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Benchmarking Best Practices in Web-Based Nursing Courses

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Abstract

This article describes the framework and process to determine best practices in online learning communities for Web-based nursing courses. The benchmarks for best practices were determined based on evidence-based research in higher education. These quality indicators were then used to develop and pilot test a benchmarking survey across three state schools of nursing. The results of the pilot test, as well as the applications and implications for benchmarking best practices, are discussed

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The information age, triggered by the technology revolution, is upon us, and it is speculated that the trends of the past two decades will not only continue but accelerate.1 The technology that has already changed many lives will continue to affect our environment and revolutionize the way we do business, including the business of education. This evolving technologic tool set is increasing and expanding the opportunities that are available to the learner, thus creating rich learning environments for teaching both mechanical and qualitative skills. Future education and training will be independent of time and place. Learners will have access to a wide range of media, as well as sources of education. The two most influential technology trends affecting the future of education will be vastly expanded computer power and increased communications bandwidth. With the advent of new tools and new power, it is imperative not to get caught up in the technology hype and allow it to drive decisions regarding use in higher education. More importantly, these enhanced communication tools should be seen as a

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learning vision pull rather than as a technology push. It is significant to remember that for the technology to be effective, it must be driven by the pedagogic goals of the course or program. Used properly, emerging and merging technologies can create powerful learning tools. As with any change, we must continually assess the outcomes derived from the use of technology in our educational practices.

During the past few years, institutions of higher education have committed billions of dollars to the use of advanced telecommunications technology for distance or distributed learning. Today, the most popular of these technologies is Web-based education. As this online learning marketplace expands, both supporters and critics are calling for outcome data related to the success of these new technologies and the effects on teaching and learning. We must accept the fact that technology alone, no matter how futuristic or exciting, does not automatically improve the learning process. In order to be successful, the focus must be on the teaching and learning and not on the technology. In April 1999, the Institute for Higher Education Policy 2 released a report calling for improved research and careful policy making for distance education. The intention of this report is not to discourage distance learning but to recommend that the higher education community take a step back and place more stringent scientific control on its research related to the use of new technologies that increase access to education. One process for establishing and improving quality outcomes is benchmarking.

This article describes the framework for benchmarking, reports results of using this framework in determining best practice benchmarks, and discusses implications and applications of the model for ensuring quality in Web-based nursing courses. The pilot study described in this article is the first of its kind for online courses, and when it is concluded it will allow other institutions to benchmark on critical areas of performance in Web-based teaching and learning.

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BEST PRACTICES AND BENCHMARKING

Benchmarking has gained popularity in the business sector as a research approach that discovers "best practices" in whatever process is designated for study. This is a process improvement technique that provides factual data that allows institutions to compare performance on specific variables in order to achieve best-of performance. Benchmarking studies are used to identify, understand, and adopt outstanding practice from one or more organizations in order to help other organizations succeed.3-6 Benchmarking provides a forum for sharing and discussing practices that work.5 Although this process is employed routinely in the business world, health care, and nursing service, it is adopted infrequently in the higher education arena.

Since spring 1999, three large, state institutions that span the central part of the United States have collaborated on a benchmarking project to determine best practices in online learning communities for nursing courses. These institutions had been offering Web-based education for several years prior to the initiation of the benchmarking project. Representatives from the three institutions partnered with a consultant from the Flashlight Program to develop, implement, and evaluate an instrument to assess outcomes of Web-based nursing courses. The Flashlight Program is part of the Teaching, Learning, and Technology affiliate of the American Association of Higher Education. The mission of the Flashlight Program is to help institutions study and improve educational uses of technology (http://www.tltgroup.org/programs/flashlight.html). Since the Flashlight Program's inception in 1994, this organization has been developing tools to assist educators in answering tough questions related to technology and education. For example, the Current Student Inventory (CSI) tool kit is designed to assess the student's views of technology-based teaching and learning.7 The CSI consists of a series of questions clustered into 14 themes or subscales that focus on the various reasons for using technology to enhance learning outcomes. These 14 principles incorporate and expand the seven principles of good practice in undergraduate education developed by Chickering and Gamson.8

