ClassTech LITRE Assessment 2005-2006
July 2006

Results of Fall and Spring Surveys and Technical Support Issue Review

NC State's ClassTech unit is in its third year of operation and third year of conducting research about its effectiveness. This research stems from a desire to improve the service ClassTech provides to faculty and students on campus, but also as a part of the campus Learning in a Technology Rich Environment (LITRE) initiative which strives to improve teaching and learning through the introduction and assessment of the effectiveness of technology implementations in our learning environment.

Through the research of the previous two years it has been very difficult to show how classroom technology has directly impacted student learning. There is a *perception* on students' and faculty's part that generally the use of technology in the classroom can positively enhance learning. Faculty were more readily able to discuss what they did with the technology and how it impacted the way they taught or used their time in and out of class. To dig deeper into student learning, additional members were added to the ClassTech assessment team in Fall 2005 who understood more about pedagogy and learning theory.

The fall semester was dedicated primarily to defining and developing a model framework based on literature that incorporated five dimensions of instructional situations, as outlined by Mehlenbacher, et al. (2000, 2002, 2005), and incorporating that into a research methodology. Originally presented in Mehlenbacher (1998), published as the five dimensions of an instructional situation characterizing Web-based and conventional classes in Mehlenbacher, Miller, Covington, and Larsen (2000, p. 179), in revised forms in Mehlenbacher (2002) and Mehlenbacher, Bennett, Bird, Ivey, Lucas, Morton, and Whitman (2005), and part of Mehlenbacher (in progress).

2005-2006 Assessment Methods

ClassTech staff again surveyed faculty teaching in classrooms supported by ClassTech at the end of both fall and spring. The survey instruments were revised somewhat to incorporate questions related to the assessment model. In fall 2005, of the 535 instructors assigned to the 54 ClassTech-supported classrooms (see http://www.ncsu.edu/classtech/classrooms/ for a list of rooms), 151 responded to the survey for a 28% response rate. In spring 2006 there was a 34% response rate with 175 of the 511 instructors completing the survey

A focus group with key staff providing technical support in the classrooms revealed support and maintenance successes and challenges as did a review of problem call tracking logs.

In the spring researchers interviewed 15 faculty and carried out detailed observations of at least one of their class sessions using an extensive rubric developed by several of the team members based on a revision of Bruce & Levin's (1997) divisions of activities engaged in when using educational technologies. We also collected and analyzed samples of student work based on the classes they observed to assess student learning. See http://www.ncsu.edu/classtech/survey_results/2005-06/ for links to the full report.

Assessment Questions

Based on previous years' research and the addition of new ClassTech Assessment Team members, the initial assessment questions were again modified somewhat in an attempt to better define our research goals.

Question 1: How does use of technology impact course's
- pedagogy,
- faculty workload,
- faculty attitudes,
- amount of material delivered?

Question 2: How does having the technology used in the classroom affect:
- use of class time and assigned coursework,
- how students learn (using LITRE defined outcomes),
- student achievement of course and program objectives?

Question 3: Are students, faculty and technical staff satisfied with the use of this technology in academic settings?

Question 4: What are the challenges of using technology in the classroom for students, faculty, and technical staff?

Findings from Faculty User Surveys

Technology's Impact on Course Pedagogy

The surveys conducted at the end of the fall and spring semesters incorporated a question for the first time related to faculty's use of technology for 10 pedagogical purposes adapted from Bruce and Levin's (1997) taxonomy of technologies for learning (Table 1).

Table 1: Media use and the learning tasks and activities that are associated with them, adopted from Bruce and Levin (1997)

Media Use	Learning Tasks and Activities
Inquiry	• *Theory building — technology as media for thinking*: Model exploration and simulation tools, visualization software, virtual reality environments, data modeling (defining categories, relations, representations), procedural models, mathematical models, knowledge representation (semantic network, outline tools), knowledge integration. • *Data access — connecting to the world of texts, video, data*: Hypertext and hypermedia environments, library access and ordering, digital libraries, databases, music, voice, graphics, video, data tables, graphs, text. • *Data collection — using technology to extend the senses*: Remote scientific instruments accessible via networks, microcomputer-based laboratories (with sensors for temperature, motion, heart rate), survey makers for student-run surveys and interviews, video and sound recording. • *Data analysis*: Exploratory data analysis, statistical analysis, environments for inquiry, image processing, spreadsheets, programs to make tables and graphs, problem-solving programs.

Media Use	Learning Tasks and Activities
Communication	• *Document preparation*: Word processing, outlining, graphics, spelling, grammar, usage, and style aides, symbolic expressions, desktop publishing, presentation graphics. • *Communication — with other students, teachers, experts in various fields, and people around the world*: Electronic mail, asynchronous computer conferencing, synchronous computer conferencing (text, audio, video), distributed information servers, student-created hypertext environments. • *Collaborative media*: Collaborative data environments, group decision support systems, shared document preparation, social spreadsheets. • *Teaching media*: Tutoring systems, instructional simulations, drill and practice systems, telementoring.
Construction	• Control systems — using technology to affect the physical world, robotics, control of equipment, computer-aided design, construction of graphs and charts.
Expression	• Drawing and painting programs, music making and accompaniment, music composing and editing, interactive video and hypermedia, animation software, multimedia composition.

