Effects of Gender Composition and Workshop Leader Gender on Student Integration within the Workshop

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Introduction

Inequality in a classroom setting can have major consequences on the success of individual students, by impacting how much students gain from collaborative learning activities with their peers. This inequality can be rooted in a gender, racial, or ethnic imbalance among students, as well as in differences in student-ability level for a particular subject (Burkam et al., 1997). Unequal representation of demographic groups within a classroom may result in alienation or discomfort on the part of minority students. Consequently, the learning experience of these students may be adversely affected, in regards to group participation and cooperative learning.

A significant amount of literature has been published on this subject over the past few decades. Rosser (1998) conducted a study on minority students in a college physics class, which revealed that underrepresentation has consequences on students’ participation in a problem-solving-based course. In the study, student groups consisting of the same racial composition were created. Therefore, the underrepresented students were mandated to work with students of the non-minority students. It was found that the minority students were less likely to integrate with their group due to differences in backgrounds and interests. After the minority students were put into a group together, their participation level and understanding of the material increased significantly (Rosser, 1998).

Previous studies have illustrated the differences in the ways students of the opposite gender interact with their peers and approach learning. It has been documented that female students respond especially well to hands-on activities such as demonstrations and laboratory exercises (Burkam et al., 1997). Educators have postulated that the lack of hands-on scientific experiences in US high schools may have a direct connection to the male domination of collegiate physical and natural science programs. The gender-role orientation and student-role orientation of females are also very compatible. Female students have an easier time interacting with each other than with
male students, who may have an intuitive domineering attitude in the classroom (Eccles and Blumenfeld, 1985).

The workshop module represents a small-group learning environment, much like that of a classroom. However, as the workshop is a primarily collaborative, rather than didactic environment, factors which may affect student participation and feeling of membership within the group become increasingly important to consider. Furthermore, students’ success within the workshop is dependent upon their ability to effectively integrate themselves within the group. Thus, we decided to focus our research upon the impact of demographic composition on student learning within workshops. Specifically, we chose to focus on the issue of gender composition. Through this study, we explored the potential association between unequal gender composition of workshops in Organic Chemistry I and student integration level. We also investigated the role of the workshop leader’s gender on student integration and learning.

We hypothesized that students of the underrepresented gender in a workshop would be more likely to report being isolated from their peers than students of the not-underrepresented gender. In addition, we predicted that female students would both be more likely to indicate that the workshop leader’s gender impacted their learning experience, than males students.

Methods

In order to test the above hypothesis, a survey was administered via email in the format of a “google document.” The survey consisted of series of multiple choice questions. Students were first requested to record their gender. In order to determine whether the student was a member of the underrepresented gender in the workshop, each student was required to list the number of male and female students in their workshop section. Measurement of the degree of student integration within the workshop was accomplished with a question asking students to rank their level of
integration in the workshop on a numerical scale from 1 (very low) to 5 (very high). Next, students were asked if they felt more comfortable among students of the same gender, opposite gender, or if gender does not contribute to their degree of comfort with other people. Similarly, they were also asked if it was easiest to work with students of the same gender, opposite gender, or if gender did not matter. In addition, students were requested to give a simple “yes” or “no” response to the question: “is the gender composition of a small group important to you?” The purpose of these three questions was to determine whether or not students felt that gender composition and gender differences are significant factors affect cohesion and success of students in a group setting. Finally, in order to measure the effect of workshop leader gender on the group dynamic, students were requested to record their workshop leader’s gender and to respond to the following question with a “yes” or “no” statement: does the gender of your workshop leader have a significant effect on your comfort level within the workshop?

The survey was sent to approximately 150 Organic Chemistry I students; out of these students, 81 responded. The data from 2 students were not included in the study because the responses given were incomplete. Thus, the responses from 79 students were used in the present analyses; this included responses from 59 female students 20 male students. The data were compiled in order to compare the effects of unequal gender composition and workshop leader gender on student comfort and integration within the workshop.

