as it translates to skills required for program related jobs/industries (reported in the aggregate as 11/26, or 42%); and (2) Faculty reported *negative experiences* using virtual technology in the classroom including the lack of faculty skills to develop course content and courses, lack of technical/administrative support, poor technology reliability, lack of student skills, and lack of university goals/standards governing virtual instruction (reported in the aggregate as 6/26, or 23%). Categories were not mutually exclusive.

Question 2: Describe barriers to your use of virtual technology to instruct classes at The University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences.

There were no clear majority view(s). Minority responses were fragmented but the two predominant minority views were: (1) Faculty identified *deficiencies affecting faculty* in the form of lack of administrative and technical support including insufficient faculty time and skills to create courses and/or content; lack of faculty skills to effectively utilize virtual technology in the classroom; and absence of virtual technology attributes (Blackboard tests and grading, whiteboards, etc. to effectively utilize virtual technology in the classroom (reported in the aggregate as 10/26, or 39%); and, (2) Faculty identified *deficiencies effecting students* in the form of lack of student skills (technological and academic – reading/writing/math) and the lack of university, college and/or departmental student performance standards in classrooms utilizing virtual technology and/or equity expectations between face-to-face and virtual classes (reported in the aggregate 9/26, or 35%). Categories were not mutually exclusive.

Question 3: Describe desired attributes of virtual instruction technology used to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences.

There were no clear majority view(s). Minority responses were fragmented but the two predominant minority views were: (1) Faculty identified desired attributes of using virtual technology in the classroom as including *seamless, user friendly technology* that has clear navigation instructions, is compatible with all electronic devices, has stable and reliable features for sharing files, websites, videos, and drawing on a "whiteboard" etc., authentically replicates "in person" instruction including all aspects of visual and auditory attributes, and simple and multi-

faceted testing and grading attributes (reported in the aggregate 12/26, or 39%); and, (2) Faculty identified desired attributes of using virtual technology in the classroom as including *adequate and scalable resources* such as training support for both faculty and students in alignment with a comprehensive/centralized university plan with goals, objectives for improving the use of virtual technology in classrooms (reported in the aggregate 5/26, or 9%). Categories were not mutually exclusive.

Question 4: Describe your perception of the outcome on student learning of the use of virtual technology to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences.

There were no clear majority view(s). Minority responses were fragmented but the two predominant minority views were: (1) Faculty perceptions of student learning outcomes using virtual technology included the presence of *more individual student engagement* in online courses versus face-to-face courses, an increased ability to interact 24/7 (synchronously and asynchronously) in online courses than in face-to-face classes, and (because of increased engagement and participation), student learning outcomes are perceived to be the same or better than traditional face-to-face classes (reported in the aggregate as 9/26, or 35%); and, (2) Faculty perceptions of student learning outcomes using virtual technology included the *lack of university standards* for virtual instruction as compared to face-to-face instruction which creates grading and student performance inequities within departments for the same class being taught face-to-face versus virtually, lack of university standards addressing the lack of student skills (technological and academic) which are perceived by faculty as being more pronounced in virtual environments than in face-to-face classes, and lack of university standards addressing diminished student performance in a virtual environment because of technological limitations such as inability to adequately replicate the visual and auditory experience of face-to-face classroom interaction (reported in the aggregate 7/26, or 30%).

Demographic/Instruction Profile Information

There were 13 demographic/instruction profile information questions contained in the survey. Each of the questions was identified by an alphabetical letter. Some participants elected not to respond to some of the questions. The questions and responses are as follows:

A. I am:
___Full-time Faculty
___Adjunct Faculty

Of the participants responding to this question 15/22 (68%) indicated they were full-time faculty and 7/15 (32%) indicated they were adjunct faculty.

B. I instruct classes: (Select all that apply.)
___On the main campus
___On Regional campus(s)
___College of Law
___Online

Of the participants responding to this question 17/23 (74%) responded that they instruct on the main campus, 11/23 (49%) responded they instruct on the regional campuses, 1/23 (4%) responded they instruct at the law school, and 10/23 (44%) responded they instruct online. Categories were not mutually exclusive.

