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Finding the Right Fit: Assessing the Impact of Traditional v. Large Lecture/Small Lab Course Formats on a General Education Course

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This study explores alternative approaches for teaching general education courses burdened with serving extremely large enrollments. It compares the effectiveness of a self-contained course in which each course section is taught by one instructor to a large lecture/small lab format in which all course enrollees attend one large lecture section and then are divided into several small lab sections for more intensive training experiences. The study uses the Introduction to Human Communication course at the authors' university. Two hundred and seventy-five students enrolled in nine large lecture/small lab sections of the course and two hundred and fifteen students enrolled in eight self-contained sections were used for this study. Comparisons were made of cognitive learning outcomes, affective learning outcomes, communication apprehension outcomes, and student evaluations of faculty. Cognitive learning outcomes indicated that students in the self-contained format did better on their first speeches and that those in the large lecture/small lab format did better on their final speech and improved more rapidly from their first to last speech. Little difference was found in level of affective learning or reduction in student apprehension. Students in both sections decreased in communication apprehension over the course of the semester. The large lecture/small lab format appeared to depress teaching evaluations.

Keywords

Class size, Graduate teaching assistants, Cognitive learning, Affective learning, Communication apprehension, Teacher evaluations

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Introduction

As state and federal budgets shrink, endowments face diminished returns, and donors reduce contributions, universities are confronting the challenges of teaching ever increasing numbers of undergraduates while simultaneously coping with serious resource constraints (Park, 2004). This challenge is especially problematic for departments teaching large numbers of general education courses serving large numbers of undergraduates. Typically English, Communication, Science, and Math departments carry the heaviest burdens for courses of this nature. These departments struggle with the logistical burden of providing high quality basic course instruction for more students with no additional faculty or resources (Todd, Davidson Tillson, Cox, & Malinauskas, 2000). For example, in the field of communication, resource constraints have become so burdensome that to cut costs, some

administrators have proposed outsourcing the basic communication course to training programs such as Dale Carnegie (Coplin, 2006). While outsourcing general education classes is not a common solution, institutions are demanding that instructional methods be changed to cope with increasing financial stress (Seiler, 1983).

A modest strategy being adopted by many departments is to deliver general education courses in a large lecture/small laboratory format in order to reduce the cost-per-credit-hour of instruction (Buerkel-Rothfuss, Gray, & Yerby, 1993; Todd, Davidson Tillson, Cox, & Malinauskas, 2000).

One example of a general education course adopting this approach is the basic communication course at the small regional university at which the authors teach. As a basic education requirement, the course serves between 800-900 students per semester. The course shifted from a small enrollment approach in which several sections were offered with 32 students and one instructor per section, to a large lecture/small lab approach in which 120 students are enrolled in a large lecture section taught by one instructor, and then several graduate assistants each teach lab sections. The alternative approach generates substantial cost savings in both salary and facilities dollars.

An analysis by the university's communication department found that hiring graduate students to assist with teaching the course could be cost effective. Based on an assumption that 30 sections of the course are offered during the typical academic year, the department estimated that 3.33 full-time faculty would be required to teach all of the course sections (the teaching load at the university is 4/4). The department estimated that it costs $4,000 to have a full-time faculty member teach one section of the course. Therefore, the department was committing $120,000 to staff the course (30 sections x $4,000 per section). The department calculated that five graduate instructional assistants (GIAs) would be required to staff the 30 basic course sections. Each GIA received $10,557 salary and $3,589 in benefits for a total of $14,146. Combined, the five GIAs needed to staff the 30 basic course sections cost the department's budget $70,730. Using GIAs to staff the basic course saved the department $49,270 per academic year.

Table 1. Comparison Cost Summary for COMM 110 Coverage Per Academic Year

Type of Instructional Coverage	***Sections of COMM 110***	**Total Students Served (based on 32 per class)**	**Annual cost per GIA/ or per Section if covered by Academic Staff**	**Total Cost for All Sections for Academic Year**
GIAs	30	960	$14,146 per academic yr. (based on 10,557 salary plus 3,589 Fringe)	**$70,730**
Instructional Academic Staff	30	960	$4000 per section	**$120,000**
			Cost Savings using GIAs : $49,270	

The potential for such savings explains why in 2006, Morreale, Hugenberg, and Worley reported an increase in the number of departments using the mass lecture/small performance laboratory format to deliver basic courses. For example, in a study by Buerkel-Rothfuss and Gray (1990), 20% of the departments surveyed used small lab sections led by graduate teaching assistants to supplement a faculty-taught mass lecture.

As the popularity of the lecture/lab model increases for general education courses, educators must ensure that changes in the delivery model do not weaken the educational impact of the courses involved. Trank, Becker, and Hall (1986) state that 85% of universities require all undergraduates to take certain general education courses because such courses are successful at teaching competencies considered essential for life-long success (Hunt, Ekachai, Garard, & Rust, 2001). If research demonstrates that students actually learn more in smaller class settings, then the large lecture/small lab format may be cost-efficient, but detrimental to student learning outcomes long-term (Todd, Tilson, Cox, & Malinauskas, 2000).

Research findings comparing student learning in small self-contained sections of courses to student learning in large lecture or large lecture/small lab formats are inconsistent, with some studies suggesting that students in small classes have higher achievement goals, and other studies showing superiority of achievement in larger-sized formats (Messman & Jones-Corley, 2001; Pearson, 1986).

