Student Expectations of Information Technology Use *in the* Classroom

This article reports the results of a survey of faculty and students conducted at Northwest Missouri State University in the spring of 1999 to learn more about student expectations for the use of technology in the classroom. Data are summarized and interpreted, and many open-ended comments from survey respondents are included.

by **Jon Rickman** and **Mike Grudzinski**

With the increased availability of multimedia tools in the classroom, many instructors have begun accepting the challenge of enhancing their traditional courses with an array of information technology (IT) applications. Many of the IT planning efforts within colleges and universities advocate that every classroom be equipped with the latest multimedia and networking equipment available, at a cost of anywhere from $3,000 to $50,000 per classroom.[1] The presumption has been that students expect schools to offer more technology-enhanced courses and that the level of expectation for technology use is far greater than most instructors are able to achieve. These presumptions, however, have not been validated by documented research.

In the fall of 1997, while attending a national technology conference, we realized that even motivated participants can be turned off by overuse, or inappropriate use, of technology. After attending session after session of highly structured multimedia presentations in dimly lit rooms, we began to feel fatigued. It reached the point that

we wished a presenter would just leave the lights on and talk with us!

Upon returning to our campus—Northwest Missouri State University—we began to talk informally with students regarding technology usage on campus and found they had some of the same thoughts. As a follow-up to these informal discussions, we formed several student focus groups to obtain more formal feedback. This led to a large-scale survey, which we conducted during the spring semester of 1999, to learn more about student expectations for the use of classroom technology at our university. But before examining the survey we conducted, one must understand the technology environment and culture at Northwest Missouri State University.

Campus Profile

In the late 1970s Northwest installed public computing laboratories in every classroom building and developed a set of student-friendly information systems. This timesharing, text-based system was expanded in the mid-'80s to provide a computer terminal and access in every faculty office and every residence hall room. This initiative created the first "electronic campus" at a public university in the nation.[2] At that time there were also more than 20 academic microcomputer laboratories to complement the timesharing services.

In the 1990s notebook computers were issued to faculty who were advanced users of information technology, and several electronic classrooms that included network connections and video projection systems were implemented. By the end of 1997 every faculty member had been issued a notebook computer and every student residence hall room included a university-provided PC with a full complement of networked services.

In the fall of 1995 two pilot technology-enhanced classrooms were created on campus, each equipped with a teacher station that included an Ethernet connection, a VCR, a laserdisc player, and a document camera. These rooms were definitely not user friendly! We found that all but the most technologically advanced faculty members needed almost constant classroom support. Thus when six more technology-enhanced classrooms were installed across campus, technology control was simplified by using the LCD projector remote control exclusively for video display selection purposes. This basic design became the standard for the additional 22 electronic classrooms that were included in the renovation in 1997 of Colden Hall, one of the two largest classroom buildings on campus.

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As notebook computers were provided to the faculty in increasing numbers and classrooms equipped with sophisticated technology, a center (now known as the Center for Information Technology in Education or CITE) was created to concentrate solely on supporting faculty in technology use. When the state of Missouri designated our university to be the statewide clearinghouse for information technology in education, the center expanded to support this responsibility. Among the support services that CITE offers faculty are training sessions for use of technology in the classroom; these are offered throughout the year but especially before the beginning of a semester.

By the time of our survey in the spring of 1999, with ubiquitous personal access to networked computing and about 50 electronic classrooms in operation, both students and faculty had become fully engulfed in a technology-based learning environment.

Survey of Technology Use in the Classroom

We decided to focus our survey of Northwest students and faculty primarily on the use of information technology in the classrooms of Colden Hall. With an enrollment of about 6,000 students, we hoped for approximately 1,500 responses (a quarter of the school population) for the survey to be meaningful.