In a review of National Science Foundation Applications of Advanced Technologies funded in 1996, Bruce and Levin (1997) found that seventy out of seventy-three of the projects focused on technologies that facilitate inquiry and communication, that three of the projects involved technologies for construction, and that none of the projects involved media for expression. This is not entirely surprising given the 1997 date of the research and most likely continues to represent the state of educational technology development and use in online learning environments.

Our faculty were asked in both the fall and spring surveys how frequently they used technology to carry out each of these teaching methods (Table 2 and Table 3). By far the most frequent use of the technology was to communicate information to students (via presentation software, through accessing web content, showing illustrations using the document camera, etc.), with 78% in the fall and 88% in the spring indicating they used the technology for this at least some of the time. This finding is supported by Butler and Sellborn (2002) who surveyed 125 faculty at Ball State University and found that faculty proficiency was highest in terms of presentation and graphics software use in the classroom. The second most frequent use of the technology was to access data (digital libraries, datasets, music, images, etc.), with 48% in the fall and 60% in the spring using technology for this at least some of the time. (Figure 1)

Table 2: Fall 2005 -- How often did you or students in your class use the equipment in the ClassTech room to do the following?

Category of Use	Most or All	Sometimes	Rarely	Never	Total	n =
To build theory (i.e. data modeling, visualization software, simulations)	10%	21%	12%	57%	100%	145
To access data (i.e. to gain access to digital libraries, databases, music, images)	11%	37%	13%	39%	100%	147
To collect data (i.e. to gather real-time data, to record sound/video)	1%	7%	13%	79%	100%	145
To analyze data (i.e. spreadsheets, statistical analysis, problem-solving programs)	6%	22%	15%	56%	100%	142
To prepare documents (i.e. desktop publishing, presentation graphics, word processing)	4%	13%	11%	72%	100%	141
To communicate information (i.e. e-mail, information display using PowerPoint or document camera)	61%	17%	5%	18%	100%	147

Category of Use	Most or All	Sometimes	Rarely	Never	Total	n =
To facilitate collaboration (i.e. collaborative data environments, shared document preparation, group decision support systems)	4%	11%	12%	73%	100%	144
To tutor (i.e. tutoring systems, instructional simulations, drill and practice systems)	8%	8%	9%	75%	100%	146
To construct (i.e. construction of graphs and charts, robotics, computer-aided design)	1%	8%	7%	84%	100%	144
To express or perform (i.e. drawing and painting programs, music composing, interactive video and hypermedia, multimedia composition)	3%	8%	12%	77%	100%	145

Table 3: Spring 2006 -- How often did you or students in your class use the equipment in the ClassTech room to do the following?

Category of Use	Most or All	Sometimes	Rarely	Never	Total	n =
To build theory (i.e. data modeling, visualization software, simulations)	15%	21%	20%	44%	100%	172
To access data (i.e. to gain access to digital libraries, databases, music, images)	16%	44%	16%	23%	100%	171
To collect data (i.e. to gather real-time data, to record sound/video)	3%	12%	22%	62%	100%	170
To analyze data (i.e. spreadsheets, statistical analysis, problem-solving programs)	7%	26%	22%	45%	100%	172
To prepare documents (i.e. desktop publishing, presentation graphics, word processing)	5%	15%	18%	61%	100%	169
To communicate information (i.e. e-mail, information display using PowerPoint or document camera)	73%	15%	3%	9%	100%	172
To facilitate collaboration (i.e. collaborative data environments, shared document preparation, group decision support systems)	7%	14%	19%	60%	100%	171
To tutor (i.e. tutoring systems, instructional simulations, drill and practice systems)	6%	19%	16%	59%	100%	168
To construct (i.e. construction of graphs and charts, robotics, computer-aided design)	4%	13%	17%	66%	100%	166
To express or perform (i.e. drawing and painting programs, music composing, interactive video and hypermedia, multimedia composition)	8%	14%	13%	65%	100%	169