Results

In order to assess general attitudes regarding the effects of gender in the workshop, student opinions on gender composition were compiled for the sample as a whole. The results are displayed in Figures 1 and 2, which summarize student responses to questions about the effect of gender composition of student comfort and performance within the workshop.
A majority of students said that the gender of their group members does not matter in terms of relative comfort within the group (82%) and in terms of group performance (72%) (Figure 1). However, there was still a portion of students who stated that they are comfortable with members of the same gender (15%), and who stated that they perform best amongst members of the same gender (20%). Finally, 86% of students stated that gender composition of a small group does not matter to them as shown by Figure 3.

We predicted that unequal gender composition within the workshop would result in isolation of those students of the underrepresented gender. In order to define this variable, we
described an integrated student as one who feels sufficiently comfortable with his or her group members to participate and collaborate with others in the workshop. Conversely, we defined an isolated student as one who feels alienated from and uncomfortable working with other students in the workshop. From the numerical scale presented in the survey, students who ranked their level of integration with their peers in workshop as 1-3 were labeled as isolated while students who ranked their level of integration as 4-5 were labeled as integrated. As shown in Figure 4, 37% of the students consider themselves isolated from their peers.

Figure 4 shows the proportions of isolated and integrated students amongst the population surveyed. The majority of students in CHM 203 feel integrated with their peers in workshop.

After dividing students into integrated and isolated factions, we calculated the proportion of students in their workshop’s underrepresented gender among each category (Figure 4). The percentage of underrepresented, isolated students who felt the workshop leader’s gender had a noticeable impact on their learning experience (27%) was much greater than the proportion of underrepresented, integrated students who provided the same response (6%) as shown in Figure 5.
Finally, Table 1 lists the percentages of students who believe their workshop leader’s gender affects their learning experience, on the basis of gender. Only 19% of females and 30% of males stated that the gender of their workshop leader did impact their learning during the workshop. Although not depicted in Table 1, of these “yes” respondents, 64% of female students reported having male workshop leaders; 67% of male students reported having female workshop leaders.

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<thead>
<tr>
<th></th>
<th>Females (59 responses)</th>
<th>Males (20 responses)</th>
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<tbody>
<tr>
<td>No</td>
<td>81%</td>
<td>70%</td>
</tr>
<tr>
<td>Yes</td>
<td>19%</td>
<td>30%</td>
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Table 1 shows the percentages of male and female students who felt the gender of their workshop leader had a noticeable impact on their learning experience and the percentage of male and female students that did not.
Discussion

In this study, we examined the influence of unequal gender composition on student integration within the workshop. This included investigating the effects of the gender composition of the students, as well as the effects of the gender of the workshop leader on student learning and comfort. The results reported above do not support the hypothesis that workshop students of the underrepresented gender are more isolated than students of the not-underrepresented gender. Similarly, the results also do not support the prediction that the workshop leader’s gender has a greater impact on the learning experience of female students than male students.

The data showed that 38% of isolated students and 34% of integrated students were members of the underrepresented gender. The minimal difference between these proportions makes it unlikely that unequal gender composition plays a significant role in impacting the level of student integration within the workshop. This result is not consistent with the findings of Rosser (1998) or Eccles and Blumenfeld (1985), which indicated that students in a demographic minority interact best within homogenous groups, and that they tend to integrate poorly with non-minority students. However, both of these studies were conducted over a decade ago, and it is possible that attitudes towards gender roles among males and females are more similar today. Thus, gender differences in the workshop environment may be less pronounced, and gender composition not a significant contributing factor to student comfort level within the workshop. Another potential reason for the observed result may be the small size of the workshops. Since most workshops consist of fewer than 10 students, the difference between the number of students in the minority and majority gender was typically no more than 3 to 4 students. Therefore, there was no overwhelming underrepresentation of one gender, compared to the other. The small size difference between the underrepresented and not-underrepresented gender may have prevented students in the
underrepresented gender from feeling the same isolation they may have, had the difference been much larger. On the other hand, the high percentage of student responses stating that gender neither affects neither student comfort levels nor students’ abilities to work with one another supports the former argument.

