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Assessment of Group Learning in Traditional and Online Instructional Formats in a Landscape  
Contracting Program

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## ABSTRACT

Learning outcomes from assigned group work often have mixed results due to instructor-based problems and student-based problems. Instructor-related problems include unclear objectives, lack of interdependence in the assignment's structure, and lack of individual accountability. Student-related problems are tied to the lack of necessary teamwork skills to work efficiently in groups and pre-conceived negative perceptions of group work. Group learning has faced yet another challenge as institutions switched to hybrid learning or fully online learning. The physical communication aspect has been removed and both students and instructors are faced with implementing group work virtually. This study aims to analyze the effectiveness of hybrid group work when students are provided with a framework for group learning and tools to foster positive group dynamics and problem-solving. A survey was to be administered among rising seniors in the 2020 spring semester to assess students' comfort levels with group work, the setting of their group work (in-person or online), and how they perceive their success in achieving learning outcomes in the group projects they participated in the previous year. Those group projects were conducted with no framework or coaching. The sample is limited to the previous year because the students would have experienced one year in the landscape contracting major core classes. Throughout the duration of the 2021 spring semester, students were to carry out group assignments with an improved framework and teambuilding exercises. A secondary survey will be administered at the conclusion of the 2021 spring semester to compare student responses from the initial survey of the same seniors. This follow up survey will use the same questions and compare the students' responses. The results of this research will be used to improve intergroup dynamics among students in-person and online and the

efficiency of group projects throughout the Landscape Contracting program and other departments within the College of Agricultural Sciences.

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## **Background**

### **Introduction**

The effectiveness of group work has been a long-standing discussion among higher education professionals. While instructors tend to implement and support group collaboration, students often question the necessity and effectiveness of it. Factors influencing the success of group work are accountability, assignment design, the instructor's role, and group dynamics. There are also several aspects that do not work when it comes to group collaboration, and these are important to address and understand before assigning collaborative projects. Student perspectives and opinions of group work are shaped by all of these factors, both positive and negative. As online learning is becoming increasingly popular among students, and now is required of students worldwide during the COVID-19 pandemic, it is important to see how to implement successfully group collaboration in an online environment. Group work requires diligent and frequent communication in order to be successful. The face-to-face learning environment provides a more readily available structure for this communication. Online learning, however, can pose a challenge with the lack of in-person collaboration. Group work can be successful in an online setting, but it requires additional knowledge of potential barriers that may occur, and it demands a greater level of effort from the instructors and students in order to be effective.

## **Effectiveness of Group Work**

Group work enhances and enriches students' education beyond the standard course information. It transforms groups of students into highly effective learning teams through frequent and high quality interactions (Michaelsen & Sweet, 2008a). Group collaboration fosters the sharing of diverse viewpoints and opinions (Scager, Boonstra, Peeters, Vulperhorst, & Wiegant, 2016). It allows students to further their knowledge by engaging with team members and learning from each other's different perspectives. Group work creates an enhanced learning environment where students join ideas and combine resources to complete a common project (Hillyard, Gillespie, & Littig, 2010).

## **Factors Affecting Group Work Success**

### **Accountability**

Accountability holds individual team members responsible for the completion of their respective parts of a group project. It is central to ensuring all group members develop by learning collaboratively, and it is critical to the success of the overall collaboration of a group (Goh, Di Gangi, & Gunnells, 2020; Hutchinson, 2007). Individual accountability holds each student responsible for taking the time to learn the necessary material and grow in knowledge in order to contribute effectively to the goals of the group and the coursework. It is the basic responsibility required of group members in any collaborative project. This sense of mutual accountability among members encourages and facilitates students' efforts within the group and aids in the reduction of "free riding," where students deny their responsibilities and ride on the