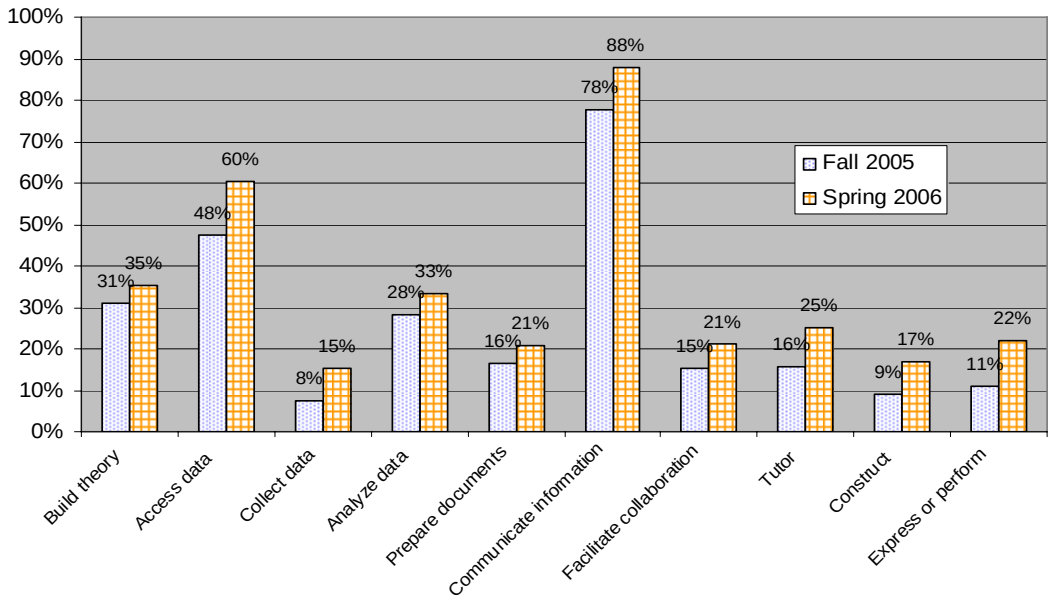
Using technology to communicate information and to access data during the course could be considered among the most basic pedagogical methods, so it's not too surprising they were the most common. Certainly there are many variables that would play into why an instructor incorporates specific teaching methods into their course, not the least of which is the appropriateness for the subject matter being taught. Might the results also indicate that faculty feel they do not have the time

to incorporate more sophisticated teaching methods? Lack of time is one of the primary reasons given in the initial LITRE faculty survey as an inhibitor of increased technology use in the classroom (2003). Potentially to some degree it is a case of "that's the way it's always been taught" and faculty aren't aware of other options. Or, might there be a sense that the additional effort needed for incorporating more sophisticated methods is not worth the payoff in improved student learning?

One interesting factor that had been included in earlier studies but was not this year, would be to control for the number of years the course was taught using technology. Do those who have taught using technology use more sophisticated teaching methods that may help promote deeper levels of learning?

Another interesting note is the increase in reported use of all pedagogies from fall to spring. Since this is the first year these questions were asked, responses can not be compared to previous years. There was also a jump between fall and spring in the percentage of respondents reporting they used the in-room computer in most or all of their classes (51% in the fall, 64% in the spring). More details on equipment usage are included below. One possible explanation for both of these increases could be that faculty who planned to use technology in their classes were assigned to ClassTech rooms more effectively in the spring. Registration and Records has been improving communication with scheduling officers and has made scheduling faculty who really need the technology into ClassTech rooms a priority. Additional comparisons between those requesting and not requesting instructional technology are in the section on Intentional Use of ClassTech Rooms.

Figure 1: Used Technology for this Pedagogy in Most or All Classes or Sometimes



Comparing Teaching With and Without Technology

The survey results from this year again indicate that the majority of faculty felt they could cover course material in greater depth when using in-room technology than teaching similar courses without

the technology (Table 4). Respondents were more evenly split on whether the technology changed the pace of the course (Table 5), covered a greater variety of topics (Table 6), or involved students more in the learning process (Table 7). However, the split was between whether the pace, variety and student involvement was improved compared to staying about the same. Based on fall results, the variable that technology seemed to potentially inhibit the most was student involvement in the learning process, though even here only 6% in the fall and then 3% in the spring indicated students were less involved. Slightly more than 44% in the fall and almost 48% in the spring felt the technology allowed their students to be more involved. One could surmise that the teaching methods employed with the technology would play heavily into whether the technology helps or inhibits student involvement.

Table 4: "How does the **depth of the material** covered in this course in a ClassTech room compare to the same or similar course taught in a room without instructional technology?"

	Fall 2005		**Spring 2006**	
	Freq	Percent	Freq	Percent
Less depth	3	2.1	5	3.0
About the same	65	45.1	65	38.0
Greater depth	76	52.8	101	59.1

Table 5: "How does the **pace** of this course in a ClassTech room compare to the same or similar course taught without instructional technology?"

	Fall 2005		**Spring 2006**	
	Freq	Percent	Freq	Percent
Slower pace	5	3.4	8	4.7
About the same	66	45.2	73	42.7
Faster pace	75	51.3	90	52.6

Table 6: "How does the **variety of topics** covered in this course in a ClassTech room compare to the same or similar course taught in a room without instructional technology?"

	Fall 2005		**Spring 2006**	
	Freq	Percent	Freq	Percent
Less variety	1	.7	5	3.0
About the same	71	49.65	81	47.9
More variety	71	49.65	83	49.1

Table 7: "How much are your students **involved in the learning process** in this course compared to the same or similar course taught without instructional technology?"

