

From novice to tech savvy teachers **A Report of Faculty Members' Teaching with Technology Experiences**

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Abstract

This study explores faculty motivations to adopt technologies for their courses, their current uses of technologies and perceptions of teaching with technologies, as well as their suggestions for how their institutions can best support them. In particular, this investigation compares novice and tech savvy teachers by looking at differences in the technologies they use, how they integrate these technologies in their courses, and the challenges they experience in doing so.

Parole chiave: Technology; Teaching; E-Learning; Motivation; Hybrid Course

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Online learning is increasingly starting to play an integral role in higher education. With the rise of continuing development of social media, teachers and students are using these tools to teach and learn in new learning environments. Understanding the impact of social media on learning requires both micro and macro examinations of how faculty members, students, and administration perceive and engage with these new media. Undoubtedly, teachers are at the forefront of facilitating this transformation. It is, indeed, up to teachers to develop a complete online course, a “hybrid” or “blended” course, or selectively use available technologies that support their teaching. Regardless of these variations of teaching with technology, studies have shown that “computer-based technologies can be powerful pedagogical tools” that extend human capabilities and provide contexts that support learning and social interaction (Sutherland, 2004, p. 5). In addition, hybrid or blended courses are both growing in popularity and gaining recognition for being highly successful at engaging learners (Jackson & Grimes, 2010). According to Olapiriyakul and Scher (2006), hybrid learning is a mixed mode of instruction, which combines traditional face-to-face instruction and online learning. Typically, face-to-face time is reduced in a hybrid class to make time for online learning activities outside of the classroom.

Some researchers contend that “it is now a necessity for faculty to possess specific technology skills in order for them to be effective teachers” (Friel, Britten, Compton, Peak, Schoch & VanTyle, 2009, p. 300). Hence, educators are exploring ways in which technology can be used to adapt their teaching to the needs of today’s computer-networked society. In view of these developments, the current study provides a timely examination of the motivations of faculty from several California State Universities to adopt different technologies for their courses, their uses of technologies, perceptions of teaching with technologies, as well as their suggestions for how their institutions can best support them. In particular, this study compares “novice” and “tech savvy” teachers by looking at differences in the kinds of technologies they use, how they integrate these technologies to advance their courses, and the various challenges they experience in teaching with technology.

In the next few sections we will review the extant literature on teaching with technology, describe the methods used for this study, report the results, and discuss the implications of this research..

Literature Review

More than a decade ago, Hermann (1999) posed several challenging questions about technology use in education. Hermann concluded that the value of the educational use of technology depends on the ways professors implement different technological tools in their courses, the time and effort both teachers and students invest in, and cost issues (e.g., total costs per program, costs per student,

etc.). The study suggested that much more investigation was needed to understand “how, how much, and how well those particular technologies are being used in those particular educational activities” (p. 29). Nowadays people are likely to agree that faculty members’ technology competency is required in order to integrate technology in higher education (Rogers, 2000). Specifically, not only the educators have to jump over hurdles to learn to teach with technologies effectively; institutions also have to provide the necessary support to train faculty members so that they have the proper knowledge and skills. Rogers suggested, furthermore, that the main paradigm shift with regard to integrating technology in the classroom is that the instructors are no longer the center of the learning experience. As technology is used in learner-centered ways, such as collaborative wikis and online discussion, the role of faculty has the potential to shift from “sage on the stage” to “guide on the side” (p. 20). Inevitably, such changes require revamping in pedagogy and significant behavioral modification of faculty to enable students to take an active role in their learning. Hence, a more social constructivist approach to teaching and learning is adopted in today’s classroom rather than the conventional teacher-centered model.

Nonetheless, there are still many debates about whether technology “enhances” teaching and learning, and numbers of scholars question the merits of such use and the changes it may bring to the quality of education. For example, Allen (2006) argued that online courses are likely to distance students from on-campus opportunities to become academically or socially integrated. Others discussed both challenges (e.g., the digital divide, translating the entire course from the traditional classroom to an online environment, etc.) and benefits (e.g., accessibility, flexibility, and interactivity, etc.) of e-learning and suggested that it is up to instructors and educational institutions to develop more suitable approaches (see Li & Irby, 2008; Slevin, 2008; Wallace, 2003).

