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A Comparison of Group and Individually Completed Course Evaluations in Introductory Astronomy

by **Tanis Lacey Casey**

Montana State University

Timothy F. Slater

University of Arizona

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Abstract

In an effort to streamline the collection of student feedback in a large enrollment introductory astronomy survey course, 283 individual students and 84 student working groups submitted mid-course evaluations. An inductive analysis of recurrent themes suggests that student course evaluations completed individually do not differ significantly from those completed by collaborative learning groups. These results suggest that faculty can obtain meaningful student feedback by analyzing a smaller number of surveys completed by groups of students, as opposed to analyzing a large number of surveys completed by individuals.

Teachers striving to achieve and document excellence in the classroom have long found self-designed, mid-course evaluations to be useful tools in monitoring students' perceptions of a course and to inform teacher decisions about mid-course corrections (Slater & Adams 2002). Mid-course evaluations in particular give students an opportunity to provide course feedback in a way that can have an immediate impact on their own learning, thus making these evaluations substantially different than formal, fill-in-the-bubble evaluations given at the end of the course.

Unfortunately, many of us teach courses with sufficiently large enrollments--such as introductory astronomy for non-science-major undergraduates--which makes administering and evaluating mid-course evaluations problematic. Personally analyzing hundreds of individual surveys presents a formidable challenge given the time constraints many of us feel. This is parallel to the problem of grading large numbers of term papers and homework assignments.

For the past several years, we have had substantial success implementing collaborative group learning activities in our large enrollment courses (Adams & Slater, 2002; Adams et al. 2002). One of the principal benefits of such an approach is that, when done well, work completed by a group can be of higher quality than work completed in isolation due to the nature of group dynamics. One of the benefits of using four-person collaborative groups is the substantial 75% reduction in the number of papers one is responsible for grading. (The number decreased from 200 to 50 in our situation.) We began to wonder what other benefits the use of collaborative groups might provide. Specifically, we were curious about the degree to which a professor can gather similar--or possibly different and more useful--mid-course feedback from collaborate learning groups instead of from individual students. When used in the context of commercial product marketing and political polling, "focus group" approaches historically have provided more useful marketing research data than individual clinical interviews because the participants' thoughts and comments can be drawn out in more detail by "piggy-backing" on each others' ideas (Skala, Slater, & Adams 2000).

In an effort to pursue the question of the usefulness of collecting mid-course evaluation data from collaborative groups, we selected two 200-student sections of our introductory astronomy course for non-science majors at a large northwestern university. The students in these courses met twice each week for 75 minutes over a 16-week semester, used weekly collaborative group learning activities to supplement lectures, and were assigned daily readings, weekly quizzes, monthly homework papers, and monthly examinations. The monthly examinations were in two parts--one completed individually and one completed in a collaborative learning group setting. Both courses were taught by the second author, and the first author served as an undergraduate research assistant and course grader.

During the sixth week of the 16-week course, 145 students from the morning section were given mid-course evaluations to be completed individually. The afternoon section was arranged into 45 self-established groups of three to five members, with each group responsible for completing an evaluation. To account for any differences in the two study populations, we reversed this process one month later. During the tenth week of the course, 138 students in the afternoon section completed the mid-course evaluation, and the morning section was divided into 39 previously self-established collaborative learning groups and asked to complete the mid-course evaluation.

The mid-course evaluation asked students to supply written answers to the following questions: (1) "What part(s) of the course do you like the best? Why is this helping you learn astronomy?" and (2) "What part(s) of the course would you like to see changed? Why would these changes help you learn astronomy better?" The mid-course evaluations were analyzed inductively by listing all of the student comments, organizing them into repeated themes, and determining the frequency with which each prevalent theme showed up in the mid-course evaluations. The summarized results were reported back to the students in the next class meeting, and the variation in responses between groups at different administrations of the survey was judged to be quite small. A summary of the results is shown in Table 1.

Table 1. Frequency of themes in student-supplied responses

	<u>Week 6</u>		<u>Week 10</u>	
	<i>Individual</i> <u>n = 145</u>	<i>Group</i> <u>n = 45</u>	<i>Individual</i> n = 139	<i>Group</i> <u>n = 38</u>

POSITIVE ASPECTS					
Weekly group work	35 %	19 %	24 %	27 %	
Professor	50	23	38	29	
Visual aids (.ppt)	25	18	21	28	
Collaborative exams	17	19	20	14	
Textbook	11	19	20	14	
Weekly quizzes	6	3	7	2	
Relaxed atmosphere	6	0	0	0	
NEEDS MODIFICATION					
Less group work	26 %	31 %	31 %	25 %	
More night observing	11	8	8	14	
Reworded exam questions	0	0	0	19	
Shorter classes	10	11	11	14	
Comprehensive exam review	0	19	19	19	
Fewer quizzes	5	14	14	14	
More closure to group activities	0	10	10	0	
Need slower pace	0	7	7	7	
Fewer written assignments	4	6	6	0	
More visual aids	4	6	6	6	
Need faster pace	4	0	0	0	
HW worth fewer points	0	6	0	0	

Add discussion section	4	0	0	0	
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NOTE: Responses add to more than 100% because students were allowed to write as many items as they wished. The "n" for groups is the number of surveys collected, not the total number of students. The morning section completed evaluations in small collaborative groups for the week six observation. Students in the afternoon section completed evaluations individually. This scheme was reversed for the week ten observation to demonstrate equivalency of samples.

Somewhat surprisingly, we found that the most frequently cited positive aspect *and* the most frequently cited negative aspect of the course was the prevalence of collaborative group learning activities. The themes that emerged in the individual responses were, with only a few exceptions, quite similar to the themes and frequencies found in the collaboratively submitted evaluations. It is interesting to note that the themes found in week six were essentially unchanged by week ten, suggesting that although the course didn't appear to improve, it didn't seem to have decayed either. Although the prevalence is not statistically significant, the presence of uninformative and flip responses such as "give him a raise" was noticeably missing from the collaboratively collected evaluations.

We acknowledge that some confidential mid-course evaluation comments from students would likely not appear on a survey completed by a group. To be clear, we are not advocating using collaboratively created course evaluations to the complete exclusion of anonymously completed individual evaluations. In our case, we repeatedly invited students to submit anonymous comments and suggestions during the period of this study. However, given the logistical challenges of collecting course evaluation data from hundreds of students, our research suggests that using collaboratively completed evaluations provides data at least as useful as those collected from individuals and, more importantly, significantly reduces the number of evaluations that need to be analyzed.

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