	Fall 2005		**Spring 2006**	
	Freq	Percent	Freq	Percent
Less involved	8	5.6	5	2.9
About the same	72	50.3	84	49.1
More involved	63	44.1	81	47.7

Examples of technology use and impact on student learning

For the spring survey faculty were again asked to provide their best example of how they used instructional technology in the course and what impact it had on student learning. The tool most frequently cited in the examples provided was the in-room computer (102 out of 170 responses). The document camera and laptop hooked into the system were each used in 25 of the examples and the

VCR/DVD combo was cited 12 times. Three respondents indicated they did not use any of the technology and one example was the use of the marker board.

When asked what impact their use of the technology in the example they provided had on student learning, by far the greatest number of open ended responses cited the ability the technology provided for students to be able to visualize the material being covered. When coded, almost 43% of respondents mentioned something about visualization. Rather than just lecturing or discussing the material, illustrations could be provided. In some cases these were static representations of concepts, theories, models or physical items. In other cases the visualizations came through animations or recordings of the phenomena being considered. Some of the comments regarding visualization were merely that it would be impossible to show some things in larger class sections without the aid of the projection system.

Less often, but still a significant number of times (about 34%) faculty mentioned something about the students' ability to comprehend the material. Most of these comments indicated the perception that students got a better grasp of the material through the use of technology. The following quotes are illustrative: "Students [were] better able to understand material and see examples of discussion material." And, "I hope they gained deeper understanding of how scientific ideas are received in society." In three cases, however, respondents felt the use of technology may not have had any impact on what students learned.

Almost 18 percent of the respondents included something about how the technology helped them organize the material or course work. One example: "I provide 80% of the lecture notes to the students before each class. Then, during class they 'fill-in' the remaining 20%. This allows them more time to listen and hopefully learn the material." And this example regarding an instructor demonstrating the use of an online virtual lab applet: "Since the students were able to see what they'd be doing out-of-class, many student questions were addressed right away in class prior to them attempting the exercise on their own."

Approximately 10 percent mentioned something in their open-ended response about active learning. For example, one instructor used the computer to project not only PowerPoint notes, but also in-class assignments that "promoted group discussion and interactions between students." Other illustrations pointed to students actively using the technology to give in-class presentations to their classmates.

A handful of examples, about 4 percent, included something about using the technology to compare and contrast—a higher order task. One instructor cited the use of technology for students to present their design projects, including computer simulations, to industry judges. In this process, "most presentations included simulations, and animations, of 'before and after' analysis."

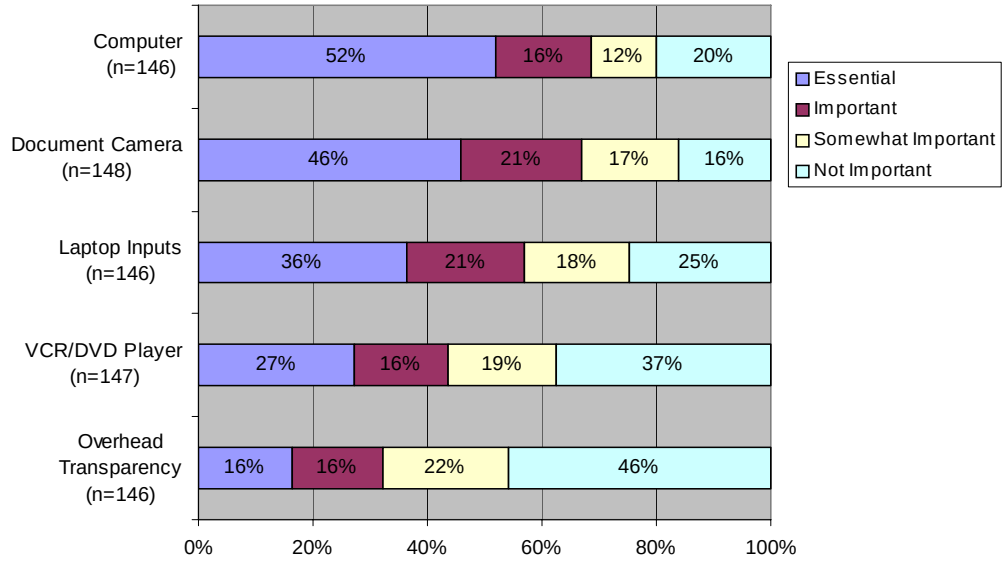
Very few of the open-ended responses provided a direct connection to improved student achievement. One exception was the following, "On exams, students did better on questions that had been illustrated than on those that were not." This example says more concretely what many faculty likely hoped was taking place through their use of visualizations.

Several faculty gave their use of a classroom response system (clickers) as their example of best use of technology. The most frequent benefits mentioned were increased student participation and the instructor's ability to readily determine whether students were comprehending the material being covered. At least one respondent had intended to use the system more extensively, e.g. grading or class attendance, but was not successful on that front.

