Perceived Utility of Methods and Instructional Strategies Used in Online and Face-to-face Teaching Environments

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Abstract The purposes of this study were to compare the instructional methods and strategies identified as useful in online teaching environments with those used in a face-to-face teaching environment, to investigate relationships between the perceived usefulness of instructional strategies and methods used by higher education faculty in both teaching environments, and to identify instructional methods transferred from an online to a face-to-face teaching environment. The following instructional methods were found to have a significant relationship with the instructional environment: student collaborative projects, student-to-student electronic discussions, lecture (direct instruction), questioning and feedback to students, and e-mail communication with the instructor.

Key words online teaching · instructional methods · teaching environment

"The only constant is change," thought Professor Smyth as she entered the quiet classroom and began to arrange her materials for the first class of the fall semester. The furniture was still in the same configuration as it was the last time she had taught in this room just a year ago. Professor Smyth, however, who usually lectured to her students, had changes planned in her teaching methodologies and strategies for this semester. After teaching an online

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course in the summer session, Professor Smyth had discovered that the Internet could be an information bridge between herself and her students.

While Professor Smyth is a fictional character, the question raised is a real one. Are the instructional models professors find most useful in an online learning environment related to the instructional models found most useful in a face-to-face learning environment? In addition, with online teaching and learning increasingly becoming an important component of higher education, do the instructional methods and strategies utilized vary with the teaching environment?

To make learning outcomes meaningful in any teaching environment, students should be actively engaged in their own learning (Coates 2005; Herrington,et al. 2002; Miliszewska and Horwood 2004; Shulman 2002; Tiernan and Grudin 2000). Because meaningful and authentic activity is basic to engagement theory, this theory can also serve as a framework for technology-based teaching and learning. "The fundamental idea underlying engagement theory is that students must be meaningfully engaged in learning activities through interaction with others and worthwhile tasks" (Kearsley and Schneiderman 1998, p. 20). Collaborative skills are developed and utilized as students interact student-to-student, student-to-teacher, and student-to-content. Moreover, the development of these skills, which require active engagement, involves "a commitment to sharing personal experiences, ideas, and alternatives with an open mind" (Merideth 2007, p. 122). Engagement in online education is different from simple interaction with technology in that it shifts the focus from thinking about computers in education as a form of a media delivery device to that of a communication tool in an authentic setting for learning. Miliszewska and Horwood (2004) and Herrington et al. (2002) agreed that engagement through interaction is necessary for online success. Students must be fully engaged in authentic learning tasks which help support "learners in their development of skills in self-regulation and self-learning" (Herrington et al. 2002, p. 7).

While Draves (2002) has estimated that by the year 2050, one half (50%) of all learning will take place in an online environment, "[t]here is nothing inherent in the technologies that elicits improvements in learning" (Russell 1999, p. xiii). In fact, the research indicates that there is no significant difference in learning when using online or face-to-face formats (Benbunan-Fitch and Hiltz 1999; Johnson et al. 2000; LaRose et al. 1998; Moore and Kearsley 1996; Swan and Jackman 2000). For online enthusiasts this is good news, for it establishes online education as a viable alternative where learning, if not statistically different, is therefore, the same. When used well, online technology does not replace the instructor; but it can shift the focus to the students' relationship with the learning process. Learners become more active in their responsibility for learning, and the instructor takes on new roles: facilitator, strategist, and coordinator for the learning activities. Obviously, these roles for both teacher and student require careful attention to instructional methods and strategies that will enhance engagement.

The Study

The purposes of this study were to compare the instructional methods and strategies identified as useful by higher education faculty in online teaching environments with those used in a face-to-face teaching environment in order to investigate relationships between the perceived usefulness of instructional methods and strategies used by higher education faculty members in both teaching environments and to identify instructional methods and strategies transferred from online to face-to-face teaching environments.