In support of larger class sizes, Siegfried and Fels (1978) found that performance on cognitive measures such as standardized tests was independent of class size. Tanner & Allen (2006) found that small class sizes with more personal attention and active learning opportunities did not significantly improve cognitive learning. Kryder (2002) found that 90% of the students in a mass lecture course liked the large lecture format and the quality of their deliverables was equal to that produced by students who took the same course in a small class format. Research by Goodman, Koster, and Redinius (2005), found no significant difference between large lecture sections and small courses on student learning. Williams, Cook, Quinn, & Jensen (1985) found that increasing class size from 30 to several hundred did not impact student achievement. Finally, Messman and Jones-Corley (2001) found that students in a mass lecture/small lab format actually had higher cognitive learning scores than students in small self-contained sections.

In contrast, Mckeachie (1978) found that large classes were not as effective as small classes in promoting student information retention, critical thinking, and attitude change. Glass and Smith's (1979) meta-analysis of class size and student achievement concluded that, other things being equal, students learn more in smaller classes. And Cuseo (2007) synthesized research findings related to the use of large class size and its impact on learning and found eight negative outcomes of large class sizes including: 1) increased faculty reliance on lecture, 2) less active student involvement, 3) reduced frequency of student and instructor interaction, 4) lower depth of student thinking in class, 5) lower Bloom's taxonomy levels of learning objectives, 6) lower levels of academic achievement in students, 7) lower levels of course satisfaction, and 8) lower student evaluations at the end of the course.

Results for affective learning outcomes are a bit more consistent than those for cognitive learning (Messman & Jones-Corely, 2001). For example, Cheatham and Jordan (1976),

Buerkel-Rothfuss and Weaver (1993), and Messman & Jones-Corely (2001) all found stronger affective learning outcomes for self-contained classrooms than for lecture/lab formats.

As a result of these mixed research findings, the goal of the current study was to compare the cognitive and affective learning outcomes of students in self-contained sections of the general education course, "Introduction to Human Communication" (COMM 110), with those of students in the large lecture/small lab format in order to assess any differences in learning between the two groups.

Course Delivery Factors Impacting Student Learning

Kerssen-Griep, Hess, & Trees (2003) identify the following variables as key to student learning: classroom environment, instructional formats, teacher characteristics, and student characteristics. The self-contained format and large lecture/small lab format differ widely on these four variables. Thus, it is possible that learning outcomes also vary widely between the two formats.

Classroom Environment

Research by Hall (1966) places the large lecture setting into the realm of "public space." Hall claims that public space is reserved for public communication only and is not conducive to interpersonal interactions or discussions. Additionally, many lecture halls contain bolted down chairs and few aisles, making it physically difficult for faculty to walk around and connect with students as well as making it awkward for students to turn and talk to each other. The restrictions of the large lecture setting create an impersonal atmosphere toward classmates and the instructor (Geske, 1992). That perception of instructor physical remoteness can make the student less likely to engage (Mackey & Freyberg, 2010).

Another physical restriction is the sheer number of students in the room in a large lecture setting. A large "audience" may mean that individual students are less likely to speak up for fear of saying something unintelligent (Chen, 2000). Lots of people in a classroom means participation is difficult, as it is hard to find time for everyone to speak (Geske, 1992). Large numbers of students in the classroom also means a lack of faculty connection with each student. For example, when there are 100 or more students in a classroom it is difficult for faculty to call students by name to encourage participation, and students see it as impersonal if the instructor says "you in the blue hat" (Chen, 2000).

Instructional Format

The transmission model of teaching and learning sees teaching as telling. In this model, students face the front and the lecturer is the "sage on the stage." Renshaw (1995) argues that this model promotes a surface approach to learning. In their 2009 study, Masikunis, Panyiotidis & Burke reported that the transmission model of lecture-based instruction was not effective at promoting student learning.

One of the concerns with the transmission model is that lectures may be considered good only when they are entertaining and exciting. Students come and sit down in the lecture context, and expect to be passive and to be entertained (Pearson, 1986). Exciting and entertaining lectures require the faculty to be "on" all the time. Meeting this expectation

can be extremely demanding on an instructor, and leaves no margin for an "off" performance on any given lecture day.

Teacher Characteristics

A good predictor of how well students do in class is their liking for the teacher, with instructors who are perceived by students as warm, caring and approachable having the most successful students (Teven, 2001). Worley, Titsworth, Worley, & Cornett-DeVito's (2007) work finds that competent instructors maximize student learning by establishing a warm and nurturing persona in the classroom. In the large lecture setting, this persona is more difficult to establish. Students in large lectures report feeling physically and psychologically removed from their instructors and it is more difficult for the instructors to demonstrate warmth and immediacy (Pearson, 1986).

Instructor clarity is another instructor characteristic that has been tied to student learning outcomes (Comadena, Hunt, & Simonds, 2007). Teachers high in instructor clarity present content in understandable manner, organize classes effectively, and provide previews and summaries of material. This clarity improves student motivation and cognitive and affective student learning outcomes (Comadena, Hunt, & Simonds, 2007). The challenge is that instructor clarity often means well organized and structured lectures, and this may limit the flexibility and spontaneity. Predetermined, structured, and practiced presentations are less adaptable to new avenues of learning that may evolve naturally during class.

Student Characteristics

One characteristic of the modern student is a decreased awareness of the impact of their actions on others in the classroom. This is evidenced by an increase in student misbehaviors in the classroom. More and more instructor time and energy is spent on issues of cheating, motivation to read and prepare, tardiness, use of cell phones, and so on (Pearson, 1986). This tendency for students to misbehave may be enhanced in the large lecture setting. In lecture classes students may take less responsibility toward the subject matter and feel free to sleep, talk, or read rather than listen/participate. The anonymity of the large section gives them the cover to act irresponsible, disruptive, or rude (Pearson, 1986). Limiting these behaviors is also harder in the large setting, as it is difficult for the faculty member to see all students and consistently maintain order. Increases in student misbehavior have a negative impact on learning outcomes (Pearson, 1986).