Importance of the Technology for Teaching

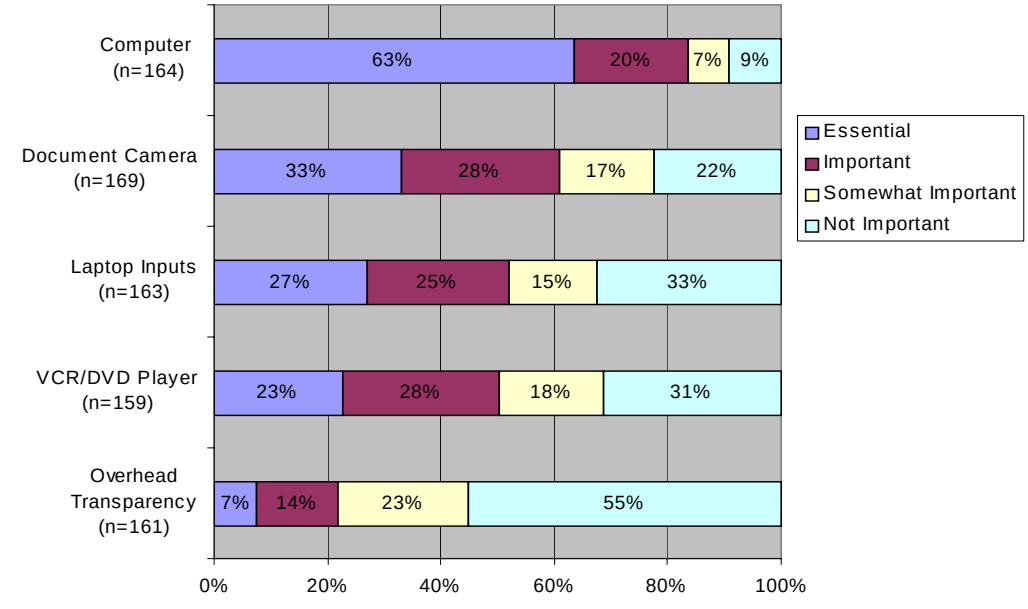
The importance faculty placed on the technology provided varied considerably among available devices. The in-room computer was seen as the most important, followed by the document camera, laptop inputs, VCR/DVD player and overhead transparency projector. Figure 2 shows results for the fall and Figure 3 for the spring. There was quite a bit of variation between semesters in responses, with significant growth between fall and spring in the percentage saying a computer was essential (52% in the fall and 63% in the spring). On the other hand, the percentage saying a document camera

Figure 2: Fall 2005 "How important are these technologies to teaching your course?"



was essential declined in the spring from the fall (46% in the fall and 33% in the spring).

Figure 3: Spring 2006 "How important are these technologies to teaching your course?"



Overall, at least 50% of respondents indicated that the computer, document camera and laptop inputs were either essential or important to the teaching of their course. While the DVD/VCR player was considered essential or important for 43% of the respondents in the fall, that percentage climbed to 51% in the spring.

The overhead transparency projector continues to decline in relative importance, likely in large part because the document camera can also be used for transparencies but also provides much more flexibility with the materials that can be used with it. One respondent stated, "The document camera opens vast new opportunities to make learning visual."

At least one instructor commented that she still used the transparency projector, but it was on the second screen in the room in conjunction with the other technology. This allowed her to easily alternate between what was being projected digitally and via the transparencies.

In other comments, a number of faculty pointed out the need for backups. E.g. if the computer didn't work, they could use a laptop or the document camera. Overhead transparency projectors were seen increasingly as a fall back, but to at least one instructor a very important back up resource.

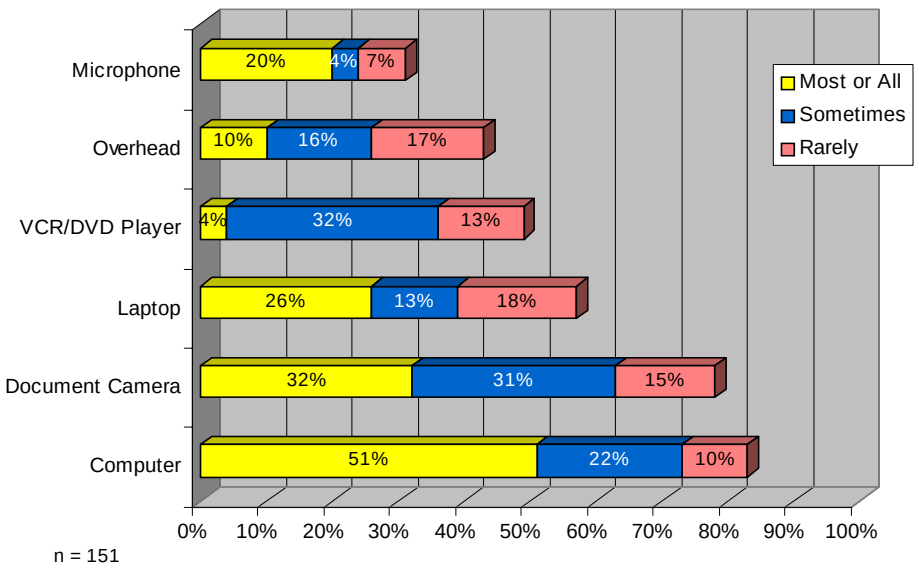
A frequent comment from faculty was the lack of board space when the screen is down, making it more difficult to transition between the two. Some of the classrooms are small and have limited board space to begin with. In some cases the screen is in the middle of board, leaving smaller sections of board on either side. Where sight lines make it possible, ClassTech tries to locate screens to one side of the teaching wall, however, there are many times when that is not feasible. Clearly, even with the importance many faculty place on access to technology, they also expressed the need for multiple writing surfaces.