This study defined online teaching as only those courses that are taught wholly online and evolved from the following research questions:

- What methods and strategies do higher education faculty members identify as useful in the online teaching environment?
- What methods and strategies do higher education faculty members identify as useful in a face-to-face teaching environment?
- What relationships exist between the instructional environment and the perceived usefulness of instructional methods or strategies by higher education faculty members?
- What instructional methods and strategies do higher education faculty members indicate that they have transferred from an online teaching environment to a face-to-face teaching environment?

This research was not designed to imply a causal relationship between the usefulness of teaching methods and strategies in an online environment or a face-to-face teaching environment. It was an attempt to ascertain the relationship between the ranked usefulness of instructional strategies and methods in online teaching and the instructional strategies and methods used in a face-to-face teaching environment as identified by the survey participants and to identify those instructional methods and strategies that faculty have transferred from an online environment to a face-to-face environment.

The institution's research review board approved this study. Participants were advised that completing the electronic web survey was strictly voluntary, responses were anonymous, and they could elect to withdraw at any time.

Variables

The independent variable in this study was the instructional environment, online versus face-to-face. The face-to-face classroom environment was defined as instruction in a physical setting where instructor and student are present. The online classroom environment was defined as one with no face-to-face instruction, but offered through a course management system.

The dependent variable in this study was the faculty perceptions of the utility of the instructional methods and strategies used in each teaching environment, online and face-to-face. This perceived utility of instructional methods and strategies was surveyed using a rank of one to ten, with a 1 (highest) rating equated with the "most useful and/or effective strategy" to a 10 (lowest) rating identified as the "least useful and/or effective strategy."

Sample

We utilized a purposive sample of faculty. A purposive sample is representative of the population. We used this type of sample because we believed that a high-response rate from a mid-sized university would provide the data needed (Fraenkel and Wallen 2006) to answer the research questions for that institution, which would have implications for other mid-sized, liberal arts universities. Fifty-two faculty members who had taught both online and face-to-face courses in the 2003, 2004, and 2005 academic years were eligible for the sample. Forty faculty members responded, a 77% response rate. This number also illustrated characteristics of the faculty as a whole even though they represented only 20% of the entire faculty at the institution. For example, the ratio of males and females in this

study (37.5 to 60%) is close to the ratio of males to females in the institution (38.6 to 61%). Participation was not confined to a particular discipline or college, but included faculty members across all disciplines and colleges within the institution. Moreover, the faculty members in the study had enough teaching experience ($M=19.4$ years) to have established their teaching styles.

Instructional Methods and Strategies

We identified the instructional methods and strategies to be assessed by choosing those that are commonly identified and associated with the methods and strategies most often used by higher education faculty in one, or both teaching environments, online and face-to-face (Jacobsen 1998; Kearsley and Schneiderman 1998; Murphy and Cifuentes 2001; Neuhauser 2002; Palloff and Pratt 1999; Shi et al. 2004). Instructional methods are distinguished from strategies in that a method has all the elements of an instructional model (syntax, social system, principles of reaction, support system, instructional and nurturant effects, and assessment) while a strategy is related to a particular type of activity. For example, lecture is a model, while student-to-student electronic discussion is a strategy or activity. The ten instructional methods and strategies chosen from the literature above are listed in order of high student engagement to low student engagement based on interactions required of the student:

- student presentations,
- student collaborative projects,
- games and simulations,
- student to student electronic discussions,
- hands-on practicum or lab work,
- individual portfolio project,
- interactive tutorials and tests,
- questioning and feedback to students,
- e-mail communication with instructor,
- and lecture (direct instruction).

The Instrument

The survey developed by the researchers consisted of 15 original questions as well as 5 selected items used with permission from the University of Minnesota's Faculty Technology Survey, 2004. A five-point Likert scale consisting of "very useful" to "not useful at all" was used to identify the respondents' perceptions of the utility of the instructional strategies in each teaching environment. In addition, respondents were asked to rank order the strategies from 1 to 10, with 1 being the most useful or effective strategy and 10 the least useful or effective strategy according to how useful or effective faculty members believed they are when used in online and face-to-face environments. In addition a "yes–no" item asked faculty to indicate what instructional methods and strategies they had transferred from an online environment to a face-to-face environment. Open-ended items then asked faculty members how they decided what instructional strategies and methods they would use in both online and face-to-face teaching environments.

