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An empirical case for introductory psychology tutorials in a large-class format

Abstract

This study examined the effectiveness of an instructional format that involved conducting introductory psychology tutorials in large conventional lecture theatres with over 100 students per class. We maximised the use of skilled tutors, variation of student perspectives, and cooperative learning in delivering interactive, active learning activities. Students (N = 284) within the class were randomly assigned to smaller groups that were scaled within the same large class environment (University reported positive reception of their learning experience at an end-of-semester survey. Moreover, they performed significantly better in a major assessment on the tutorial component than a previous cohort taught in conventional small tutorial classes. Our findings indicate that active learning techniques can be implemented just as effectively in a large class tutorial for illia I. These findings have practical implications for designing effective pedagogically vigorous instructional formats for introductory liberal arts courses.

Keywords

case, empirical, tutorials, large, psychology, class, format, introductory

Disciplines

Arts and Humanities | Life Sciences | Medicine and Health Sciences | Social and Behavioral Sciences

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CHAPTER ELEVEN

AN EMPIRICAL CASE FOR INTRODUCTORY PSYCHOLOGY TUTORIALS IN A LARGE-CLASS FORMAT

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Chapter Overview

This study examined the effectiveness of an instructional format that involved conducting introductory psychology tutorials in large conventional lecture theatres with over 100 students. Students ($N = 284$) within skilled tutors, were randomly assigned to smaller groups that were seated delivering into the large class environment. Students reported positive conceptions of their learning experience when they performed significantly better in a major assessment on tutorial classes. Our findings indicate that active learning techniques can be implemented just as effectively in cohort taught in conventional small findings have practical implications that active learning techniques can pedagogically vigorous instructional formats for introductory psychology and other liberal arts courses.

An Empirical Case for Teaching Introductory Psychology Tutorials in a Large-class Format

Research in higher education has long acknowledged the importance of active learning, whereby students are provided with opportunities for discussions, self-discovery, and other exercises that enable all students to have some direct involvement (Benjamin, 1991). Techniques such as drawing upon students' personal experience and thoughts (Buskist & Wylie, 1998; Carroll, 2001; Hamer, 2000; Rosell, Beck, Luther, Goedert, Shore, & Anderson, 2005), cooperative learning with a small group of fellow students (Harton, Richardson, Barreras, Rockloff, & Latané, 2002; Magel, 1998; Vreven & McFadden, 2007), and other general methods for increasing student participation (e.g., Boniecki & Moore, 2003; Graham, Tripp, Seawright, & Joeckel, 2007) have been implemented in undergraduate (UG) teaching across different academic disciplines. The general consensus is that active learning is vital to positive student learning outcomes.

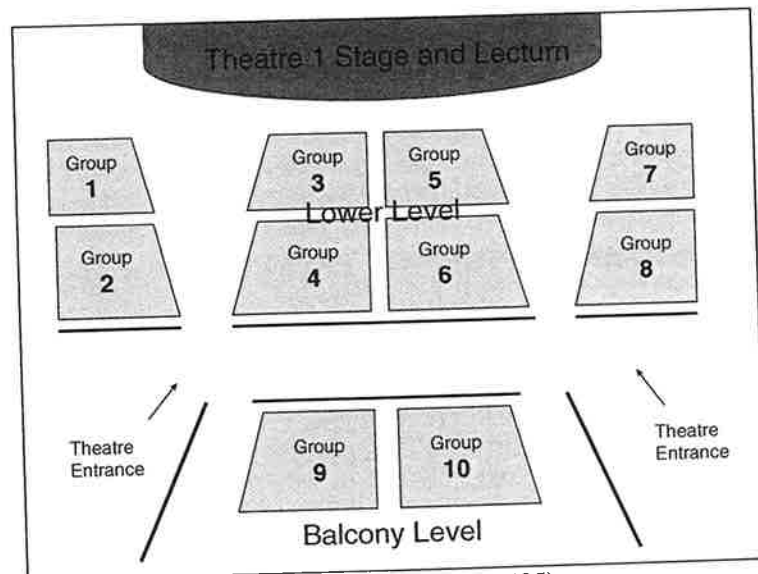
It is conceivable that active learning activities can be implemented more easily in a small class format (Benjamin, 1991). However, when students from a subject with large enrolment are divided into multiple smaller tutorial classes, individual classes are typically facilitated by graduate student tutors who may vary vastly in teaching experience and competence (Buskist, 2000; Sharpe, 2000; Muzaka, 2009). In attempting to facilitate high-quality teaching of tutorial classes, subject coordinators often need to devote much time and effort toward selecting, training, and mentoring their tutors (e.g., Silverstein, 1982; Newcombe & Bagwell, 1997; Park, 2004). Furthermore, sometimes the personnel and economic costs of teaching PSYC101 can be substantial (e.g., see Silverstein, 1982, who utilised 40 teaching assistants to teach approximately 1200 students in an introductory psychology course, and acknowledged that there was no guarantee that all teaching assistants would do a satisfactory job in teaching). Moreover, students sometimes anecdotally report feeling that tutors for certain classes are better class facilitators, or that the discussions in certain tutorial classes are more fruitful than in others. Whilst teaching quality can contribute toward students' perceived or actual class interaction, class dynamics and student perspectives can also vary largely across tutorial classes. The issue of inequitable differences in the quality of graduate student tutors and the quality of class interactions, together with pragmatic issues of cost effectiveness and class scheduling, point to the importance of innovative classroom restructuring that enables a smaller number of high-quality tutors to facilitate learning activities for the large