C. I have taught at the University of La Verne:
___ Less than five years
___ I have taught at the University of La Verne:
___ Less than five years
___ Between five and 10 years
___ Over 10 years

Of the participants responding to this question 2/23 (9%) report they have instructed under five years at the University of La Verne, 4/23 (17%) report they have instructed between five and ten years at the University of La Verne, and 17/23 (74%) report they have instructed over ten years at the University of La Verne.

D. I instruct classes for the following College(s): (Select all that apply.)
___College of Arts & Sciences
___College of Business & Public Management
___College of Education & Organization Leadership
___College of Law

Of the participants responding to this question 7/23 (30%) report they instruct for the College of Arts and Sciences (CAS), 15/23 (65%) report they instruct for the College of Business and Public Management CBPM), 3/23 (13%) report they instruct for the College of Education and Organizational Leadership (CEOL), and 1/23 (4%) report they instruct for the College of Law. Categories were not mutually exclusive.

E. I instruct: (Select all that apply.)
___Undergraduate students
___Graduate students

Of the participants responding to this question 20/23 (87%) report they instruct undergraduate students and 18/23 (78%) report they instruct graduate students. Categories were not mutually exclusive.

F. I am:
___Female
___Male
___Other (you may elaborate) _____

Of the participants responding to this question 9/23 (39%) report they are female and 14/23 (61%) report they are male.

G. I am:

___Under 40 years of age
___Between 40 and 50 years of age
___Over 50 years of age

Of the participants responding to this question 1/23 (4%) report they are under forty years of age, 2/23 (9%) report they are between forty and fifty years of age, and 20/23 (87%) report they are over fifty years of age.

H. I am:

___Highly proficient in the use of instructional technology
___Moderately proficient in the use of instructional technology
___Marginally proficient in the use of instructional technology

Of the participants responding to this question 8/23 (35%) report they are highly proficient in the use of instructional technology, 12/23 (52%) report they are moderately proficient in the use of instructional technology, and 3/23 (13%) report they are marginally proficient in the use of instructional technology.

I. I have:

___Frequently used virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in my course instruction.
___Occasionally used virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in my course instruction.
___Never used virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in my course instruction.

Of the participants responding to this question 10/22 (46%) report they frequently use virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in their course instruction, 8/22 (36%) report they occasionally use virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in their course instruction, and 4/22 (18%) report they never use virtual collaboration technology (sharing desktop files, websites, and/or real-time synchronous visual and/or audio communications) in their course instruction.

J. My class design includes: (Select all that apply.)

___Lecture
___Group activities
___Individual Student presentations
___Student team presentations
___Class discussion
___Case studies
___Other (please elaborate) _____

Of the participants responding to this question 23/23 (100%) report their class (course) design includes lectures, 23/23 (100%) report their class (course) design includes group activities, 21/23 (91%) report their class (course) design includes student team presentations, 23/23 (100%) report their class (course) design includes class discussion, 18/23 (78%) report their class (course) design includes case studies, and 5/23 (22%) report their class (course) design includes "other" activities such as tests, reflection papers, electronic portfolios, games, polls, problem-solving workshops. Categories were not mutually exclusive.

K. I would:
___Be interested in learning how to begin to use virtual collaborative technology in my courses
___Be interested in learning more advanced techniques in using virtual collaborative technology in my courses
___Not be interested in learning about incorporating virtual collaborative technology in my courses

Of the participants responding to this question 10/20 (50%) reported they would be interested in learning how to begin to use virtual collaborative technology in their courses, 13/20 reported they would be interested in learning more advanced techniques in using virtual collaborative technology in their courses, and 2/20 (10%) reported they would not be interested in learning about incorporating virtual collaborative technology in their courses. Categories were not mutually exclusive.

L. I prefer training in the use of instructional technology in the following mode(s): (Select all that apply.)
___ synchronous video-conferencing (virtual collaboration)
___Recorded videos
___Online documentation
___Print documentation

Of the participants responding to this question 9/21 (43%) reported they prefer training in the use of instructional technology in person, one-on-one, 11/21 (52%) reported they prefer training in the use of instructional technology in person, in small groups of 10 or less, 6/21 (29%) reported they prefer training in the use of technology in person, in groups of 10 or more, 8/21 (38%) reported they prefer training in the use of instructional technology in live synchronous video-conferencing (virtual collaboration), 10/21 (48%) reported they prefer training in the use of instructional technology using recorded videos, 11/21 (52%) reported they prefer training in the use of instructional technology using online documentation, and 2/21 (10%) reported they prefer training in the use of instructional technology using recorded videos, 11/21 (52%) reported they prefer training in the use of instructional technology using print documentation. Categories were not mutually exclusive.

