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## **AC 2012-3367: EXPLORING THE REASONS FOR COLLABORATION AND COOPERATION AMONG GRADUATE STUDENT RESEARCHERS**

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# Exploring the Reasons for Collaboration and Cooperation among Graduate Student Researchers

## Abstract

The future of engineering education research will depend on collaborations among educators, researchers, and students. Participation in research collaborations helps graduate students within the engineering education community gain an understanding of the challenges of such endeavors as well as various ways of overcoming those challenges. Over the course of their program, engineering education graduate students will collaborate with a variety of people, including faculty members, members of industry, and, in some cases, their fellow students. Research collaborations among graduate students provide a means to diversify interests, develop research skills, build relationships, and advance engineering education research.

The purpose of this study was to explore the *factors that affect graduate students' willingness to participate in collaborative engineering education research with other graduate students*. This research was conducted in two phases: a literature review and a pilot study. The first phase involved a literature review to provide insight about the barriers and bridges to multidisciplinary and dispersed collaborations. In the second phase of the study, we sought to gain an initial understanding of graduate students' perceptions of collaborative research. A pilot study was conducted at a graduate student research workshop, which was designed to help attendees develop research questions for collaborative research. Findings showed that while graduate students expressed great interest in pursuing collaborative research, they largely did not do so because of a lack of time, support, and concerns regarding conflict with potential collaborators. Suggestions to promote collaborative research among graduate students include providing specific venues online and at conferences to encourage inter-student interaction and facilitate collaborative work.

## Introduction

Researchers participate in collaborative projects to promote innovation,<sup>1</sup> share resources and knowledge,<sup>2,3</sup> and develop new products.<sup>4</sup> Collaborations also provide researchers with the opportunity to learn through cooperation.<sup>2,5</sup> For a given project, the collaboration may be composed of researchers within the same discipline at the same institution, researchers across disciplines at the same institutions, or dispersed researchers in a variety of disciplines located at institutions on different continents. The collaboration may be of students in a capstone course or a blend of student researchers and faculty within a research group. The combination of those involved in a research project can be endless.

In engineering, the momentum toward innovation often promotes a collaborative mindset and environment. More specifically, in engineering education, the nature of the field (i.e., living at the border of multiple disciplines) encourages and sometimes necessitates collaboration. Even though engineering education now has degree-granting programs, an opportunity and a need to foster collaboration among emerging scholars exists and is made evident by the following quote: "Even as new Ph.D. graduates trained specially in engineering education emerge, collaborations that cross disciplinary lines will continue to be a critical component of engineering education

research” (p. 123).<sup>6</sup> Specifically, research collaborations among graduate students provide a means to diversify interests, develop research skills, and build relationships. Furthermore, research collaborations can significantly impact such things as identity development, and preparing students for their future professions.

An overarching goal of graduate education is to support the preparation of emerging scholars for “professional and/or academic life” (p. 1).<sup>7</sup> This objective is achieved through a variety of traditional experiences, such as courses and assistantships both in research and teaching. Sometimes these traditional experiences are coupled with a variety of collaborations (e.g., research groups, journal clubs). Co-curricular experiences, such as study abroad, university exchanges, and internships/co-ops, also aim to add a holistic approach to higher education. With this approach, students have the potential to broaden their experiences and their understanding of themselves as emerging scholars.

One promising approach to enhancing the student experience, particularly the graduate student experience, is through peer collaborations. According to Crede and Borrego (2010), collaborations can be a significant experience in graduate students’ identity development—

Students begin to craft their professional identity by “trying on” possible images of themselves to see how well they fit. One way these images are established is through the individual’s professional development network, and the relationships students have members of their profession and learning community (p. 3).<sup>8</sup>

Graduate education is often characterized as an independent endeavor, requiring a certain level of self-motivation. During this solitary endeavor, students grapple with a range of issues, including exploring, understanding, and defining personal beliefs and values. Thus, it may be possible for graduate students to support one another in research team environments.<sup>9</sup>

