New Media Needs Assessment of Faculty for Integration into Instruction

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Abstract

The combination of interrelated shifts – policy changes, global knowledge-based economy, shifting characteristics of students, and emerging technologies – suggest that faculty must go beyond the traditional stand-alone, textbook-based instruction and use new media to provide rich learning environments where digital resources are infused into instruction to augment students' learning experiences and interactions. However, there are discrepancies between existing technological resources and faculty's knowledge of such resources to produce the desired outcomes in many universities. The purpose of this study is to assess new media needs of faculty members. Twenty-one faculty from a small university in Southern California responded to a 72-item, 5-point Likert-type attitudinal scale and provided written responses to 11 open-ended questions. The findings suggest that the participants perceive a gap between their optimal performance and actual practice. The study suggests that the university should conduct technology-needs assessments of faculty with a goal of identifying their technology knowledge and needs.

Keywords: New media, needs assessment, digital economy, faculty, instruction,

Introduction

Contemporary faculty members teach at a time when students' learning is influenced by multiple factors, including increasingly diverse student populations with differing learning needs and styles, rising tuition, funding cuts, evolving societal demands and expectations, and evolving new media. For example, both public and private sectors expect universities to prepare workers to participate in a digital economy, a globally integrated knowledge economy that requires workers to produce and use information and communication technologies (ICTs) for collaboration, teamwork, innovation, and skills to draw on diverse sets of expertise (Dede, 2011; Ito et al. 2008). The shifting landscape of the U.S. economy, from an industrial to information economy, suggests that faculty must become innovative and transformative in using new media to prepare students to acquire the knowledge and skills to become productive individuals in a globalized world where information is available instantaneously and interactions occur across national and geographical boundaries.

Faculty members also recognize the value of cultural capital that young adults bring into lecture rooms. As "digital natives" youths live their lives around new media. New media is defined as the social communication and interactive technologies, including the Internet, laptops, videos, websites, iPhone, tablets PCs video cameras (Jenkins, 2006). Hence, teaching in the context of these new media suggests that faculty members need a pedagogical shift that entails a redefinition of instruction to meet learning and social needs of today's technology-savvy youth with increasingly "geek" (computer expert) learning styles. More importantly, professors have to transform the traditional, impersonal lecture-based professor-centered instruction to more active, outcome-based, and learner-centered practice where students access and share knowledge and pool resources to solve problems (Jenkins, 2006). Faculty need to use technology to extend students' ability to locate and synthesize information. Indeed, technology-based interactive tools offer faculty the opportunity to engage in multi-modal instruction, curricula changes, and new forms of online collaboration and research (Glenn, 2008). Ito et al (2008) argue that social values, norms in education, and teachers' practices are being challenged by "a shifting landscape of media and communications in which youth are central actors" (p. 4).

Furthermore, most university administrators are under enormous pressure to control costs even as they face the challenge of enrolling more students while revenues continue to decline as a result of the Great Recession (the financial crisis that began in 2007).

University administrators are demanding that faculty develop online and/or hybrid courses (a blend of face-to-face and online instruction) to extend access to postsecondary education for more students and reduce costs. For example, the California State University (CSU) system, the nation's largest university system, will in fall 2013 offer between 10% and 15% of all undergraduate courses online to all students (*Oakland Tribune*, 2013). Similarly, the University of California (UC) system plans to develop more online courses for students. In both systems, a student on one campus can take online courses at other campuses for credit. The two university systems have committed more than $20 million to improve students' access to online courses.

While the present attention to technology in educating young adults in California and other universities across the nation should be applauded, many faculty members may not have the wherewithal to leverage technology to provide engaging and transformative learning experiences for students. The U.S. Department of Educational (2010) laments the disparity between existing technological resources and faculty's knowledge and use of them:

> The technology that enables connected teaching is available now, but not all the conditions necessary to leverage it are. Many of our existing educators [including university professors] do not have the same understanding of and ease with using technology that is part of the daily lives of professionals in other sectors. . . This gap in technology understanding influences program and curriculum development, funding and purchasing decisions about educational and informational technology in schools, and pre-service and in service professional learning. This gap prevents technology from being used in ways that would improve instructional practices and learning outcomes. (p. 5 – 6).

There is an urgent need for technology needs assessments of faculty to enhance teaching and learning. Spurlin (2007) defines needs assessment as "a type of evaluation that provides a formal process for identifying, documenting, and prioritizing gaps between current and desired results, based on the cost to meet the need versus the cost to ignore the need" (p. 2). New media needs assessments help researchers collect information about new technology and propose data-driven recommendations to policymakers for strategic planning. Needs assessments allow researchers to define **optimal performance** (what faculty need to know or be able do), determine **actual performance** (what faculty actually know and are able to do), determine **causes** of gaps, and propose **solutions** to close gaps between current and desired performance.