work of other group members (Scager *et al.*, 2016). Holding team members accountable for their individual portions forces each student to contribute and carry out their designated tasks. With that being said, students must be held accountable to not only their teammates, but also to the instructor for the quality and quantity of their work (Michaelsen & Sweet, 2008a). The instructor serves as a mediator to ensure individual accountability is upheld and each member is achieving the necessary requirements. A useful tool to implement for upholding accountability is a group assessment. A group assessment is useful for ensuring students contribute to the group work and holding members accountable to the team as a whole (Michaelsen & Sweet, 2008a). It gives group members a chance to express the contributions or lack thereof of their teammates to the instructor and address any accountability issues. The group assessment holds each team member accountable for his or her work and the impact it has on the group overall. Most often group assessments are administered anonymously, which helps to inform instructors of problems within groups without fear of retaliation. They also usually contain a peer evaluation section. This section helps to further promote individual accountability while the assessment as a whole helps promote group processing when the groups reflect on the results (Chang & Brickman, 2018). The inclusion of a peer evaluation component also has been shown to reduce the incidence of free riding. If implemented early enough in the project and administered frequently throughout, peer evaluations and group assessments have additionally been shown to improve students' attitudes toward group work and result in a more positive view of the collaborations (Chang & Brickman, 2018; Chapman & Van Auken, 2001). When using group assessments, however, they must be implemented with caution and be carefully thought out so they do not cause any resentment or problems among students (Feichtner & Davis, 1984). Anonymity can help with this, but the



content and questions must also be carefully considered. These evaluations and assessments should foster collaboration and cohesiveness rather than cause division within groups.

### **Assignment Design**

The design of the assignment must promote both learning and team development. Assignments that emphasize decision-making generate a high level of discussion and encourage group members to engage with each other. Assignments that require complex tasks or lengthy documents, on the other hand, hinder both learning and team development. They inhibit free-flowing discussions by imposing a sense of urgency for project completion and forcing students to focus on dividing and conquering roles rather than collaborating together (Michaelsen & Sweet, 2008a).

The assignment must also allow for autonomy in deciding important aspects of a group project (Scager *et al.*, 2016). Giving students the opportunity to select a topic or organize their project encourages collaboration among peers and facilitates group discussions. It helps groups work together effectively to create a project they have a personal investment in. Eliminating choices and instead assigning topics or organizational structures removes an essential aspect of team collaboration and directs students towards dividing roles rather than developing the project together.

Additionally, the assignment must be complex enough to require the assignment of group work and must be relevant to the course content. The density and complexity of the project is crucial for creating effective group work. The task needs to be extensive enough for group members to require everyone's contributions in order to complete it on time, and it needs to be

complex enough to require discussions and feedback on each other's work (Scager *et al.*, 2016).

The density and complexity of a project is crucial for creating effective group work because when implemented correctly, it necessitates the presence of groups and does not leave any questions as to why group members are necessary rather than completing the assignment individually. The context of the group project must be of relevance to the course content in order for group work to be beneficial. Students who perceive the project as relevant often have a more positive experience with group work whereas those who perceive it as unrelated or unnecessary to complete as a group have more negative experiences (Feichtner & Davis, 1984).

The final aspect of the assignment design necessary to create a positive group experience is the allotment of class time for group collaboration. Students' worst group experiences came from projects where they had little to no in-class time to work on the project and rather had to devote hours outside of class to complete the project. Students' best group experiences, on the other hand, came from projects when they split in-class and out-of-class work time evenly. The more time students spend working on projects both in and out of class, the more cohesive the team members become and the more positive the group experience is (Feichtner & Davis, 1984).

Thus to be truly effective, a group project design must emphasize decision-making, allow autonomy in deciding project details, be of sufficient complexity and density, be relevant to the course content, and have in-class collaboration time implemented into it.

### **Instructor's Role**

The instructor plays a critical role not only in ensuring the proper implementation of group work but also in fostering collaboration and a positive experience among students. The

success of cooperative learning is dependent on articulated knowledge of the process at hand for groups and suitable instruction to convey the material (Hutchinson, 2007). Groups cannot and will not be successful without thorough communication from the instructor on what is required of and expected from groups. The assignment and feedback process must be structured so students understand what is expected for them to produce, are familiar with the finished product that is to be submitted by the group, and have several opportunities to receive feedback on their performance (Feichtner & Davis, 1984). The material and process must be clear in order to foster collaborative and effective group work. This comes in the form of written instructions detailing the project design and requirements and in the form of verbal instructions throughout the duration of the project. Receiving feedback often and in a timely manner also shows the instructor is involved and students are not going through the project on their own. It also has a positive impact on groups when they receive immediate feedback on their performance and can make the necessary adjustments and corrections before moving forward in the project process (Feichtner & Davis, 1984).

When it comes to group formation, it is essential for the instructor to oversee the process in order for groups to be properly formed and managed. This ensures groups have adequate resources to complete the assignment, aids in developing group cohesiveness through team member selections, and ensures groups have the opportunity to develop into learning teams (Michaelsen & Sweet, 2008a).