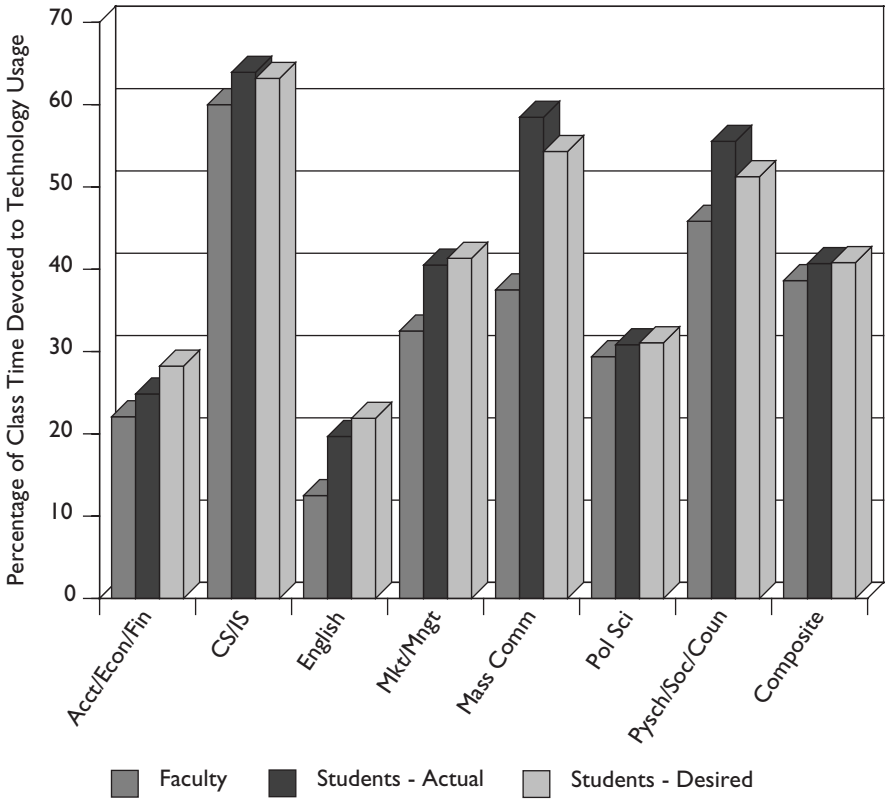
We calculated that a survey administered on Wednesday morning March 10, 1999, to every class that met in Colden Hall at 8:00, 9:00, 10:00, and 11:00 would provide a potential pool of 2,335 student responses. It would also provide a potential for 60 faculty responses. The proposed survey date and times provided a good cross section of all academic departments housed in the hall, including Accounting/Economics/Finance, Computer Science/ Information Systems, English, Marketing/Management, Political Science,Psychology/Sociology/Counseling, and one class from Mass Communications, a department housed outside of the hall.

Faculty were asked to fill out a survey for each different class they taught, but not for multiple sections of the same class (during the designated survey times). For example, an instructor who taught three sections of English 110 during these times would fill out one survey; however an instructor who had one section of English 110 and two sections of English 111 would fill out two surveys.

Students were asked to fill out the survey specifically for the course section they were attending that morning, so some students might fill out multiple

Figure 1

Class Time Devoted to Technology Usage



surveys if they had more than one class in Colden Hall during the specific survey times. Student surveys were distributed at the beginning of class and collected immediately so students would be less likely to base their responses on the IT activities for that particular day. A total of 1,682 responses were received from students for a 72-percent return rate. All 60 faculty responses were returned for a 100-percent return rate.

Key questions asked of students on the survey included: (1) What percentage of class time is devoted to technology usage in this class? and (2) What percentage *should* be devoted to technology usage in this class? Students were then also asked to list which classroom applications of technology they found *most* and *least* useful.

The key question asked of faculty was: What percentage of class time do you devote to technology usage in this course? Faculty were also asked which of the classroom applications of technology they used.

Results of the survey are shown in Figures 1 through 4.

Survey Data Analysis

The survey data showed a wide variation in the amount of technology that students expected to be used in the classroom. It should be noted that the data were collected from students who were taking courses taught by faculty highly experienced with IT as well as by faculty just beginning to use basic IT tools in their classrooms.

Many administrators and faculty are looking for an overall average for the amount of time that students desire IT to be used in the classroom, so we computed such an average. But one should keep in mind that this will vary from campus to campus and we do not mean to suggest it as a benchmark for others. Because of our particular IT environment, it is possible that Northwest students expect more IT usage in the classroom because they chose to attend a school that promotes the "electronic campus" in its recruitment efforts, and students in every residence hall room use their university-provided bedside PC on a daily basis.