While the concerns that are being raised are important, there is also growing evidence to support the merits of educational technology and hybrid learning. For example, a U.S. Department of Education meta-analytic study examining over 51 effects from research studies published between 1996 and 2008 concluded:

In recent experimental and quasi-experimental studies contrasting blends of online and face-to-face instruction with conventional face-to-face classes, blended instruction has been more effective, providing a rationale for the effort required to design and implement blended approaches. (Dept. of Education, 2009, p. xvii)

As more research starts to look at the implementation of teaching with technology, it is also important to find ways to support teachers overcome the instructional challenges, and increase their knowledge by providing constructive

advice and suggestions. To this end, King (2002) identified six elements for success in online teaching and learning, especially focusing on teachers' understanding of the potential of technology use in the classroom setting. These elements are:

- (1) presentation of accurate, current, and substantial content; (2) in-depth dialogue among course participants about the content meaning, application, and implication; (3) the ability for learners to be able to ask questions and share responses in an environment that can be personalized to support responsiveness, trust, and insight; (4) the ability of the technology to work smoothly enough to not detract from learning; (5) the capability to facilitate collaborative work among learners easily; and (6) the development of assignments that can both apply to the classroom and to academic research. (p. 235).

In addition to studying educators' online teaching experiences, scholars have investigated students' perceptions of learning with technology, since this kind of two-way investigation provides unique insights into the dynamics of teaching with technology. Overall, these kinds of studies have shown positive support for online education from both teachers and students, and proposed useful guidelines for developing e-learning environments (see Amrein-Beardsley, Foulger, & Toth, 2007; Liaw, Huang, & Chen, 2007). However, some studies indicated that teachers and students differed in their expectations of using technology. For example, in their study, Gallini and Barron (2002) found that every student used online communication tools (e.g., chat discussion groups). Their investigation showed that the increased interactivity with their instructors and peers through online discussion was the biggest benefit of a Web-infused course, whereas only half of the faculty used online communication tools. In fact, most of the teachers reported that they were not happy because they had to change their pedagogical approaches when using the Web. The observed discrepancy between students and teachers' perceptions of e-learning was further illustrated by Li's (2007) research. In this study, the majority of students indicated that they liked using technology and believed it could be effective for learning. In addition, students embraced the use of technology to prepare for the future and meet the demands of the workplace. However, most teachers were less enthusiastic about embracing technology. They indicated that computer technology should be used when necessary. They were also more skeptical about integrating advanced communication tools (e.g., videoconferencing) into their courses, expressing the concern that students had limited experience and that this kind of integration was too costly. Hence, Li found that "teachers tend to ignore their students' views and

desires” when it comes to adopting computer technology, because they fear “being replaced by computers” (p. 393).

Regardless of these contradictory outcomes, it is clear that the role of teachers in online courses determines in part the success of students’ e-learning experience. Wallace (2003) noted that teachers’ social presence and immediacy (i.e., facilitating or moderating discussions, managing the flow of content through assignments and responses, etc.) impacted students’ satisfaction and learning the most. Moreover, the effectiveness of using technology in teaching depends largely on instructors’ technology use experiences. According to Kim and Bonk (2006), teachers’ pedagogical and technological skills were important factors that influence their readiness to integrate technology in their teaching. Moreover, Meloncon’s (2007) research indicated that the readiness of online instructors could be examined based on the electronic landscapes in which they operate. These landscapes are comprised of personal, pedagogical, technological, institutional, and managerial dimensions. Hence, instructors need to evaluate these five different dimensions and determine their relative weight of importance, which will assist them to be ready and prepared to engage in online teaching. Finally, Panda and Mishra (2007) also investigated faculty members’ motivations to adopt e-learning for their courses. Their study suggested that faculty members’ motivations were highly influenced by their personal interest in using technology, their perceptions of e-learning as a stimulating intellectual challenge, and the extent to which an adequate technology infrastructure was provided.