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BENCHMARKING PROCESS

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Defining the benchmarks


Table 1

The first step in the benchmarking process is to determine what to benchmark.[5,6] The variables selected for this benchmarking project were derived from frameworks and models used in nursing [7] and in higher education to illuminate the effect of the use of technology.[9,10] The variables include *outcomes* that are enabled by Web-based courses (learning, recruitment/retention, access, convenience, connectedness, computer proficiency, preparation for real-world work, socialization, and satisfaction), *educational practices* used to facilitate learning (active learning, time on task, respect for diversity, interaction with faculty, interaction with peers, and rich and rapid feedback),[8,11] and the *use of technology* (technology infrastructure and the use of technology to promote productive use of time). The variables selected for benchmarking are defined in Table 1.

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Mapping the process

The next steps of the benchmarking process are to enlist partners and define a mapping process.[5,6] The three schools involved in this study decided to collaborate with the Flashlight Program team to ensure that the research would provide a broad base of potential practice differences that could be revealed in the benchmarking process. The mapping process, as described in the framework above, was based on the use of the technology, the course development process, and design for curriculum outcomes that are common to all three schools of nursing.

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Developing the survey instrument

The instrument used to collect the benchmarking data for this study was adapted from the Flashlight Program CSI tool kit and consists of 52 items.[7] Forty items on the survey elicit student perceptions of the specific outcomes, educational practices, and use of technology. This survey uses a 5-point Likert scale asking the respondents to indicate to what extent they disagree or agree on items when comparing this Web-based course to a course that uses primarily face-to-face communication. Ten items obtain demographic data about the students and their educational experiences. Two open-ended questions ask students what they found to be best about the course and what needs to be improved. Content validity of the items for the instrument was established by reviewing the nursing literature about Web courses and using a national consensus panel of experts in distance education.[7] In addition, the items used in the nursing survey were selected from the Flashlight Program item bank and reviewed by a panel of nursing faculty at the three schools of nursing participating in this study. The reliability of the survey instrument was established from the sample of students participating in this study. Chronbach's alpha for the total instrument was.85.

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Gathering performance data

Data for the pilot study were gathered from 219 students enrolled in courses offered primarily on the Web at three schools of nursing during the fall semester of 1999. After obtaining approval for the study from the respective institutional review boards, the survey was administered to students taking the Web courses by using a link that the student activated to complete the survey. The survey was deployed from a file server used by the Flashlight Program that was maintained at Washington State University. Student identification information was removed, and responses to the survey items were aggregated for data analysis.

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Measuring performance

One method of benchmarking is to compare practices and outcomes from different organizations against one's own organization. For the purposes of this study, the mean for each indicator is reported as the benchmark.

Descriptive and inferential statistics (correlation, analysis of variance [ANOVA], and t-test) were used to analyze the data. SPSSX version 10 was used for data analysis. Content analysis was used to analyze the data from the two open-ended questions.

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RESULTS

The educational practices and outcomes enabled by the technology are revealed by the results of the study on each of the performance indicators: outcomes, educational practices, and use of technology. Findings are reported on the aggregated data across the three schools participating in the study.

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Demographics

Of the 219 students who participated in the study, 90% were females, 24% of the students were age 20 to 29 years, 34% were age 30 to 39 years, 34% were age 40 to 49 years, and 7% were over 50 years of age. Ninety-three percent of the students identified their race as white. Seven percent of the students were taking Web courses that met requirements for the RN-BSN program, 67% were in courses in MSN programs, 11% were in RN-MSN programs, and 15% were taking courses in ND or PhD programs. Of these courses, 66% were required core courses, and 26% were required courses in a major or specialty. Most courses were three academic credits. It was determined that approximately 80% of the students had taken between two and six other Web courses. Fifty-six percent of the students lived less than 30 miles from the campus, and 21% lived more than 100 miles from the campus. About one third of all students who participated in the survey identified themselves as living in rural areas.