first-year course in a different class format. Apart from improving the economics of running the subject, the key pedagogical benefit of such restructuring is that students' learning experience can become more equitable if they can all be taught by a small number of high-quality tutors in the department, and that students' input and perspectives shared in any particular small class can benefit other students taking the subject.

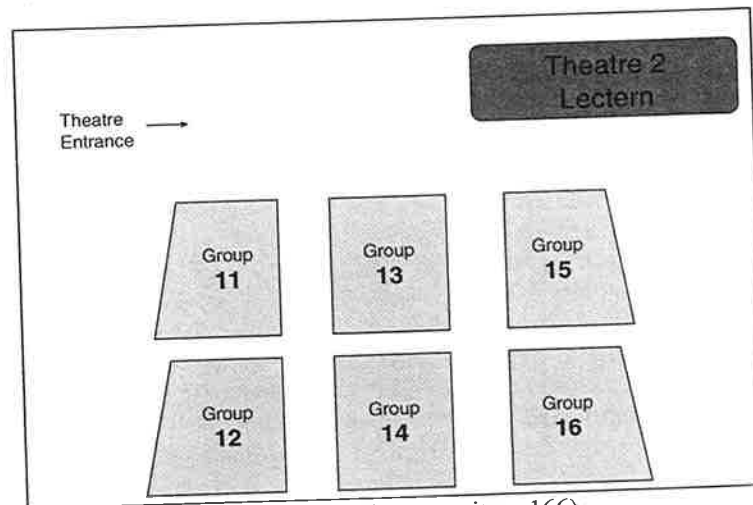
A Redesigned First-year Psychology Tutorial Teaching Format

We report on a redesigned tutorial teaching format in our first year course, PSYC101, to address the above concerns. Our approach was modelled from the Student-Centred Active Learning Environment for Undergraduate Programme (SCALE-UP) project (Beichner, Saul, Allain, Deardorff, & Abbott, 2008; Gaffney, Richards, Kustusch, Ding, & Beichner, 2008), in which the layout of a classroom that can accommodate a large class is redesigned, so that smaller groups of about 10 students sit at round tables for discussions, small-group problem solving, and other interactive learning activities. The tutor moves around the classroom to address students' questions and facilitate collaborations within each group. Thus, the overall class size can be fairly large, but students can work within a reasonably small group to maximise interpersonal interaction and active class participation.

Based on the general principles of SCALE-UP, we trialled a redesign of PSYC101 tutorial classes, but for delivery in two conventional tiered lecture theatres. Each lecture theatre was large enough for multiple small-group "areas" to be formed. Students were instructed to sit within their group's allocated area during tutorials, and to work with their group members for class discussions and other interactive learning activities. The creation of smaller groups within the large class environment was of central importance to our redesigned teaching format, because students would still have a sense of identity and community despite being placed in a large class environment (e.g., "I belong to Group X"), thus overcoming feelings of depersonalisation in such an environment (Benjamin, 1991). Students would work with and get to know other students within the same small group throughout the semester. To increase the likelihood of student diversity and perspectives within smaller groups of students, students were randomly assigned into the smaller groups (see also Magel, 1998, for a similar technique used to assign students to different sections of a large class for cooperative learning activities).



(a) Large lecture theatre (seating capacity = 435)



(b) Smaller lecture theatre (seating capacity = 166)

Figure 1. Allocation of space within two conventional lecture theatres for teaching PSYC101 tutorials in large-class format.