M. I prefer training (whether in person or virtual) in the use of instructional technology: (Select all that apply.)
___Weekdays between 8am – 5pm
___Weekday evenings after 5pm

    ___Weekends between 8am-5pm
    ___Weekends after 5pm

Of the participants responding to this question 15/21 (71%) reported they prefer training (whether in person or virtual) in the use of instructional technology weekdays between 8:00 a.m. and 5:00 p.m., 3/21 (14%) reported they prefer training (whether in person or virtual) in the use of instructional technology weekday evenings after 5:00 p.m., 8/21 (38%) reported they prefer training (whether in person or virtual) in the use of instructional technology weekends between 8:00 a.m. and 5:00 p.m., and 1/21 (5%) reported they prefer training (whether in person or virtual) in the use of instructional technology weekends after 5:00 p.m. Categories were not mutually exclusive.

DISCUSSION

This section portrays a faculty profile and their perceptions and experiences at the University of La Verne regarding barriers and attributes of using virtual technology in the classroom and the effects on student learning outcomes. Findings are compared to the scholarly literature. Based on the findings and the literature on this topic, implications and recommendations are presented.

Faculty Profile – Summary

Demographic/informational. The profile of faculty responding to the survey regarding experience and perceptions of the use of virtual technology in the classroom and the effects on student learning outcomes is that of a predominantly full-time (68%), predominantly male (61%), aged 50 or older (87%) faculty member associated with the College of Business & Public Management (65%) who has predominantly taught undergraduate students (87%) over 10 years (74%), primarily on the main campus (74%). The profile of faculty responding to this survey reveal they are moderately proficient in the use of instructional technology (52%), frequently use virtual collaboration technology (46%), and they incorporate lecture (100%), group activities (100%), class discussion (78%), and case studies (22%) in the delivery of their courses. Fifty percent (50%) report they would be interested in learning how to begin to use virtual collaboration technologies in their courses and they prefer to participate in training in person in small groups of 10 or less (52%) and, in addition, also preferred training using recorded videos (48%) and online documentation (52%). Preferred days and hours for training were weekdays between 8:00 a.m. and 5:00 p.m. (71%).

Experience in using technology in the classroom. Describing their experience using virtual technology to instruct classes at the University of La Verne in online and/or hybrid formats on the main, regional, law school, or online campuses (Question 1) the faculty responses generated no clear majority view. The reported positive experiences of faculty using technology in the classroom included use of Blackboard and/or WebEx with minimal issues, the value of creating student learning communities, experiencing increased student participation, greater access for students to course offerings and the relevance of students learning and applying the use of technology in the classroom as it translates to skills required for program related jobs/industries (42%). Negative experiences of faculty using technology in the classroom included lack of faculty skills to develop course content and courses, lack of technical/administrative support, poor

technology reliability, lack of student skills, and lack of university goals/standards for virtual instruction (23%).

Barriers to using technology in the classroom. Describing barriers to using virtual instruction technology to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences (Question 2) the faculty responses generated no clear majority view. A strong minority view (39%) of faculty identifying barriers to using technology in the classroom included a lack of support (insufficient time, skills, technical assistance, virtual technology attributes, i.e., usability of Blackboard tests and grading, whiteboards, etc.); and, (2) a slightly weaker minority view (35%) of faculty identifying barriers to using technology in the classroom identified deficiencies affecting students in the form of lack of student skills (technological and academic – reading/writing, mathematics), the lack of university, college and/or departmental student performance standards in classrooms utilizing virtual technology, and/or a lack of equity expectations between the delivery of face-to-face and virtual classes (35%). The categories were not mutually exclusive.

Attributes of using technology in the classroom. Describing the desired attributes of virtual instruction technology used by faculty to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses, including student preferences (Question 3) there were no clear majority views. A strong minority view (39%) of faculty identifying attributes of using technology in the classroom included seamless, user friendly technology (clear navigation instructions, compatible, reliable, replicates "in-person" feel); and adequate and scalable resources (sufficient training support).

