

The Scholarship of Teaching: Classroom Research at KU

*Teaching and Learning
in Large Classes at KU*

Fall 2001

A study for the faculty of the University of Kansas
from the Center for Teaching Excellence

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Foreword

The Scholarship of Teaching: Classroom Research at KU is an annual publication that shares with the university community research that examines issues related to instruction. The task was undertaken because we believe that classroom research leads to improved practice. This third edition is focused on student and instructor satisfaction in large classes at KU. Whether we teach small or large classes, the findings of this study have implications for all instructors. We hope you find that the results of this study reaffirm your beliefs about teaching large classes, as well as learn new insights into the instructional dimensions involved in such settings.

How does scholarship lead to improved practice? First, it creates a climate on campus for the serious discussion of teaching and learning, and it meets the intellectual challenges of teaching through continuing study and investigation. Faculty need more than just awareness of what they and their students should do. They need to assess impacts that will very likely result in challenges leveled against long-standing assumptions and practices. Second, a scholarly approach to instruction encourages active inquiry about teaching and learning. When it comes to learning in our disciplines, we thrive. We do what the literature proposes as ideal: take charge of our learning. Studying teaching can help us thrive in our classrooms.

I want to express sincere appreciation to the instructors who so willingly provided us the opportunity to survey their classes during a busy time of the semester. Also, to the instructors who responded to our survey (60 percent return rate)—without your input and perspective, this study would not have been as complete and meaningful. Thank you.

One of CTE's goals is to continue to encourage and support colleagues who wish to contribute to the scholarship of teaching at KU. I am mindful of the enormous contribution classroom teachers can make to the practice of teaching, especially their own but also that of their colleagues. This publication is one effort to initiate interest in the scholarship of teaching.

Fred Rodriguez, Director
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INTRODUCTION

Large classes present a special challenge for higher education institutions, for those who teach them, and for those who enroll in them. A growing body of research points to the value of undergraduate learning environments that set high expectations, promote active and interactive learning, and give students personal validation and frequent feedback on their work. At a time when much has been written and discussed about undergraduate instruction, the return to large classes may appear to be an anomaly.

Today, a growing number of higher education institutions are using the large-class environment. At KU, like many campuses, an increasing number of classes are now regularly enrolling from 100 to 700 students. (In a few instances there are courses with nearly 1,000 students enrolled at KU.) The reasons for offering large classes vary but primarily are based on economic or resource issues rather than on pedagogical issues.

For many years, researchers have studied the effects of class size on teaching effectiveness and student learning. Although this research has yielded conflicting results and few definitive answers, one point is clear: large-class instruction is a complicated process that affects numerous instructional dimensions in the classroom. Sorting out those dimensions and getting a clearer understanding of their complex interactions is the focus of this study.

Class size and instructional dimensions

Teaching is a complex process. Whether one is teaching in a small- or large-class setting, the teaching-learning process produces complex interactions among the instructor, students, content, and context—creating a host of interacting dimensions. Class size poses the potential for complicating these interactions through imposing constraints on content and physical space. For example, class size affects student-instructor interaction or the type of instruction methods employed. Although the dimensions are the same whether a class is large or small, the ways they are adjusted may account for the differences between small and large classes.

This study begins to examine these interactions by assessing students' and instructors' perceptions of important instructional dimensions in the large class setting. By having students and instructors provide insight about the effectiveness of large classes (what is helpful and what is not in the teaching-learning process), we hope to provide the KU community information that is most helpful and informative in understanding the large class experience for both students and instructors.

Class size and student achievement

The question of class size was one of the first college teaching problems

approached by research. Are small classes really more effective for student learning than large classes? The common perception has generally been "yes." However, the research offers no single answer.

Among the first investigators of class size and student achievement were Edmondson and Mulder (1924), who compared the performance of students enrolled in a 109-student class with students enrolled in a 43-student class of the same education course. They found the achievement of the two groups was approximately equal, with a slight edge for the small class on an essay and the mid-semester tests, and for the large class on quizzes and the final examination. A number of similar experiments over the next five decades generally supported these findings.

However, the Macomber and Siegel experiments at Miami University in the late 1950s and early 1960s are notable because their measures included, in addition to conventional achievement tests, measures of critical thinking and problem solving, scales measuring stereotypic attitudes, and tests of student attitudes toward instruction. They found statistically significant differences that favored the smaller classes, particularly for high-ability students. When retention of knowledge was measured one to two years after completion of the courses, small differences favored smaller classes in eight of the nine courses compared (Siegel, Adams, & Macomber, 1960). A more recent meta-analysis of research on class size also tends to support small classes (Kulik & Kulik, 1989).