In many cases, the basic classroom technology ClassTech provides in its rooms are seen as the new minimum standard for teaching. "These technologies are now the baseline for how I prepare courses. I assume at least this much, and to innovate in education I look for new ways to go beyond what's there already, or to use existing tech in new and novel ways."

Frequency of Equipment Usage

Not surprisingly, the importance faculty place on a particular type of technology is highly correlated to how often that equipment is used. Again, the computer was used most frequently, followed by the document camera, laptop input, DVD/VCR player and overhead transparency projector. (See Figure 4 and Figure 5.) There has been an increase since the spring 2004 survey in percentage of respondents indicating they use the in-room computer in most or all of their classes, from 41% up to 64% in spring 2006. Those who used a laptop in all or most all of their classes declined from fall to spring from 26% to 17%, while those who said they sometimes used it increased from 13% to 21%.

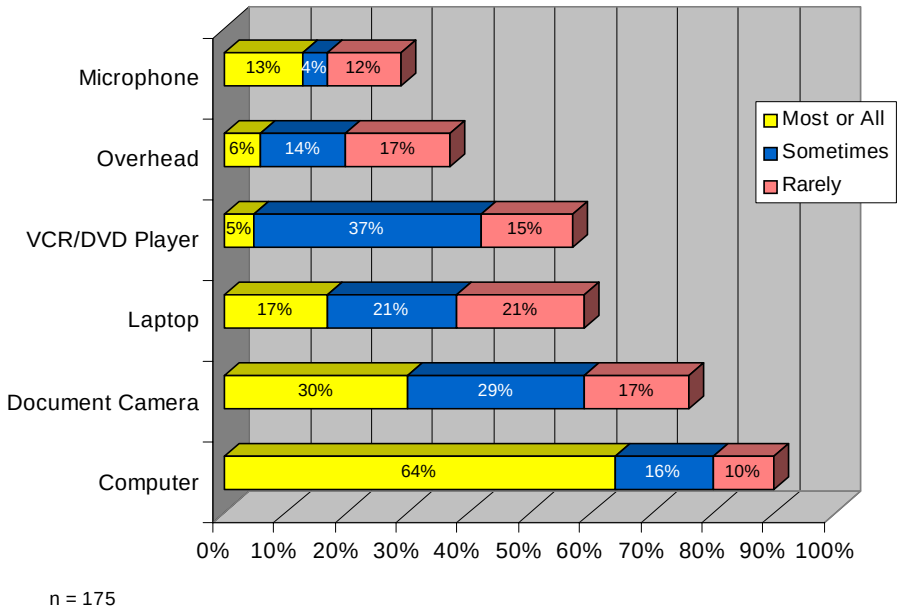
Figure 4: Fall 2005 "How often did you or students in your class use the equipment in the ClassTech room?"



Most respondents were very pleased with the availability of the technology. Several comments indicated they would incorporate the use of the technology more into their courses and use the equipment more often if they knew they would be assigned to a technology-enhanced classroom. Those who do have reliable access to these rooms may do more with it. Several provided comments such as, "Since I have been lucky enough to have access to multimedia/wired classrooms during the past 4 or 5 years, my instruction is built around this access. Without it, I have to prepare entirely different lesson plans." One faculty member said he does not use technology because colleagues who invested the time in making digital materials "but were kicked out so that the room could be used by a larger, non-using class."

Most faculty indicated they have access to a laptop, either because they own it or it is assigned to them (69% in spring) or it is shared or can be checked out as needed (12% in spring). Even with the

Figure 5: Spring 2006 "How often did you or students in your class use the equipment in the ClassTech room?"



n = 175

high access to laptops, the convenience of not having to bring a computer ranked high in importance of having an in-room computer available. The availability of a laptop connection for instruction consistently ranks behind the availability of an in-room computer and document camera in importance and survey comments continue to note faculty's preference for using the computer rather than their own laptop.

Intentional Use of ClassTech Rooms

In the fall survey about half of the respondents (76 out of 149) said they had not specifically requested use of a room with instructional technology; however, it was clear from the results that most of the respondents made significant use of the technology. It is probably safe to assume many were expecting a room with technology even if they had not explicitly requested it. The question was changed in the spring to ask, "Did you *or your scheduling officer* request a classroom with instructional technology for your course?" and the number of those who responded negatively shrank to below 25 percent (41 out of 168). Maybe an even better way to ask the question in future surveys is, "Were you expecting to be teaching in a classroom with instructional technology?"

Comparisons were made between responses of those who said they asked for a room with instructional technology and those who had not. Both the fall and spring survey results indicated those who requested technology rooms were more likely to use the technology to access data and to communicate information than those who did not request a room.