Unfortunately, many universities, eager to infuse technology into instruction, may "put the cart before the horse" by emphasizing the purchase and installation of new technology without needs assessments of faculty in ways that promote teaching/learning. In making decisions to purchase new media, it is important that administrators have an understanding of whether the technology is the most effective tool for faculty to integrate into instruction and if the university has the resources and capacity to manage the technology effectively and efficiently. Without technology needs assessments, universities may not have the necessary information for making decisions about funding, purchasing, programs, and curriculum development.

Despite significant investments in technology over the last decade, many faculty members are unable to infuse technology effectively into instruction (U.S. Dept. of Educ., 2010). Indeed, many universities seem ill-prepared for technological transformation and are unmotivated to experience innovation (Kirschner & Paas, 2001). In many faculty's technology integration into instruction is limited to placing books or syllabi on the Web. What is especially troubling is that limited studies have focused on technology needs assessments at the university level, even though technology infusion into instruction is contingent upon several factors, including availability of technology, funding, support, professional development and training (Javeri & Persichitte, 2007). Without needs assessments, and therefore with little solid evidence of what technologies are supposed to achieve, many studies end up selecting inappropriate problems for resolution (Spurlin, 2007). It is little wonder that several studies have pointed to faculty's continuing difficulties in integrating technology into instruction in ways that make a difference in students' learning (Bates & Poole, 2003; Dede, 2011).

The objective of this study is to assess the participants' new media needs for instruction. The research is guided by five research questions:

- What are the participants' perceptions of new media needs (hardware) for instruction?
- What are the participants' views of new media needs (software) for instruction?
- What are their views of support staff needs for integrating new media into instruction?
- What are the participants' views of facility/space needs to use new media for instruction?

- What are the participants' views of professional development and training needs for integrating new media into instruction?

This study contributes to literature on new media needs assessment of university professors. A needs assessment is a force that drives instructional design such as technological integration into instruction, use, and evaluation. Unfortunately, research is limited on technology needs assessment at the university level as existing studies tend to focus on technology needs of K–12 teachers. Hence, the study addresses a practical concern regarding lack of information on faculty's new media needs at this university (site of this study).

Technology Needs Assessment: A Theoretical Framework

"Need" is the discrepancy between the way things are (actual) and the way we want things to be (optimal) (Altschuld, 2004; Lan 2001). Because institutions such as universities are interested in efficient and effective allocation and utilization of time and resources, needs assessments are based on relevance and accountability. Hence, needs assessment can be defined in the university context as a "process of determining goals, measuring needs, and establishing priorities for action" (Burton & Merrill 1991, p. 26). Viewed in light of this precise definition, needs are gaps in universities' results that should be assessed for the purpose of determining the discrepancies between what is and what should be (Altschuld, 2004; Clarke, 2003). Needs assessment provides data for faculty and administrators to analyze, identify, and make informed decisions about prioritization of problem solution and opportunities to meet unmet needs.

Needs assessment has many components. One model of needs assessment identifies four aspects of needs assessment: (a) identifying a broad range of possible goals; (b) ranking goals in order of importance, (c) identifying gaps between expected and actual performance, and (d) setting priorities (Burton & Merrill, 1991). Lan (2001) refines different theories and develop an integrative model of needs assessment for faculty: (a) infrastructure (hardware/software resources and access), (b) incentives (policies, seminars, workshops, and peer consultations) for faculty to use new media, (c) motivation (dispositions to use new media as an effective pedagogical tool, and confidence to use it or acquire the skills to use it), and (d) knowledge and skills to use new media to facilitate instruction. A model of needs assessment outlined in the preceding paragraph has the potential to move the majority of faculty toward infusing new media into instruction as it offers an effective framework for guiding decision-making process (Clarke, 2003). Technology needs assessment of faculty can provide empirical data for identifying gaps between desired and actual performance and subsequently for analyzing and identifying the causes of such gaps.

The Research

This is a quantitative research, an approach that seeks to explain phenomena by employing predetermined instruments to collect numerical data that are analyzed using statistical techniques (Creswell, 2009). Quantitative researchers use unbiased approaches that allow them to develop generalizations that contribute to a theory that enables and explains, explores, predicts, and understands phenomena (Creswell, 2009). The approach is particularly suitable for this study because it allows me to measure the diverse views, perspectives, and opinions from faculty regarding how they integrate new media into instruction.

Survey Development & Administration

The development, validation, and administration of the survey relied on the *tailored design method*, which involved "using multiple motivational features in compatible and mutually supportive ways to encourage high quantity and quality of response to the surveyor's request" (Dillman, Smyth & Christian, 2009, p. 16). A goal of this approach is to assure face and content validity (Groves, 2004). The development of the survey was guided by theory of new media and a literature review of past studies regarding faculty members' perceptions of their technology use previously conducted in this research. I also frequently revisited the research questions to make sure that survey items align with the questions because development of survey items as a "method must depend on the formulation of a core research question that is amenable to being answered through a survey" (Baumann & Bason, 2011, p. 414). Next, I identified subscales of the questionnaire as well as developed a preliminary pool of survey items for each subscale. The draft of the questionnaire contains a 72-item 5-point Likert-type attitudinal scale (Strongly Agree, Agree, Not Applicable, Disagree, and Strongly Disagree). Section A (items 1 – 8) deals with biographical data of the participants. Statements in section B to F were arranged in clusters.