Class size and instructional method

Class size may also affect the instructional methods employed in teaching. One recent study has shown that "extensive lecturing ... was the pedagogical technique most often utilized in the classrooms of [first year] students" (reported in Newman & Scurry, 2001), and a large class size surely encourages the use of lecturing. However, the use of lecturing ignores some proven problems with the method. Penner (1984), Verner and Dickson (1967), and others have noted that time on task (paying full attention) with the lecture method is high for the first 10 to 20 minutes, then tends to drop until near the end of the class when attention picks up in anticipation of the end. The thoroughness of student note-taking reflects similar changes over the course of the lecture (Gardiner, 1994). The literature on retention of course content presented via lecture is even more troubling. Gardiner reports research that indicated that students retain 42 percent of lecture content when assessed immediately after the presentation; this dropped to 20 percent a week later.

Class size also affects instructor attitudes. Kuh, Schuh, and Whitt (1991) reported on a *compact of disengagement* between instructors and students. In effect, instructors in large-class environments often send the

message, "You leave me alone and I will leave you alone." Large classes, by their very nature, too often set up a distance between instructors and students, where more often than not the faculty member does not know the students personally and vice versa.

In a similar way, students may feel less responsible or accountable in a large class. Too many attend irregularly. Studies suggest that large lecture attendance dwindles throughout the semester and is often down to 30 to 40 percent by the end of the term. Why don't students attend large classes as often as smaller ones? One reasonable cause is that in many large classes, note-taking services have sprung up as a lively businesses, or instructors themselves place all lecture notes and supporting materials online. If students believe they are not learning much by going to class, they will likely miss it. This is supported by a study of student perceptions of large college classes (Wulff, Nyquist, & Abbott, 1987); the researchers concluded, "Foremost among the dimensions of large classes that hindered students' learning was the lack of instructor-student interaction and opportunities for questions and discussions."

Class size and student and instructor satisfaction

Class size affects both student and instructor satisfaction, but most research on the topic focuses primarily on the student rather than the instructor. A recent study conducted by Carbone and Greenburg (1998) at the University of Maryland yielded an overall general dissatisfaction with the quality of large-class learning experiences. Their random sampling of students revealed what troubled them the most:

- Lack of interaction with faculty members (in and out of class)
- Lack of structure in lectures
- Lack of or poor discussion sections
- Inadequate contact with teaching assistants
- Inadequacy of classroom facilities and environment
- Lack of frequent testing or graded assignments

Only 25 percent of the students agreed with the statement "The size of the class does not affect my ability to learn," whereas 15 percent disagreed and another 41 percent strongly disagreed.

On the other hand, research by Wulff, Nyquist and Abbott (1987) identified four categories of general satisfaction of large classes expressed by students:

- Presence of lots of other students (e.g., "more people to get to know, to study with, to talk to, to have fun with, to compare notes with")
- Lack of pressure in class to be called on or to attend
- Sense of independence and self-reliance

- Variety of attendance options

How to improve large classes

There is little consensus on how to improve large classes. Some contend that the large class, "tell them and test them" structure is ineffective and should be replaced in favor of smaller, more intimate classes. Others argue that as long as the reward system favors research, there will be little incentive to improve large class teaching. Other faculty may blame the students enrolled in such courses—for their disengagement, lack of maturity, motivation, or skills for learning in these environments. Others still are resigned to the reality that large lower-division classes will always be needed to subsidize upper-division and graduate ones, and they believe the answer lies in more charismatic lectures, electronic technology, or both.

Meanwhile, in recent years, a growing number of college teachers have quietly been transforming their large-class settings to make them more academically and socially involving for their students. These teachers share an assumption: they believe that deeper engagement and more lasting learning arise from the active use of the concepts of the class, the construction of one's own knowledge and meaning, and the creation of a student community—right in the moment—during the class itself. Even though they are dealing with these large class enrollments, these faculty members are continually working to develop ways to increase student involvement and active learning, raise expectations, and increase feedback. Several are teaching here at KU.

The insights from examining students' and instructors' perceptions suggest that it is useful to incorporate students' interpretations in our efforts to understand the teaching-learning process in the large class context. The students' perceptions reinforce our assumptions that teaching is a complex process that requires balancing a variety of instructional dimensions. Although we know that the instructor is ultimately responsible for decisions about course content, objectives, use of class time, and evaluation procedures, we are convinced that knowing how students perceive large classes can assist in the decision-making process. We believe that instructors who have a more informed understanding of how students interpret their large-class experience can adjust a number of instructional dimensions to enhance the learning process in large classes for both themselves and their students.

Research questions

For both students and instructors in large classes (defined as 100 or more students), we asked the following questions:

1. In general, what is the satisfaction in taking or teaching a large class?
2. What factors enhance or inhibit the effectiveness of student learning in large classes?
3. What factors enhance or inhibit the effectiveness of instructor teaching in

large classes?

4. What teaching methods are most and least effective for student learning in a large class?

METHODOLOGY

We collected data from students and instructors during the spring 2001 semester. First, to determine the parameters of our survey, we asked 50 students in a multi-section basic social science course that included a research participation requirement to complete an open-ended questionnaire designed to solicit information about their perspectives and experiences as students in large classes (see Appendix A). Likewise, we asked 11 randomly sampled current instructors of large classes to complete a similar open-ended questionnaire designed to solicit information about their perspectives and experiences as instructors in large classes (see Appendix B).