Perhaps the most important role the instructor has is his or her influence on student's perception of group work. One of the crucial reasons students think group work isn't productive or effective is because of the instructor. Students are likely to blame any group problems on the instructor's attitude or lack of competence. Thus it is imperative when choosing to implement

group work, the instructors do all they can to remove legitimate causes for criticism, limit negative aspects of team projects, increase students' commitment to the groups, and increase students' ability to make the groups work effectively. They need to devote the time to discussing the benefits and value of working in groups, make attempts to reduce grade and work inequalities, provide insight into group dynamics and encourage students to discuss these dynamics, and take a process-oriented approach rather than a task-and-outcome approach in order to facilitate effective and positive group work (Feichtner & Davis, 1984; Chapman & Van Auken, 2001). Meeting these criteria will help to make group work as effective and collaborative as possible, while providing a more positive experience for the students. Throughout all of these requirements, instructors need to be sure to address any negative attitudes that linger in students from previous group experiences to prevent them from being carried into present and future group projects (Hillyard *et al.*, 2010). If these attitudes are not addressed, students will continue to feel as if the issues that caused them are still being ignored. Instructors must devote the time to understanding why negative attitudes were formed in the first place and take the time to alleviate those perceptions going forward.

The instructor's attitude can have an impact on all of these areas. As the instructor takes a more positive approach and role, students' work and grade equity concerns decrease (Chapman & Van Auken, 2001). This is important because these concerns directly influence students' attitudes towards group work. Any worries over work and final grade distributions have a negative influence on the perceived benefits of group collaboration. Taking a positive approach to group projects and alleviating these concerns helps students have a better experience and a more positive attitude toward group work. The instructor's overall enthusiasm and interest for helping students understand the material also has a great influence on students' approaches and

attitudes (Hutchinson, 2007). The more enthusiasm and interest an instructor relates to students indicates his or her commitment to helping the students and groups succeed with their work. It motivates students to put forth their best effort and gives them a more positive experience, which in turn will shape their perception of group work to be more positive overall.

### **Group Dynamics**

Two main factors influence the success of group dynamics: group size and diversity. Group size is an important factor for encouraging group collaboration. Groups too large can exclude individuals from participating and sharing viewpoints. They also create a logistical problem when it comes to arranging outside meeting times (Feichtner & Davis, 1984). The more group members there are, the more difficult it becomes to create a cohesive and inclusive work schedule. Groups too small, in contrast, make it easier logistically but can create pressure and put too large of a workload on the group members. Groups of three to five students have been found to be of optimal size for dividing equal responsibilities (Scager *et al.*, 2016).

Group diversity is important for creating a beneficial learning environment. Groups with diversity in members' perspectives and styles increases learning, especially in group work that requires creativity (Scager *et al.*, 2016). The presence of different viewpoints and perspectives fosters a learning environment as these ideas come together and individuals learn new ways to approach topics or think about ideas. Diverse input in problem-solving discussions also has a positive impact on both learning and performance (Michaelsen & Sweet, 2008a). It allows team members to work through problems and learn how to find the solutions or make corrections for

steps they completed wrongly. Group diversity allows individuals to collaborate together and benefit from their combined knowledge.

### **Aspects That Do Not Work**

There are many key aspects of group work that enable cohesive and efficient collaboration to occur; however there are also several aspects that do not work for creating a collaborative environment.

When it comes to forming groups, allowing students to select their own groups, making groups too small (less than 3) or too large (greater than 8), and dissolving and reforming groups throughout the semester do not foster a beneficial group work environment. All of these scenarios take away from group cohesiveness and effectiveness. Instructor-assigned groups facilitate a better learning environment since peers were placed together for the sole purpose of successfully completing the group project and do not have any outside factors affecting this process (i.e., half the group being close friends and focusing on unrelated plans rather than the project itself, etc.). Dissolving and reforming groups breaks the group dynamic that was already established and built throughout the course of the project and forces new groups to start from the beginning for establishing a cohesive and positive dynamic.

When it comes to project design, structuring the assignments so they are not complex enough or so students could easily complete them individually without any collaboration hinders the production of a collaborative group environment. The purpose of group work is to create an environment where peers can work together to complete a common goal. Creating a simple assignment defeats the purpose of creating a group dependent assignment. One of the other

important aspects of project design is the inclusion and importance of feedback. Projects need to be submitted in stages throughout the semester to allow for feedback to be given. Having group work turned in late in the semester will inhibit any feedback that could potentially be received and will leave students feeling frustrated or as if they are being led blind through the process. Peer evaluation is a critical component of feedback, and not including any form of it throughout the duration of the project or in the final grade does not help to foster a positive group work environment.