If a carefully designed large class learning environment can be made to “feel smaller” (i.e., compatible with the atmosphere in a conventional smaller tutorial class; Goodman, Koster, & Redinius, 2005), we predicted that students would feel able to engage in class activities, contribute toward class discussions, and learn from the feedback provided in a large-class environment. Furthermore, by utilising high-quality tutors (Silverstein, 1982; Gray, 2008) and increasing student diversity within each smaller tutorial group, we predicted that students would report receiving adequate attention and support from their tutor, and would benefit from the perspectives offered by students within and outside their own group within the same large class environment (Harton et al., 2002). This should, in turn, translate to better performance in a lab book assignment directly related to the tutorial component of the subject.

Method

Participants

Our primary sample comprised UG students at a medium-sized Australian university. Participants were enrolled in PSYC101 during Autumn Session, 2008 ($N = 284$, 62% female; mean age = 21 years, $SD = 5.09$). The class included students majoring in Arts and Humanities (9%), Commerce (4%), Science and Engineering (6%), Creative Arts (2%), Law (2%), Health and Medical Sciences (43%), Psychology (33%), and international exchange students (1%).

This study also included another PSYC101 student sample ($N = 301$) from Autumn Session, 2007 (67% female; mean age = 20.91 years, $SD = 5.74$), when tutorials were conducted in small class format. There were 15 tutorial classes that varied in their class days and times, each with an enrolment capacity for up to 22 students. This comparison sample was included to assess the relationship between class restructuring and students' performance in the lab book assignment.

Materials and Procedure

Students from the 2008 cohort were randomly assigned to 16 tutorial groups¹ at the start of the semester, with up to 20 students per group. Tutorials were held simultaneously in two separate lecture theatres, with tutorial groups 1 to 10 assigned to one theatre, and groups 11 to 16 assigned to a second theatre. Each tutorial group had its designated section for seating in the theatre, and students were instructed about this

arrangement via a seating plan at the beginning of the semester (Figure 1). Each large tutorial class was led by a postgraduate student tutor who was experienced in facilitating interactions in large-group settings. However, given the very large class size involving groups 1 to 10, another tutor (who had taught PSYC101 tutorials in 2007) was also hired for that class to assist with facilitating class activities and discussions.

Small group discussions and activities were facilitated via the pyramid method (Vrenven & McFadden, 2007, for a similar approach), in which students were initially instructed to work in pairs. Each pair then compared their answers and thoughts with another pair of students. This process was repeated as necessary for students from the same group to adequately share their views and perspectives. During class activities and small-group discussions, the class tutor (and assistant tutor in the larger class) approached individual groups to facilitate discussion and to address any questions arising from tasks and discussions. A whole-class discussion was included in each week's tutorial, where student representatives from randomly selected groups were asked to share the outcomes of their activities and discussions with the whole class, while all groups were encouraged to compare the perspectives offered by the presenting groups. In the second-last teaching week of semester, students completed anonymously a 10-item survey that gathered feedback on their perception of the large-class tutorial format. Answers were provided on a seven-point rating scale (1 = strongly disagree; 7 = strongly agree). Items for the survey are shown in Table 1.

Students' marks in a lab book assignment were used to examine the relationship between tutorial teaching format and students' assessment marks. This assignment included eight weekly exercises related to the PSYC101 tutorial topics and class activities. These exercises included questions that required students to record or summarise results from in-class activities, report on additional take-home tasks associated with in-class activities and discussions, and reflect on how concepts and issues covered in the tutorial topics might be applied to everyday settings. The nature and complexity of lab book assignments in different academic years were comparable, with the context of some questions changed across academic years, while still requiring students to apply the same relevant psychological concepts and knowledge to answer questions satisfactorily. A lab book handout with the relevant exercises was available for download from the subject website at the start of each week. The lab book assignment comprised the completed exercises collated in hard copy format, which was submitted in its entirety in the final week of semester. A detailed set of marking criteria was used for marking questions in the

lab book assignment.

Table 1: Mean ratings from large tutorial class format survey

Survey Item	<i>M</i>	<i>SD</i>	<i>t</i> ^a
1. The large-class tutorial format used in PSYC101 provides a good learning environment to assist my learning.	4.17	1.80	1.49
2. The PSYC101 tutorials maintained a class environment in which I felt comfortable engaging in tutorial activities.	4.36	1.68	3.35*
3. The PSYC101 tutorials maintained a class environment in which I felt free to contribute within my tutorial group.	4.53	1.55	5.42*
4. The PSYC101 tutorials maintained a class environment in which I felt free to contribute to the entire class.	3.46	1.61	-5.25*
5. Because of the large-class tutorial format used in PSYC101, I was able to benefit from comments and contributions made by students in other tutorial groups.	5.13	1.57	11.30*
6. The presentation of examples and supplementary materials (e.g., demonstrations, videos) in PSYC101 tutorials kept me involved and interested.	5.64	1.36	18.82*
7. My tutorial group received an appropriate amount of attention from my tutor(s).	4.92	1.56	9.25*
8. I was able to apply psychological concepts taught in this subject through tutorials.	5.05	1.36	12.10*
9. The time and effort spent in PSYC101 tutorials was a worthwhile investment.	4.74	1.56	7.47*
10. My understanding of the subject was assisted by the tutorials.	5.13	1.50	11.83*