Using the results of the initial questionnaires, we created two surveys: the first completed during the end of the semester during a class meeting by 1,576 students enrolled in large classes (see Appendix C), and the second completed and returned by mail by 42 instructors of large classes (see Appendix D). The surveys included questions on teaching methods and technologies used in large classes, preferred instructional methods, level of satisfaction in large classes, personal information, and class information.

The surveys featured two types of questions. Students and instructors were asked both multiple choice questions and questions rating their attitudes to various statements scored 1 (strongly disagree), 2 (disagree), 3 (neither agree or disagree), 4 (agree), or 5 (strongly agree). For multiple choice questions, aggregate responses were reported as percentages; for attitude questions, aggregate responses were reported as averages.

Class characteristics

In the spring semester of 2001, KU offered 66 100- and 200- level classes with 20-day enrollments of 100 or more students. We randomly selected 11 classes, of which nine agreed to be surveyed at the end of the semester (a tenth class agreed to be surveyed, but scheduling precluded it). Table 1 shows the class characteristics of those surveyed.

Table 1: Class Characteristics
(n = 9)

Class type: Humanities 33.3%, Natural sciences 22.2%, Social sciences 22.2%, Professional 22.2%

Location: Budig Hall 55.6%, Robinson Center 22.2%, Smith Hall 11.1%, Wescoe Hall 11.1%

Final enrollment: Mean 303.1 students, Lowest 122, Highest 606

Attendance policy: Yes 22.2%, No 77.8%

Class web site: Yes 66.7%, No 33.3%

Discussion sections: Yes 33.3%, No 66.7%

Student characteristics

The nine classes selected to be surveyed had a total final enrollment of 2,718 students of which 1,576 students completed surveys (58%). Table 2 shows the student characteristics of those surveyed.

Table 2: Student Characteristics
(n = 1576; NR = No response)

Class: Freshman 44.0%, Sophomore 30.3%, Junior 14.4%, Senior 9.6%, Other 0.7%, NR 1.1%

Gender: Male 45.9%, Female 52.3%, NR 1.8%

Required course for the student: Yes 57.6%, No 40.4%, NR 2.3%

Number of large classes taken at KU (including current course):

One 4.8%, Two 11.0%, Three 18.6%, Four 20.3%, Five or more 44.0%

Instructor characteristics

In addition, we also sent the 70 instructors of the 66 large classes (four of the classes had two instructors) a similar survey of which 42 instructors responded (60.0%). Table 3 shows the instructor characteristics of those surveyed.

Table 3: Instructor Characteristics
(n = 42; NR = No response)

Rank: Lecturer 14.3%, Assistant professor 21.4%,

Associate professor 14.3%, Professor 47.6%, Other 2.4%

Gender: Male 64.3%, Female 33.3%, NR 2.4%

Number of large classes taught at KU (including current course):

One 19.0%, Two 7.1%, Three 4.8%, Four 7.1%, Five or more 61.9%

Attendance policy: Yes 35.7%, No 64.3%

Class web site: Yes 57.1%, No 42.9%

Discussion sections: Yes 66.7%, No 33.3%

RESULTS—STUDENTS

Teaching methods and technologies used in large classes and students' preferred instructional methods

When asked "Which teaching method helps you learn best?" 18.3% of students responded lectures, 14.0% responded class discussions, 5.1% responded small group activities, and 49.8% responded a combination of methods. However, when asked how often the instructor used the various methods, students responded, on average, that instructors lectured most of the time (1.13), led class discussions some of the time (2.06), and provided small-group activities none of the time (3.73).

When asked "Which type of test best measures your learning?" 27.9% of students responded multiple choice, 15.5% responded essay, 1.4 % responded true/false, 4.8% responded matching, and 49.8% responded combination of test types. However, when asked which type of test the instructor used most often, 69.7% responded multiple choice and 27.4% responded a combination of types.

When asked if they found it useful when an instructor used an overhead projector or PowerPoint during class, students on average agreed (4.18). This result corresponded with the average response to "How often does the instructor use an overhead projector or PowerPoint in this class?" of most of the time (1.24). When asked if they found it useful when an instructor used audio tracks, slides, or video clips during class, students gave an average response of agree (3.83). And, instructors used audio tracks, slides, or video clips during class some of the time (average response of students of 2.25). Students also found it useful when an instructor used a microphone during class (average response of students of 3.89). However, in practice, five instructors used microphones most of the time and four instructors used microphones none of the time. When asked if they found it useful when an instructor had a web site in conjunction with class, students gave an average response of agree (4.13). However, six of the classes surveyed had web sites and three classes did not have web sites. Surprisingly, 17.4% of students did not know if their class had a web site or not. Of the students in classes with web sites, 80.7% accessed the class web site more than three times.

Three of the nine classes surveyed had discussion sections. Those students in discussion sections in their class (483 students) agreed with the state-

ment, "Discussion sections help me understand the material in this class" (3.79). However, those students not in discussion sections in their class (1093 students) neither agreed or disagreed with the statement (3.13). In addition, those students also disagreed with the statement "Adding discussion sections to this class would help me understand the material presented in this class."