In Section B (items 9 – 20), the participants responded to statements about their perceptions of new media (hardware) needs for instruction. In Section C (items 21 – 32) faculty members responded to statements about their perceptions of new media (software) needs for teaching. Section D (items 33 – 42) deals with statements relating to the participants' views of technology support staff needs to integrate new media into instruction. In Section, E (items 43 – 61), the participants responded to statements regarding their perceptions of facilities/spaces needs to integrate new media into instruction. Section F (items 62 – 72) deals with the participants' views of professional development and training needs to infuse new media into instruction. Furthermore, there was a box at the end of each section where the professors provided informational responses. Finally, I constructed 11 open-ended questions for the participants to provide written responses.

Two professors (who did not participate in the main study) were consulted for suggestions to enhance the content validity of the survey. The faculty consisted of one male and one female, one full-time (tenure) faculty and one part-time lecturer. The professors had different levels of experience using new media for instruction. The professors' suggestions were used to improve the survey, including rewording and defining some items for clarity, deleting some items to avoid repetition, and clarification of terminologies. Baumann & Bason (2011) argue that researchers have the responsibility to develop clearly worded survey items. The final copy had 72 items. The final version of the survey was administered during the main study.

Survey administration

A mixed-mode survey was developed to collect data for the study. First, an e-mail was sent to all faculty members to explain the study and seek their cooperation in responding to my survey. Two days later, a hard copy of the survey was placed in each professor's mailbox. After a week, another email was sent as a reminder to those who had not returned their copies of the survey to complete and return them. This tailored design method is suitable for this study as it enhances response rate and minimize survey error (Baumann & Bason, 2011). Thirty-four copies of the survey were sent out but 22 were completed and returned to me. This gave a return rate of 65%.

Data Analysis

The quantitative data were analyzed using the SPSS+ Statistical software for descriptive statistics and reliability analysis. A probability level of $p < .05$ was set for all tests of statistical significance. Responses to the survey were subjected to a Factor analysis to verify the goodness-of-fit for each cluster as in Table 1.

Table 1: Cronbach Alpha for Internal Consistency Reliability

Items	# of Items	Cronbach's Alpha
9 - 20	11	.431
21 – 32	11	.453
33 – 42	9	.624
43 – 61	18	.876
62 – 72	10	.832

Cronbach's Alpha also was used to verify the reliability of the survey and it was reliable at .694. Descriptive statistics of demographic data were counted and converted to percentages. Table 2 shows the profile of the participants.

Table 2: Profile of Participants (N = 21)

Demographics & Professional Experience	#	% of Respondents
Academic Qualifications		
B. A.	0	0%
M. A.	12	57.14%
Ph. D.	9	42.86%
Other:	0	0%
Teaching Experience (years)		
1–3	2	9.52%
4–6	5	23.81%
7–10	3	14.29%
11–15	3	14.29%
15–20	3	14.29%
More than 20	5	23.81%
Age		
31–35	3	14.29%
36–40	2	9.52%
41–45	2	9.52%
46–50	4	19.05%
51–55	3	14.29%
56–60	2	9.52%
61 & above	5	23.81%
Gender		
Male	8	38.10%
Female	13	61.90%
Ethnicity		
Mexican-American	3	14.29%
White/Caucasian	14	66.66%
No Response	4	19.05%
Personal Technology Use		
Not at all	0	0.0%
Small Extent	0	00.00%
Moderate Extent	6	28.57%
Large Extent	15	71.43%
Not Application	0	0.0%
In-Class Technology Use		
Not at all	0	0.00%
Small Extent	1	4.76%
Moderate Extent	10	47.62%
Large Extent	10	47.62%
Not Application	0	0.00%

Finally, the participants' written responses to the open-ended questions were analyzed using thematic analysis approach, a method involving identifying and analyzing patterns or themes within data (Creswell, 2013). The written responses were read many times to identify themes that ran across the data. I simultaneously coded the raw data and constructed categories that captured the themes across the written responses (Creswell, 2009).

Similarly, informational items listed by the participants in the boxes such as camtasia, video conferencing technology, and grade reporting software were read several times and tabulated and converted into percentage scores. The participants' responses were tabulated to show narrative texts, quotations, differences, and similarities. For reliability and validity of the themes, I ensured that the themes represented the whole set of data. Also, a colleague (an independent reviewer) was asked to evaluate and identify themes across the data to test if the themes we both identified were compatible with the data.

Results

The research objective of this study is to assess the participants' new media needs for instruction. Next, the data analysis is presented according to the research objectives identified at the beginning of this research. Some statements that reflect the views of the majority of the participants are quoted to support specific findings.