Student learning outcomes using technology in the classroom. Describing faculty's perception of the outcome on student learning of the use of virtual technology to instruct classes at the University of La Verne in online and/or hybrid course formats on the main, regional, law school, or online campuses (Question 4) there were no clear majority views. A strong minority view (35%) of faculty perceptions of the effect of using technology in the classroom on student learning outcomes included a perception that there was more individual student engagement present in virtual classrooms than in face-to-face, and, learning outcomes were the same or better in virtual classrooms as compared to face-to-face classrooms. A slightly weaker minority view (30%) of faculty perceptions of the effect of using technology in the classroom on student learning outcomes was a lack of university standards (for parity as between face-to-face and virtual classes in terms of grading, activities, and time).

The next section compares the findings of this study to those of similar studies of faculty perception of the use of technology in the classroom in higher education.

IMPLICATIONS

Although the number of survey responses in this study was insufficient to perform statistically significant analyses, the findings may provide university administrators and policy makers with insights for minimizing negative faculty experiences with using virtual technology in the classroom. Reducing or eliminating inhibitors may optimize faculty utilization of technology

benefiting students. Faculty responses to the survey, while not representing majority views, represent strong minority views. The minority faculty views are generally positive in their reporting of experiences in using virtual technology in the classroom. Notwithstanding, a significant minority of faculty believe existing virtual technology does not adequately support their academic needs, is not always reliable, and needs to be more accessible, versatile, and compatible with a wide array of applications and devices. These faculty findings are generally consistent with the findings reported in the University of La Verne's study of undergraduate students' perception of Blackboard LMS attributes (Barajas-Murphy, 2015).

A significant minority perception of faculty who responded to the survey believe administration needs to better support faculty in online teaching initiatives by providing well defined policies which provide parity for teaching and creating courses using virtual technology, multi-modal technical support and training for both faculty and students, and standards for students enrolled in online course or hybrid courses using virtual technologies. A significant factor in adopting instructional technology is integrating it into instructional activities (Groves & Zemel, 2000). "This view is supported by the 1998 National Survey of Information Technology in Higher Education that showed 33.3% of the respondents reporting that 'assisting faculty integrate technology into instruction' was the most important technology issue at their college or university," (Beggs, 2000, p. 1).

LIMITATIONS

Limitations of this study include a very small response rate of study participants relative to the total survey population. The faculty profile described in this study is derived from responses received, which may not be indicative of the greater faculty population at the University of La Verne or institutions elsewhere. Another limitation was categorization of descriptive responses into themes. The process is subject to interpretation. Other researchers may achieve slightly different results. Also, this study was designed as a preliminary probe into the perceptions of faculty and the use of technology in the classroom at the University of La Verne. Future studies conducted at the University of La Verne may reveal more in-depth detail of faculty perceptions of the use of technology in the classroom at the University of La Verne through the utilization of objective as opposed to subjective responses.

Future research may expand upon the field of knowledge raised by the findings presented earlier from the work by Lefebvre (2009) which posed questions of how and why older faculty tend to be early adapters of new initiatives such as online technology in classrooms. Although addressed tangentially in the work of Elzarka (2012) in a discussion centered on faculty engaged in the use of education technologies generally being self-directed early adopters, a deeper investigation may reveal significant findings which may positively impact the adoption of virtual technologies in the classroom.

Additionally, a further recommendation for future research for the University of La Verne is to conduct a study similar to that conducted for undergraduate students at the University of La Verne by Barajas-Murphy and presented at the EDUCAUSE conference (2015) for all student

populations and full and adjunct faculty at all campus locations to compare and contrast findings and conduct associated needs analyses.

RECOMMENDATIONS

Based on the findings of this study and informed by the body of work in the research reviewed, recommendations are offered to optimize faculty experiences in conducting online courses. Lefebvre (2009) suggests:

> As colleges and universities in the United States struggle to incorporate web-based distance education programs into the curriculum, there is little understanding of the ideal faculty work environment that enhance or inhibit these initiatives. Faculty buy-in has consistently been cited by researchers as a key ingredient for success in post-secondary distanced education program implementation. (p. 4)

Lefebvre's work (2009) is well informed by literature (Kelley, 2014; Hawkins, Stancavage, & Dossey, 1998).