Level of satisfaction in large classes

Overall, student satisfaction with large classes was neither overly positive or negative. Students, on average, neither agreed or disagreed with the following statements: "I find it easy to ask questions in this class" (2.78), "I feel motivated to learn in this class" (3.20), "For this course, I prefer a large-class setting rather than a small-class setting" (3.06), and "Overall, I like large classes" (3.11). Students did respond positively to the following statements: "I like the attendance policy in this class" (3.63), "The noise level in this class disrupts my learning" (2.41), "I am satisfied with the quality of instruction in this class" (3.61), and "For this class, I receive prompt feedback on my class assignments and tests" (3.52).

Responses to the statement, "Overall, I like large classes" did not vary by gender: both male and female students neither agreed or disagreed with an average response of 3.09 for men and an average response of 3.13 for women. However, responses to the statement did vary by student ranking: an average response of 3.26 for freshmen, 3.06 for sophomores, 2.86 for juniors, and 2.96 for seniors. There was no correlation with class size.

The results of these questions were also correlated using the Pearson product-moment method with the results of the question, "Overall, I like large classes." See Table 4.

Table 4: Relationship between student satisfaction variables and overall satisfaction with large classes

Variable	Correlation
Attendance policy	0.222*
Asking questions	0.249*
Motivation to learn	0.310*
Noise level	-0.185*
Quality of instruction	0.315*
Large-class over small	0.602*

Prompt feedback

0.251*

(* = $p < 0.001$)

All of the correlations reached the $p < 0.001$ level of significance. Students who rated overall satisfaction with large classes highly also said they preferred having no attendance policy, felt asking questions in class was easy, felt motivated to learn, said noise levels did not disrupt their learning, felt satisfaction with the quality of instruction, preferred a large-class setting to a small-class setting for the current class, and received prompt feedback on assignments and tests.

Student attendance

~~Students were asked how many class sessions they attended during the course:~~
1.6% of students responded almost none, 2.8% responded one quarter, 5.3% responded half, 23.7% responded three quarters, and 65.2% responded almost all. Asked "Where do you usually sit in this class?" 28.6% of students responded front, 44.7% responded middle, and 24.7% responded back. Also, when asked, "Does the room arrangement allow you to see and hear clearly?" 89.3% of students responded yes, and 7.5% responded no.

Instructor office hours and interaction

When asked how many times they visited instructors' office hours, 1.7% of students responded three or more times, 4.0% responded two times, 7.2% responded once, and 83.2% responded never. Of those students who did visit office hours (233 students), 44.6% of students found the visit very helpful, 30.9% found the visit somewhat helpful, 18.0% found the visit slightly helpful, and 6.4% found the visit not at all helpful. When asked, "Does the instructor of this course know your name?" 8.8% of students responded yes, 75.1% responded no, and 14.3% responded I don't know.

Student grades

Students were also asked what grade they anticipated in the course: 35.9% of students responded A, 44.6% responded B, 16.3% responded C, 1.3% responded D, and 0.4% responded F. The results of this question were correlated using the Pearson product-moment method with satisfaction and class variables. See Table 5.

Table 5: Relationship between student satisfaction and class variables and anticipated course grade

Variable Correlation

Attendance policy	-0.093	
Asking questions	-0.103*	
Motivation to learn	-0.197*	
Noise level	0.033	
Quality of instruction	-0.150*	
Large-class over small	-0.193*	
Prompt feedback	-0.202*	
Overall satisfaction	-0.133*	
Attendance	-0.181*	
Visits to office hours	0.019	
Seating location	0.068	(* = p < 0.001)

Seven of the 11 variables reached the $p < 0.001$ level of significance. Those students who anticipated high grades in the course also found it easy to ask questions in class, felt motivated to learn in class, were satisfied with the quality of instructor, preferred a large-class setting to a small-class setting, felt they received prompt feedback on assignments and tests, liked large classes overall, and attended more classes.

RESULTS—INSTRUCTORS

~~Teaching methods and technologies used in large classes~~ and instructional methods and student learning

When asked "Which teaching method helps your students learn best, regardless of class size?" 4.8% of instructors responded lectures, 4.8% responded class discussion, 0% responded small group activities, and 85.7% responded combination of teaching methods. However, when asked to rate the frequency of the use of various teaching methods, instructors responded, on average, that they lecture most of the time (1.14), lead class discussion not very much of the time (2.79), and use small group activities none of the time (3.66).

When asked "Which type of test best measures your students' learning, regardless of class size?" 11.9% of instructors responded multiple choice, 33.3% responded essays, 2.4% responded true/false, 2.4% responded matching, and 50.0% responded combinations of test types. However, when asked which test type they use most frequently, 50.0% of instructors responded multiple choice, 16.7% responded essay, 0% responded true/false, 2.4% responded matching, and 28.6% responded combination of test types. When asked if students are able to learn course material in a large class as well as they learn it in a small class, the

average response disagreed with the statement (2.33).