The Participants' Perceptions of New Media Needs (Hardware) for Instruction

Professors' perceptions of new media needs are important in understanding gaps between optimal and actual performance. Through a needs assessment, a university can determine what professors need to know (optimal performance) and what they actually know to support students' learning (actual performance). Table 3 indicates that the faculty express positive attitudes, with scores ranging from (M = 1.50; SD = 1.22) to (M = 3.64; SD = .92).

Table 3: The Participants' Perceptions of New Media (Hardware) Needs for Instruction

Items	Mean	Std. Error of Mean	Median	Std. Deviation
9. I have access to a computer workstation.	3.64	.24	4.00	.92
10. I have a laptop computer for personal use during lectures	2.78	.35	3.00	1.31
11. I have a Tablet PC for use during instruction.	1.71	.24	1.50	.91
12. I have access to iPods for instruction in my courses	1.64	.24	1.00	.92
13. I have access to networked computers for instruction.	2.50	.37	2.00	1.40
14. I have iPhone for use during instruction.	1.07	.35	1.5	1.32
15. I have access to digital video recording camera.	1.92	.38	1.5	1.43
16. I have podcast to use for instruction in my lectures.	1.92	.35	1.50	1.32
17. I have computer multimedia for instruction.	3.28	.30	4.00	1.13
18. I have access to streaming video for instruction.	3.14	.31	4.00	1.16
19. I have access to interactive (Smartboard.	1.50	.32	1.00	1.22
20. I have access to Student Response Systems.	1.50	.34	1.00	1.28

Table 3 shows that the participants express a high rate of agreement with statements that they have access to a computer work station, with a mean of 3.64; have computer multimedia for instruction, with a mean of 3.28; and have access to streaming video for instruction, with a mean of 3.14. The participants also show a medium agreement with the statement that they have laptop computers for personal use during lectures, with a mean of 2.78, and have access to networked computers for instruction, with a mean of 2.50. However, the participants show a low rate of agreement with statements that they have access to interactive smartboard, with a mean of 1.50; student response systems, with a mean of 1.50; iPods for instruction in my courses, with a mean of 1.64; iPhone for use during instruction, with a mean of 1.07; and Tablet PC for use during instruction, with a mean of 1.71.

The majority of the participants, in their written responses to the open-ended questions, suggest that they do not have adequate and modern hardware to integrate into instruction. A professor writes: "There are minimum hardware needed for expected basic services to the faculty and students. I feel that additional items should be available on a 'check-out' basis." Another participant states: "The training and provision of hardware/software is lacking. The university needs to invest in new media so that the faculty can have access to more resources for teaching." Similarly, a professor argues: "The university should provide more hardware for the faculty and students. The administration needs to prioritize this and provide resources." The participants suggest some hardware they consider important for integration into instruction, including online iPad, collaboration technology, online gaming technology, simulation tools, web-application technology.

The Participants' Views of New Media Needs (Software) for Instruction

Professors' perspectives on software needs for instruction are crucial for universities to determine the gaps between "what is" and "what should be" and prioritize the gaps in what technology to buy and how best to support faculty in using the technology to meet the learning needs of students. Table 4 shows that the participants express positive attitudes, with scores ranging from (M = .78; SD = .80) to (M = 3.85; SD = .36).

Table 4: The Participants' Views of New Media (Software) Needs for Instruction

Items	Mean	Std. Error of Mean	Median	Std. Deviation
21. I have access to different educational websites.	3.85	.09	4.00	.36
22. I have access to WebQuests for instruction.	1.71	.36	1.50	1.38
23. I have access to chat rooms for instruction.	3.14	.34	4.00	1.29
24. I have access to Google Earth, Maps, Translator, etc.	2.42	.40	2.00	1.50
25. I have access to Google docs for instruction.	1.28	.30	1.00	1.13
26. I have access to Weblog for instruction.	2.21	.43	2.00	1.62
27. I have access for Wikis for instruction	3.42	.34	4.00	1.28
28. I have access to different social network sites.	.78	.21	1.00	.80
29. I have access to MUVEs for instruction.	1.72	.44	2.00	1.66
30. I access to video game software for instruction	1.14	.31	1.00	1.16
31. I have access to virtual worlds[1] for instruction.	2.28	.39	2.50	1.48
32. I have access to podcasts for instruction.	1.42	.22	4.00	.85

Table 4 indicates that the participants express a high rate of agreement with statements that they have access to different educational websites, with a mean of 3.85; and access to chat rooms for instruction, with a mean of 3.14; access to Wikis for instruction, with a mean of 3.42. However, the participants show a low rate of agreement to the statements that they have access to social network sites for instruction, with a mean of .78; access to video game software for instruction, with a mean of 1.14; access to podcast technology for instruction, with a mean of 1.42; access to WebQuests for instruction, with a mean of 1.71; and access to MUVEs for instruction, with a mean of 1.72.