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Outcomes

One of the intended outcomes of Web courses is the ability to make education *accessible*. Forty-two percent of the respondents indicated that one of the reasons they were taking the course was because it was offered on the Web. In the positive comments reported in the open-ended questions, students in this study noted the value of accessibility.

Convenience is also cited as a primary advantage of Web courses. Results of this study indicate that students agree that Web courses are convenient (M = 3.7, SD = .79). There were positive correlations (P = .01) between convenience and several of the educational practices—active learning (r = .64), feedback (r = .34), student-faculty interactions (r = .54), and interaction with peers (r = .37). There also were correlations (P = .01) with outcomes of satisfaction (r = .76), preparation for real-world work (r = .67), socialization (r = .66), and connectedness (r = -.54). There were differences in perception of the convenience of Web courses by the age of the students and the distance they lived from the campus. Students over the age of 50 years (F = 3.09, df = 3, 212, P <= .02) found the courses more convenient than those who were younger (20-29 or 30-39 years); students who were younger (20-29 years) found Web courses to be less convenient than those who were over 40 years of age. Students who lived more than 100 miles from campus (F = 6.67, df = 4, 211, P <= .01) found Web courses to be more convenient than those who lived less than 30 miles from the campus.

In general, students were *satisfied* with these Web courses (M = 3.2, SD = 1.18). This is consistent with findings reported elsewhere in the nursing literature.[12] There are strong correlations (*P* = .01) with satisfaction and preparation for real-world work (*r* = .84), socialization (*r* = .79), connectedness/lack of isolation (*r* = -.62) and convenience (*r* = .76). An ANOVA revealed differences in satisfaction (F = 5.77, *df* = 4, 212, *P* <= .01) according to the distance the students lived from the campus (students who lived farther from the campus were more satisfied [F = 2.15, *df* = 3, 212, *P* <= .05] with the Web courses than those who lived closer) and age (older students [40-49 years and over 50 years] were more satisfied with Web courses than students who were younger [20-29 years]).

Isolation, or lack of connectedness, has been reported in the literature as one of the primary concerns of students and faculty in Web-based courses.[12] Students in this study appear to feel somewhat isolated from faculty and students in these courses (M = 3.6, SD = 1.08). Isolation is negatively correlated (*P* = .01) with satisfaction (*r* = -.61) and socialization (*r* = -.50). The more the students perceive being isolated, the less satisfied they are with the Web courses, and the less they perceive being socialized to the profession. Students who lived farther away from campus reported less isolation (greater connectedness) (F = 4.49, *df* = 4, 210, *P* <= .01) than those students who live less than 30 miles from campus. The sense of isolation also is related to age—students over 50 years of age feel more connected (F = 4.07, *df* = 3, 211, *P* <= .01) than all other age groups.

The lack of the ability for students to be socialized into the profession is frequently offered as a criticism of distance learning in nursing. However, the benchmark for this study indicated otherwise, as students in this study reported *socialization* as an outcome of these nursing Web courses (M = 3.5, SD = 1.01). There are moderate correlations (*P* = .01) between socialization and educational practices (active learning, *r* = .57; feedback, *r* = .55; student faculty interactions, *r* = .59; and interaction with peers *r* = .34).

Computer proficiency tends to improve when students are required to use the technology.[13,14] This was true in this study, as students' ratings of their abilities to use the technology in the Web courses improved significantly from the beginning of the course to the end of the course (*t* = 95.7, *P* <= .01).

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Educational practices

* *Time on task*. Students in this study reported spending 6 to 10 hours per week participating in the course. Students neither agreed nor disagreed (M = 3.17, SD = 1.14) that they spent more time studying for the Web course than they did for a course offered on campus.