Despite the challenges faced by large lecture classes in terms of the four variables identified by Kerssen-Griep, Hess, & Trees (2003) as key to student learning, additional research indicates that a large lecture/small lab course delivery model can be just as effective as a self-contained delivery model if designed and delivered well. While students may feel a little lost in the large lecture, they also have smaller lab sessions with a GTA (Graduate Teaching Assistant) who knows their name, and can provide them with a sense of connection. Additionally, the GTA model allows a faculty member to integrate active-learning techniques into large enrollment classes by providing smaller settings for application and reflection on lecture content and a space for students to feel connected and cared for (Tanner & Allen, 2006). Thus, the physical limitations of being purely in a large lecture setting may be mitigated by the blended model of the large lecture/small lab.

Additionally, the transmission method of teaching has its limitations but also its strengths. Different people learn best in different modes (Pearson, 1986). The lecture/lab model allows for multiple modes to reach more students. Students who enjoy sitting back and

listening to an educational and entertaining lecture and students who appreciate the more engaged model of discussion, application, and practice are both served in the lecture/lab model.

An additional benefit of the large lecture/small lab model is that students have a variety of faculty to interact with and connect to. If only one instructor is involved (as in the self-contained model), a student who does not connect with that instructor faces limited options. In the lecture/lab model, the student has two to five other instructors to approach. Additionally, the use of graduate students as GTAs in the lecture/lab model may mean that students feel a greater sense of connection. Graduate students are closer to the students in age and attitudes than a traditional instructor. People are more likely to like, to feel they can approach, and to want to emulate people that seem similar to themselves in terms of physical appearance, personal background, and personality (Erkut & Mokros, 1984). This may mean that the lecture/lab model with the use of GTAs and an instructor of record allows for the best of both worlds; the credibility outcomes of the experienced faculty, and the similarity benefits of the GTA.

Finally, the lecture/lab model allows students to thrive who might not traditionally do so. For example, high communication apprehension students express a great preference for larger sections (Pearson, 1986) where they don't feel pressured to answer an instructor and can absorb information without stress. And, while in small section classes higher communication apprehension equals lower performance, there is no correlation between communication apprehension and performance in large lecture classes (Pearson, 1986).

Faculty Outcomes

While the primary focus is on student learning outcomes, the current study also explores the impact that teaching using the large lecture/small lab model has on the faculty involved. At the university level there is wide-spread reliance on student ratings of teachers as the primary data upon which judgments about teacher performance are based, and these ratings play a significant role in hiring, tenure, promotion, and merit decisions (Beatty & Zahn, 1990). And while Feldman (1984), found only an occasional and very small negative effect of class size on student evaluations of faculty, Toby's 1988 study found that for 70% of the faculty studied, the larger the class size, the lower the instructor ratings. Additionally, Smith, Kopfman, & Ahyun (1996) found that in large classes students feel isolated and uninvolved, and miss the lack of individual attention, and that this often leads to negative student perceptions of the instructor.

Research highlights concerns with general education courses in terms of faculty burnout (Morreale, Hanna, Berko, and Gibson, 1999). Burnout may be an even greater issue with the large lecture/small lab format. The lead instructor, who only sees students en masse, obtains fewer of the intrinsic rewards possible in the classroom (bonding with students, watching particular student's growth across time, etc). Instructors need such intrinsic rewards to sustain motivation in the long run (Komarraju, 2008). Add to this lack of connection a greater likelihood of poor faculty evaluations, and instructor morale may suffer. For this reason, it is important to assess the impact of the large lecture/small group format on the instructors as well as on the students.

In sum, questions addressed by this study include:

RQ1: What (if any) impact does the large lecture/small lab model have on student cognitive learning outcomes compared to the self-contained delivery model?

RQ2: What (if any) impact does the large lecture/small lab model have on student communication apprehensive levels compared to the self-contained delivery model?

RQ3: What (if any) impact does the large lecture/small lab model have on student affective learning outcomes compared to the self-contained delivery model?

RQ4: What (if any) impact does the large lecture/small lab model have on student evaluations of faculty compared to the self-contained delivery model?

Methods

Participants

All participants in this study were undergraduate students enrolled in various sections of the basic introduction to communication course with no prior knowledge of the study. All participants were above the age of 18. Approximately eight to nine hundred students were enrolled in the basic course that particular semester, based on self-enrollment through the typical university registration system. Of those, four hundred and ninety students were involved in the study. Study participants were chosen based on whether or not their instructor was willing to participate in the study. If they participated, instructors offered their entire section of students. The result was two hundred and seventy-five students who were enrolled in nine large lecture/small lab sections, and two hundred and fifteen students who were enrolled in eight sections of the traditional course format. Fifty-seven percent of the participants were female and 43 percent of the participants were male.

Description of Course

The basic introduction to communication course follows a hybrid format, covering interpersonal, group, and public speaking concepts. At the end of this course students should be able to understand and apply a variety of effective methods for organizing and delivering their ideas in both oral and written form. They should be able to understand how communication apprehension impacts communication in both interpersonal and public speaking contexts and apply strategies for managing communication apprehension. They should understand the role of listening in communication and practice enhanced listening skills. And, they should understand the primary concepts relevant to small group communication (e.g., roles, norms, decision-making) and interpersonal communication (e.g., self-concept, perception, nonverbals), and public speaking (e.g. performance skills, organizational patterns, documenting sources).