In their written responses to the open-ended questions, the participants suggest they lack access to important new media (software) for integration into their courses. A participant notes: "Most of the time, I cannot find software that is relevant to what I teach. I think the university should purchase software that is relevant to specific disciplines." Another faculty member writes: "What we have now is not particularly useful. We need software that provides interactive activities for instructor and his/her students. We need software that allows instructors to create their content such as specific lessons, assignments, and tests for students." A professor writes: "We need software that allows the instructor to use group and individual work so that some students can work independently on a given assignment while the rest of the class can work collaborative on a group assignment." In addition, the participants suggest specific software they want the university to purchase, including tutorial software, online games software, simulation tool, learning management system, online collaboration tools, video and presentation software, Web sites and camtasia.

The Participants' Views of Support Staff Needs for Integrating New Media into Instruction

Faculty's perceptions of technology support staff needs influence their decisions on whether to integrate new media into instruction. Such views provide an understanding of the discrepancy between how support staff should provide expertise to help faculty optimally infuse technology into planning, designing, and implementation of curricula (and systems integration in lecture rooms) how they actually provide support. Table 5 indicates that the participants express positive attitudes, with scores ranging from (M = 1.64; SD = 1.08) to (M = 2.57; SD = 1.28).

Table 5: The Participants' Perceptions of Support Staff Needs for Integrating New Media into Instruction

Items	Mean	Std. Error of Mean	Median	Std. Deviation
33. My university has media specialists to provide support.	2.50	.35	3.00	1.34
34. My university has applications support analysts.	2.71	.30	3.00	1.13
35. My university provides technical support during instruction.	1.92	.24	3.00	.91
36. My university provides applications support analysts.	2.17	.34	2.00	1.28
37. My university provides instructional media specialists.	2.14	.39	2.00	1.46
38. My university provides multimedia development specialists.	2.07	.32	2.00	1.20
39. My university provides 24x7 supports.	2.05	.24	2.00	.92
40. My university provides course support.	1.64	.28	1.00	1.08
41. My university provides instructional media specialists.	2.12	.35	2.00	1.34
42. My university provides instructional media specialists.	2.35	.19	3.50	.74

Table 5 shows that the professors express a low rate of agreement with the statements that the university provides course support to help them use new media, with a mean of 1.64; provides technical support analysts to provide classroom support while they are actually teaching, with a mean of 1.92; provides applications support analysts to provide support on how to use various types of software programs, with a mean of 2.17; and provides multimedia development specialists to help develop and author interactive multimedia programs, multimedia presentations, and computer graphics, with a mean of 2.07. The participants further indicate that a low rate of agreement with statements that the university provides 24x7 support (e.g. help desks, web sites, and help lines) to help professors use new media for instruction, with a mean of 2.05, and provides instructional media specialists to help with technology-based redesign of their courses, with a mean of 2.14.

In their responses to the open-ended questions, the participants suggest that support from the technology support staff is inadequate. A participant writes: "The university should provide adequately trained support staff to work with faculty. Sometimes I have to go to Apple store and get training but lately it has been difficult for me to travel to the other campus for training." Another professor states that, "I suppose there are a few tech/media experts among the faculty, but most of us need help to explore, learn, and integrate the new media." A participant writes: "The university should provide adequately trained support staff. Support staff members are essential to facilitate faculty's learning about and use of technology." Another faculty member states: "I think the success of using new media in the classroom depends on the whole course curriculum and instructor preparation. It's not an automatic thing. Instructors need assistance to fix glitches as they occur." A participant writes: "There are often technical difficulties. So faculty need support staff who are experts and who can help faculty to use new media for instruction."

The Participants' Views of Facility and Space Needs to Use New Media for Instruction

Professors' views of technology facility/space needs are crucially important, as such facilities provide faculty with knowledge of gaps (between optimal and actual performance) for opportunities for hands-on experimentation with new media and collaborations among faculty. Table 6 indicates that the professors express positive attitudes, with scores ranging from (M = .92; SD = 1.14) to (M = 3.28; SD = .82).

Table 6: The Participants' Views of Facility and Space Needs to Use New Media for Instruction

Items	Mean	Std. Error of Mean	Median	Std. Deviation
43. I have access to the new media in all the lecture rooms.	3.07	.38	4.00	1.43
44. Rooms I use for instruction have wireless networks.	3.28	.22	3.50	.82
45. My university has computer labs for faculty use.	2.50	.42	3.00	1.60
46. My university provides wireless capabilities.	1.64	.35	1.50	1.33
47. My university provides cybercafés for faculty, students.	1.57	.35	1.500	1.34
48. My university provides group work areas for faculty.	2.78	.21	3.00	.80
49. My university equips lecture rooms with audio & videoconferencing systems.	1.92	.39	2.00	1.49
50. My university provides wide-shot, remote control camera.	2.21	.39	2.00	1.47
51. My university provides interactive SMART board.	2.14	.39	2.00	1.46
52. My university provides access to live webcasting.	1.78	.39	2.00	1.47
53. My university provides podcasting technology.	.92	.30	1.00	1.14
54. My university provides gaming technology for faculty.	1.42	.34	1.00	1.28
55. My university equips lecture rooms with Smartbord.	2.07	.38	2.00	1.43
56. My university equips lecture rooms with wireless microphones.	1.14	.36	1.00	1.35
57. My university provides lecture capture systems.	1.28	.35	1.00	1.32
58. My university equips rooms with automated lecture recording and archiving tool.	1.92	.41	1.50	1.54
59. My university provides interactive projection screen.	1.50	.41	1.00	1.55
60. The filters in the computers allow me to access important websites for instruction.	2.14	.41	2.00	1.56
61. My university provides Webinar to help faculty deliver lectures to their students.	1.78	.35	2.00	1.31