* *Active learning*. Active learning requires that the student be a participant in the learning process. Active learning contributes to course outcomes and satisfaction. In this study, the benchmark indicated that students perceived they were actively involved in the learning process (M = 3.3, SD = .84). In addition, active learning is positively correlated (*P* = .01) with feedback (*r* = .40), student-faculty interaction (*r* = .69), and interaction with peers (*r* = .54). There are differences among students who live farther from the campus—more than 100 miles—(F = 2.47, *df* = 4, 210, *P* <= .04). Students who live more than 100 miles find learning in Web courses to be more active than those who live closer to the campus.

* *Feedback*. Feedback about processes and progress in the course is essential to attaining outcomes. Students in this study perceived that they were, in fact, receiving feedback in their Web courses (M = 3.7, SD = 1.01). Students who lived more than 100 miles from campus reported receiving more feedback (F = 3.08, *df* = 4, 213, P <= .01) than those students who lived 11 to 30 miles from the campus.

* *Interaction with peers*. Students were somewhat less likely to interact with peers

in the Web courses than in a traditional classroom (M = 2.7, SD = 1.03). In addition, there are differences in interaction among younger students (20-29 years), who were less likely to interact with their peers than those students who were older (40-49 years and over 50 years).

* *Interaction with faculty*. Students also were somewhat less likely to interact with the faculty when compared to interacting in a course that uses face-to-face discussion (M = 2.3, SD = 1.06). Students who lived more than 100 miles from the campus approached significance in their perception of more student-faculty interaction (F = 2.2, *df* = 4, 211, *P* <= .06) than those students who lived closer (less than 30 miles) to the campus.

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Use of technology

Technology (hardware and software) used to offer Web courses must be reliable, accessible, and support productive use of time. In this study, students disagreed that the technology contributed to good use of their time (M = 2.6, SD = 1.07) and provided a reliable infrastructure (M = 2.2, SD = .77). There were geographic differences between students and their perception of the utility and effectiveness of the technology. For example, students who lived farther from the campus (more than 51 miles) found that the technology was less able to support productive use of time (F = 4.12, *df* = 4, 213, *P* <= .01), and the infrastructure was less reliable (F = 3.0, *df* = 4, 212, *P* <= .02).

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IMPLICATIONS AND APPLICATIONS

The results of this study across the three schools provide useful and relevant data about Web-based education. The individual school and aggregated data allow for the comparison to our framework of best practices. As Epper 15 noted, "benchmarking is more than simply comparing oneself against a statistical norm or standard. Benchmarking involves first examining and understanding your own internal work procedures, then searching for `best practices' in other organizations that match those you have identified."(p26)

There are several ways to examine individual school data and use the results to strengthen or improve performance. Epper 15 pointed out that benchmarking is "a systematic way of learning from others and changing what you do."(p26) The results can be used by faculty to strengthen or improve their teaching-learning strategies and by the instructional design person to foster the use of these best practices in teaching and learning. In addition, administrators can examine data in terms of technology supports for both students and faculty. All can query the data for the attainment of outcomes of a particular program. The following examples demonstrate how the results can be used to improve processes.

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Faculty applications

For a faculty member, the survey instrument provides a wealth of information about students' perceptions of their Web-based courses. For many faculty, course evaluations are sometimes perceived as "happiness indices" and do not provide sufficient and necessary data for course improvement. This survey provides specific feedback about the design of a course, attainment of learning outcomes, and feedback on defined educational practices. The benchmarks assessed in this survey encourage and support faculty to design their Web courses with the educational practices supported by evidence-based research 8,16 and advocated by the Flashlight Program.7

For example, time on task is an important scale to examine. One of the primary concerns of students about Web-based courses is the perceived amount of time they spend online. Many students initially report that they spend two to three

times more time in an online class than in a face-to-face class. Most students view the face-to-face class as a discrete amount of time, such as the amount of seat time in a classroom. They often forget to add the class preparation or study time, including reading textbooks and articles or writing papers. Many students, especially new ones, are not familiar with the rule of thumb that for every hour in the classroom, there are three associated study hours apart from the classroom. This also applies for Web-based courses, in which students are expected to devote more than 3 hours per week for a three-credit course.