There is departmentally mandated consistency across all sections of the basic course such that all sections share the same learning objectives, same required assignments, same rubrics for assessing performance, and same weights for various assignments. Thus, in terms of content and assessment, the two course formats are very similar.

The self-contained sections are capped at 32 students and take place in a small classroom with moveable desks. The instructors of the self-contained sections involved in this study were two full-time instructors who have taught the basic communication course at the university for at least three years.

The large lecture/small lab sections involved in this study were taught by a primary instructor in conjunction with three Graduate Teaching Assistants (GTA's). The primary instructor was responsible for the course schedule and syllabus, delivering course content, designing activities, and developing course policies and procedures. The GTAs were responsible for facilitating the small labs and for observing and evaluating student presentations. The large lectures were held in a lecture hall that seats 120 students in a theatre style classroom with a computer, projector, and two aisles. All lectures were conducted by the primary instructor. Students met in the large lecture 1-2 times per week. The small lab sections had 32 students each and were held in self-contained small classrooms. Each GTA facilitated three lab sections. Students met in their lab sections a minimum of once per week. New material was covered in lecture first and then reviewed or applied in the lab. A significant number of active learning exercises, group activities, demonstrations, and multi-media presentations were incorporated into the lecture class periods. Consistent training was provided throughout the semester to ensure that grading was uniform across all GTA sections and final grades were comparable.

Measures

Variables measured include: 1) student cognitive learning outcomes, 2) student affective learning outcomes, 3) student communication apprehension outcomes, and 4) student evaluations of faculty. Cognitive learning ranges from the simple retention of information to the complex synthesis of material (Bloom, Hastings, & Madaus, 1971). Affective learning encompasses feelings and emotions toward the course, faculty and subject matter (Krathwohl, Bloom, & Masia, 1964). Communication apprehension refers to the fear or anxiety associated with communicating with others (McCroskey, 1977).

In the current study cognitive learning was assessed quantitatively using student scores on comparable assignments and exams. Scores were all recorded as percentages allowing for direct comparison between groups. In both the large lecture/small lab sections and the self-contained sections student grades on their first speech of the semester, their last speech of the semester, test grades on the three content areas (interpersonal, small group, and public speaking) and student overall final grades were used to assess cognitive learning.

Communication apprehension levels were assessed using the Personal Report of Communication Apprehension, or PRCA (McKroskey, 1982). The PRCA was given to students in both the large lecture/small lab sections and the self-contained sections of the course during the first and the last weeks of the semester.

Affective learning was assessed qualitatively. Students were asked to write a 2-3 page paper in which they reflected on their experiences in the class, what they felt they learned, what they liked or disliked, and their overall reactions to the course. These papers were subjected to thematic analysis. Working together, the researchers first coded papers to identify specific accounts. Drawing upon Miller (1992), accounts were defined as "self contained semantic expressions of an event or experience which in themselves are separable from surrounding discourse" (p. 6). Secondly, the researchers labeled the accounts according to the component (cognitive learning, affective learning, skill-based learning) that they most exemplified. If an account did not seem to fit, it was placed in the "Other" category.

Impact on instructor was assessed quantitatively using the department's standard student evaluation of faculty instrument. The Instructor of Record and the graduate instructional assistants' were also interviewed for their perspectives on the experiences of teaching the large lecture sections.

Results

To explore the differences between the large lecture/small lab and the self-contained model in terms of student cognitive learning outcomes, a series of independent sample t-tests were conducted comparing the scores of the two groups on six measures of cognitive learning: 1) students' first speech, 2) students' final speech, 3) grades on three quizzes, and 4) final course grade. For the first speech performance of the semester, the large lecture/small lab students had a mean score of 75.96 (*SD* = 12.75) and the self-contained students had a mean score of 79.85 (*SD* = 11.35). The difference between the two groups was statistically significant, $t(48) = -3.49$, $p = .001$. The self-contained group outperformed the large lecture/small lab group on the first speech.

To address RQ1, the researchers examined average scores on the final speeches. For the final speech performance of the semester, the large lecture/small lab students had a mean score of 84.08 (*SD* = 13.50) and the self-contained students had a mean score of 80.54 (*SD* = 13.44). The difference between the two groups was statistically significant, $t(484) = 2.87$, $p = .004$. The large lecture/small lab group outperformed the self-contained group on their final speech.

The change difference between the first speech and last speech was calculated to explore whether or not there was a statistical difference between the two student groups on the amount of improvement from the first speech to the final speech. The large lecture/small lab students had a mean change level of 8.12 (*SD* = 15.32) and the self-contained students had a mean change level of .67 (*SD* = 15.11). The difference between the two groups was statistically significant, $t(483) = 5.34$, $p = .000$. The large lecture/small lab sections of the basic course showed statistically more improvement between their first speech and their last speech than the self-contained sections did.

The two groups were also compared on performance on course quizzes related to the three topic areas of the class, interpersonal, small group, and public speaking. For the interpersonal quiz, the large lecture/small lab students had a mean score of 74.68 (*SD* = 30.54) and the self-contained group had a means score of 70.78 (*SD* = 19.26). The difference between the two groups was not statistically significant, $t(484) = 1.63$, $p = .103$. Both groups performed at comparable levels on this quiz. For the small group quiz, the large lecture/small lab students had a mean score of 80.00 (*SD* = 26.34) and the self-contained group had a means score of 83.12 (*SD* = 11.51). The difference between the two groups was not statistically significant, $t(471) = -1.57$, $p = .115$. Both groups performed at comparable levels on this quiz. Finally, for the public speaking quiz, the large lecture/small lab students had a mean score of 74.94 (*SD* = 27.81) and the self-contained group had a means score of 79.00 (*SD* = 15.92). The difference between the two groups was not statistically significant, $t(484) = -1.91$, $p = .057$. Both groups performed at comparable levels on this quiz.