Reports on the impact classroom technology had on teaching their course also showed a difference between who had and had not requested technology (Table 8). In both fall and spring, faculty requesting technology said the depth of material covered was greater, and students were more involved when using technology in the classroom. Fall results showed a difference in the perceived pace of the course. In the spring, there was a perceived difference in the variety of topics covered in the course.

Table 8: Comparisons of teaching course with and without technology among those who requested classroom technology and those who did not

Fall 2006	Requested Room (Mean)	Did Not Request Room (Mean)	T-test Significantly Different $p < .05$	Spring 2006	Requested Room (Mean)	Did Not Request Room (Mean)	T-test Significantly Different $p < .05$
	n=73*	n=76*			n=127+	n=41+	
pace of course	**2.5**	**2.4**	0.016	pace of course	2.5	2.4	
variety of topics	2.5	2.5		**variety of topics**	**2.5**	**2.3**	0.023
depth of the material	**2.7**	**2.3**	0.0005	**depth of the material**	**2.6**	**2.4**	0.033
involvement of students in the learning process	**2.5**	**2.3**	0.016	**involvement of students in the learning process**	**2.5**	**2.2**	0.002

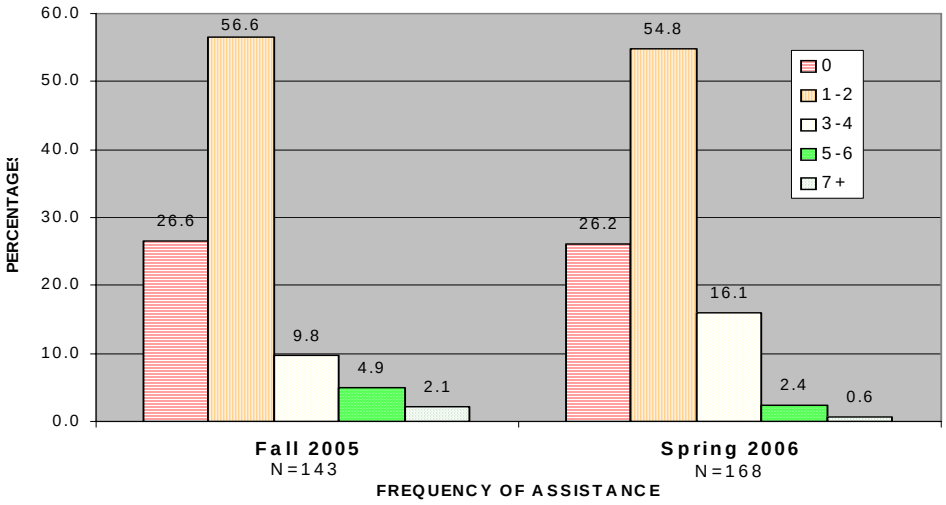
* In the fall faculty were asked "Did you specifically request a classroom with instructional technology?"
+ In the spring faculty were asked "Did you or your scheduling officer request a classroom with instructional technology for your course?"

Those in the spring who said they or their scheduling officer *had* asked for a room with technology were significantly more likely to feel having a computer in the room was important (M = 3.5), than those who had *not* specifically requested technology (M = 2.8), $p < .001$. Interestingly, in the fall survey, those who had not requested technology were more likely to say having an overhead transparency projector was important (M = 2.2), than those who had requested technology (M = 1.8), $p = .015$.

ClassTech Support and Maintenance

About 75 percent of respondents in both fall and spring indicated they had sought assistance from ClassTech or the NCSU Help Desk at least once. While the percentage of those who said they never requested Help Desk or ClassTech help and those who asked for it only once or twice remained fairly steady between fall and spring, there was an increase in the number who said they requested assistance three or four times, from 10% in the fall to 16% in the spring and a decrease in those requesting help five or more times from 7% in the fall to 3% in the spring (Figure 6).

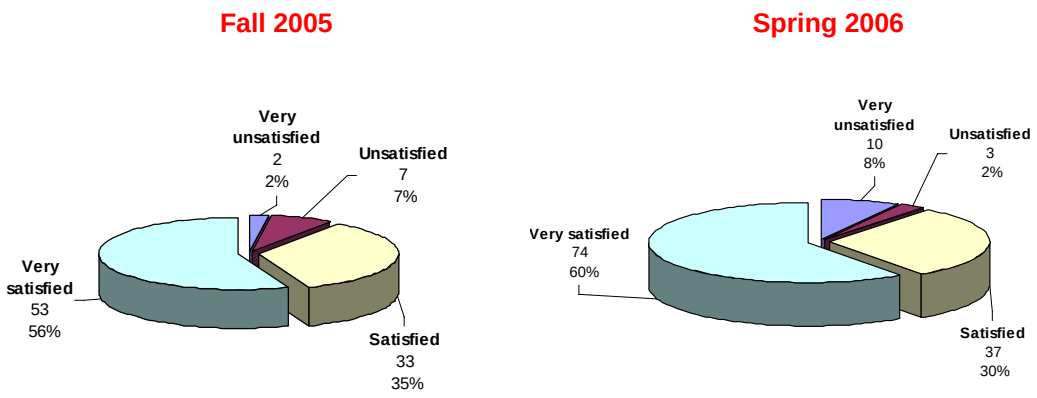
Figure 6: How often did you seek assistance from the Help Desk or ClassTech staff?