   The study's electronic survey was distributed through the use of online survey software. Included in the software were provisions to send automatic email reminders to non-responders without the researcher knowing who had completed or who had not completed

the survey in a timely manner. Those who had completed the survey were automatically excluded from receiving the reminder email. Participants were contacted by email and invited to complete the online survey by clicking on a direct web link to the online survey included in the email. Demographic data was also collected and included the respondent's rank, years of teaching experience in higher education, tenure, sex, and discipline. Follow-up invitations to participate (5 days after the initial invitation) were sent through the automatic email option in the survey software to those individuals who did not complete the survey in the first round of information gathering.

Results

This study combined descriptive and correlational design, obtaining frequencies, descriptive measures, and conducting a Spearman correlation test on ranked usefulness of instructional methods and strategies. When faculty identified the usefulness of each strategy within a particular teaching environment, online or face-to-face, the results were mixed. The following table (Table I) presents the response percentages allotted the instructional methods and strategies for both online and face-to-face environments.

The instructional methods and strategies that were identified most often as "very useful and/ or useful" in the online teaching environment were *student-to-student electronic discussions*, *questioning and feedback to students*, and *e-mail communication with instructor*. The instructional methods and strategies most often identified as "very useful" and "useful" in the face-to-face environment were *student collaborative projects*, h*ands-on practicum or lab work, lecture (direct instruction), student presentations, questioning and feedback to students*. *E-mail communication with instructor* as an instructional method/strategy in a face-to-face setting has the highest percentage of any strategy that was labeled as "somewhat useful."

The instructional methods and strategies deemed "not very useful" or "not useful at all" in an online environment were *student collaborative projects, games and simulations*, and *portfolio projects*. In a face-to-face environment, the least useful methods and strategies were *student-to-student electronic discussions* and *interactive tutorials and self-tests*.

Survey items also asked respondents to rank order the most useful or effective strategy and method as a 1 and the least useful or effective strategy and method as a 10 for both online and face-to-face teaching environments. No two methods or strategies could be given the same rank. The Spearman *rho* was used to analyze the rank order data in relation to the teaching environment. However, because there were some tied ranks in the data, the tied ranks were replaced with their mean ranks and then ρ was recalculated (Ferguson and Takane 1989). Mean scores were also calculated to provide further description of the data. Because a score of 1 was a high ranking in this study, a low mean score in Table II indicates a higher ranking of the strategy in the teaching environment. The results of this analysis are reported in Table II.

The majority of the survey respondents ranked *questioning and feedback to students* as a highly useful and effective strategy in both an online teaching environment (2.67) and a face-to-face environment (3.57) The value of the Spearman's rank-order correlation of method to environment was significant to the $p<0.05$ level. *E-mail communication with the instructor* was also ranked highly in an online environment (3.35) but was not ranked in the top half of strategies in a face-to-face environment (6.45). The value of the Spearman's rank-order correlation of method to environment was significant to the $p<0.013$ level.

Conversely, the ranking of *lecture (direct instruction)* was much higher for and strongly related to the face-to-face environment (3.73) than the online environment (6.45). The value

Table I Frequency Percentages of Instructional Methods and Strategies in Online and Traditional Teaching Environments