The last quantitative cognitive measure used to compare the two models was final course grade. For the overall final grade, the large lecture/small lab students had a mean score of 79.91 (*SD* = 10.96) and the self-contained group had a means score of 81.75 (*SD* = 10.41). The difference between the two groups was not statistically significant, $t(484) = -2.89$, $p = .054$. The large lecture/small lab group performed comparable to the self-contained group in terms of final grade.

In addition to performance skills and knowledge of course concepts, the basic course is also designed to help students decrease communication apprehension. To explore RQ2, whether use of the large lecture/small lab model affected communication apprehension, the researchers used Personal Report of Communication Apprehension (PRCA) scores.

On the version of the PRCA taken during the first week of class, the large lecture/small lab students had a mean score of 64.35 (*SD* = 15.67) and the self-contained group had a mean score of 65.62 (*SD* = 14.92). The difference between the two groups was not statistically significant, $t(408) = -838$, $p = .402$. On the version of the PRCA taken the last week of the semester, the large lecture/small lab students had a mean score of 58.76 (*SD* = 15.08) and the self-contained group had a mean score of 59.90 (*SD* = 13.66). The difference between the two groups was not statistically significant, $t(407) = -801$, $p = .424$.

Both the self-contained format sections and the large lecture/small lab sections decreased in communication apprehension over the course of the semester. A paired-sample t-test examining the difference in PRCA levels between the pre and post-tests for the large lecture/small lab sections found that students reported significantly lower PRCA scores at the end of the semester than the beginning, $t(199) = 9.91$, $p = .000$. Likewise, a paired-sample t-test examining the difference in PRCA levels between the pre and post-tests for the self-contained sections found that students reported significantly lower PRCA score at the end of the semester than the beginning, $t(183) = 7.21$, $p = .000$.

The change difference between the students' scores on the early PRCA and the later PRCA was calculated to see if there was a difference between the two groups in terms of amount of reduction in communication apprehension over the course of the semester. The mean change score for the large lecture/small lab sections was 5.40 (*SD* = 7.70) and the mean change score for the self-contained group was 6.54 (*SD* = 12.30). The difference between the two groups was not statistically significant, $t(382) = -1.09$, $p = .274$. Thus, the two groups did not differ significantly in how much they reduced their communication apprehension over the course of the semester.

RQ3 asked whether use of the large lecture/small lab designed affected affective learning. Data was gathered by asking students to write short papers about their experiences in the course. A random sample of 25 papers from across the GTA sections and 25 papers from across the self-contained sections were subjected to in depth qualitative analysis.

The thematic analysis of student reflection papers from the large lecture/small lab sections and self-contained sections identified five reoccurring themes about the impact of this model on affective student learning outcomes. Results were similar across the two groups. Students in both sections talked about how the course activities were engaging and educational (17 comments in the self-contained sections, 20 comments in the GTA sections). Sample comments include:

Self-contained Section Student: *I thought activities we did in class helped me understand things from the book and lecture better. The "write an ad for a random object" thing we did was one that stands out. Sometimes activities in class can feel sort of like a waste of time, but I didn't feel that way in this class.*

GTA Section Student: *I loved the stuff we did in the small discussions, like the tower build for group comm and the gender discussion in the interpersonal unit. They were fun but also made me think. I am an RA and I am going to use the "Top 10 things men and women should know" exercise on my floor, it was great.*

Students in both sections reported that the class lectures were entertaining and informative (11 comments in the self-contained sections, and 24 comments in the GTA sections). Sample comments include:

Self-Contained Section Student: *I liked the lectures. Some were kind of commonsense, but it is good information to have. I thought the professor did a nice job keeping us paying attention.*

GTA Section Student: *Dr. XXX is always so energetic and fun in lecture. Whatever caffeine she is on she should keep on taking. She keeps a room of over 100 students engaged. I will always remember the trust lecture when she had us sit on each other's laps and the cohesion lecture when we had to lift her over our heads with just one finger. Thought for sure we were going to drop her, but she trusted us.*

Students in both sections reported that the course kept them attentive and engaged in the material (49 students in the self-contained sections, and 72 students in the GTA sections); Sample comments include:

Self-contained Section Student: *This was a hard class. A lot of work for a 100 level course, and you couldn't just check out or float along in this class. You had to stay on top of the outlines, exams, and speeches. But I learned stuff I can use in other classes and at work. And practice public speaking is always good.*

GTA Section Student: *I liked how there was a lot of variety in assignments, teachers, big lecture/small groups, etc. It was confusing at first, but after a while it made sense and then I liked it. I think it kept me more interested and I learned the concepts better cause I got to hear them from both Jim and Dr. XXX.*

Finally, students in both sections reported that it was their best or most enjoyable class that term (21 students in the self-contained sections, and 13 students in the GTA sections). Sample comments include:

Self-contained Section Student: *I loved this class. I had a class like it in high school, but I think it was good to have it again. Learned better public speaking skills, and made some good friends. Great class, one of my favorites.*