^aOne-sample *t* test comparing the mean against a value of 4. **p* < .001 (2-tailed)

In contrast to the tutorial teaching format in 2008, seven graduate student tutors were hired in 2007 to conduct learning activities for these classes, with each tutor being assigned to teach one to three classes. At the start of the semester, students signed up for one of these classes as per their preference, timetabling constraints, and availability of spaces in individual tutorial classes when they signed up. The class composition was similar to that of the primary sample. All tutors received the same teaching materials (e.g., PowerPoint slides, handouts, general instructions on how each week's activities were to be conducted); however, individual tutors might vary in the specific methods and techniques used to facilitate class activities.

A postgraduate student experienced in introductory psychology tutoring was hired as head tutor in both 2007 and 2008 (and primary tutor of groups 1 to 10 in 2008) to oversee that the same teaching materials (e.g., PowerPoint slides, class activities, discussion points) were used in all classes. The subject coordinator and the head tutor oversaw that the same marking criteria were used in assessing students' performance in the lab book assignment across both years. To recapitulate, the general teaching and assessment methods were comparable across the two years, but the teaching layout and personnel differed between them.

Results and Discussion

To assess whether or not students perceived the restructured class format positively, one-sample t-tests were conducted to compare mean survey item ratings against the midpoint value of 4. As reported in the mean ratings and statistics in Table 1, students were generally positive in their evaluation of the large tutorial class format. The exceptions were Items 1 and 4. There was a statistically non-significant trend for students to agree that the large-class tutorial format provided a good learning environment (Item 1). Perhaps not surprisingly for a subject comprising many UG freshmen, students did not feel that the tutorials provided an environment in which they felt free to contribute to the entire class (Item 4).

Crucial to this study's aims, however, was the significant finding that students felt that they could benefit from the comments and contributions made by other tutorial groups within the same large class (Item 5). They also perceived that they could adequately engage with their tutorial group, tutors, and the class activities (Items 2, 3, 6, 7). Furthermore, the items on conceptual understanding and the general value of PSYC101 tutorials were all positively endorsed (Items 8, 9, 10). These findings based on

student evaluations collectively indicate that the pedagogical integrity of students' learning was not compromised by the novel, large tutorial class format.

Finally, we found that students from the 2008 cohort had a significantly higher mean lab book assignment mark (65.93%, $SD = 12.61$) than the 2007 cohort ($M = 61.27\%$, $SD = 13.30$), $t(583) = 4.35$, $p < .001$, Cohen's $d = .36$. This finding supports our prediction that the redesigned tutorial format is beneficial to learning outcomes.

Thus, our data suggest not only that students taught in a large tutorial class environment show similar academic performance as those taught in smaller tutorial classes (Goodman et al., 2005), students' learning outcomes can in fact be better in a large class format. This finding refutes the notion that small class sizes with a low student-to-tutor ratio are required for students to have more interaction and better learning outcomes (Benjamin, 1991; Cuseo, 2007). Instead, our findings point to the importance of identifying ways for the class to maintain an atmosphere that encourage active participation and learning, despite its large physical size (Goodman et al., 2005).

Conceivably, various reasons could have contributed to the significant difference in mean lab book assignment marks between 2007 and 2008. This said, our findings could not be explained by potentially discrepant marking procedures and/or criteria between these two years, because the same subject coordinator and head tutor were involved in setting the marking criteria for the lab book, and in overseeing the marking process in both years. Also, given the composition of the PSYC101 student population and the overall class size each year, it is unlikely that there was a systematic upward shift in students' academic calibre in 2008.

Rather, two other explanations are more likely. First, it was possible that students' overall greater access to the "handpicked" PSYC101 tutors has positively affected their learning. An alternative way of considering the present findings is that they highlight the potential *negative* effects of smaller tutorial classes (i.e., ones that utilised tutors with varied skills and experience) on student learning. If we were to maintain the conventional class structure of running separate smaller tutorial classes, less than half of the PSYC101 student population would have been assigned to classes that were facilitated by those high-quality tutors. Although it is possible to provide more extensive support and training to all graduate student tutors to enhance their teaching skills and effectiveness in facilitating PSYC101 class activities, it is more cost effective and pedagogically beneficial for students to be taught by tutors with good teaching skills and personality characteristics that are well suited for promoting engagement with learning

activities. Through restructuring PSYC101 classes, this valuable teacher resource can be shared widely across the entire student cohort. The consistency of information disseminated to all students in a class was also useful in alleviating doubts that certain students were advantaged or disadvantaged in their learning. These teacher-focussed factors might provide greater confidence and motivation for students to learn and achieve in the subject.