Table 6 indicates that the participants show a low rate of agreement with the statements that the university provides podcasting technology for instructors' use in lecture rooms, with a mean of .92; equips lecture rooms with ceiling-mounted and wireless microphones for presentation during instruction, with a mean of 1.14; provides lecture capture systems for automated recording and posting of lectures online, with a mean of 1.28; provides interactive projection screen (smart board technology) in lecture rooms for instruction, with a mean of 1.50; provides access to live webcasting in lecture rooms, with a mean of 1.78; and provides Webinar to help faculty deliver lectures to their students, with a mean of 1.78. The participants also indicate a low rate of agreement with the statement that their university provides wireless capabilities for them to use new media outside their offices and lecture rooms, with a mean of 1.64; provides cybercafés for faculty and students to use new media, with a mean of 1.57; equips lecture rooms with audio and videoconferencing systems with high-definition camera for presentation and collaboration during instruction, with a mean of 1.92; and equips rooms with automated lecture recording and archiving tools, with a mean of 1.92.

The participants' written answers to the open-ended questions indicate that they perceive a need for the university to provide adequate facilities and spaces for faculty to use new media. A participant writes: "Training areas are needed. Much new equipment and software is not completely user-friendly. Tiny symbols are not always self-explanatory. Faculty need instruction and support time." Another professor states: "Although we have our offices but we need a separate facility or space where faculty members can come together to share ideas. Such a space can lead to informal collaboration, which in turn can lead to teaching partnerships, and interdisciplinary research, and new ideas about how to integrate new media into instruction."

The Participants' Perceptions of Professional Development and Training Needs

Professors' perceptions of professional development and training influence their decisions on whether to integrate new media into instruction on a frequent and sustained basis to enhance teaching and learning. Needs assessments of professional development and training offer professors an understanding of the discrepancy between optimal and actual knowledge, skills, and practices to design thoughtful teaching strategies and skillful implementation to address students' learning needs. Table 7 shows that the participants express positive attitudes, with scores ranging from (M = 2.00; SD = 1.24) to (M = 2.78; SD = 1.62).

Table 7: The Participants' Perceptions of Professional Development and Training Needs

Items	Mean	Std. Error of Mean	Median	Std. Deviation
62. My university provides release time for me.	2.22	.39	3.50	1.49
63. I need training to update my knowledge of new media.	2.17	.38	3.00	1.42
64. My university needs to partners with other organizations.	2.35	.42	3.00	1.59
65. My university needs to provide professional-grade video.	2.38	.43	3.50	1.62
66. My university needs to provide regular training.	2.31	.39	3.00	1.48
67. My university needs to provide in-person workshops.	2.42	.35	3.00	1.34
68. I need training on how to use new media.	2.42	.35	3.00	1.34
69. I need training on how to create a website.	2.64	.37	3.00	1.39
70. I need training in transferring reading materials into students' iPods and iPhones.	2.21	.35	2.00	1.31
71. I need training on how to use video clips.	2.00	.33	2.00	1.24
72. I need training to teach students on they can use an internet-based publishing and editing tool.	2.07	.38	2.50	1.43

Table 7 indicates that the participants show a medium rate of agreement with the statement that they need training on how to use video clips to present new content to students, with a mean of 2.00; need training to teach students on how to use an internet-based publishing and editing tool, with a mean of 2.07; need training in transferring reading materials into students' iPods and iPhones to make such texts accessible to them, with a mean of 2.21; need further training to update their knowledge of new media and their capacities, with a mean of 2.17; and I need training on how to use new media to search for and disseminate information, with a mean of 2.42. The participants further indicate that the university provides release time for instructors to learn how to integrate new media into instruction, with a mean of 2.22; the university needs to provide professional-grade video for faculty to watch for their media creation and development, with a mean of 2.38; needs to provide regular training to improve their knowledge and skills in using different media, with a mean of 2.13; and needs to provide in-person workshops for them on how to integrate new media into their courses, with a mean of 2.42.

