Introduction

Employers are looking for graduates with a high level of interdisciplinary, collaborative, and globally oriented skills (National Academy of Sciences, 1995), including communications, conflict resolution, and planning/project management.

Students need more practice in group activities to prepare them for those aspects of career that require collaboration; more instruction in group functioning and assessments that promote and evaluate learning is needed (Sorensen and Lunde, 1993).

In recent years, higher education has shifted from a strictly instruction-based curriculum to include more collaborative learning activities using online platforms like Google Docs (Chu, 2008; Chu and Kennedy, 2011).

Collaborative learning is an educational approach to teaching and learning where groups of students work together to solve a problem, complete a task, or create a product (Laal and Ghodsi, 2012; Sorensen and Lunde, 1993).

Instructors use collaborative learning as an educational tool to: improve student skills in working and communicating with others, enable students to learn from one another, and enrich student experience in course content (Kelemen and Spich, 1984).

From a pedagogical perspective, group projects as part of collaborative learning are beneficial for workplace, student, and instructor purposes (Young and Henquinet, 2000).

Advantages of collaborative learning include social, psychological, academic, and assessment benefits, as collaborative learning is based on cooperation of teams and not competition between students (Laal and Ghodsi, 2012; Laal et al., 2013).

Objectives

Develop an inter-institutional cooperative learning project during which students work via distance to create a single-document literature review of environmental factors that affect flowering and fruiting of crops produced in high tunnels.

Evaluate the effectiveness of the collaborative learning experience based on changes in 1) student perception of group projects; and 2) student perception of their confidence in knowledge about the topics researched.

Materials and Methods

A written pre- and post-project survey instrument included statements that evaluated 1) student perception of group projects, and 2) student confidence about knowledge of environmental impacts on crops produced in high tunnels. Students responded using a Likert-type scale to indicate the level of agreement (1) or disagreement (4) with each statement (Table 1).

The pre-survey instrument was administered in the second week of the Spring 2015 semester to six undergraduate students enrolled in HORT 625 Floraal Crops Production and Handling at Kansas State University and two undergraduate and two graduate students enrolled in HORT 542 Flowering and Fruiting in Horticultural Crops at Oklahoma State University.

Students were assigned to groups of two or three by the instructors so that each group had at least one student from both universities. To facilitate project completion, five sequential written instructional documents were developed to move students through the project’s process (Figure 1).

The post-survey was administered two weeks before final exams. All participants in both surveys without compensation (n = 10). Paired t-tests were used to compare pre- and post-survey responses in Microsoft Excel 2013.

Results

Student perceptions about group work did not change appreciably from before to after collaborating on this project. The only statement that showed a change in student perception from pre- to post-project was whether “group projects cause (students) to earn a better grade than [they] would have on [their] own” (Table 1).

Students perceived that the group project resulted in them earning a lower grade.

Student perceptions of their knowledge gain about how light, environment, and fertilization influence a crop’s flowering response in high tunnels improved after completing their respective courses, of which the project was a key part (Table 2). However, students did not report increased confidence in being able to review literature or more strongly perceive that research provides the basis for growers to innovate their production practices, perhaps because they already agreed with these statements in the pre-survey.

In the post-survey qualitative questions, students were asked whether the project, with improvements, should be included in future offerings of the course. Eighty percent said “yes”, 10% said “no”, and 10% did not clearly indicate their opinion (n = 10).

Discussion

Instructors were surprised by how ill-prepared upper-level students were to find and summarize literature, then extract cohesive ideas from their summaries. On scale of 1 to 10 with 10 being most difficult to follow, and 5 being the most readable, students rated the final manuscript at 4.5. The average of student ratings of manuscript quality was 7.1, indicating that they recognized that it was not publication-quality.

On a scale of 1 to 10 with 10 being the most beneficial to my share and probably more to this project, average student response was 7.6. This result may help explain student perception that the project decreased their grade compared to working alone.

Despite student agreement that they were confident in reviewing the literature to understand physiological responses, instructor observation paired with several student comments suggested that more instruction should be given on how to conduct a proper literature search.

Other qualitative student comments about how to improve the project included more clearly conveying the project process from the beginning and throughout; better explanation and instruction on how to use Dropbox or use a different program to share documents; select a more general topic; provide instruction on how to communicate with partners; provide more updates and require more submissions to check on progress; and perhaps the project would be more valuable if each group created their own manuscript.

Student perception of group work was generally lukewarm, both before and after the collaborative project. For example, they only somewhat agreed that “I prefer group projects to typical class assignments” (Table 1).

Conclusions

Instructors should consider spending a whole lecture on explaining the project and showing students how to perform a literature search, cite the literature, develop a literature cited section, track references, and use technology such as Dropbox to share documents. Alternatively, extensive supporting documents in addition to the written Project Phase documents (Figure 1) must be provided.

Though frustrating for students, the use of inter-institutional collaborative learning such as reviewing literature based on a topic of interest can promote confidence related to content knowledge gain.

Literature Cited


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