This literature review shows that different factors and aspects of integrating technology in education need to be taken into account in order to make faculty members more technologically competent. In every educational institution, examples of teaching with technologies are evident, yet relatively few studies have examined and compared teachers’ experiences with teaching with technology in different fields. Experienced (“tech savvy”) teachers may provide insightful knowledge to those who are less experienced (“novices”), yet they may also encounter different (using) challenges than those who just begin to use e-learning tools. In addition, more studies are still needed to understand the actual implementation of online tools into teaching (esp. with regard to course planning), as most studies focus on outcomes rather than the implementation *process*. Questions like “Which e-learning tool should I adopt for the course I’m teaching?” “How does it work?” “How do I manage online materials?” “Are there any potential challenges to use technologies in the classroom?” and “What design-driven pedagogies and learning models should I explore?” can create a constructive dialogue between tech savvy teachers and novices. Therefore, the current study surveyed tech savvy and novice teachers from a variety of academic institutions in California by looking at differences in the technologies they use, their motivations for using technology in their courses, the types of support they

require (or desire), and their perceptions of teaching with technology. In addition, this research aimed to gain insight into the actual ways in which teachers are currently using various technologies to improve their teaching as well as the challenges they experience in doing so.

Methods

Measures and Data Collection

A standard survey methodology was used to explore faculty experiences and perceptions of educational technology. Based on previous research (see King, 2002; Li & Irby, 2008; Slevin, 2008; Wallace, 2003), a questionnaire consisted of 36 questions was developed to examine faculty members' teaching with technology experiences. The first part of the survey included 6 questions regarding respondents' demographic information. The second section included 10 questions about their experiences with teaching with technology. Specifically, faculty members' motivation to use technology in their courses, changes they made to their courses to integrate technology, types of support they received for teaching with technology, as well as types of Web tools used were surveyed. Faculty respondents were asked to provide a qualitative example of how they integrated technology or a Web tool into their classes in an innovative way. In addition, they were asked to comment on their best and most challenging teaching experiences with teaching with technology. The third section included items regarding teachers' perceptions of using technology for the purpose of teaching and learning. Overall, the survey comprised various types of questions, including closed (check-list or Likert-type) and open-ended questions.

A paper-and-pencil version of the survey was distributed to faculty from various California State University (CSU) campuses while they attended the 12th Annual CSU Symposium on University Teaching held at Cal Poly, San Luis Obispo in May of 2009. The CSU Symposium is a peer-reviewed conference for teaching and learning. It seeks to recognize and advance excellent instructional practices, to disseminate innovative ideas, to promote collaboration, and to encourage the continued exploration and evaluation of ways that educators teach from 23 CSU campuses. The survey was handed out during session breaks and respondents were asked to drop their questionnaire in a drop box. Of the 50 surveys distributed, a total of 22 faculty surveys were completed and returned (44% response rate).

As is custom, the conduct of the study was approved by the Human Subjects Review Committee of the authors' university.

Data Analysis

To analyze the data, descriptive statistics were computed, using the Statistical

Package for the Social Sciences (SPSS). To analyze the qualitative portion of the data, thematic analysis was used. For this part of the analysis, the responses to the open-ended questions were read repeatedly. This repeated reading enabled the identification and labeling of recurring points of reference in the data. In turn, looking at the regularity with which these points of reference resurfaced enabled the definition of specific themes in teacher experiences with teaching with technology.