In their responses to the open-ended questions, some participants argue that the university needs to provide ongoing professional development and training. A participant writes: "It is important that the university provides professional development and training because many faculty members are not tech savvy and are reluctant to break away from old teaching methods." Another participant states: "The university should provide frequent professional development opportunities and trainings. The training and on-going support are vital to most faculty." A participant argues, "We [faculty] need some training to use new media. We need to be able to model for our students how to integrate technology into their day-to-day instruction." A faculty member writes: "Professional development and training sessions are important so that we
[faculty] are up-to-date with instruction of students."

Discussion

Findings from the analysis of the quantitative and written responses data suggest that while the participants perceive that they have access to some hardware such as computer multimedia and streaming video, they lack sufficient access to others, including smartboard, iPods, iPhone, and Tablet PC for instruction. Furthermore, the professors indicate that they have access to educational websites, chatrooms, and Wikis for instruction but have limited access to software such as social network sites, WebQuests, and MUVEs. The participants further indicate that they do not have adequate technology support staff, including technical support analysts, application supports analysis, multimedia development specialists, and instructional media specialists. The participants also indicate they do not have adequate facilities and spaces well equipped with equipment for live webcasting, Webinar, audio and videoconferecing systems, high definition camera, interactive projection screen, and automated recording and archiving technology. In addition, the professors perceive that they have fairly sufficient professional development and training on how to use video clips to present new content, teach students to use an internet-based publishing and editing tool, transferring reading materials into students' iPods and iPhones. The findings suggest that technology-needs assessment is a crucial step in understanding, documenting, and assessing new media needs of professors, current infrastructure for integrating new technology into instruction, and perceived gaps.

Technology-needs assessments allow university administrators to find out the cause of performance problems, including inadequate support from technology support staff, lack of incentives to use integrate technology into instruction, lack of knowledge and skills, and lack of access to new technology (Spurlin, 2007). Moreover, needs assessments allow faculty and university administrations to identify and analyze the priority technology needs for faculty, staff and students. With the growing expectations that higher education will provide students with knowledge and skills to function effectively in the 21st century, administrators need to use technology needs assessments to improve the quality of decisions regarding purchasing and installing new media technologies for faculty use. In particular, with the combination of interrelated shifts – limited resources, global knowledge-based economy, shifting characteristics of students, and emerging technologies – universities need to use technology needs assessments to set priorities and determine what new media to buy and which to wait.

Furthermore, new media is increasingly becoming important in the social, academic, and emotional lives of young people. This view suggests that professors need to know about their students' goals, outside school, social interests and understand learning resources and systems that can make learning experiences relevant to their lives (Dede, 2007). Hence, faculty must go beyond the traditional stand-alone, textbook-based instruction and use technology to prepare students who are flexible and adaptable in learning new skills, creative, collaborative, and knowledgeable in solving complex problems (Ito, 2010; Jenkins, 2006). Equally important, professors need to use new media to provide access to more flexible set of learning resources that exist far beyond the lecture room (Dede, 2011). In this regard, faculty need to use technology needs assessments to inform their future pedagogical decisions.

Implications and Conclusions

The objective of this study was to assess the participants' new media needs for instruction. Regarding new media needs (software and hardware) assessment, the findings suggest that the participants perceive a considerable gap between their optimal performance and actual practice. In addition, the participants perceive a lack of adequate technology support staff to help them integrate new media into instruction. The professors note that the university does not provide well-equipped facilities/spaces that potentially can promote hands-on experimentation with new media and enhance collaboration among colleagues. However, the findings indicate that the participants have a fairly sufficient professional development and training on how to integrate new media into instruction.

The findings have implications for facilitating infusion of new media into instruction at this university (site of this study) and others. First, the university needs to conduct technology needs assessments of faculty with a goal of analyzing and identifying their technology knowledge, and skills. Such assessments will help identify in more detail the specific needs of specific professors and help administrators prioritize new media for buying and installation. Second, technology is transforming every aspect of human life, including education. Hence, universities need to allocate more resources for new media infrastructure to enhance interaction and dialog among faculty (Dawson & Kilbane, 1999). Such materials support should be coupled with genuine efforts by faculty to develop a shared vision and goals relevant and beneficial to individuals' professional practices in different disciplines.

Third, professors need strong support from the university, including professional development and ongoing training such as seminars, workshops, conferences, and group sharing of knowledge can help faculty gain knowledge, confidence, skills and dispositions necessary to infuse technology into instruction. The university can provide adequate technology support staff with expertise in the different aspects of information and communication technologies (ICTs). The university also can provide release time for faculty members so that they have sufficient time to learn and practice how to integrate new media into practice.

Finally, many professors may need a reconceptualization of their teaching strategies to allow them to integrate both generic and content-specific software into instruction. Such a revision means that professors should design their own needs assessments to assess their current integration of technology into instruction. Such an effort will allow faculty to set instructional priorities and focus effort and time on addressing problems, come up with right solutions, and use time and resources more effectively and efficiently. Hence, needs assessments can help improve the quality of faculty's decisions – thus helping them to move from current (actual) to desired (optimal) performance.