Baran et al. (2013, p. 35) argue that, "support and development programs are critical in helping teachers engage in the process of pedagogical inquiry and problem solving as they reflect on the interactions between content, online technologies, and pedagogical methods within their unique teaching contexts." McAlpine and Weston (2000) suggest faculty requires opportunities to reflect and dialogue with peers to elevate their instructional skills. Reflection and dialogue are essential inputs into successful online instruction design of learning activities that are relevant or authentic to the students.

Addressing the gap between achieving the ideal faculty work environment that enhances online instruction and providing faculty development and support necessary to meet faculty needs, the following recommendations are offered:

<u>Recommendation 1: Needs Assessment</u>

Faculty Development initiatives should meet the needs of faculty. A needs assessment survey followed by analysis of the survey results is an effective first step to begin building a program that addresses faculty needs (Gautreau, 2011; Mullinix & McCurry, 2003; Smylie, 1988; and Tam, 2000) and can provide insight into what is needed to overcome barriers.

Suggestions for identifying inhibiting factors (barriers) include a web based anonymous survey, structured focus groups, and individual interviews conducted with faculty members (Ayers & Doherty, 2003; Gautreau, 2011; Jafari, McGee & Carmean, 2006; Pawlas & Olivia, 2008).

Explaining inhibiting factors, Pawlas & Olivia (2008) expound on the importance of classroom community by examining the survey-based ALN, Sense of Classroom Community Index (SCCI) developed by Alfred Rovai. They explain that this instrument is used

> "…to explore the development of learning communities in both traditional and online environments. …[Rovai] found that although overall sense of community was the same in both formats, it varied on components contributing to that sense. Moreover, the variability in overall SCCI scores among the online courses was much greater than among face-to-face classes, indicating that the development of community in online courses is more sensitive to course design and pedagogical factors than it is in traditional classrooms," (Pawlas & Olivia, 2008, p. 108).

Moreover, students who actively participate in direct online discussion benefit from the engagement, and from observing the direct interactions with other students and the faculty (Pawlas & Olivia, 2008; Sutton, 2001). This process is known as "vicarious interaction" (Pawlas & Olivia, 2008, p. 109). Finally, there has been considerable research conducted on the usability and satisfaction of commercial platforms used within online and distance education, such as Blackboard, WebCT, D2L, and Canvas. Many researchers have found perceptions around these applications to be favorable, especially when used to supplement face-to-face (Hartman, Dziuban, & Moskal, 2000; Pawlas & Olivia, 2008; Sandercock & Shaw, 2000; Wernet, Olliges, & Delicath, 2000) or in synchronous online courses (Borthick & Jones, 2000).

Thus, the benefits of community can be achieved and enhanced in robust online environments using either or both active engagement or passive engagement.

Recommendation 2: Faculty Development Programs

Gautreau (2011) advocated promoting faculty development programs based on the following principles of change management theory to meet the changing needs of faculty as identified in a needs assessment survey:

> Fullan identified seven factors that influence the adoption of changes. Those factors include: (a) access to innovation, (b) orientation to a new policy, (c) community support or pressure or apathy for the change to take place, (d) administrative support, (3) existence and quality of instruction and innovation that change will bring, (f) external change agent that supports and initiates the changes; and (g) professor advocacy. Fullan asserts that there are three stages consistent in the change theory. Stage 1 is the initiation of the prospective change; this stage includes an introduction to the new policy or technology, Stage 2 is characterized by the implementation of changes that may include technologically enhanced software or hardware. Finally, Stage 3 is the institutionalization of the innovation that fosters the change. For example, the system wide availability of an LMS would serve as institutionally available factor that would influence change. The change theory emphasis is that once the stages are present, change will transpire. (p.7)

This recommendation for faculty development programs is supported by the work of Wallin, (2003) and Laurillard (1993). Implementing effective organizational change requires a concerted effort on the part of an institution's administration using principles as identified by Kotter and Cohen (1995) decades ago. An updated compressed analysis of the effective implementation or organizational change is presented below:

Table 2: Kotter's 8-Step Process (compressed).