Results

Participants

The respondents ($N = 22$) included faculty in various positions and stages of their careers, including lecturers (22%), assistant professors (41%), associate professors (18%), professors (14%) and other (5%). Participants ranged in age from 28-62 years of age with an average age of 46 years. Fourteen faculty respondents were female and eight respondents were male. Faculty participants taught in a variety of disciplines, including Engineering, Computer Science, Industrial Technology, Special Education, Modern Languages, Health Sciences (Nursing, Kinesiology, Gerontology), Librarian Studies, Art & Design, Sociology, Psychology, Business & Management, English, and Communication Studies. Faculty respondents came from the following CSU campuses: CSU-Northridge, Cal Poly-San Luis Obispo, CSU-San Bernardino, Cal Poly-Pomona, CSU-Long Beach, CSU-Monterey Bay, and CSU-Los Angeles.

Teaching with Technology Experiences: Novices vs. Tech Savvy Teachers

To determine a teacher's technology use experience, respondents were asked to indicate to what extent they used technology in their teaching. Results showed that 27% of the respondents could be classified as "novices," implying that they were unfamiliar with teaching with technology, did not use much technology in their courses, and mostly taught using a traditional, face-to-face format. Thus, the term "novice" does not refer to the number of years these respondents taught, but to their experience with teaching with technology. Forty-five percent of the respondents could be classified as "relatively experienced with technology" teachers, implying that they had used technology in their courses but had never taught a hybrid course. Twenty-eight percent of the respondents could be classified as "tech savvy" teachers who had experience with teaching hybrid courses and/or fully online courses.

Looking at teachers' experiences of Web tools use for teaching, respondents were first asked to check whether they had used a particular Web tool from the list, which included an online course discussion board, chat room, wiki, blog, e-portfolio, virtual classroom, online test or survey, podcast, online grade book,

online assignment, multimedia, Internet research, or other. After indicating the tools they have used for teaching, they were asked to provide their reasons for using such tool by selecting one or more reasons from the following list: accessibility, usability, pedagogy, convenience, interactivity, university-provided or free, and student interest/request. The results showed that novice teachers predominantly used tools like the online course management discussion board or grade book (83% for each), but none of them used blogs, chat rooms, e-portfolios, virtual classrooms (e.g., whiteboard), or podcasting. In terms of their reasons for using these tools, convenience was the top reason for both the discussion board and the online grade book for novice teachers. Those relatively experienced with technology teachers mainly used (in order of importance) online assignments (90%), Internet research (70%), online grade books (70%), the online course management discussion board (70%), online tests or surveys (60%), or multimedia (60%), as well as (to a lesser extent) wikis and e-portfolios (40% for each). Like the novices, they did not use blogs, chat rooms, virtual classrooms or podcasting very much. The top reasons for using online assignments were convenience and accessibility. Consideration of pedagogy was the main reason for using the Internet research tool. Using the online grade book was based on convenience as well. And the reason for using the discussion board was interactivity. Lastly, tech savvy teachers predominantly used online tests or surveys (83%) as well as discussion boards (83%), followed by online assignments (67%), chat rooms (50%), multimedia (50%) and online grade books (50%). Their reasons for using online tests or surveys were usability and convenience. Their reasons for using discussion boards included usability, pedagogy, convenience, and the fact that they were provided by their university. Their reasons for using online assignments were based on pedagogy and convenience.

Teachers' Motivation to Teach with Technology

As far as respondents' motivations to use technology in their courses were concerned, they were asked: "What are your main reasons for teaching with technology?" Respondents indicated their reasons by using a checklist containing the following items: (1) received grant/release time to enhance course with technology, (2) to be more tech savvy, (3) to be more professional, (4) to deliver up-to-date teaching materials, (5) university or administrative demands, (6) to enhance team based learning through web collaboration, (7) for professional development (e.g., retention, promotion, tenure), and lastly, (8) other (please specify). The number of times a reason was indicated was tallied, which revealed the most prevalent reasons. For novices, the most prevalent reason was to deliver up-to-date teaching materials, followed by being more professional and tech savvy. None of the novice teachers indicated that receiving grant/release time or for professional development was a main reason to teach with technology. One

novice teacher also commented that convenience was a motivator. Faculty who were relatively experienced with technology mostly felt motivated to use technology because it allowed them to enhance team-based learning through web collaboration, deliver up-to-date teaching materials, and be more professional. Interestingly, as the next qualitative statements indicate, relatively experienced teachers expressed reasons for using technology that extended beyond simple convenience:

“To reduce required student note-taking.”