Despite their obvious value, cooperative experiences are uncommon among graduate students in the engineering education community. Consider the following example: approximately 800 students are members of the American Society for Engineering Education (ASEE); yet only a small number of papers or posters at the Annual Conference and Exposition are collaborations solely among graduate students (e.g., graduate students conducting a needs analysis of the graduate student community<sup>10</sup> or examinations of ASEE student chapters<sup>4,11-13</sup>). Currently, little is known about the factors that influence graduate students’ willingness to seek out these collaborations, and how these relationships are developed. Thus, the purpose of this study is to explore the factors that affect graduate students’ willingness to participate in collaborative engineering education research with other graduate students. Specifically, a “greater awareness of the factors that support and hinder productive collaboration can facilitate more widespread cross disciplinary collaboration” (p. 1).<sup>14</sup> Due to the rarity of graduate student collaborations within engineering education, it is important to study the barriers and bridges impacting these types of collaborations. Furthermore, while little research has focused on this topic, even fewer studies have focus on the experiences of graduate students especially in engineering education.<sup>8</sup>

In this study, we examine factors that affect students’ willingness to participate in collaborative engineering education research with other graduate students by answering the following research question: What are the barriers and bridges to graduate students’ collaboration? We explore this

topic through a literature review and a pilot study that allowed us to gain an initial understanding of graduate students' perceptions of collaborative research.

## **Barriers and Bridges to Collaboration**

As mentioned previously, research collaborations can take many forms involving participants from a variety of locations with varying degrees of expertise. In each unique collaboration, no matter how distinct, there are common barriers and bridges that can impact collaborators and the success of the overall project.<sup>1,2,6,14,15</sup> These barriers and bridges can be summarized using four main themes: (1) the initial conception of the collaboration, (2) the individual collaborator, (3) the interactions amongst the co-collaborators, and (4) the context of the collaboration.

### *The initial conception of the collaboration*

For a collaborative research project to exist, individuals must come together with the purpose of pursuing some goal or examining a specified topic or problem. These individuals may meet at a conference, an institution research symposium, a faculty meeting, or other academic-related gathering.<sup>6</sup> Networking may encourage individuals with similar interests to gravitate to one another, resulting in the decision to collaborate on a project. Thus, a researcher's attendance at disciplinary conferences or research meetings and their willingness to network can facilitate the conception or initiation of a collaborative project. In some cases, a project may require a particular level of expertise in a given topic or methodology, causing an individual to seek out other researchers for the purpose of collaboration. For cross-disciplinary projects, this search may be a barrier for many researchers, who may not know where to find the right environment or group of people to approach for the desired type or level of expertise.<sup>14</sup> In our use of the term cross-disciplinary, we consider a cross-disciplinary collaboration as one that uses either a multidisciplinary approach or an interdisciplinary approach.<sup>6</sup>

Hara (2003) explains that among groups of science researchers there is little awareness of collaboration opportunities.<sup>2</sup> In engineering education, however, awareness of collaboration opportunities may not be a barrier to collaborative efforts. For example, as many of the NSF proposals in the field are comprised of partnerships of engineers and social scientists.<sup>14</sup> Yet, student researchers may be unaware of the option to seek faculty members or graduate students outside of their research group to be collaborators. Especially since for many faculty members, collaborations are seen as a rite of passage for a graduate student----

Undergraduate students and beginning graduate students are seldom viewed as potential collaborators and have limited exposure to/or participation in collaborate research...For some faculty/scientists, working with students (and postdoctoral researchers) does not imply collaboration unless the student is exceptional (p. 957).<sup>2</sup>

### *The individual collaborator*

In many collaborative efforts, it is the individual who may either pose the greatest threat or be the greatest asset to the success of the collaboration. A researcher needs to have an interest in the topic and a commitment to the project at hand to support a successful collaboration.<sup>2,15</sup> A collaborator may be aided or burdened on the project by his or her professionalism,

accountability, and patience.<sup>15</sup> All of these traits may even prohibit the collaboration from being formed initially. In examining interdisciplinary teams of graduate students, Morse (2007) observed that a graduate student's previous experiences with team projects and his or her communication strategy served as either a potential detriment or advantage to a successful collaborative project.<sup>15</sup> In an academic setting, the educational preparation of a team member can also impact the success of the project.<sup>2</sup> For cross-disciplinary projects, an individual's understanding of his or her epistemology and its associated strengths and weaknesses can affect his or her ability to make sense of the multiple disciplines on the project.<sup>6</sup> Graduate students who are still in the process of developing an identity within their research field may find this barrier to a particular challenge.