We drew the following conclusions from analyzing the survey data shown in Figure 1:

- Students do not want IT used 100 percent of the time but do expect usage in all subject areas.
- Students appear to desire IT for less than 50 percent of classroom activities.
- The percent of time students thought IT should be used in individual courses coincided with the actual percent of time faculty were using IT.
- For classes in which they perceived that actual IT use was less than 40 percent, students desired more. In classes in which they perceived actual IT use was more than 40 percent, they desired less.
- The average percent of time that students thought IT should be utilized is 40 percent.

The data also suggest that responding students respected the instructor's judgment on how much IT should be used, welcomed wide variations in the amount of time that IT is used, and took into account the amount of technological sophistication and comfort level of the instructor. In all but one department, the students' perception of the percent of technology use in a course matched the level of technology use reported by the faculty. These conclusions are all derived from the data displayed in Figure 1.

Data in Figure 2 support the conclusion that students generally find that some technology is helpful in the class-

room; only about 3 percent felt the removal of all technology would be most useful. The data in Figures 2 and 3 show that PowerPoint and the document camera received the most positive and least negative student responses regarding their usefulness. Figure 4 data correlate with these data, that is, the IT applications students found the most appropriate were also those that faculty used the most.

Faculty and Student Comments

A blank space for comments was also provided on both the faculty and student surveys. After analyzing the 259 student and 28 faculty responses, we drew the following conclusions.

- Faculty must be trained on how to use the equipment or support personnel need to be close at hand. Many students indicated they were frustrated because class time was lost due to a professor not knowing how to use the equipment.
- Technology must enhance the instructional experience, not overpower or replace it.
- Readily available IT equipment promotes usage from even the most technologically challenged faculty members.
- Students like PowerPoint when text and graphics are properly sized and when presentations can be posted to the Web so they can be downloaded at the student's convenience.
- Students dislike PowerPoint when faculty go too fast through the material, get too much information on one slide so it is difficult to read, or in general have poorly designed slides.
- Students prefer faculty use of the document camera to their writing on a board, but care must be taken to write large and legibly. Students questioned the effectiveness of placing textbooks on document cameras and zooming into selected areas.

Faculty comments on classroom use of IT included the following:

"I rely heavily on document cameras in my writing courses. I am miserable in my Valk [another building on campus] *classroom with the ancient overhead projector and useless plastic sheets. I want my lecture notes on PowerPoint, but I am lazy. Also, for literature next year, I plan to have students make presentations incorporating PowerPoint and the Internet but, again, I need the time to plan."*

—

"I am becoming more adept at using the new teacher station technology. The document camera and direct hookup to my laptop for both PowerPoint and Internet access has [sic] *been valuable. I hope to continue to learn and leverage the information access into my classroom lectures and exercises."*