It has been found when employed individually, all of these factors will measurably reduce the effectiveness of group learning and when employed in combination, will ensure that group learning is counterproductive (Feichtner & Davis, 1984).

### **Student Perspectives (Factors Shaping Attitude and Opinion Formation)**

There are multiple factors shaping the attitude and opinion formations students have towards group work.

Group assignment has been found to impact student's attitudes toward group work. Students in self-selected groups had a slightly more positive view of group work and felt the process was more valuable, useful, and effective than those in randomly assigned groups. However, students in randomly-selected groups felt that members used group meeting times more efficiently and the group as a whole was more task-oriented (Chapman, Meuter, Toy, & Wright, 2006). Students are more likely to have positive group work experiences in classes where groups are either formed by the professor or by a combination of methods but not when

the groups were formed by themselves. Students have attributed the cause of worst group experiences to be when the students had formed their own groups (Feichtner & Davis, 1984).

Lack of team cohesion is also associated with students' negative feelings toward teamwork. One of the factors influencing this is assigning team roles rather than allowing students to select the tasks they want to undertake (Ott, Kephart, Stolle-McAllister, & LaCourse, 2018). Assigning roles does not help with group cohesion and does not make the project go more efficiently. It leaves students feeling frustrated and aids in them developing a negative perception of group work.

Interpersonal group dynamics that went wrong are another contributing factor to students' negative experiences in group work. This includes a few individuals dominating the project and completing all the work as well as the instructor not intervening. These often lead to enhanced negative opinions on the effectiveness of group work. Students value instructor mediation and leadership, and if not given any, they often feel frustrated and do not enjoy group assignments. If group members work together cohesively and are all academically prepared for the group work, then students feel as if group work is effective and creates an enhanced learning opportunity (Hillyard *et al.*, 2010).

Students having a positive attitude toward their task is the strongest positive influence on the quality of decisions made and overall performance of the teams (Chapman & Van Auken, 2001). Students' perceived motivation and enjoyment of the group assignment has a significant relationship with their perceived learning and knowledge gained (Gomez, Wu, & Passerini, 2010). The more enjoyable the project is and the more positive the experience, the more students will gain from group collaboration.



Overall, students as a whole have a generally positive view on group work (Chapman *et al.*, 2006; Chapman & Van Auken, 2001). They are likely to report having a positive experience with group members regardless of group composition or performance level (Chang & Brickman, 2018). Factors that have been found to encourage and facilitate these positive attitudes are the use of peer assessments, the ability to discuss group issues, and instructors discussing group dynamics and logistics (Chapman & Van Auken, 2001). Students truly value discussions, feedback, and clarity with group projects. Including all of these in the structure of an assignment aids in fostering an overall positive experience with group work.

### **Online Group Collaboration and the Challenges It Poses**

In recent years, online education has been a growing trend among students for the time and space flexibility it gives them. During this COVID-19 pandemic, online education has been carried out by schools worldwide. As education continues to remain online or in a hybrid learning environment, instructors must learn how to implement effectively the “normal” teaching strategies in an online environment, and students must learn to adapt to this new way of learning. For instructors, understanding and successfully implementing teaching methods for group work activities can be challenging in a face-to-face teaching environment, so incorporating these ideas into an online platform creates an even greater challenge (Hutchinson, 2007). The downside of online group work is the greater time commitment required due to the more frequent, consistent interactions needed to complete a project (Goh *et al.*, 2020). It also creates management issues as students try to adapt to asynchronous time and learner communication mediums. The online group collaboration projects require organization and preparation, project monitoring, and the

use of tools and group space to carry out effectively group work. (Ernest, Catasús, Hampel, Heiser, Hopkins, Murphy & Stickler, 2013). Online students already find it difficult to effectively manage their time and meet deadlines for their assignments and activities, and adding group work with all of these new requirements on top of it creates even more of a challenge. This added burden of coordinating team activities can leave students with a negative experience regarding online group collaboration (Goh *et al.*, 2020).