Instructors agreed that using a microphone improved student learning (3.55), that using an overhead projector or PowerPoint improved student learning (3.81), that using audio tracks, slides or video clips improved student learning (3.55), and that using discussion sections improved student learning (4.12). When asked for their frequency of use, the results correspond: instructors, on average, use a microphone some of the time (2.12), use an overhead projector or PowerPoint most of the time (1.17), use audio tracks, slides or video clips some of the time (2.29), and two-thirds of instructors used discussion sections. When asked if having a web site in conjunction with the class improves student learning, instructors, on average, neither agreed or disagreed (3.38). This result corresponds to the fact only 57.1% of the instructors have a web site in conjunction with their class. When asked "Does the room arrangement allow your students to see and hear clearly?" 88.1 percent of instructors responded yes, and 11.9% responded no.

Level of satisfaction in large classes

On average, instructors were not very enthusiastic about teaching large classes. They disagreed with the statement, "I am satisfied with the student attendance in this class" (2.33), and they neither agreed or disagreed with the statements "I feel students are motivated to learn in this class" (2.88), "I am satisfied with the quality of student's learning in this class" (2.98), "For this course, I prefer a large-class setting rather than a small-class setting" (2.52), and "Overall, I like large classes" (2.71). Instructors felt positively about only three statements: they found it easy to answer student questions in their class (3.73), the noise level did not disrupt their teaching (2.50), and they provided prompt feedback on class assignments and tests (4.39).

The results of these questions were also correlated using the Pearson product-moment method with the results of the statement, "Overall, I like large classes." See Table 6.

Table 6: Relationship between instructor satisfaction variables and overall satisfaction with large classes

Variable	Correlation
Student attendance	0.581*
Answering questions	0.525*
Motivation to learn	0.608*
Noise level	-0.097
Quality of learning	0.680*

Large-class over small	0.732*
Prompt feedback	0.356

(* = $p < 0.001$)

Five of the seven variables were significant at the $p < 0.001$ level. Instructors who rated overall satisfaction with large classes highly also were satisfied with student attendance, found it easy to answer student questions in class, felt their students were motivated to learn, were satisfied with the quality of their students' learning, and preferred a large-class setting over a small-class setting for the current course. The noise level of the class and providing prompt feedback were not as significant.

Student attendance

When asked "About what percent of your students attend class on a regular basis?" 42.9% of instructors responded half, 47.6% responded three quarters, and 9.5% responded almost all. Only 35.7% of instructors had an attendance policy.

Instructor office hours and interaction

~~When asked "How many times per week do you hold regular office hours?" 47.6%~~ of instructors responded three or more times, 45.2% responded two times, 2.4% responded one time, and 4.8% responded none. Of those instructors who held regular office hours (40), 50.0% responded that less than 25 students visited their office hours, 41.3% responded that 25 to 50 students visited, 7.5% responded that 50 to 75 students visited, and 2.5% responded that over 75 students visited their office hours.

When asked "Approximately how many of your students' names do you know?" 66.7% of instructors responded ten percent or fewer, 19.0% responded one-quarter, 7.1% responded one-third, 7.1% responded half, and 0% responded more than half.

DISCUSSION

Teaching methods and technologies used in large classes and instructional methods and student learning

What the results show, from both a student's and an instructor's perspective, is a disconnection between preferred teaching/learning methods and actual classroom practices. Both students and instructors overwhelmingly felt a combination of teaching methods (e.g., a mix of lectures, class discussion, and small-group activi-

ties) worked best, but in practice in most, if not all, classes the lecture was used most of the time. Similarly, with tests, both students and instructors felt a combination of testing methods (e.g., multiple choice, matching, and essay) best measured student learning, but nearly 70% of students and 50% of instructors identified multiple choice tests as the type used most often. These results perhaps reflect the logistical constraints placed on the large-class setting: running a class discussion or organizing small-group activities in a class of 100 or more students can be a challenging undertaking. Likewise, with the convenience of optical scan forms, the large-class setting encourages the use of multiple choice tests rather than more grading-intensive essays or short answer tests.

Students and instructors both agreed on the efficacy of media and web sites in large classes. Students and instructors generally cite the use of overheads or PowerPoint, audio and visual media, and web sites as improving student learning. With few exceptions, the use of overheads or PowerPoint and audio and visual media seem to be in common practice. However, the use of class web sites seems to be in less common practice—a little over half of instructors had class web sites. Those instructors who feel web sites improve student learning use them and vice versa.

Student and instructor satisfaction

In general, students are neither overly satisfied or dissatisfied with large classes. They were most satisfied with not having an attendance policy, the lack of disruptions caused by noise, the quality of the instruction, and receiving prompt feedback on class assignments and tests, which the correlations also illustrate. Students were less satisfied with the ease of asking questions, motivation to learn, and preferring a large-class setting over the small-class setting. This suggests student satisfaction centers on the instructor rather than themselves: high satisfaction is associated with no attendance policy, ease of asking questions, feeling motivated to learn, and the quality of instruction.