Figure 2

Classroom Technology Applications Students Find MOST Useful

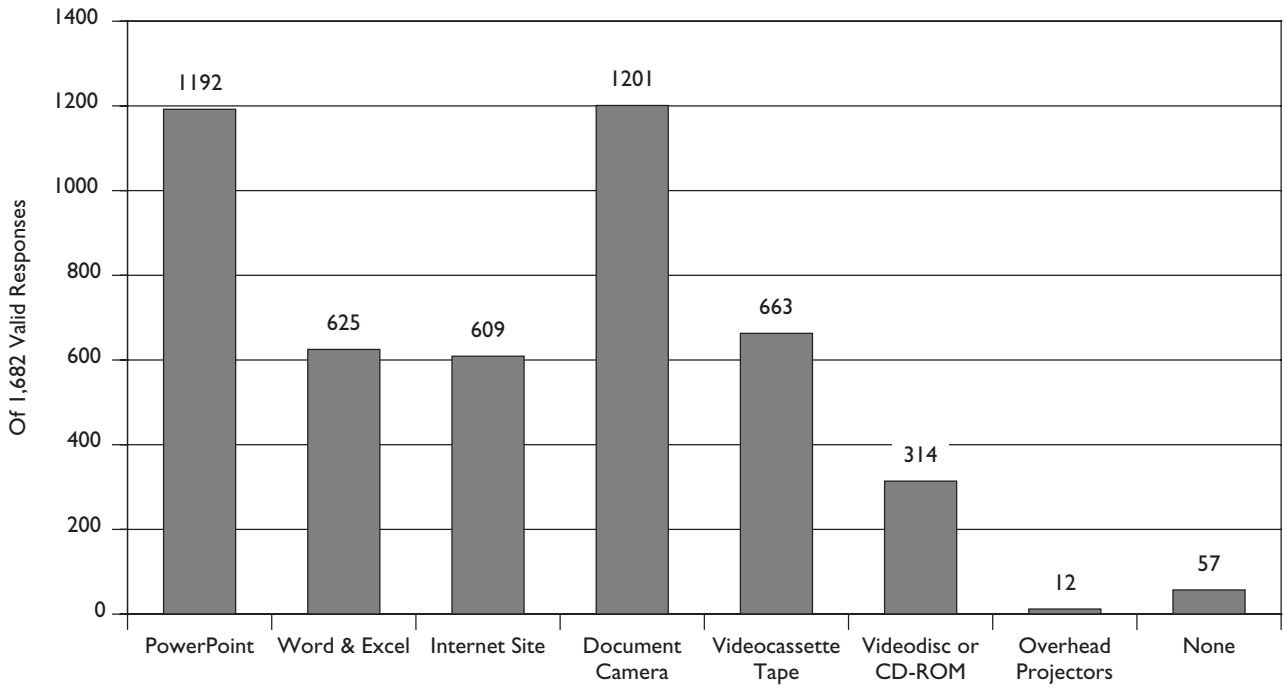
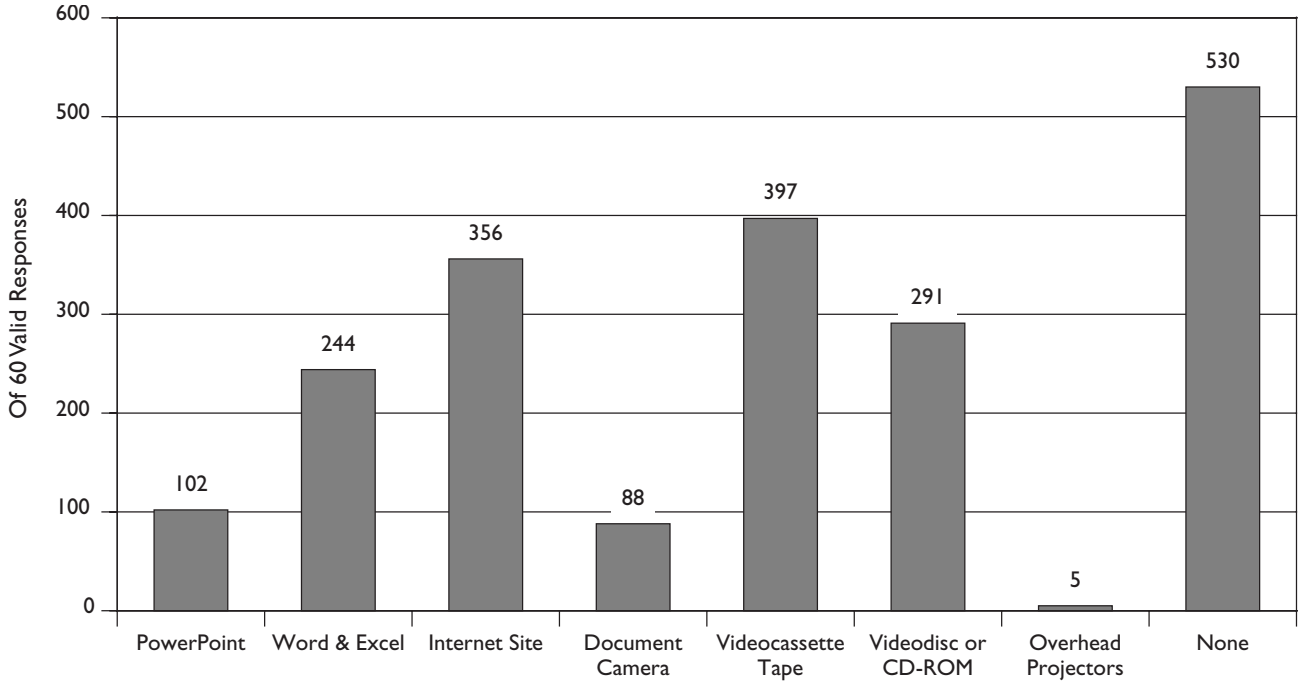


Figure 3

Classroom Technology Applications Students Find LEAST Useful



"While I do not use the document camera or VCR frequently, they are very useful to have in place for when I do want to use them."