“Necessary for the material I teach.”

“Increase time students engage in subject.”

“To make my teaching as effective as possible.”

These comments illustrate that relatively experienced teachers see technology as something that can help them become more effective in their work, for example because it motivates students to engage with their course subject. Tech savvy teachers’ top reason for using technology was to deliver up-to-date teaching materials, followed closely by being more professional and tech savvy. Like novices, none of them indicated that receiving grant/release time for professional development was of a key motivator. One tech savvy teacher offered a qualitative comment, noting that technology allows for “more efficient delivery of information and collection of assignments.” This statement illustrates that technology can be viewed as an extension of one’s teaching, which can help with both course organization/administration as well as delivery.

Changes and Support Needed to Teach with Technology

Next, respondents were asked to indicate what changes they had to make to be able to teach with technology. The majority of novice teachers (83%) stated that they needed to gain more knowledge about teaching with technology, research and compile new teaching materials/ideas, and maintain online materials. Few of them (17%) noted that they decreased face-to-face teaching time to allow time for online work. All of the relatively experienced teachers (100%) mentioned that they needed to spend more time to prepare their course. In addition, most of them (78%) also mentioned that gaining knowledge and researching new ideas was necessary. Tech savvy teachers made a variety of changes for their courses, including increased time to prepare the course, gaining knowledge about teaching with technology, and maintaining online materials. Different from other teachers, half of the tech savvy teachers (50%) had reduced the face-to-face time for their hybrid or online course.

Finally, teachers were asked to indicate the kinds of support they received for teaching with educational technologies. The findings showed that more than half

(57%) of the respondents received group training, particularly the novice (67%) and tech savvy teachers (67%). Seventy-eight percent of the relatively experienced teachers received support through books and online tutorials. Few of the respondents received funding and support from their academic institution. By responding to an open-ended question, teachers also described what support would be most useful or beneficial. In this regard, novice teachers stated that “both (group training and private consultation)” were very useful in terms of support, since “some questions [are] hard to get answered in [a] large group.” They also mentioned that “workshops that focus on ONE technology [were] most helpful,” since they tended to “get overwhelmed when too many options are thrown at [them] at once.” Some novices even went so far as to state that they “needed [their] hand held” and that “private consultation and workshops” were key. Furthermore, several novices mentioned that both proper training and proper equipment were necessary. Relatively experienced teachers noted that having sound, up-to-date equipment was most important, *especially in terms of software*. Some of the more experienced teachers also mentioned that “private consultation” or “group training and workshops” were quite important, not because they wanted to have their hand held, but because they wanted to advance their understanding of particular technologies. For tech savvy teachers, specific, advanced training was most important. As two respondents stated,

“Training sessions for Blackboard, module, making videos; fabulous drop-in flexibility for individual help, troubleshooting, advice.”

“Training and funding to spend more time to prepare the materials (both online and offline) and learn which tools work for different classes.”

Tech savvy teachers also noted the importance of having the right equipment, but were more specific in their recommendations. As one teacher stated, “Having the lab room made available and the creation of smart-rooms.” As illustrated by the following statement, one tech savvy teacher seemed rather disillusioned by the support they received at their institution:

“None. Lip service only, no real support, just a few souls who are true believers that we need to search out.”

Teaching with Technology Examples and Challenges

An open-ended question was used to gather information of how faculty members integrated technology or a Web tool into their classes in an innovative way. All of the respondents provided this kind of an example. As the following statements illustrate, novices were rather rudimentary in their approach:

“Online resources vs. hand copy handouts, save money \$.”
“YouTube clips...various websites (e.g., US Census).”
“Used URLs of websites for online interactive tutorial and examples for psychometrics (grad) class.”
“Use of Blackboard and discussion boards.”