GTA Section Student: *This class is my favorite class that I have had in college. And Dr. XXX is my favorite professor. I thought I would hate the class at first and there are still some people in the class that I hate, but Dr. XXX and Molly were awesome. I just declared a comm major and it's because of this class.*

Both formats revealed only one major theme in terms of negative affective learning. Students in both sections reported that they did not find the quizzes or exams to be fun or engaging (19 students in the self-contained sections, and 23 students in the GTA sections). Sample comments include:

Self-contained Section Student: *I don't think exams should be part of a public speaking course.*

GTA Section Student: *The quizzes were dumb. I know they were supposed to make sure we read, but we are in college now. If we don't read, we don't read. I don't need a quiz to "check up on" me.*

The final question (RQ 4) was the impact that teaching a large lecture/small lab section has on student evaluations of faculty. In order to explore this question faculty evaluations for all sections of the basic course taught in the past two years were averaged to create a series of "gold standard" scores on six evaluation measures: 1) I would recommend this instructor to other students, 2) This instructor is an effective teacher, 3) I was satisfied with this instructor, 4) This instructor respected students, 5) My overall assessment of this course is . . . , and 6) the grand mean across all 26-items on the standard faculty evaluation measure. The gold standard scores on each item represent the average score on that item that faculty members receive when teaching the basic course in the self-contained format.

Secondly, faculty evaluations for the past two years of teaching self-contained sections of the basic course were calculated for the professor who was primary instructor of the large lecture/small lab sections in the current study. This resulted in an average student evaluation score for teaching the basic course prior to teaching it in the large lecture/small lab format. After these standards were calculated, four sets of one-sample t-tests were conducted. The first set compared the instructor of record's past performance in self-contained sections of the basic course to the overall faculty average performance in the basic course. None of the comparisons were statistically significant (see Table 2) demonstrating that when teaching the basic course in the self-contained method, the instructor of record's performance was in-line with the faculty average.

Table 2. Instructor of Record's Past Performance Compared to Overall Faculty Average

	M	***SD***	**Test Value**	***t***	***df***	***p* (2-tailed)**
Recommend Instructor	1.67	.44	1.84	-1.03	7	.335
Instructor is Effective	1.54	.26	1.74	-2.08	7	.075
Satisfied with Instructor	1.64	.36	1.81	-1.25	7	.250
Instructor Respects Students	1.38	.19	1.55	-2.30	7	.054
Assessment of Course	1.77	.42	1.90	-.821	7	.439
Overall Faculty Score	1.59	.26	1.75	-1.68	7	.137

The second set of one-sample t-tests compared the instructor of record's evaluations from the large lecture/small lab sections of the basic course to the overall faculty average in the past two years of self-contained sections. The instructor's evaluations were significantly below the average on all measures (see Table 3).

Table 3. Instructor of Record's Large Lecture/Small Lab Scores Compared to Overall Faculty Average

	M	***SD***	**Test Value**	***t***	***df***	***p* (2-tailed)**
Recommend Instructor	2.59	.51	1.84	4.36	8	.002
Instructor is Effective	2.31	.52	1.74	3.32	8	.01
Satisfied with Instructor	2.61	.57	1.81	4.18	8	.003
Instructor Respects Students	1.96	.32	1.55	3.81	8	.005
Assessment of Course	2.45	.65	1.90	2.60	8	.032
Overall Faculty Score	2.25	.39	1.75	3.78	8	.005

The third set of one-sample t-tests compared the instructor of record's evaluations from the large lecture/small lab sections of the basic course to her own average evaluation scores over the past two years of teaching the basic course in the self-contained format. The instructor of record's large lecture/small lab evaluations were significantly below her past averages on all six measures (see Table 4).

Table 4. Instructor of Record's Large Lecture/Small Lab Scores Compared to Her Past Self-contained Format Scores

	M	***SD***	**Test Value**	***t***	***df***	***p* (2-tailed)**
Recommend Instructor	2.59	.51	1.67	5.35	8	.001
Instructor is Effective	2.31	.52	.154	4.47	8	.002
Satisfied with Instructor	2.61	.57	1.64	5.06	8	.001
Instructor Respects Students	1.96	.32	1.38	5.37	8	.001
Assessment of Course	2.45	.65	1.77	3.19	8	.013
Overall Faculty Score	2.25	.39	1.55	5.28	8	.001

A final series of one-sample t-tests were conducted comparing the GTA's faculty evaluations from the large lecture/small lab sections to the overall faculty average. The GTA's averages on all six measures were significantly above the overall faculty average (see Table 5).

Table 5. GTA's Large Lecture/Small Lab Scores Compared to Overall Faculty Average

	M	***SD***	**Test Value**	***t***	***df***	***p* (2-tailed)**
Recommend Instructor	1.37	.36	1.84	-3.84	8	.005
Instructor is Effective	1.42	.36	1.74	-2.68	8	.02
Satisfied with Instructor	1.38	.23	1.81	-5.36	8	.001
Instructor Respects Students	1.31	.21	1.55	-3.37	8	.01
Assessment of Course	1.68	.29	1.90	-2.22	8	.05
Overall Faculty Score	1.49	.23	1.75	-3.29	8	.01

As a final measure of the impact of the large lecture, small lab format on instructors, interviews were conducted with the primary instructor and the GTA's for the nine GTA-facilitated sections. Thematic analysis of these interviews resulted in the four general themes discussed below.