—

"I don't see myself as devoting time to technology usage, but rather as utilizing technology to save preparation time for myself and the students. It's helpful to have all this immediately *available. It allows us to address issues as they come up and not [have] to go and find machines and copy materials. But don't take our whiteboards—we still like to write stuff up on them."*

—

"The screen needs to be placed in the front corner of the room opposite of the teacher station, so it does not cover the white board."

—

(The latter two comments provided excellent feedback regarding classroom layout in Colden Hall. Such a configuration will be considered in future classroom renovations.)

Student comments on classroom use of IT included:

"I think the use of PowerPoint for class lectures is great for organization of notes and information."

—

"PowerPoints are only useful if they are well developed."

—

"Technology is good until it starts taking over your teacher's job. I responded [on this survey] *that computers should be used between 25–50 percent."*

—

"I think all my teachers use the technology almost every day for one reason or another. The technology adds to the lecture and since it is already in the classroom, teachers don't have to hunt down everything they need for class."

—

"The technology in Colden Hall provides a better learning experience and makes student presentations better."

"I think it is extremely helpful to have technology in the classroom because we will probably see it all again in the workplace."

—

"I am a visual learner so any additional visuals that can be added are beneficial to me. Also, technology is our future so the more we use, the more prepared we are for our future."

—

"Some teachers rely too much on technology. They let PowerPoint teach for them. We have to write a mile a minute just to keep up with them."

—

"I feel that teachers need to be better trained on how to use this equipment. Sometimes it takes half of the hour to just get set up."

—

"Overhead projectors are clearer than the document camera and projectors."

—

"I prefer the old-fashioned way of teaching where teachers used their imaginations to make classes interesting."

"I enjoy being at such a technologically advanced school."

—

"I think Northwest gets too hyped up on technology."

—

"More important than technology is information from a professor that knows what's going on. Technology is fluff—lower our tuition instead! "

—

"As a Student Ambassador, I always point out technology in the classroom. Most families are very impressed, especially with the document camera and video projector."

—

"Different classes and professors need to use different amounts and types of technology. It isn't 'one size fits all'."

—

"This survey is not needed because I don't think a teacher should be told how much technology he/she should have to use in class."

Conclusions

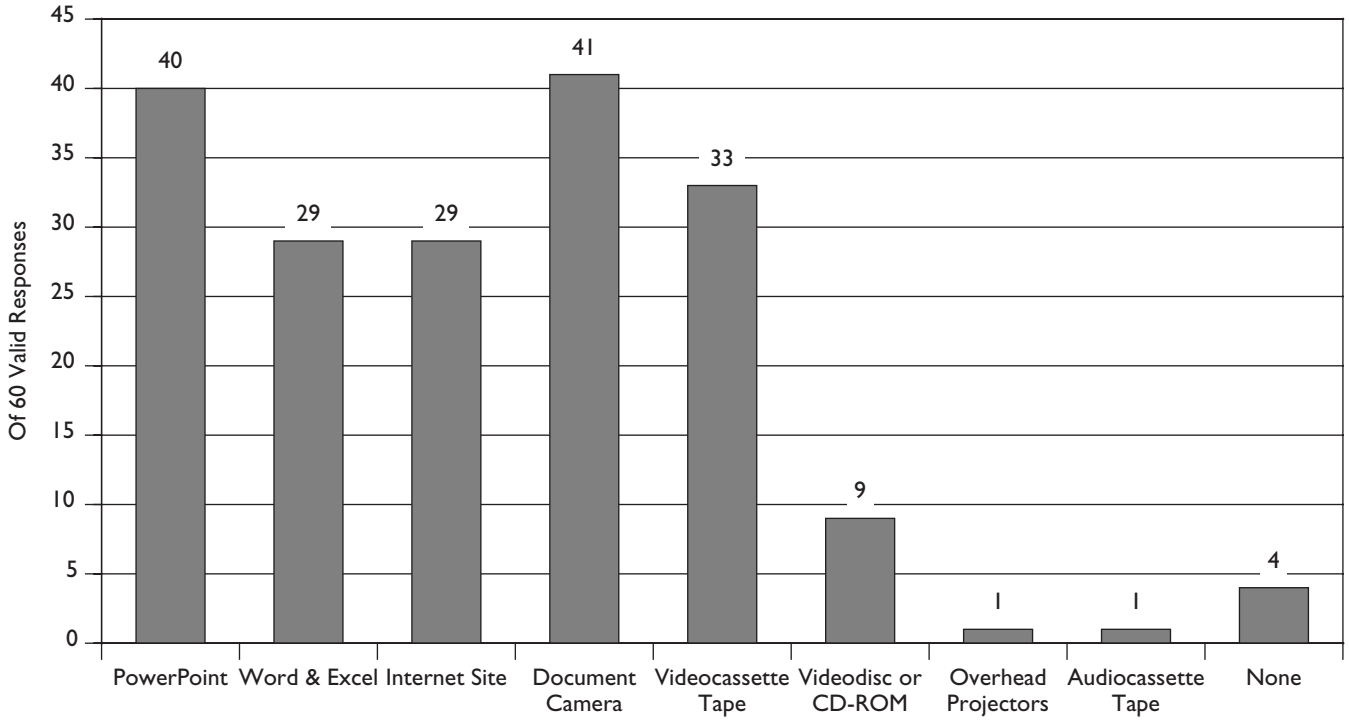
Finding where the line can be drawn between satisfaction and discontent in classroom IT usage was the primary purpose of our survey and its analysis. Although actual, expected, and desired levels of classroom IT utilization vary by department, it appears utilization is still expected by students in all academic departments. This finding, added to the fact that it is quite difficult to schedule or mobilize special IT equipment for particular faculty on particular days, appears to support the installation of IT enhancements in every classroom on campus. The constant presence of technology in the room appears to help more faculty members to experiment and utilize IT in their classes.