It is important for instructors to construct learning experiences that allow students sufficient time to interact with the content. Research has shown that if more time is spent on a task, it is more likely that learning will occur.8 In this study, students reported spending 6 to 10 hours a week participating in course activities. Considering the rule of thumb mentioned above, this is about average for a two- to three-credit course. However, if students report spending an extraordinary amount of time on a course, the faculty member should first try to ascertain the reason for the differences in time expectations. It may be an indicator that a faculty member should reexamine course assignments, learning activities, readings, and requirements. Or perhaps this is a first online class for the students, and a lack of computer skills is consuming more time than the actual learning activities. It is important to determine the cause in order to find the right solution. In some instances, students report less time on task. Again, the faculty member should carefully examine the rationale for this outcome. One recommendation might be to have faculty members reiterate realistic time commitments for each unit, class, or module. Faculty can explicitly state their expectations that all students should spend a minimum of 6 to 9 hours per week in learning activities such as reading, participating in class assignments, and dialoguing online with their colleagues and faculty.

The active learning scale provides faculty members with rich data for decision making. Active learning allows students to engage in the learning process. Active learning experiences are important in that they require thoughtful and analytic information processing. Creating active learning experiences is often difficult for traditional classroom teachers who depend heavily on the lecture method as their primary teaching strategy. For example, an experience might have students work in teams and debate an issue such as the effect of technology on health care. This experience requires that students learn about both the negative and positive effects of technology while working as a team to defend their own positions and rebut their opponents' positions. This exercise requires that students be self-directed and immerse themselves in the learning process.

In this study, students perceived they were more actively involved in learning in online courses than they were in traditional face-to-face teaching. If, however, students do not perceive the experience as active learning, then faculty members can reassess the learning activities or provide more guidance to the students regarding active learning. In some instances, students are not prepared to be active learners. They are accustomed to being passive learners, listening to lectures and providing evidence of their learning through papers, exams, or assignments. Many students do not necessarily know how to participate in their own learning, and they therefore have difficulty being self-directed learners. Faculty may need to encourage student participation and promote active involvement through a learner-centered model. Faculty also may need to work with instructional designers or other faculty to learn how to structure active learning and how to encourage students. It is imperative that both students and faculty reestablish their roles in a Web-based learning environment.

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Instructional designer applications

From an instructional designer's perspective, benchmarking provides an abundance of information for faculty development opportunities. The results also can be used for the development of specific faculty and student guides related to educational practices or the appropriate use of Web-based technology. Based on the results of this survey, an instructional designer can construct faculty

development seminars specifically targeted to gaps or weaknesses. The instructional designer can work individually or in small faculty groups to redesign courses with these educational practices in focus. They also can develop sample exercises or assignments to exemplify certain educational practices based on the ones that need significant improvement. In addition, the instructional designer can inspect the extent of the identified problem areas and answer questions such as: Is it a specific content area, specific course, specific program, or specific instructor? Using their knowledge and expertise, these individuals can create guidelines or handouts to be used by faculty for such things as "netiquette" or "how to be a self-directed learner." The data gleaned from this survey will provide information for the next steps in faculty and student development and progression in the use of Web-based courses.

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Administrator applications

For administrators, the survey provides relevant data to make better decisions about the necessary supports to deliver Web-based courses. Web courses place new demands on both faculty and students. Both must have the computer skills necessary for participation, access to ongoing technical support, and the motivation to teach and learn in a technology-based environment. Orientation to online courses and to the technical requirements (hardware and software standards) is also a necessary consideration. In addition, technical support increasingly is becoming an important issue. With Web-based courses, the extension of technical support hours beyond the traditional 9 to 5 day becomes a necessity. As with other distance learning techniques, students must have access to resources from a distance. These resources include access to technical assistance, as well as to learning resources such as the library and other student services.