Instructional methods/strategies	Very useful	Useful	Somewhat useful	Not very useful	Not useful at all	Not applicable
Student collaborative projects						
Online	10.8%	8.1%	21.6%	21.6%	18.9%	18.9%
Traditional	41.0%	35.9%	12.8%	7.7%	0.0%	2.6%
Games and simulations						
Online	13.2%	13.2%	10.5%	18.4%	10.5%	34.2%
Traditional	17.9%	25.6%	33.3%	7.7%	2.6%	12.8%
Interactive tutorials and self-tests						
Online	28.2%	25.6%	15.4%	10.3%	2.6%	17.9%
Traditional	10.3%	23.1%	30.8%	20.5%	0.0%	15.4%
Student-to-student electronic discussions						
Online	35.9%	30.8%	15.4%	5.1%	2.6%	10.3%
Traditional	5.1%	20.5%	23.1%	33.3%	7.7%	10.3%
Hand-on practicum or lab work						
Online	16.7%	8.3%	16.7%	8.3%	8.3%	41.7%
Traditional	61.5%	20.5%	2.6%	0.0%	5.1%	10.3%
Lecture (direct instruction)						
Online	16.2%	35.1%	16.2%	8.1%	16.2%	8.1%
Traditional	38.5%	41.0%	15.4%	5.1%	0.0%	0.0%
Student presentations						
Online	10.5%	21.1%	18.4%	15.8%	5.3%	28.9%
Traditional	23.7%	42.1%	26.3%	5.3%	0.0%	2.6%
Portfolio projects						
Online	13.5%	13.5%	10.8%	21.6%	5.4%	35.1%
Traditional	21.6%	21.6%	24.3%	8.1%	2.7%	21.6%
Questioning and feedback to students						
Online	74.4%	20.5%	5.1%	0.0%	0.0%	0.0%
Traditional	61.5%	28.2%	7.7%	0.0%	0.0%	2.6%
Email communication with instructor						
Online	71.1%	21.1%	7.9%	0.0%	0.0%	0.0%
Traditional	28.2%	15.4%	43.6%	5.1%	7.7%	0.0%

of the Spearman's rank-order correlation of method to environment was significant to the $p<0.001$ level). *Student collaborative projects* were also seen as more useful in the face-to-face environment (4.69) than in the online teaching environment (7.19). The value of the Spearman's rank-order correlation of method to environment was significant to the $p<0.05$ level. *Student-to-student electronic discussion* ranking revealed a stronger ranking in the online environment (4.28) than in the face-to-face environment (7.89). The value of the Spearman's rank-order correlation of method to environment was significant at the $p<0.05$ level. In contrast to *student-to-student electronic discussion*, survey respondents ranked *hands-on practicum or lab work* higher in usefulness in the face-to-face environment (4.17) than in the online environment (6.82); however, the correlation between the ranking of method and the environments was not statistically significant.

Figure 1 summarizes the means of rankings for the instructional methods and strategies and visually depicts these rankings in online and face-to-face environments.

The ranked usefulness results for online teaching are supported by data in which the respondents indicated instructional methods or strategies that they had transferred from

Table II Instructional Methods and Strategies Ranked by Usefulness

Instructional methods and strategies	Mean of rank order for online teaching environment	Mean of rank order for traditional teaching environment	rho	Significance level
Student presentations	6.8676	5.3289	0.302	P<0.09
Student collaborative projects	7.1892	4.6892	0.417	P<0.05*
Games and simulations	7.0857	6.0972	0.301	P<0.14
Student-to-student electronic discussions	4.2838	7.8889	0.332	P<0.05*
Hands-on practicum or lab work	6.8194	4.1711	0.242	P<0.16
Portfolio projects	6.6286	6.6743	0.736	P<0.001***
Interactive tutorials and self-tests	4.7297	6.9861	0.256	P<0.14
Questioning and feedback to students	2.6667	3.5658	0.320	P<0.05*
E-mail communication with instructor	3.3462	6.4474	0.146	P<0.013**
Lecture (direct instruction)	5.4923	3.7263	0.513	P<0.001***

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the .01 level (2-tailed)