Second, it was likely that the systematic, pyramid approach used for facilitating class discussions has promoted greater overall student engagement with learning activities. This structured approach to facilitating class interactions, augmented by the range of opinions and ideas offered and discussed within a large class environment, might have improved students' understanding of issues and concepts relevant to psychology. Evidence for this explanation is abundant in the mean survey ratings (in particular, see Items 5 and 10 in Table 1). Conceivably, the pyramid approach can be used more extensively even in small tutorial class settings to encourage greater student interaction and sharing of ideas. It is also possible to facilitate greater sharing of perspectives and views among students from separate smaller tutorial classes through online bulletin boards and other discussion forums. However, the instantaneous sharing of views across different tutorial groups appears to be a unique positive feature of the present restructured class format. Its contribution to student learning warrants further systematic research.

Whilst these two explanations may individually contribute to the present findings, these results are likely to be a reflection of the synergy of these teacher-focussed and learning environment factors. From a research perspective, it may be tempting for future research to isolate the unique contributions of these factors. However, from practical and pedagogical perspectives, it will be of greater value to further examine the joint effects of teacher and learning environment factors on student perceptions and learning outcomes, and to compare them against the perceptions of and learning outcomes for student cohorts that are taught in conventional separate smaller tutorial classes.

A limitation of the present study is that we did not conduct a survey of the 2007 PSYC101 student cohort on their perceptions of the PSYC101 learning experience. This information would have been useful in identifying possible sources of difference in students' learning experience between the present restructured class format and the traditional, smaller tutorial class format. Future research that seeks to examine the effectiveness of this type of class restructuring should obtain baseline data on students' learning experience prior to implementing the new teaching format.

Conclusions

An important function of UG tutorial classes is to facilitate student learning via active engagement, sharing views and perspectives with fellow students and the tutor, experiencing illustrative experimental phenomena, and having opportunities to apply learned concepts. Our findings add to the accumulating evidence that large classes per se are not detrimental to learning. Consistent with the principles of the SCALE-UP project (Beichner, et al., 2008; Gaffney, et al., 2008), our data indicate that this novel approach to organising and teaching tutorials in large class format is time- and cost-effective, and may significantly facilitate student learning.

Moreover, we have provided early validation of how high-quality tutors may be utilised innovatively to maximise their impact on student learning. Finally, another previously underutilised resource – diversity of views and opinions across different groups within the PSYC101 student population – has been shown to have good potential in augmenting students' learning outcomes. After all, appreciating that the human experience can be highly subjective, and that different perspectives may all contribute toward understanding human behaviour, are precursors to appreciating the complexities of the academic discipline of psychology. This research has opened many avenues for further ways that tertiary educators may design their courses, to fully utilise these resources and to reap pedagogical benefits.

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Notes

Students were allocated to the 16 groups according to their position in an alphabetised class list. The first 16 students on the class list would be assigned sequentially to Groups 1 through to 16, respectively. This process was repeated until all students on the list were allocated. Students were notified of their group number at the start of the semester, and were explicitly instructed that swapping to a different group was not permitted. Attrition rates during the semester were comparable across these groups. Other information on class management procedures can be obtained from the first author on request. Both tutors selected to lead the two large classes have had experience teaching in "conventional" tutorial classes. In addition, both tutors were selected on the basis of their extensive public speaking experience outside of university (one tutor played a leadership role in an international youth group convention, and the other tutor previously worked as a radio announcer for a major radio network). The two samples for this study were students who remained enrolled in PSYC101 at the end of the semester. The student attrition rates in 2007 and 2008 were similar (32% vs. 28%, respectively), $\chi^2(1, N = 858) = 1.62, p > .20$. The number of students that constituted the reported attrition rate included all students who were enrolled and subsequently withdrew from PSYC101 at any point in a semester. These included students who enrolled and withdrew online from the subject even before the semester commenced. Hence the attrition rate does not fully represent students who discontinued with PSYC101 during the semester. Jessica Browne is now at Deakin University Direct correspondence to Amy Chan, University of Wollongong, Australia. Email: amychan@uow.edu.au