Those who were relatively experienced with technology provided more sophisticated illustrations of technology use in their courses. For example, some used wikis in innovative ways to improve their teaching:

“Student teams use wiki for collaborative document creation.”
“Worked with a professor to use a wiki for collaborative research and tracking info sources.”

Other innovative examples included:

“Embedded video, so students can review material until it’s mastered.”
“Work with a librarian to develop courses related to information literacy.”
“Using voice thread to deliver a portion of the language curriculum; students deliver project: e-dictionary.”
“Google sites: class websites and students’ e-portfolio; Blogger: e-journal and commenting.”
“Students using textbooks—went to all reading from open-source. Distributed reading on inexpensive flash drives or over web.”

Unsurprisingly, tech savvy teachers provided the most advanced examples of technology use in courses:

“Internship class. Meet face to face several times but required reports (8) submitted, reviewed, edited, resubmitted again online so for hour tracking, hours check, etc.”
“1 minute video of institutional introducing assignment is good for visual, audio learners. Helps them remember important info about weekly assignments and announcements.”

On the other hand, respondents also commented on the biggest challenges they had experienced when teaching with technology. In this regard, novices noted:

“Wiki tools change suddenly and unannounced.”
“No equal access; technical difficulties.”
“When it doesn’t work! Not having right equipment; not having trouble-shooting help at time with problem.”
“Learning to use any sophisticated or new technology is incredibly frustrating + time consuming. Technology is not a black box; you have to learn everything to make it work reliably.”
“Equipment not working!”
“Getting it up and running; knowing how to launch it; downtime of system”

In terms of challenges, relatively experienced teachers stated:

“Technical status with projection system, wireless access, etc.”
“Time it takes in preparation.”
“Student’s level of exposure to technology; classroom management to keep them concentrating.”
“Takes up time; different skill levels incoming.”
“Open source tools are often short-lived; tech support on part of institution; access to software blocked by university; IT security standard too intense, stifles up creativity).”
“Time; giving-back feedback; make sure students are aware of assignments: 70-80% on top but 20-30% do not even know about assignments if not announced in class.”
“Frequent equipment malfunction; poor maintenance of equipment.”

Finally, tech savvy teachers noted the following kinds of challenges:

“Getting support from colleagues to change their staid teaching methods.”
“Student disrespect in chat rooms, as if faculty cannot read these posts; no faculty doing the same class, so no backup, alone in the wilderness feeling.”
“User un-friendliness of Blackboard; teaching faculty = ‘herding cats & moving cemeteries’”
“Maintaining the materials (need to update all the time); some tools don’t work as expected.”

Teachers’ Perceptions of Using Technology

The last section of the survey measured teachers' perceptions of using technology. Teachers reported their perceptions by evaluating twenty statements through the use of 5-point Likert-type scales (1 = strongly disagree; 5 = strongly agree). Table 1 details the descriptive statistics for these statements by comparing novice, relatively experienced, and tech savvy teachers. Overall, teachers' perceptions of teaching with technology were positive and the differences between novice, relatively experienced, and tech savvy teachers were minimal. Most of them indicated that they are satisfied with their teaching with technology experiences; they also plan to implement additional Web tools in future courses. Faculty respondents strongly agreed that teaching with technology requires continual training and updating, and their universities have been supportive of their efforts to use educational technology.

Discussion

Successfully implementing technology into the curriculum is a complex issue for colleges and universities (Osika, et al., 2009). Georgina and Olsen (2008) observe that large sums of money have been invested in technological software and infrastructures throughout higher education. Yet, "technology alone does nothing to enhance pedagogy/andragogy. This, of course, means that faculty must be trained in the use of the tools-not just given access to the tools" (Georgina & Hosford, 2009, p. 690). Educators are critical decision-makers in terms of whether or not to adopt technology, and how to use it. Therefore, it is crucial to explore their motivations, experiences, and perceptions.