Instructors are much more dissatisfied with large classes. Besides dissatisfaction with student attendance, instructors do not feel their students are motivated to learn or feel satisfied with the quality of their students' learning. They do feel positive about being able to answer students' questions and giving prompt feedback on class assignments and tests. This suggests instructor dissatisfaction centers on variables they feel they cannot control (e.g., student attendance, motivation, learning) and instructor satisfaction centers on variables they feel they can control (e.g., answering questions in class, prompt grading).

Student attendance

One of the biggest disagreements between students and instructors centers on attendance. Student satisfaction with the attendance policy was higher

in classes without an attendance policy and lower in classes with an attendance policy. Clearly, for students, an attendance policy is not one of the desirable features of a large class. However, instructor satisfaction with student attendance was very low (an average response of 2.33) and only 35.7% of the instructors had an attendance policy.

When asked, 65.2% of the students surveyed reported attending almost all class sessions and a further 23.7% reported attending three-quarters of class sessions. However, most instructors observed that only 50 to 75% of their students attended on a regular basis. The instructors seem to be more accurate. The student response belies the fact that when our surveys were conducted near the end of the spring semester, only 1,576 students completed surveys (i.e., those attending class the day of the survey) out of the total final enrollment of 2,718 students in the classes surveyed—a 58.0% attendance rate for the nine classes surveyed. Thus, we can assume, the students who took the survey tended to have better attendance.

Clearly student attendance could be improved through class attendance policies. Instructors who do not have attendance policies may feel either they do not need an attendance policy (e.g., students should be free to attend or not) or that maintaining one is logistically infeasible (e.g., calling roll for 200 students). In addition, as our initial fact-gathering questionnaire suggested, attendance may also be affected by the ready availability of class notes outside of class (e.g., bought from note-taking services, obtained on the class web site, or copied from classmates). Obviously, if students can obtain class notes and class assignments outside of class and if there is no attendance policy, then student attendance will be lower.

Instructor office hours and interaction

Students and instructors agree on this point: instructors hold regular office hours and few students choose to go see them. Likewise, both students and instructors agree that instructors do not or can not learn all students' names. As Wulff, Nyquist, and Abbott (1987) point out from their study, the lack of instructor-student interaction was foremost among the dimensions of large classes that hindered students' learning. Improving one or both of these areas—office hour attendance and learning names—would improve instructor-student interaction.

Conclusion

Students are taking more large classes: on average, the freshman students in our survey (44.0% of those surveyed) responded that they had taken three or more large classes in their academic career at KU and the sophomores in our survey (30.3% of those surveyed) responded that they had taken four or more large classes. Over 60% of all students surveyed reported they had taken four or more large classes during their time at KU. Clearly, if the same number (or more) of large classes continues to be offered at KU, these classes must be provided necessary

resources because they impact so many students.

In a like way, 61.9% of instructors surveyed reported they had taught five or more large classes at KU. Thus, a handful of instructors are being relied upon to teach quite a few large classes. This alone may help explain the low satisfaction among the instructors of large classes. In any case, this statistic reminds us that these few instructors teach many of our students, and they need support.

Recommendations

The results of our survey suggest a number of ways large-class instruction could be improved at KU:

1. Increase the diversity of teaching methods in the large-class setting. Instructors could use a number of ways to make a large class "smaller" through such activities as pairing and sharing, hosting e-mail discussion lists, or having a question box.
2. Increase the diversity of testing methods in the large-class setting. Instructors could offer different assignment or test types beyond the common multiple-choice type. Here the use of student graders or teaching assistants would help dramatically.
3. Improve student attendance in large classes. Because of the perceived anonymity of the large-class setting, students feel their absence is not noticed. However, instructors do notice. Instructors should ensure that students know their presence is important through class participation or an attendance policy. In addition, as with any class (large or small), students must believe attending class is beneficial, worthwhile, and the best means for learning the material.
4. Improve instructor-student interaction. If instructors hold office hours, students should be encouraged to visit, whether formally or informally. Instructors should also explore ways to make the class more personal, less anonymous—by learning names or through assigned seating.
5. Investigate instructor fatigue in large classes. As our survey showed, over 60% of the instructors surveyed reported that they had taught five or more large classes in their time at KU. Departments have a responsibility to ensure that the large classes offered are not thrust upon a few instructors. Departments could also ensure that instructors receive course reductions for teaching large classes.
6. Investigate whether departments provide sufficient support for the instruction of large classes. If a department offers a large class, then every effort should be made to support these instructors—from technological support to GTAs.

Through implementing these six recommendations, we believe satisfaction with

large classes would improve for both students and instructors. At KU, we urge those involved with teaching large classes—administrators, deans, department chairs, and faculty—to consider these points so that instructors of large classes receive the support they need and students in large classes receive the instruction they deserve.

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**APPENDIX A:
Student Questionnaire**

Large Class Student Questionnaire

The Center for Teaching Excellence is collecting information from instructors and students on teaching and learning in large classes at KU (classes with 100 or more students). Your responses to the following questions will be used to help us identify a common list of the factors that will become part of the actual survey that will be used this spring. (Do not sign your name; all responses are to remain anonymous).