Group collaboration in an online format breaks the seamless flow of steps experienced in face-to-face learning due to students' time availability and the delay/slack time where students wait for others to finish steps before the group can proceed. This break in flow can slow team consensus building and the learning experience as members have to refamiliarize themselves with topics. Proactively managing the flow that would have manifested naturally in a face-to-face environment is one of the single most challenging issues for instructors in online learning. (Goh *et al.*, 2020). The best way to manage this situation is for the instructor to encourage positive interdependence and take a more active role in implementing group projects (Hutchinson, 2007).

Instructors must play a more active role to ensure students are maintaining focus and can reengage in the group discussions. Students have much higher expectations of the instructors in an online environment to provide feedback in a detailed and timely manner (Goh *et al.*, 2020; Palsolé & Awalt, 2008). Failure to do so disrupts the group's flow and progress, so the instructors are held more accountable and to higher standards in online group collaboration. Continuous assessment and engagement throughout the process also helps create a more positive experience for students and increases their individual performance (Rajabalee, Santally & Rennie, 2020). Students need structure and guidance for online discussions with effective online

instructions requiring extensive planning and forethought. They need clearly conveyed assessment criteria, detailed planning, clear instructions and timing, general ground rules for participation, and even model submissions as to what is expected in order to provide more clarity. The instructor needs to foster support and encouragement, student responsibility and accountability, provision of group spaces, and resolution of concerns or conflicts (Hutchinson, 2007). The instructors must work with individual teams regularly not only to resolve resolutions and conflicts, but also to ensure each group is progressing through the activities and give any advice on issues that have occurred. It's important for them to facilitate social interaction between group members in order to create a collaborative online experience and foster positive group dynamics (Hutchinson, 2007; Ernest *et al.*, 2013). The success of online group collaboration is dependent on student participation and interaction (Ernest *et al.*, 2013). Instructors must find ways to increase interactions among students to build on group work concepts and foster a collaborative learning environment in order to keep students motivated and help them achieve their learning goals (Rajabalee *et al.*, 2020). They also must positively reinforce group member engagement during each stage of the process (Goh *et al.*, 2020). They need to play an active role in consulting individual groups, but they must also bring the teams together as the class shifts from one step to the next to ensure all groups stay on track (Goh *et al.*, 2020).

## Materials and Methods

A Qualtrics survey was to be administered to junior and senior level landscape contracting students as well as one combined-major course consisting of students from the agribusiness and plant science horticulture majors. The survey consisted of 13 questions regarding the difficulty of group work, the impact of the setting in which group work is carried out, the perception of group work, and past experiences with group work (Appendix A). The junior level landscape contracting students completed Residential Landscape Planning (HORT 269) in the fall semester, with the class being split in terms of in-person learning or online learning. The students were given a choice in their selection of learning method, and some students chose to be fully online for the course of the semester while the remainder chose to be in person for the duration of the semester. These students are now all in Landscape Construction I (HORT 464) and will have the survey administered through that course. The senior level landscape contracting students completed Landscape Construction II (HORT 466) in the fall semester. The class was entirely in-person and involved multiple group work assignments. These students are now in Landscape Planting Design (HORT 368) and will have the survey administered through that course. The combined major course was the cross-listed Retail Horticulture Business Management (AGBM/HORT 455) course. This class was entirely online for the duration of the fall semester and featured a semester-long group project that had groups meeting several times over the semester to complete portions of the project. The survey was to be emailed to those students individually as there is no one course the students are in together for the spring semester. The survey was to be presented as voluntary to the students and would have no impact on their academics. The students who completed the survey were to be entered into a

drawing to win a \$25 Amazon gift card.

## Results

Due to the COVID-19 pandemic, this thesis was not able to be completed. The pandemic delayed the Penn State IRB approval process to the point where it could not be approved in time to complete this thesis. The survey is still under review and subject to approval with the IRB office. Once the survey is approved, I plan to implement the survey to the above-mentioned classes and complete this preliminary step of the research. The findings are intended to be submitted to the North American Colleges and Teachers of Agriculture (NACTA) journal in the hopes of publication. The subsequent steps that would have been taken following the data analysis would have been to provide the students in said classes with a framework for group learning and tools to foster positive group dynamics and problem-solving. A follow-up survey would have been implemented at the end of the 2021 spring semester to assess students' perceptions of group work after receiving the framework and tools. The results would have been analyzed to determine if the framework and if the tools (or specific tool(s)) had a more positive impact on students' group work experiences and perceptions.