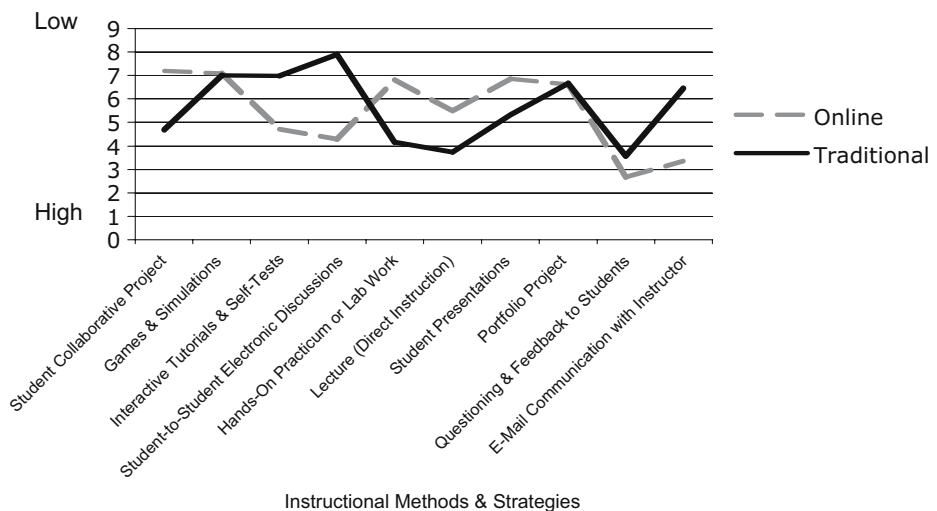***Correlation is significant at the .001 level (2-tailed)

Fig. 1 Means of ranks of instructional methods and strategies.

online to face-to-face settings as presented in Table III. The same three instructional strategies that are the highest ranked in an online environment—*questioning and feedback to students, e-mail communication with instructor, and student-to-student electronic discussions*—are the same three instructional methods and strategies that faculty members identified most often as having transferred from an online to face-to-face environment.

In addition to the survey items referenced above, the survey respondents were also given two open-ended questions asking them how they decided what instructional methods and strategies to use in an online environment and a face-to-face environment. The twenty-seven responses ($n=27$) about choosing methods and strategies in an online environment were examined for themes and then rank ordered by the number of times a theme was referenced (there could be more than one theme per response). These themes are reported in Table IV. When teaching online, the most prominent theme for choosing instructional methods and strategies was technical resources, followed by student considerations and learning.

The results in Table IV contrast markedly with the themes identified in the second open-ended question about choosing instructional methods and strategies when teaching face-to-face. More faculty members responded to this question ($n=35$), producing a greater variety of themes. The most prominent theme for choosing instructional methods and strategies in a face-to-face environment was experience, followed by course content. In both environments, however, student considerations and learning were among the top three most referenced themes.

Discussion

While there are specific instructional methods and strategies that are more familiar and comfortable for faculty to use in both teaching environments, this study reveals faculty members' perceptions that some of the instructional strategies and methods studied are more useful for one environment than the other. Obviously, the majority of faculty members in this study are most comfortable with lecturing in a face-to-face teaching environment. This strategy is a very traditional teaching method in higher education. It is the most often used method (Lammers and Murphy 2002) and is typical of what is traditionally visualized as happening in a college classroom—a large number of students sitting in a lecture hall, listening to the expert lecturing. This traditional view of transferring knowledge is hard to

Table III Instructional Methods and Strategies Transferred from Online to Face-to-Face Teaching Environments

Instructional methods/strategies	Percent of faculty transferfrom online to traditional teaching environments
Student presentations	0.5%
Student collaborative projects	0.5%
Games and simulations	15%
Student-to-student electronic discussions	60%
Hands-on practicum or lab work	12.5%
Portfolio project	0.5%
Interactive tutorials and self-tests	27.5%
Questioning and feedback to students	40%
E-mail communication with instructor	57.5%
Lecture (direct instruction)	15%

Table IV Ways Faculty Respondents Choose Instructional Methods and Strategies When Teaching Online

Theme	Number of times referenced
Technical resources	11
Student considerations and learning	8
Ability to adapt familiar strategies	6
Experience	5
Course content	4
Assessment and cheating concerns	2
Size of the class	1
Instructor personality	1

envision in an online environment. Yet transferring lecture notes to an online environment is a typical strategy to a novice online instructor. Mayer (2002), however, has suggested that the transfer of learning online succeeds better from narration and animation presented conversationally than by posting copious lecture notes and irrelevant elements because simply reading lecture notes does not encourage engagement.