Are you currently a: ___Freshman? ___Sophomore? ___Junior? ___Senior?

Please consider any or all experiences you have had in large classes at KU when you answer the questions.

1. What are 3 things **you like** about a large class?

2. What are 3 things **you do not like** about a large class?

3. What are 3–5 things that teachers do that **you find most helpful** for your learning in a large class?

4. What are 3–5 things that teachers do that **you find least helpful** for your learning in a large class?

APPENDIX B:
Instructor Questionnaire

Large Class Instructor Questionnaire

The Center for Teaching Excellence is collecting information from instructors and students on teaching and learning in large classes at KU (classes with 100 or more students). Your responses to the following questions will be used to help us identify a common list of the factors that will become part of the actual survey that will be used this spring. (Do not sign your name; all responses are to remain anonymous).

Please consider any or all experiences you have had in large classes at KU when you answer the questions.

1. What are 3 things **you like** about a large class?

2. What are 3 things **you do not like** about a large class?

3. What are 3–5 methods that **you find most helpful** for teaching a large class?

4. What are 3–5 methods that **you find least helpful** for teaching a large class?

APPENDIX C:
Student Survey

Student Survey of Large Classes

The Center for Teaching Excellence is interested in learning about the experiences of students and instructors who take and teach large classes. We want to identify teaching practices that make large classes particularly effective because they enhance student learning. This survey will provide important information about the experiences and perceptions of students who are enrolled in large classes at KU. When you answer questions that refer to an instructor, please answer them based on the instructor who meets the whole class, rather than an assistant who helps with the class by leading discussions or lab sections. All information about class instructors, class titles and numbers, or students will be confidential.

PLEASE RECORD ALL YOUR RESPONSES FOR QUESTIONS 1-38 ON THE SEPARATE MACHINE-SCORABLE ANSWER SHEET.

Section I. Teaching Methods & Technologies Used in Large Classes

Tell us how frequently the instructor uses each of the instructional methods listed below.

1. How often does the instructor lecture in this class?
 - a. Most of the time
 - b. Some of the time
 - c. Not very much of the time
 - d. None of the time

2. How often does the instructor lead class discussions?
 - a. Most of the time
 - b. Some of the time
 - c. Not very much of the time
 - d. None of the time

3. How often does the instructor use small group activities in this class?
 - a. Most of the time
 - b. Some of the time
 - c. Not very much of the time
 - d. None of the time

4. How often does the instructor use an overhead projector or PowerPoint in this class?
 - a. Most of the time
 - b. Some of the time
 - c. Not very much of the time
 - d. None of the time

5. How often does the instructor use audio tracks, slides, or video clips in this class?
 - a. Most of the time
 - b. Some of the time
 - c. Not very much of the time
 - d. None of the time

6. How often does the instructor use a microphone in this class?
 - a. Most of the time
 - b. Some of the time

- c. Not very much of the time d. None of the time
7. Which type of test does the instructor of this course use most often?
a. Multiple choice b. Essay c. True/false d. Matching
e. Combination of item types
8. Does this class have a website?
a. Yes b. No c. I don't know
9. How often have you accessed the class website?
a. More than 3 times b. 2 times c. 1 time
d. This class does not have a website

Section II: Students' Preferred Instructional Methods

In this section of the survey, tell us which instructional methods you prefer.

10. Which teaching method helps you learn best?
a. Lectures b. Class discussions c. Small group activities
d. Combination of teaching methods
11. Which type of test best measures your learning?
a. Multiple choice b. Essay c. True/false d. Matching
e. Combination of item types
12. Discussion sessions help me understand the material in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
13. Adding discussion sessions to this class would help me understand the material presented in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
14. I find it helpful when an instructor uses audio tracks, slides, or video clips in class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
15. I find it helpful when an instructor uses a microphone.
a. Strongly disagree b. Disagree c. Neither agree nor disagree

d. Agree e. Strongly agree

16. I find it helpful when an instructor uses an overhead projector or PowerPoint.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
17. I find it helpful when an instructor has a website in conjunction with class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree

Section III. Level of Satisfaction in Large Classes

Tell us how satisfied you are with large classes at KU.

18. I like the attendance policy in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
19. I find it easy to ask questions in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
20. I feel motivated to learn in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
21. The noise level in this class disrupts my learning.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
22. I am satisfied with the quality of instruction in this class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
23. For this course, I prefer a large-class setting rather than a small-class setting.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
24. For this class, I receive prompt feedback on my class assignments and tests.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree

25. Overall, I like large classes.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree

Section IV. General Information

We plan to summarize information by student and class variables. Please tell us about yourself.

26. What is your student classification ?
a. Freshman b. Sophomore c. Junior d. Senior e. Other
27. What is your gender ?
a. Male b. Female
28. How many large classes (100 or more students) including this course have you taken at KU?
a. One b. Two c. Three d. Four e. Five or more

Section V. Class Information

Please tell us about this class.