This exploratory study compared novice and tech savvy teachers from different institutions of the California State University system by looking at differences in the kinds of technologies they use, their motivations for using technology in their courses, the types of support they require (or desire), and their perceptions of teaching with technology. This investigation also looked at the actual ways in which teachers are currently using technologies to enhance their teaching as well as the challenges they experience in doing so. The results showed that regardless of their experience with teaching with technology, all respondents agreed that receiving the right equipment, training, and support are crucial for the success of educational technology use. In addition, all respondents shared the same kinds of motivations for teaching with technology, namely to be more professional and to deliver top-notch teaching materials. While no stark contrasts were found when comparing inexperienced and experienced teachers in terms of perceptions of teaching with technology (see Table 1), this study reveals important, subtle, qualitative differences. First of all, it seems that most novice teachers have a rudimentary understanding of the different technologies that are available to them. Their motivations to use technology predominantly focus on being able to deliver course materials, becoming more professional, and convenience. This suggests

that they mainly use technology for course preparation/administration rather than delivery, and that technology seems to drive *them* more than that they drive *it*. Findings like these show how important it is for inexperienced teachers to receive the proper individual and group training so that they learn what specific technologies can be used to achieve specific teaching objectives.

Second, those who are relatively experienced with technology showed a much more in-depth understanding of the uses of technology in the classroom. In fact, this study suggests that they are much more willing to experiment with different tools, take risks, and view the appropriation of new technologies as an interesting learning opportunity. Moreover, this group clearly sees technology as *an extension of themselves* and knows how to use it to enhance their course preparation/administration as well as delivery. However, they are also the first to recognize that teaching with technology requires an on-going investment of time, and are aware of the limitations of specific technologies as well as the need for proper equipment and technical support. When looking at the ways in which these teachers use technologies to enhance their courses, it also becomes clear that they are able to appropriate them in innovative ways. Thus, in contrast to the novice teachers, *they* seem to be driving the technology rather than vice versa.

Finally, tech savvy teachers clearly are the most knowledgeable teaching with technology. Interestingly, this group seems to be quite selective—“picky” even—in terms of what specific technology to use, believing that “less is more.” In other words, they really spend time to select the technologies that fit their course. Moreover, unlike novice and relatively experienced teachers, these tech savvy teachers are the ones who intentionally decrease face-to-face course time in order to create the right mix of online and offline instruction. That is, they are well aware that both teacher *and* students require considerable time and effort to master specific technologies in such a way that they benefit both teaching and learning. Furthermore, what distinguishes tech savvy teachers from their peers is that they are often critical of the institutional environment in which they have to operate. As especially the qualitative statements indicated, many tech savvy teachers are rather frustrated with the technological infrastructure of their academic institutions, as well as with the kinds of support they receive from their university and even from their departmental colleagues. These findings show how important it is for universities to support educators in their endeavors to improve educational quality and accessibility through the use of technology.

Limitations and Directions for Future Research

While this self-report study only investigated the perceptions and experiences of a small group of CSU teachers during a symposium on university teaching, it provides important insights into the benefits and possibilities as well as challenges of teaching with technology in an academic setting. It will be important to conduct

more comprehensive studies, based on larger samples of teachers and, possibly, in different cultural contexts, to deepen the results of this exploratory investigation. Continuing this kind of research will be important for understanding how the constant technological changes that characterize today's society affect teachers' appropriation of new technologies (and their resistance to it), as well as the overall ways in which education is conceived and delivered (see Slevin, 2008).