The reverse transfer of some interactive modes of communication involving student-to-student discussion and email communication with the instructor from online to face-to-face environments, however, does point to changes taking place for the survey respondents, These changes require more interactive engagement from students and faculty alike. Student learning from online student discussions must be qualified, however, by the type and quality of the discussions as well as the value that the professor places on them. Yet student-to-student discussions can help build a greater sense of community (Rovai 2002) than face-to-face classroom discussions, and online discussions are actually more effective in divergent thinking and reflection than face-to-face classroom discussions (Parker and Gemino 2001).

E-mail communication has quickly become a mixed blessing, enabling quick and personal feedback as well as creating additional work. Faculty members typically expect that students attending a face-to-face class will have contact with the instructor during class or provide office hours for communication beyond the classroom (Kuh and Hu 2001; Paulson 2002). However, e-mail communication is the major way that specific contact with an online instructor is available to students; and it must be accepted as an integral part of online teaching and learning.

Undoubtedly, the faculty members in this study value communicating with students as an important part of their teaching. They perceived only one instructional method, *questioning and feedback to students,* as "very useful" or "useful" in both online or face-to-face environments. As a method that helps clarify and extend the knowledge and understanding of course concepts, questioning and feedback also provide and validate the perception of the social presence of the instructor and that of other students in the online environment since physically seeing and hearing another person is not as easily acquired (Anderson et al. 2001; Swan 2002).

While the respondents evidenced common perceptions about questioning and feedback, they also found other instructional methods and strategies of high engagement more useful in a face-to-face environment than in an online environment. For example, *games and simulations* are deemed "useful" or "somewhat useful" in a face-to-face environment, but when used online, they involve complicated technology and specialized training. There are valuable simulations on the Internet that would certainly add interaction with content, but

experimenting with this type of instruction may need to be promoted through professional development.

While more experienced faculty are leading the way in distance education at the institution studied (average of 19.5 years of teaching experience), the technology and the instructional methods and strategies that were identified as useful and ranked highly by the faculty sample in this study are not generally cutting edge and do not create direct student interaction with course content.

The qualitative data provided in Table IV about choosing teaching methods evidence faculty members' concerns about technology reliability and resources when teaching online. For example, R(espondent)15 explains, "This is dictated by the digital technology that is available. Collaborative work has been difficult in a virtual environment thus my reliance on lecture/presentation threaded with discussion groups." Yet online faculty members are still concerned about student needs and their learning as R25 indicates, "What strategies will reinforce students learning, more repetition and variety in presenting the same idea." The qualitative data in Table V which lists themes referenced by faculty members when choosing instructional methods and strategies for teaching face-to-face reveals instructors who rely on their own experience most often to choose teaching methods when in this environment. For example, R30 states, "This is based on my experience from what has worked in previous courses I have taught." The second most referenced theme, course content, is closely aligned with efficiency and problem-solving. R3 reports, "I start with my subject matter; mostly quantitative, then determine what I should talk about and what exercises I should use." Student needs and learning are also significant themes as faculty members choose instructional methods and strategies for their face-to-face classrooms as illustrated by R14's comment "Those that appear to meet student needs given the teaching/learning situation, and incorporate as much experiential learning as possible."

Implications and Recommendations

While our study surveyed only faculty members from one institution who had taught online in the years 2003, 2004, and 2005, results do have implications for other institutions because the faculty sample crossed disciplines and included faculty members at different ranks and years of experience. The perceived usefulness of some instructional strategies over others may be due to the obvious: that was the way they (the faculty)

Table V Ways Faculty Respondents Choose Instructional Methods and Strategies When Teaching Face-to-Face

Theme	Number of times referenced
Experience	13
Course content	9
Student considerations and learning	8
Effectiveness of teaching	8
Size of the class	4
Level of the class	4
Feedback possible	3
Engagement in learning	2
Time period	2

were taught. In addition, many faculty members know their content but may not have had experience with any pedagogy or research about ways to teach effectively (de Verneil and Berge 2000; Knowlten et al. 2000; Markel 1999; Palloff and Pratt 2001). The implication here is clear: Show Me the Engagement! Professional development must be tailored to address both the technology skills and pedagogy needed to produce student and faculty engagement that generates meaning and positive student outcomes. Translating and transforming high engagement instructional methods and strategies for the online from the face-to-face environment is one way to reflect upon and revise instruction to increase teaching presence, interaction with students, and learning.