References

Altschuld, J. (2004). Emerging dimensions of needs assessment. *Performance Improvement. 43(1), 10–15.*

Bates, A. & Poole, G. (2003). *Effective teaching with technology in higher education.* San Francisco, CA: Wiley & Sons.

Baumann, J. & Bason, J. (2011). Survey research. In N. Duke & M. Mallette (eds.), *Literacy research methodologies* (2nd ed. Pp. 404–426). New York, NY: Guilford.

Burton, J. & Merrill, P. (1991). Needs assessment: Goals, needs and priorities. In L. Briggs, K, Gustafson & M. Tillman (Eds.), *Instructional design: Principles and applications* (2nd ed.) (pp. 21–45). Englewood Cliffs, NJ: Educational Technology.

Clarke, N. (2003). The politics of training needs analysis. *Journal of Workplace Learning, 15(4), 141–153.*

Creswell, J. (2009). Research design: *Qualitative, quantitative, and mixed methods approaches* (3rd ed.), Los Angeles, CA: SAGE.

Dawson, K. & Kilbane, C. (1999). Technology and teaching in the Curry School of Education. *AACTE Briefs, 20(1), 10–11.*

Dede, C. (2004). Planning for "neomillennial" learning styles Implications for investments in technology and faculty. Retrieved January 15th, 2013 from www.planningforneomilleniallearningstyles.

Dede, C. (2007). Reinventing the role of information and communications technologies in education. In L. Smolin, K. Lawless & N. Burbules (Eds.). *Information and communication technologies: Considerations of current practices from teachers and teacher educators. 106 Yearbook of the National Society for the Study of Education (Part 2, 11– 38).* Malden, MA: Blackwell.

Dede, C. (2011). Reconceptualizing technology integration to meet the necessity of transformation. Journal of Curriculum & Instruction, 5(1), 4–16).

Dillman, D., Smyth, J. D., & Christian, L. M. (2009). *Mail and internet surveys, the tailored design method.* NJ: John Wiley & Sons, Hoboken.

Georgina, D. & Olson, M. (2008). Integration of technology in higher education: A review of faculty self-perceptions. *Internet & Higher Education, 11, 1–8.*

Glenn, M. (2008). The Future of higher education: How technology will shape learning: A Report from the Economist Intelligence Unit, sponsored by the New Media Consortium. Retrieved January 18th, 2013 from www.nmc.org/pdf/Future-of-Higher-Ed-(NMC).pdf.

Groves, R. (2004). *Survey errors and survey costs*. New York, NY: Wiley.

Ito, M., Horst, H., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P., Pascoe, C. & Robinson, L. (2008). *Living and learning with new media: Summary of findings from the digital youth project.* The John D. & Catherine T. MacArthur Foundation. Chicago, IL: The MacArthur Foundation. Retrieved February 7, 2013 from www.digitallearning.macfound.org.

Javeri, M. & Persichitte, K. (2007). Measuring technology integration practices higher education faculty with an innovation component configuration map (ICCM). *International Journal of Technology in Teaching and Learning, 3(1), 28–50.*

Jenkins, H. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. An occasional paper on digital media and learning. John D. & Catherine T. MacArthur Foundation.

Kaufman, R. & English, F. (1979). *Needs Assessment: Concept and application.* Englewood Cliffs, New Jersey, NJ: Educational Technology Publication.

Kirschner, P. & Paas, F. (2001). Web-enhanced higher education: A tower of Babel. *Computer in Human Behavior, 17, 347–353.*

Kress, G. (2008). New literacies, new democracies. Retrieved February 26th, 2010 from http://www.beyondcurrenthorizons.org.

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning. *Internet & Higher Education, 15, 247–254.*

Lan, J. (2001). Web-based instruction for education faculty: A needs assessment. *Journal of Research on Computing in Education, 33(4), 385–399.*

Leu, D. Jr., Kinzer, C., Coiro, J. & Cammack, D. (2004). Towards a theory of new literacies emerging from the Internet and other information and communication technologies. In R. Ruddell & N. Unrau (Eds.), *Theoretical models and process of reading 5th Edition* (pp. 1570– 613). Newark, DE: International Reading Association.

Oakland Tribune. (2013). California state university unveils 'radical' new plan for online courses. Retrieved August 1, 2013 from: http://www.mercurynews.com/education/ci_23768533/california-state-university.

Rossett, A. (1995). Needs assessment. In Anglin, G. (Ed.), *Instructional technology, past, present, and future* (183–196). Englewood, CO: Libraries Unlimited.

Spurlin, J. (2007). Using needs assessment as a holistic means for improving technology infrastructure. EDUCAUSE Learning Initiative: Advancing Learning through IT innovation. Retrieved February 23rd, 2012 from www.net.educause.edu/ir/library/pdf/eli3012.pdf.

U.S. Department of Education (2010). Transforming American Education: Learning powered by technology (A draft of National Educational Technology Plan 2010 Executive Summary). Retrieved July 15, 2013 from www.ed.gov/sites/default/files/NETP-2010-final-report.pdf.