At the same time, future research should not overlook students' experiences with and perceptions of the "hybridization" of education. As Bruns and Humphreys' (2005) have shown, more and more courses, if not entire educational programs, require hybrid formats to prepare students for the changing needs of different professional fields. Students *themselves* seem to be the first to acknowledge these needs, and many of them are keen to immerse themselves in blended course environments (see Li, 2007; Minocha & Roberts, 2008). More studies need to be conducted that look at both teachers' and students' ways of dealing with the rapidly changing landscape of education. In this regard, research particularly needs to investigate how variations in structuring a blended course, combinations of online (e.g., group wikis) and offline (e.g., traditional exams) assignments, and so forth, affect teaching and student learning. In addition, future studies will need to be conducted in order to understand whether certain kinds of courses lend themselves more to the hybrid course format than others. For example, to what extent would this kind of a course format be suitable for teaching technical courses in engineering or comparative literature? Conducting this kind of research will help us employ technology "for *delivering* instruction" rather than simply "for preparation and communication" (Russell, Bebell, O'Dwyer, & O'Connor, 2033, p. 297, emphasis added). Ultimately, educational research helps us to find optimal equilibria between traditional, face-to-face and blended course formats that reflect the demands of today's computer-mediated society.

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Table 1

Descriptive Statistics for Teachers' Perceptions of Teaching with Technology

	Novice Teacher	Relatively Experienced Teacher	Tech Savvy Teacher
	<i>Mean</i> (<i>SD</i>)	<i>Mean</i> (<i>SD</i>)	<i>Mean</i> (<i>SD</i>)
Overall, I am satisfied with my experiences teaching with technology.	3.17 (1.17)	4.30 (0.48)	4.00 (1.10)
The use of innovative technology invigorated my teaching.	3.17 (0.75)	4.10 (0.57)	4.00 (1.55)
The class was more interactive as a function of my use of technology.	3.50 (0.84)	3.40 (0.84)	4.00 (1.27)
It is more convenient to teach with technology.	3.67 (1.37)	3.10 (1.37)	3.67 (1.51)
Teaching with technology enhanced my performance as an instructor.	3.67 (1.03)	4.10 (0.88)	3.83 (1.17)
Teaching with technology enables an instructor to give more timely feedback.	3.83 (0.41)	3.70 (0.95)	4.00 (1.55)
I plan to implement additional Web tools in my course in the future.	4.00 (1.10)	4.40 (0.70)	4.33 (1.21)
Student satisfaction increased as a result of the use of technology in my course.	4.00 (1.00)	3.78 (0.67)	3.83 (1.60)
Students learned more as a function of the use of technology in the class.	2.80 (0.84)	3.78 (0.97)	3.83 (1.17)
Students performed better in my class as a function of technology use.	2.80 (0.84)	4.00 (0.47)	3.67 (1.51)
The use of technology was anxiety provoking for me.	3.00 (1.55)	1.80 (0.92)	2.00 (1.27)
The use of technology was anxiety provoking for my students.	2.17 (1.33)	2.40 (0.70)	2.67 (1.37)
Learning to teach with technology is	3.83	4.10	4.50

	Novice Teacher	Relatively Experienced Teacher	Tech Savvy Teacher
	<i>Mean</i> (<i>SD</i>)	<i>Mean</i> (<i>SD</i>)	<i>Mean</i> (<i>SD</i>)
very time consuming.	(0.98)	(0.74)	(0.55)
Teaching with technology requires continual training and updating.	4.50 (0.55)	4.60 (0.52)	4.50 (0.55)
It is difficult to make Web based course materials accessible for those with disabilities.	3.83 (0.75)	4.80 (0.42)	3.17 (1.60)
Teaching with technology is challenging due to technical difficulties beyond the instructor's control.	4.17 (0.75)	4.30 (0.82)	3.50 (1.38)
Teaching with technology requires more communication with students.	3.50 (1.23)	3.90 (0.74)	3.67 (1.37)
My department is supportive of my efforts to use educational technology.	4.33 (0.82)	3.60 (1.08)	3.50 (1.52)
My college is supportive of my efforts to use educational technology.	4.33 (0.82)	4.20 (0.63)	4.00 (1.27)
My university is supportive of my efforts to use educational technology.	4.67 (0.52)	4.30 (0.82)	4.00 (1.10)

Note: Mean scores reflect perceptions based on a 5-point Likert-type scale (1 = strongly disagree; 5 = strongly agree).