Reflection about current teaching practices and a commitment to continued learning may be encouraged through the following recommendations.

- Professional development opportunities need to be readily available, supported by the institution, and acknowledged as scholarly activity for faculty members so that this type of professional development and scholarship will be recognized by tenure and promotion committees.
- An online model for teaching needs to be provided as part of professional development to assist in the design and development of online courses. For example, a "mock" course for instructors could demonstrate different types of testing, collaborative projects, and communication. A model course of this type could also contain instructions for multimedia, general rubrics, and suggestions for increasing student engagement in online learning. An online model of this type also emulates the idea of anytime, anyplace learning for the faculty so that instructors can have access to professional development beyond scheduled workshops.
- The opportunity to participate in a course as an online student would benefit faculty who are unfamiliar with an online environment. Participating as a student online can also help faculty members identify with the experiences that their students will have and see first-hand, experience the commitment on the part of the student that is needed to navigate, and complete an online course successfully (Bennett and Lockyer 2004; Palloff and Pratt 2001).
- Development of a mentoring program could offer support after initial training as well as motivation to continue. A faculty member who is inexperienced in online teaching methodology and pedagogy could be teamed with a faculty member who has taught successfully online.
- Rubrics that could be modified by faculty members for use in their courses to increase sensitivity to accreditation standards and discipline-specific content requirements could be developed and disseminated.
- Assessment of all courses (both face-to-face and online) can be conducted by the instructional unit so that student perceptions can be heard and instructors rewarded for quality teaching.
- Team-teaching to support innovation in the classroom could be adopted. A faculty member who is skilled at using a particular instructional method or strategy could team with someone who is skilled at using a different method. This would provide both with the opportunity to see and feel how a specific set of instructional methods or strategies can work in a particular teaching environment.
- Creation of anti-cheating course materials can significantly reduce the incidences of cheating (Olt 2002) in both online and face-to-face teaching and learning environments. Although anti-cheating strategies exist, faculty may not have the knowledge or skill to create these types of assessments.

Conclusion

Contemporary students are expecting and demanding more from their higher education experiences (Mupinga et al. 2006; Sheard and Lynch 2003). Faculty members' perceptions of their own teaching in both online and face-to-face environments cannot be modified to meet the expectation for "best practice" unless they first identify their perceptions about instruction and the usefulness of practices that they currently employ. Reflection about those practices then can become an important part of planning instruction in any environment. However, support strategies must be in place for both students and faculty members who are participating in the online environment and utilizing technological applications in the face-to-face teaching environment (Steinbronn and Merideth 2003).

Instructional technology support staff within a higher education institution can assist faculty with accessing a variety of course materials in an efficient manner by creating, maintaining, and updating a diverse set of shared resources, a database of effective teaching studies for both online and face-to-face environments, and focused technological help. For example, if technology support staff digitized video and audio clips, scanned information, and created visual effects for online courses, faculty members could utilize more multimedia without having to learn advanced technical skills. Faculty workshops in the use of specialized electronic tools, software, and other devices could then be offered to increase the implementation and use of multimedia with the focus on the application of the tool, not on the technology per se (Mehlinger and Power 2002). In addition, technology support staff could post useful online sites and resources that outline effective course design, instruction, and content materials for faculty members.

With this type of support in place, higher education institutions can have faculty members who are on the cutting edge of innovative and engaged teaching in any environment. This type of teaching and learning will, in turn, have an edge in producing positive student outcomes for current and continued learning.

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