Below are the results that would have been expected had the preliminary survey been able to be implemented and the data analyzed.

## Discussion

Based on previous studies, the expected results would have been to observe a majority of students reporting group work as helpful, especially in face-to-face formats. Students often report having a generally positive experience with group work in traditional settings and value the experiences gained from working with others (Chapman *et al.*, 2006; Chapman & Van Auken, 2001). Thus it would be expected that the students in the courses surveyed for this thesis would also describe group work overall as being helpful and positive. Online instructional formats would have been expected to result in students finding group work unhelpful and the aspect of meeting with students more difficult in an online format. Previous studies have found that an online setting creates an even greater challenge for students and adds an extra burden when they are expected to coordinate group projects and find additional time to meet (Goh *et al.*, 2020). Online learning environments often leave students feeling unsatisfied, especially if the online learning was not a choice, i.e., remote learning due to the COVID-19 pandemic, etc. It is incredibly difficult to learn in such an environment and even more difficult to carry out a group assignment successfully and smoothly among members. Thus, it would be expected that the juniors and seniors of this survey who experienced in-person learning for years and recently had to adjust to online learning would most likely feel group work in an online setting is unhelpful and more difficult.

It would have been expected that students found instructors useful in contributing to the success of groups in both face-to-face and online formats. Studies have found the instructor plays a crucial role in not only students' perceptions of group work but also in ensuring the assignment is implemented smoothly (Hutchinson, 2007; Feichtner & Davis, 1984; Chapman & Van Auken, 2001). The instructor sets the tone for how enjoyable an assignment can be and has the ability to

foster a great learning environment with a project. This is much easier to accomplish in an in-person setting, which also gives the instructor the ability to monitor the progress of groups. It allows them to more easily play an active role in the development of the project as well as observe any potential problems with the assignment design or implementation. In an online format, it is much more difficult for an instructor to play an active role and supervise project development and team cohesion. The instructor must be incredibly diligent to create a successful and positive online group work experience. Because of the difficult nature of a virtual group project, students more often than not are left with negative experiences unless an instructor has gone above and beyond to make the experience meaningful. Thus, it would be expected that the students surveyed would have found the instructors useful in contributing to the success of both in-person and online group work, because it truly comes down to the instructor's involvement when determining group work success.

It would have been expected that students felt group work framework should mainly include peer evaluations, but may also include progress reports to the instructor. Peer evaluations have been found to improve students' attitudes about group work and result in more positive experiences from the collaboration (Chang & Brickman, 2018; Chapman & Van Auken, 2001). Peer evaluations provide a safe atmosphere for students to freely express how the project went and explain if any members did not contribute as they should have. The benefits and safe sharing space of a peer evaluation would make it a component that students would be expected to select for inclusion. Progress reports could also have been an expected selected response from students. Groups often have positive experiences and impacts on the project when they receive frequent and immediate feedback on the assignment (Feichtner & Davis, 1984). This gives students the opportunity to communicate with the instructor and ensure they are meeting the required criteria.



It gives them a chance to make adjustments and corrections throughout the process before they move on to the next major section, and it makes the experience overall more enjoyable. Although peer evaluations are often the most important component outside of the project itself, these progress reports are also important and thus could have been one of the survey's top responses as well.

## **Conclusion**

Although the survey could not be implemented and thus the data could not be gathered, it would be expected based on previous studies that overall students would find group work helpful and feel instructors have an important role in the success of the collaboration. Peer evaluations would have been expected as a chosen component to include in the design of group work assignments as well as progress reports as an additional component. Not only are instructors crucial in the success of group work but so are the framework and assignment design. Students must have assignments that are challenging and complex enough to require other team members, an instructor who will play an active role in creating a positive work environment and ensuring the project design is carried out smoothly, and an opportunity to evaluate anonymously and share the contributions of members as well as personal opinions on how the assignment went. Once all of those factors are achieved and implemented, then group work will be more successful and provide students with a more positive experience.

# Appendix A

## Qualtrics Survey

11/18/2020

Qualtrics Survey Software

English ▼

### SURVEY INSTRUCTIONS

**Implied Informed Consent Form for Social Science Research, The Pennsylvania State University**

**Identifying how landscape contracting students view groupwork before and after establishment of groupwork frameworks**

#### **Principal Investigators:**

Margaret Hoffman, Landscape Contracting Program Coordinator, Department of Plant Science, 306 Tyson Building, University Park, PA 16802 Email: mch7@psu.edu or Phone: 814-863-6167

**1. Purpose of the Study:** To learn how Penn State landscape contracting, plant science or horticulture students view their experiences with groupwork and if learning outcomes and attitudes can be improved through the development of strong groupwork frameworks. This study also determines if differences exist between student experiences during remote vs face to face classes.