First, instructors of GTA-facilitated sections reported that much more of their time and energy was spent in classroom management and enforcement of course policies in the GTA sections than in the self-contained sections that they instructed. The faculty provided three potential explanations for this difference. One was that students were more disruptive in the larger sections than in the smaller ones. It was more anonymous so there was more cell phone usage, skipping class, etc. A second reason was simply that more students equal more issues. A faculty member with four regular sections in one semester has 128 students to deal with. The instructor of record in the GTA program during the semester this study was conducted was responsible for 288 students. Another explanation was that due to a concern for consistency, faculty had to be much more careful about how they addressed student concerns about attendances, missed work, illness, late assignments, and so on. Each instructor had to ensure he/she was following policy exactly and time had to be spent sharing issues with other faculty to ensure that all instructors knew how concerns were being handled. As one instructor noted, *"When I have my own class and some student comes with an unusual issue, I can just deal with it. And often, nobody knows but the student and me how I deal with it. But, with the GTA classes, all the students talk to each other and word gets around. You have to make sure that you are treating the student just like the other instructors will, so there is a lot of checking in, clarifying, and getting caught up in the details. There are SO many emails from students and from GTA team members!"*

A second theme that came out of the interviews was a perception that GTA-facilitated sections required more energy and preparation than traditional courses. For example, the instructor of record commented, *"There is no room for an off day. I have to be on, on, on. It gets exhausting. I feel like I can walk into my other classes and "wing it" if need be. But*

with the COMM 110 class, I have to perform. And, not just in the lectures. I am the role model for all the GTA's so I have to design great exercises, write great assignments, etc. Everything has to be really good as it is being used as a model. Still, it keeps me creative and fresh, as I am always seeking new ways to keep lectures interesting and the activities I design for the small group application days fun and useful."

A third theme was a sense of disconnect from the students. This was reported both by the GTA's and by the instructor of record. Both reported the perception that it was harder to bond with students in the GTA-facilitated sections. *"I have wonderful students and they are really dedicated,"* said one instructor, *"but it is harder to feel like they are mine, if you know what I mean. I have to share them and I have less time with them and the whole set up means that I don't get to know them as well. It's a different climate."*

The final theme was that all the instructors found the GTA-program extremely rewarding. A variety of reasons were provided for why they enjoyed being part of the program, including the joy of team-teaching, the benefits of the mentor-mentee relationship between instructor of record and GTA, the benefits of gaining supervised experience in the classroom, and the fulfillment that comes from helping students learn. *"I am so glad I got this job. I think Dr. XXX does a great job at leading the team. She is upbeat, helpful, supportive, and always there. I am taking a class in instructional communication and it is great to have role models like Dr. XXX and the other GTA's on the team. I don't make a lot of the mistakes we talk about in that class because even though I am a "new" teacher, I have tons of guidance."* In addition, the instructor of record commented, *"I gain so much from this position. It is double the benefit because not only do I get to see students grow and learn, but I also get to see junior faculty grow and learn, and I get to feel that I have done my part to help both."*

Discussion

The current study was designed to answer four questions about how/if moving from a self-contained model of a general education course to a large lecture/small group model impacts student and faculty outcomes. The first question of interest to this study was: What (if any) impact does the large lecture/small lab model have on student cognitive learning outcomes compared to the self-contained delivery model? Results demonstrated that there were no significant differences in level of student performance on quizzes related to course content and on final course grade, providing evidence that the new model did not harm student learning in terms of comprehension of course concepts, but rather stayed comparable to self-contained format outcomes. These findings support earlier research by Siegfried and Fels (1978), Tanner & Allen (2006), Kryder (2002), Goodman, Koster, and Redinius (2005), and Williams, Cook, Quinn, and Jensen (1985) who found that increasing class size does not negatively impact student achievement.

Results demonstrated that the two groups did differ significantly in performance levels on the first and last speech and on the level of improvement between the first and last speech across the course of the semester. The large lecture/small lab sections performed more poorly on the first speech than the self-contained sections, but more strongly on the final speech. Additionally, the large lecture/small lab sections showed significantly more improvement between the two speeches than the self-contained sections did. These findings can be explained in a variety of ways. One potential explanation might be that the large

lecture/small lab setting is more intimidating at first, so that student comfort level in presenting their first speech is lower in the large section than in a self-contained section, and student performance suffers as a result. Then, over time, students adapt to the large lecture/small lab model, and performance improves.

The dramatic difference in improvement from first to last speech between the two sections is worth examining. One possible explanation is that the lecture/lab students do start out performing more poorly as they don't feel as comfortable in their first presentation in the large setting, thus, leaving more room for improvement. An additional explanation is that the large lecture/small lab model allows for greater student feedback and oversight as students are able to receive information and suggestions from multiple teachers, and that this leads to stronger improvement over time. In addition, the large lecture/small lab model is very structured. In order to make such a model successful and ensure consistency across GTA's and sections, every assignment has a very clear grading rubric, assessment sheet, and explanation associated with it. Additionally, every lecture is clearly organized and structured, and every application exercise/activity for each lecture is carefully debriefed in terms of what students should be learning and applying to their own performances. This careful structure may help students clearly understand exactly how they will be assessed and strive to meet those expectations over the course of the semester. Although this finding focused on speaking performance, the authors anticipate that similar results could be accrued for other situations that involved intensive skills-type training.

One must also consider the sample size for the study and its possible contributions to the variations in average scores. Although groups of 275 and 215 are of adequate size to explore the research questions presented here, a few outliers having difficulty with the first assignment could depress average group scores. This finding deserves more exploration. If the large lecture/small lab approach is resulting in lower scores on first performances and greater improvements on the second speech, it would be beneficial to understand if these changes are far reaching across all students in the course or concentrated in a few students who have particular difficulty with public speaking.