29. Is this a required course for you?
a. Yes b. No
30. About how many class sessions have you attended for this course?
a. Almost none b. 25% c. 50% d. 75% e. Almost all
31. Does this course have an attendance policy?
a. Yes b. No c. I don't know
32. How many times have you visited the instructor during office hours?
a. 3 or more times b. 2 times c. Once d. Never
e. Instructor does not have office hours
33. If you have visited your instructor during office hours, how helpful was your visit?
a. Very helpful b. Somewhat helpful c. Slightly helpful d. Not at all helpful e. Never visited office hours

34. Where do you usually sit in this class?
a. Front b. Middle c. Back
35. Are you enrolled in a discussion or lab section for this course?
a. Yes b. No
36. What final grade do you anticipate in this course?
a. A b. B c. C d. D e. F
37. Does the instructor of this course know your name?
a. Yes b. No c. I don't know
38. Does the room arrangement allow you to see and hear clearly?
a. Yes b. No

Thank you very much for participating in this survey.

APPENDIX D: Instructor Survey

Instructor Survey of Large Classes

The Center for Teaching Excellence is interested in learning about the experiences of students and instructors who take and teach large classes. We want to identify teaching practices that make large classes particularly effective because they

enhance student learning. This survey will provide important information about the experiences and perceptions of instructors who teach large classes at KU. All information about instructors, class titles, and numbers will remain confidential. Please return by May 11.

PLEASE USE A #2 PENCIL TO RECORD ALL YOUR RESPONSES FOR QUESTIONS 1-35 ON THE SEPARATE MACHINE-SCORABLE ANSWER SHEET.

Section I. Teaching Methods & Technologies Used in Large Classes

Tell us how frequently you as the instructor use each of the instructional methods listed below.

1. How often do you lecture in this class?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
2. How often do you lead class discussions?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
3. How often do you use small group activities in this class?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
4. How often do you use an overhead projector or PowerPoint in this class?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
5. How often do you use audio tracks, slides, or video clips in this class?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
6. How often do you use a microphone in this class?
a. Most of the time b. Some of the time
c. Not very much of the time d. None of the time
7. Which type of test do you use most often in this class?
a. Multiple choice b. Essay c. True/false d. Matching
e. Combination of item types
8. Does this class have a website?
a. Yes b. No

Section II: Instructional Methods and Student Learning

In this section of the survey, tell us which instructional methods you believe are effective in various settings.

9. Using audio tracks, slides, or video clips improves students' learning.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
10. Using an overhead projector or PowerPoint improves students' learning.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
11. Having a website in conjunction with a class improves students' learning.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
12. Discussion sessions help students understand class material.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
13. Which teaching method helps your students learn best, regardless of class size?
a. Lectures b. Class discussions c. Small group activities
d. Combination of teaching methods
14. Which type of test best measures your students' learning, regardless of class size?
a. Multiple choice b. Essay c. True/false d. Matching
e. Combination of item types
15. In a large class setting, using a microphone improves students' learning.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree
16. Students are able to learn course material in a large class as well as they learn it in a small class.
a. Strongly disagree b. Disagree c. Neither agree nor disagree
d. Agree e. Strongly agree

Section III. Level of Satisfaction in Large Classes

Tell us how satisfied you are teaching large classes at KU.

17. I am satisfied with the student attendance in this class.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

18. I find it easy to answer student questions in this class.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

19. I feel the students are motivated to learn in this class.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

20. The noise level in this class disrupts my teaching.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

21. I am satisfied with the quality of students' learning in this class.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

22. For this course, I prefer a large-class setting rather than a small-class setting.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

23. For this class, I provide prompt feedback on students' class assignments and tests.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

24. Overall, I like large classes.
 - a. Strongly disagree
 - b. Disagree
 - c. Neither agree nor disagree
 - d. Agree
 - e. Strongly agree

Section IV. General Information

We plan to summarize information by instructor and class variables. Please tell us about yourself.

25. What is your rank ?
 - a. Lecturer
 - b. Assistant professor
 - c. Associate professor
 - d. Professor
 - e. Other

26. What is your gender ?

- a. Male b. Female

27. How many large classes (100 or more students) including this course have you taught at KU?
a. One b. Two c. Three d. Four e. Five or more

Section V. Class Information

Please tell us about this class.

28. Is this a required course for your students?
a. Yes b. No
29. About what percent of your students attend class on a regular basis?
a. Almost none b. 25% c. 50% d. 75% e. Almost all
30. Does this course have an attendance policy?
a. Yes b. No
31. How many times per week do you hold regular office hours?
a. 3 or more times b. 2 times c. Once d. I do not have office hours
32. This semester, how many students visited you during your office hours?
a. 0–25 b. 26–50 c. 51–75 d. More than 75
e. I do not have office hours
33. Are your students enrolled in a discussion or lab section for this course?
a. Yes b. No
34. Approximately how many of your students' names do you know?
a. 10% or fewer b. 25% c. 33% d. 50% e. More than 50%
35. Does the room arrangement allow students to see and hear clearly?
a. Yes b. No

Thank you very much for participating in this survey.