**2. Procedure:** You will be asked to respond to a survey about your experiences with groupwork in landscape contracting Hort 269, Hort 368 or Hort 466 or Hort 455.

**You must be at least 18-years of age and either registered student now or in the past, in Penn State courses Hort 269, Hort 368 , Hort 466 or Hort 455**

To participate in the survey please read the entire implied consent form and click "Yes, I agree" to begin the survey.

**3. Duration/Time:** Completion of this survey should take approximately 7 minutes.

**4. Statement of Confidentiality:** Your participation in this research is confidential. The summarized survey data will not contain any information that could identify to whom the responses belong. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared because your name is in no way linked to your responses.

Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet by any third parties.

**5. Voluntary Participation:** Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer, though we are unable to use your survey responses if you do not answer all the questions.

**6. Compensation:** If you successfully qualify for and complete this survey you will qualify

for a \$25 Amazon.com gift card code drawing after the survey has concluded.

**The gift card codes will only be emailed to those who meet these criteria:**

- 1) those who are at least 18-years of age,
- 2) currently registered and complete Hort 368 or Hort 464 in Spring semester 2020

**After you submit your survey, you will be asked to provide the following so that we can issue your gift card:**

- 1) your name,
- 2) valid email

**7. Right to Ask Questions:** Please contact Margaret Hoffman with questions or concerns about this study.

**Do you meet the criteria to participate in this study (you must be at least 18-years of age, currently registered in Hort 269,368 466 or 455), and have you read the consent statement and agreed to participate in the research?**

- Yes, I meet the criteria and I agree to participate
- No, I do not meet the criteria and/or agree to participate

#### **Student Resources**

Which courses have you been or are enrolled in ?

11/18/2020

Qualtrics Survey Software

Hort 269
Hort 368
Hort 466
Hort 455

How helpful or unhelpful is group work in your remote classes in achieving learning objectives?

- helpful
- unhelpful
- doesn't matter
- doesn't apply

How helpful or unhelpful is group work in your face to face classes in achieving learning objectives?

- helpful
- unhelpful
- doesn't matter
- doesn't apply

How easy or difficult is it to work with other students in a group in face to face format ?

- easy
- moderately easy
- moderately difficult
- difficult
- doesn't apply

How difficult is it to work with other students in a group in remote format?

- easy
- moderately easy
- moderately difficult
- difficult
- doesn't apply

How useful are the faculty in contributing to the success of the group in face to face format?

- Very useful
- Moderately useful
- Slightly useful
- Not useful

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doesn't apply

How useful are the faculty in contributing to the success of the group in remote format?

- very useful  
 moderately useful  
 slightly useful  
 not useful  
 doesn't apply

### Perception of School Culture/Atmosphere

How satisfied or dissatisfied are you with your group work experiences in landscape contracting up to now?

- Very Dissatisfied  
 Dissatisfied  
 Somewhat Dissatisfied  
 Neutral  
 Somewhat Satisfied  
 Satisfied  
 Very Satisfied

Rate the following statements



	Group work		
	don't agree	somewhat agree	agree
Group work helps me to better understand concepts presented by the instructor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyone contributes equally in groupwork assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I deserve the grade I receive in group work assignments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually get angry at one of my group members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy the social aspects of group work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ability to effectively work within a group will be valuable when employed after graduation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My academic group work experiences in landscape contracting have improved my teamwork. <input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you rate the following statements concerning group work

don't agree                      agree                      somewhat agree

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	don't agree	agree	somewhat agree
Group work works best when there is a project lead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group work works best when there are scheduled progress check ins with instructors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group work is improved with clear goals .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group work is valuable because it is real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group work experience is dependent on team construction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having a real client makes group work more meaningful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Group work framework should include which of the following?

progress reports to instructor  
contracts for work assigned to each member of the group  
penalties for not contributing  
student peer evaluations  
the ability to 'fire' group members  
none of these

Did you find it more difficult to do groupwork remotely?

- Definitely yes
- Probably yes
- no difference
- Probably not
- Definitely not
- doesn't apply

Is it more difficult to communicate with group members if you are remote

- yes
- sometimes
- No
- doesn't apply

If you said remote groupwork work is more difficult remotely, why is it?