Leading Changes 8-Step Process (1996)	Accelerated 8-Step Process (2014)
Respond to or affect episodic change in rigid, finite, and sequential ways	Run the steps concurrently and continuously
Drive change with a small, powerful core group	Form a large volunteer army from up, down and across the organization to serve as the change engine
Function within a traditional hierarchy	Function in a network flexibly and agilely outside, but in conjunction with, a traditional hierarchy
Focus on doing one new thing very well in a linear fashion over time	Constantly seek opportunities, identify initiatives to capitalize on them, and complete them quickly

Kotter International, Inc. (2015)

Specific best practices for faculty development in higher education promoted by Ayers & Doherty (2003) are:

1. *Training modules should blend pedagogical principles and technological features.*
2. *If possible, training should try to keep the technology transparent.*
3. *Training should be reinforced by follow-up to ensure that instructors are integrating what they learned into their teaching and curricula.*
4. *Learning from peers has been found to be highly effective in the academic environment.*
5. *As in the delivery of instruction for students, faculty development in instructional technology should be 'just-in-time' and on-demand.*
6. *Training offered through summer institutes should cover a range of content such that faculty can have choices for intensive training.*
7. *Training by itself cannot accomplish much unless campuses provide an enabling technological environment.* (p. 10)

Recommendation 3: Learning Management Systems (LMSs)

Research from the literature and the results of this study show faculty has a tendency not use technology and LMSs because of barriers presented in the usability of systems emanating from design flaws or challenges. (Fathema & Sutton, 2013; Panda & Mishra, 2007). Specific issues identified by faculty as barriers include: suitability of design in screen and system, easiness of course procedure, interoperability of the system, test, learner control, variety of communication and test types and user accessibility (Fathema & Sutton, 2013; Panda & Mishra, 2007; Pituch & Lee, 2006; Russell, Bebell, O'Dwyer, & O'Connor, 2003; and Weaver, Spratt & Nair, 2008).

Because the quality of technology systems (usability by faculty and students) significantly affects faculty usage of technology in the classroom, it behooves system designers, university administration, and institutional policy makers to focus on technology interfaces, features, functions, content, navigation, speed, interaction capability, etc. (Fathema, Shannon & Ross, 2015). Students desire increased use of social networking attributes coupled with LCM system discussion forums (Exter, Korkmaz, Harlin & Bichelmeyer, 2009). Faculty and students should be asked to provide continuous feedback which can be used to address barriers and dialogue with

system proprietors. It is equally important to provide online and face-to-face support and training (Fathema, et al., 2015; Hustad & Arntzen, 2013; Panda & Mishra, 2007).

The recommendations outlined above are not stand-alone but rather proposed as a continuous improvement process.

CONCLUSION

Growing demand for online programs and courses is defining the direction of future strategies not just at the University of La Verne, but for institutions around the world. Robust online programs and virtual technology for both online and hybrid courses is central to meeting or surpassing university goals and objectives for sustainable student-oriented academics.   Faculty is central to achieving the goals of the institution, but minimally they require: (1) Accessible, reliable, user-friendly and responsive technology; (2) Accessible, responsive and engaging technical support; (3) Standards to ensure workload and compensation parity among face-to-face, online, and hybrid courses; and, (4) Standards to ensure grading and student learning activities/performance parity among face-to-face, online, and hybrid courses.

Fathema et al. (2015, p. 211) assert that, "There is an increasing concern in regard to the quality of the interface and the ways in which tasks are completed in these (LMS) systems." This assertion is supported by Rockwell et al. (1999).

A needs assessment program should be established to guide faculty development programs to ensure continuing improvement and responsiveness to developing academic initiatives and technology innovations. Perhaps stated best in the Education Development Center's 1995 national study, as stated by Ertmer (1999, p. 59), was the caution that, "It is not training in the technology but training in how to leverage the technology to provide, increase, improve, and/or assess student learning," that is important.

Coupled with faculty needs assessment should be a student needs assessment. Facer (2012, p. 109) found "… student voice and distributed leadership are increasingly playing a role in school management approaches."   Successful integration of student and faculty development programs which support faculty and student needs in the utilization of technology in the classroom is the path to achieve institutional goals for increasing and improving online course offerings.

This study's findings may inform faculty, administration, and policy-makers as to needed actions to address the gap between faculty needs and institutional goals for the use of virtual technology in classrooms in both the near-term and long-term view. There is the potential of developing and implementing institutional best practices guiding the ever-evolving needs and resources necessary to achieve institutional academic goals encompassing the use of virtual technology in the classroom.

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