An unexpected survey result was finding the document camera tied with PowerPoint as the classroom technological application students found most useful. We expected software applications to rank somewhat higher than the document camera. PowerPoint, although being rated as one of the two most effective classroom IT tools, received a mixed reaction from students. They like it for the fact that many times it makes it easier for them to take notes in class, or they may be able to download presentations from a faculty Web site, but they dislike poorly designed presentations and faculty speeding through their presentations. Such comments validate the supposition that a support system, complete with curriculum design personnel, is needed to instruct faculty on proper preparation and presentation of classroom IT materials.

We noted a correlation between the document camera and PowerPoint being the two most widely used tools by faculty and their ranking by students as most effective. Students seem to be able to sense and appreciate the technological prowess of their instructors and don't want to see them forced into adding IT into their curriculum, as evidenced by multiple student narrative

Figure 4

Classroom Technology Applications Used by Faculty



responses. PowerPoint and the document camera seem to be the first IT tools most instructors feel comfortable with and have adopted to use in their classroom activities.

From the comments by students it became evident that the use of technology did not ensure that the instructional process was always enhanced. In fact, it was pointed out that a faculty member using IT sometimes resulted in material being presented faster than students desired. Students also commented about instructors not being as well prepared for a class and reverting to reading information from the display. This appears to be an electronic version of the old stereotype of the boring instructor who uses class time to read the textbook out loud. It is evident that technology can in fact amplify instructional weaknesses as well as strengths.

We believe that as additional efforts are made to incorporate the use of IT across the curriculum, even more IT enhancements will occur inside the classroom. Faculty members will continue to become more comfortable with technology, and student, faculty, and administrative expectations will probably rise.

This initial research indicates follow-up studies will need to be conducted to determine the relationship between teaching style and student technological sophistication and expectations for IT usage. Further study should also provide a deeper understanding of what students feel the role of technology should be in the classroom. For example, should technology be used to replace lecture time? Should it be used to highlight important points or ideas in a lecture? Should it be used to provide a framework for the course and to structure classroom activities? Or should it be used only to present information, such as simulations, which could not be presented in any other format?[3]

Endnotes:

1. S. Andrews, D. Stecker, D. Weill, and W. Winstead, "Tragedy of the Commons: Who Owns Classroom Space?" *Planning for Higher Education*, summer 1999, 32–38.

2. J. Rickman and D. Hubbard, *The Electronic Campus* (Maryville, Mo.: Prescott Publishing, 1992).

3. From personal correspondence with J. McLarty, August 10, 1999.

Jon Rickman (rickman@mail.nwmissouri.edu) is vice president for information systems and Mike Grudzinski (mgrud@mail.nwmissouri.edu) is distance learning manager at Northwest Missouri State University.

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