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## ACADEMIC VITA

### Education

#### **The Pennsylvania State University, University Park, PA**

*Bachelor of Science in Plant Sciences; Horticulture; Agronomy Minor, May 2021*

Schreyer Honors College Student

#### Relevant Coursework:

Principles of Crop Management	Plant Ecology
Introduction to Soil Sciences	Horticultural Systematics
Emerging Issues in Plant Science	Plant Propagation
Field Crop Entomology	Principles of Integrated Pest Management
Vegetable Crop Production	Hydroponics and Aquaponics
Plant Pathology	Principles of Weed Management
Post-Harvest Physiology	Flower Crop Production
Spanish I and II for Ag	Environmental Effects on Horticulture
Retail Horticulture Business Management	

### Professional Experiences

#### **Biological Pest Control and Integrated Pest Management Research, University Park, PA**

*Independent research with the College of Agricultural Sciences' Greenhouse Manager, Scott DiLoreto, Spring 2018- Fall 2018*

- Conducted research on banker plant systems to control aphid infestations
- Deployed biological controls to combat thrips, aphids, and whiteflies in the College's research and educational greenhouses

#### **Helena Agri-Enterprises, Maple Park, IL**

*Paid internship, Agronomy & Sales Intern, May-August 2020*

- Collected and analyzed tissue tests and soil samples
- Created field data and ran fertilizer mix formulas in the AGRIntelligence databases
- Held sales conversations with farmers
- Discussed tissue test results to help design a nutrient management and application program

#### **Midwest Groundcovers, Virgil, IL**

*Paid internship, Greenhouse intern, May - July, 2018*

- Oversaw and aided in the planting and propagation of the fall crop and subsequent spring crop
- Assisted in pulling wholesale orders and conducted quality assurance before shipping them out
- Conducted weekly pH and EC tests
- Designed and implemented potting machine operation and trials to determine a more efficient process for transplanting plugs

#### **Yaeger's Farm Market, DeKalb, IL**

*Paid internship, May - August, 2019*

- Implemented weed control on vegetable and pumpkin fields and harvested vegetables and sweet corn for retail and wholesale markets
- Operated farm machinery and carried out upkeep and repairs as needed
- Tended to livestock, repaired and redesigned pens, and planted new pasture land
- Performed quality assurance and fulfilled wholesale orders for the distributing business

*Manager of Chrysanthemum Operation, Sales Clerk, and Field Hand, March 2014 – August 2018*

- Learned how to provide a positive retail experience for customers while keeping the farm market well-stocked and running smoothly
- Assisted in growing annual flowers and vegetable crops as well as maintaining the fields and harvesting vegetables throughout the summer
- Managed the chrysanthemum crop and ensured the operation ran smoothly
- Designed unique and attractive flower arrangements for planter boxes and hanging baskets

**Whiskey Acres Distilling Co., DeKalb, IL**

*Assistant Distiller, Bartender, May 19 - August 19, 2019*

- Managed the mash process up to fermentation for bourbon and rye making
- Barreled the spirits once they came off the still and bottled the spirits that were aged
- Applied the knowledge gained throughout the summer to construct my own specialty bourbon recipe
- Provided a quality customer experience while fulfilling bar orders

**Leadership Experiences**

*The Pennsylvania State University*

- Ag Advocate
  - Provided college tours to prospective students and their families
  - Served on panels and spoke to hundreds of accepted students and their families
  - Represented the College of Agricultural Sciences at the National FFA Convention
  - Raised awareness for the College of Agricultural Sciences and the agriculture industry as a whole
- President (1 year) and Secretary (2 years) of the Horticulture Club
  - Coordinated and held club meetings, events, and guest speaker series
  - Served on the Houseplant Committee
  - Facilitated the yearly Rose Sale and Indoor Houseplant Sale
  - Competitor at the 2019 National Collegiate Landscape Competition
    - 3<sup>rd</sup> place in Arboriculture Techniques, 7<sup>th</sup> place overall as a team, Annual and Perennial Identification

**Awards**

- Evan Pugh Award
- 2019 GPN/Nexus Intern of the Year
- Outstanding Sophomore for the College of Agricultural Sciences
- College of Agricultural Sciences Top 1%
- Sparks Award
- President's Freshman Award
- Dean's List all 4 years