The survey also provides valuable information about students' perceptions of the required supports for Web-based courses. In this study, students reported that the technology did not contribute to the good use of their time. They also reported that the technical infrastructure was unreliable. An interesting result was that the distant students perceived the problem, whereas local students did not—possibly because local students had alternatives; they could come to campus, whereas distant students did not have that option. Thus, the results from this survey can be forwarded to the appropriate administrative personnel for a reexamination of services. In some cases, it might be the essential data to improve the infrastructure necessary for Web-based course delivery.

The survey instrument also yielded data about the attainment of course outcomes. The assessment of learning outcomes is beneficial to the overall evaluation of the curriculum and meets the demands of external assessments or accreditation bodies. Faculty, students, administrators, and accreditors are interested in learning outcomes, especially when schools are testing Web-based courses. The ability to investigate these outcomes on an individual school level, as well as with comparable schools, will be most valuable to all the stakeholders. Data from any of the individual scales, such as connectedness or socialization, will provide insight into the processes associated with Web-based delivery. For example, additional student supports or faculty development might contribute to improved educational practices.

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CONCLUSION

The information provided by a benchmarking survey allows an institution, school, or individual faculty to begin the quality improvement process. This survey instrument and the benchmarking process itself allow institutions to identify gaps in performance and strengthen their processes to achieve a quality educational program. The benchmarking practice based on this survey provides a framework for action instead of a set of statistical parameters.[15] Benchmarking can serve as a "lever of change and as an example of how institutions can create opportunities for collaboration"[15(p31)] in the development and implementation of Web-based courses

in nursing.

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Key words: assessment; benchmarking; best practice indicators; outcomes; quality indicators; Web-based courses

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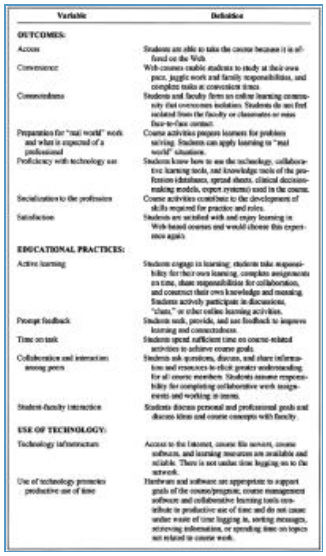

Variable	Definition
OUTCOMES:	
Access	Students are able to take the course because it is offered on the Web
Convenience	Web courses enable students to study at their own pace, juggle work and family responsibilities, and complete tasks at convenient times
Connectedness	Students and faculty form an online learning community that overcomes isolation. Students do not feel isolated from the faculty or classmates or miss face-to-face contact.
Preparation for "real world" work and what is expected of a professional	Course activities prepare learners for problem solving. Students can apply learning in "real world" situations.
Proficiency with technology use	Students know how to use the technology, collaborative learning tools, and knowledge tools of the profession (databases, spread sheets, clinical decision-making models, expert systems) used in the course.
Socialization to the profession	Course activities contribute to the development of skills required for practice and roles.
Satisfaction	Students are satisfied with and enjoy learning in Web-based courses and would choose this experience again.
EDUCATIONAL PRACTICES:	
Active learning	Students engage in learning; students take responsibility for their own learning, complete assignments on time, share responsibilities for collaboration, and construct their own knowledge and meaning. Students actively participate in discussions, "chats," or other online learning activities.
Prompt feedback	Students seek, provide, and use feedback to improve learning and connectedness.
Time on task	Students spend sufficient time on course-related activities to achieve course goals.
Collaboration and interaction among peers	Students ask questions, discuss, and share information and resources to elicit greater understanding for all course members. Students assume responsibility for completing collaborative work assignments and working in teams.
Student-faculty interaction	Students discuss personal and professional goals and discuss ideas and course concepts with faculty.
USE OF TECHNOLOGY:	
Technology infrastructure	Access to the Internet, course file servers, course software, and learning resources are available and reliable. There is not undue time logging on to the network.
Use of technology promotes productive use of time	Hardware and software are appropriate to support goals of the course/program; course management software and collaborative learning tools contribute to productive use of time; and do not cause undue waste of time logging in, sorting messages, retrieving information, or spending time on topics not related to course work.

Table 1

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