The second question of interest to the current study was, what (if any) impact does the large lecture/small lab model have on student communication apprehensive levels compared to the self-contained delivery model? Results demonstrated that students in the two sections did not differ in level of communication apprehension at the beginning and end of the course or in amount of improvement in communication apprehension over the course of the semester. Both groups showed significant improvement in communication apprehension over time, and the difference in the amount of change between the two groups was not significant. Thus, both groups improved about the same in terms of communication apprehension over the course of the semester. This supports the idea that students do not find the large lecture/small lab model significantly more anxiety producing than the self-contained sections.

Communication apprehension studies stress that apprehension is normal and that the best way to reduce it is to practice—to interact with others as much as possible (McKroskey, 1982). Thus, a course that is structured in ways to get students talking often in a variety of contexts will have the greatest positive impact on communication apprehension. The fear that the anonymity, perceived isolation, and lower level of involvement in the large sections would mean that students had fewer opportunities to communicate and thus, wouldn't get the same benefits in terms of lower their communication apprehension was proven false.

However, it is important to remember that lectures need to be interactive and infused with opportunities for students to discuss and reflect in order to maintain these benefits in the large lecture/small lab model.

The next question of interest was, what (if any) impact does the large lecture/small lab model have on student affective learning outcomes compared to the self-contained delivery model? A qualitative analysis of students' final course papers revealed few differences between groups. The large lecture/small lab sections indicated greater engagement and enjoyment of the lectures and greater overall engagement and enjoyment of the course, but more students in the self-contained sections talked about how the basic course was their favorite course. In both sections, approximately 55% of the students reported high levels of engagement and enjoyment in the course. Thus, the model of delivery does not seem to impact affective learning outcomes.

The final question of interest to this study was, what (if any) impact does the large lecture/small lab model have on student evaluations of faculty compared to the self-contained delivery model? Results demonstrated that being the instructor of record for the large lecture/small group model lead to a significant decrease in faculty evaluation scores. Previously, the current evaluation scores for the instructor of record in the basic course under the self-contained model were on par with departmental averages, and often were better than the average. However, her evaluation scores under the new large lecture/small lab model were significantly below her previous average, and below the overall faculty average. On the other hand, evaluation scores for the GTAs were above the faculty averages.

One possible explanation for this finding is related to the nature of the course structure and the roles involved. As instructor of record, the lead professor is responsible for the syllabus, the assignments, the course content, the grading rubrics, course management, and course policies. This is made clear to students so that the GTAs are not in a position of having to hear student concerns that are not in their power to address. However, the instructor of record does not have the time or physical ability to develop a personal relationship with the 500 or more students he/she has in the large lecture/small lab format. Students see the instructor of record as the impersonal "bad guy" that makes them read the text, designs the exams, and creates class policies, while the GTAs are the "fun, nice guys" that lead them in interesting activities, know their names, and seem to care about them more than the instructor of record.

Limitations

There are two important limitations to the current study. First, the current study is a "snapshot" study in that it only provides a picture of how the large lecture/small lab model and the self-contained model compared during one semester. To provide a more robust comparison of the two models, longitudinal research that compares the two formats over time would be very valuable. A second concern is that while the two versions of the basic course share the same learning objectives, basic assignments, structure, and so on, they were not taught by the same instructor. Thus, while we believe that any differences found between the two groups on student and faculty outcomes were primarily due to format differences, we cannot say for sure as we were unable to control for instructor. It would be valuable to have the same instructor teaching in the large lecture/small lab format and in the self-contained format so that a true comparison can be made. Results of student evaluations of instructors must also be approached with caution. It is difficult to know if

the nature of the course design led to the lower evaluations, or if the results were due to a particular performance of the instructor during the time of the study. Further exploration of the question would be helpful.

Conclusion

Pearson (1986) stresses that small sections for general education courses may soon be little more than an historical recollection as the large section is today's reality at many universities. Thus, it is essential to assess what works and what does not work in the large lecture/small lab delivery model so that we can design large class models that are successful in achieving student learning outcomes.

The current research demonstrates that student learning is not negatively affected by taking a general education course in the large lecture/small lab format. These findings support Tanner and Allen's (2006) claim that students can learn in large classes and that quality teaching is possible in large classes as long as those classes infuse numerous active and engaging learning opportunities. Considering that the large lecture/small group format has the capacity to generate significant revenue savings, the change from the self-contained model to this new model seems a win/win for the department and the students.

However, the current study does provide a note of caution in terms of the impact on the faculty involved in teaching the newer model. Serving successfully as the primary instructor in large lecture/small lab format classes may require skills that take time to acquire (Toby, 1988). Teaching in this model is not a place for a novice instructor as it does not easily provide the rewards of more self-contained teaching and may result in early burnout. In addition, newer instructors who are still vulnerable should not be placed in a situation where their evaluations may suffer due to the nature of the course model and not as a reflection of their actual teaching skills. It is also important that primary instructors in the large lecture/small lab model are very strong public speakers who are comfortable with the role of "entertainer and performer" in the classroom (Pearson, 1986). Finally, it is essential that department administration understands that being the instructor of record in this new format is challenging. Faculty can easily become disheartened if they feel unsupported, unappreciated, or disenfranchised by administrators (Park, 2004).

In sum, the results of this study are positive in terms of student outcomes but the findings remind us that significant shifts in course delivery modes cannot be simply grafted onto existing sets of physical facilities, faculty, and unaltered concepts of classroom instruction. Adopting new instruction models requires careful reflection and a significant change in how the department, the faculty member, and the students view their roles in the classroom.

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