Of those who did request help from ClassTech or Help Desk staff, at least 90% were satisfied or very satisfied with the help they received (Figure 7). This is up slightly from spring 2005 when 87% were either satisfied or very satisfied, however, a t-test did not show it was a significant difference.

In the spring survey ten respondents who said they requested help from ClassTech or Help Desk staff indicated they were very unsatisfied with the help they received. This was a troubling number since in earlier surveys there were never more than two respondents indicating they were very unsatisfied. Examining the individual responses, however, provided at least some solace but potentially added to the confusion. At least three of the ten responded to open ended questions praising the quality of ClassTech help. One said, "This was the first year that I used the phone reporting system for ClassTech help. It was very effective. The response time was good and the personnel were courteous." And another was even more effusive in his praise: "Class tech was very responsive to my requests, and on more than one occasion provided support that was vital to that day's lecture topic. I was very impressed with Class Tech's ability to quickly and effectively respond to technical difficulties and/or ignorance on my part regarding the operation of certain components of the class technical infrastructure."

Figure 7: Satisfaction with support from NCSU Help Desk or ClassTech staff



Faculty were also asked whether they requested help from students, colleagues or someone else. They asked for help much less frequently from these sources, and were either as satisfied or less satisfied with the assistance they received (Table 9).

Table 9: Overall satisfaction with the help received from various sources

	Fall 2005			Spring 2006		
Source of help	N	Mean Satisfaction	Std Dev	N	Mean Satisfaction	Std Dev
ClassTech / Help Desk	95	3.4	0.7	124	3.4	0.9
Colleague	29	3.4	0.9	37	3.2	1.0
Student	37	3.3	0.7	59	3.1	0.7
Other	3	3.0	1.0	8	2.5	1.3

A support-related question in the survey explained ClassTech's goal to respond to classroom technology issues within 10 minutes of receiving a call. Faculty were asked what they feel is an appropriate response time. Of the 169 responding, 29% felt 5 minutes was appropriate, 54% agreed 10 minutes was appropriate, 7% felt 15 minutes was adequate, 4% felt it was okay to wait until the class break, and 7% said "Other" with responses ranging from "instant if something isn't working" to variations on "it depends on the problem." It is clear there is an expectation that staff will respond quickly. Comments as well as experience have shown that some faculty do not want to be disturbed during a class. These faculty generally also don't report the problem until after their class which causes staff to either have to interrupt the next class or that section also loses the opportunity to use the technology that isn't working.

Technical Support Staff Focus Group and Problem Log Review

Conversations with the ClassTech support staff show a strong desire to continually refine procedures to provide the best service and support as efficiently as possible.

According to staff and call data, computers continue to be the largest consumer of support resources. This is not surprising since they are the most sophisticated piece of equipment and are used the most frequently (behind the actual data projector, which is at the heart of the systems installed in the rooms). A run of poorly made computer system boards caused some headaches at the end of last year and the beginning of this academic year, but since these have been replaced fewer issues have been detected.

Persistent issues with document cameras that had been a significant problem last year have been resolved since most of the defects have been repaired by the manufacturer under warranty service.

Increased attention and supply of batteries in rooms with microphones has led to a decrease in calls related to dead batteries in microphones.

To reduce the need for batteries, staff have removed wireless keyboards and replaced them with wired keyboards. Faculty have indicated and support staff observed that the wireless mouse is the critical component for remote use and that the keyboards were not being used as a portable device.

In response to complaints that the adjustable keyboard trays were difficult to use, staff have removed most of them out of classrooms. A couple of them were left at the request of a few faculty.

The largest strides in ClassTech support have come in the development of improved processes for the support of classrooms. This includes increased staff documentation and follow through of processes for swapping out equipment. Staff have also spent a lot of time discussing roles and responsibilities regarding the support of classrooms. The goal is that no more than two part-time staff are involved in any one call. If two part-timers can not resolve a call, it will immediately be escalated to Tier II full time staff. Tier II & III staff are available for consultation on issues that arise.

ClassTech has spent significant resources organizing and equipping the warehouse space and cargo vans appropriately as well as implementing processes to ensure these continue to operate efficiently. This allows staff to respond more quickly to requests for assistance and have a greater likelihood of resolving hardware issues if they arise.

Significant development time has gone into improving the ClassTech Room Check application and smaller tools that surround it such as the Email Manager. This has allowed a more structured and organized preventative maintenance schedule plan, reducing the number of calls. It has also become easier to track issues in rooms through the integration of the Room Check application into Remedy, the problem tracking system.

Conclusions

The overall conclusions of the ClassTech Assessment Team that have been drawn from reviewing the above survey and technical support results as well as the ClassTech Observation Study have been pulled together in a separate document. All of the documents surrounding the ClassTech research performed during the 2005-06 academic year may be found online at:
http://www.ncsu.edu/classtech/survey_results/2005-06/

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