The results showed that the gender of the workshop leader does not play a more significant role in the learning experience of female students than in the learning experience of male students. This finding is neither supported nor refuted by the relevant literature. We had initially predicted that due to the greater sensitivity of female students to gender composition in groups, that they would be more likely to be cognizant of effect of the workshop leaders’ gender on their comfort level and group dynamic in the workshop. However, this was not the case. Only 19% of females reported that the gender of the workshop leader had a noticeable effect on workshop comfort level, whereas 30% of males reported the same. It is possible that this deviation from the predicted result was due to the large number of total female responses (59) in comparison to male responses (20). On the other hand, it is may be significant that over 60% of both males and females who reported that the gender of the workshop leader effected workshop comfort also had workshop leaders of the opposite gender. It also may be significant that among students of the underrepresented gender, a greater percentage of isolated students (27%) reported that the gender of the workshop leader impacted their learning experience, than that for integrated students (6%). This finding seems to indicate that gender differences do play a role in student-leader relations in the workshop, although for only a small proportion of students. The reason behind why this small faction of students is conscience of the effects of the workshop leader’s gender seem not to be the result of being a member of the underrepresented gender, but rather due to some other sensitivity.
The lack of corroboration between the results and the hypothesis make this study inconclusive. It appears that unequal gender composition does not play a significant role in influencing levels of student integration within workshops, while the gender of the workshop leader may impact the learning experience of a small percentage of students. However, both of these hypotheses must be tested by further research.

There are several limitations to this study which may have affected the results. The data was collected via survey, and thus the accuracy of the results is limited by self-response. If this study were repeated, it would be wise to observe interactions between students in the workshop in addition to collecting student responses, in order to also have data without the bias of self-reporting. Another limitation to this study is the unequal number of male and female responses. This study focused upon gender composition and gender differences; this discrepancy may have had an effect on the results. In addition, in the process of analyzing the data no statistical analyses were performed, thus, we do not have a measure of the validity of our results. Finally, this study also suffers from the challenge of measuring causality with an observational study. The hypothesis predicted that unequal gender composition is the cause of poor integration of students of the underrepresented gender in workshops. Although we were able to measure the percentages of students in each of these categories, it is difficult to assert that one variable has an effect on the other without conducting an experimental study. If this study were repeated, it would be wise to conduct a formal experiment with an experimental and control group, in order to measure the predicted causal association.

Although our study yielded inconclusive results, the subject of gender composition and its effects on group learning is still an important one. Thus, there are many potential trajectories for future research in this area. For example, in our study we attempted to determine whether the
underrepresented gender was more or less likely to feel isolated within the workshop than the not-underrepresented gender. In the future, it may be interesting to examine whether one gender is more likely to feel isolated than the other when underrepresented. In addition, our study only generated a “yes” or “no” response to whether or not the gender of the workshop leader’s gender effects student learning in the workshop. It would be pertinent to investigate whether this effect is positive or negative in regards to the group dynamic. Examining factors effecting student-leader relationships represents a large area for future research.

Studies such as this, exploring variables impacting student learning are significant to developing effective education programs. In the United States, schools and colleges often emphasize equal learning opportunities for all students. Despite this claim, however, there are clear inequalities between the successes of various demographic groups in the classroom. For example, male students continually outscore female students in standardized tests in mathematics and science; and, White and Asian students typically outscore Black and Hispanic students on college entrance exams (Fletcher and Tienda, 2010). While there are several factors contributing to these discrepancies, it is important to consider how difference in classroom socialization between students of different demographic groups may affect their overall learning experience and future academic success.
References