### *The interactions among co-collaborators*

Beyond an individual's personal bridges and barriers to collaboration, another factor comes from the interactions among the various co-collaborators on the project. Small group dynamics, as specifically related to work style, trust, and overall compatibility, can positively or negatively affect the overall collaboration.<sup>1,2,6</sup> In the past, physical distance between collaborators was a salient barrier to collaboration, reducing the likelihood of forming or succeeding with a collaborative project.<sup>1,16</sup> With the improvement in communication technology, much of this challenge has been overcome, but it may still have an impact on coordination and communication among the collaborators.<sup>1,14,16</sup>

In regards to the project itself, researchers have found that a common vision and shared expectations for the research and the collaboration support the success of the overall project.<sup>2,15</sup> The interactions among the collaborators in how each views, understands, and respects one another's epistemology can dictate the group's willingness to adjust components of the project throughout its lifetime.<sup>2,6,15,17</sup> Another important factor in the interactions among co-collaborators is the effect of disciplinary language, especially on a cross-disciplinary projects.<sup>2</sup> For these types of collaborations, the uncommon vocabulary and conflicting semantics may deter collaborators from gaining an appreciation and understanding of one another's backgrounds and knowledge base.

### *The context of the collaboration*

Up to this point, the factors impacting collaboration efforts have focused on an isolated individual or group of individuals. Research, however, is part of a large external environment that can support or hinder the success of a collaborative project. At the institutional level, a survey of NSF principle investigators (PIs) indicated that administrative support and faculty openness to collaboration had a large impact on a faculty member's decision to participate in collaborative work.<sup>6,14</sup> Additionally, tenure and promotion policies involving credit for securing cross-disciplinary funding and performing collaborative work were shown to support collaborative efforts.<sup>6,14</sup> Within the research field itself, external incentives (e.g., prestige, funding, and publications) were also found to play a significant role in motivating faculty to seek out and participate in collaborative research.<sup>2</sup>

For a graduate student, the context of collaboration can strongly impact his or her decision to participate in collaborative work. While not subject to the same institutional pressures, at the program level, a student's advisor, the student's stage in his or her program, as well as the student's funding situation can serve as barriers or bridges to collaboration.<sup>15</sup> For human-subjects research, there is an additional constraint in the institutional review board, which requires a faculty member sponsor on the application. The external incentives may be similar to faculty, but may also depend on the field of research. If conferences or journals do not accept papers or posters, which do not include a faculty member as an author, students may not have an outlet for collaborative efforts solely among graduate students.

### *Summary*

From the literature, it is clear that there are many layers of bridges and barriers to collaboration. The layers were shown to impact every type of collaboration, from faculty advisor and student projects to cross-disciplinary faculty collaborations, and every stage of the collaborative process, from the project's conception to its completion. In the case of graduate students, however, research is limited regarding which of the factors would specifically prevent or hinder collaborative research.

Considering the field of engineering education research specifically, the nature of the research within the field promotes collaboration across disciplines, levels and types of expertise, and institutions. Still, the emerging scholars, who could benefit from participating in collaborative work and furthering the development of their professional identity, rarely engage in collaborations with their peers. Through an initial investigation of the potential barriers or bridges to graduate student collaborations, we will advance our understanding of the most critical factors and begin to develop ways to promote these types of collaborations.

### **Data Collection Methods**

This study involved participants who took part in a workshop hosted by the Graduate Engineering Education Consortium of Students (GEECS) during the ASEE 2011 Annual Conference and Exposition. The workshop specifically targeted students, both graduate and undergraduate, who are currently conducting engineering education research. The purpose of the two-hour long workshop was to help students develop collaborative research questions based on participants' interests. For this pilot study, pre- and post- paper-based surveys were used to explore the *factors that affect graduate students' willingness to participate in collaborative engineering education research with other graduate students*. The post-workshop survey also included an evaluation of the workshop; however, the subsequent discussion will focus only on the results of the two surveys, as the evaluation was used for internal organizational improvements. The questions from both surveys can be found in Appendix A.

The pre-workshop survey consisted of multiple choice questions about information regarding the participants' perceptions of graduate student research collaborations, basic demographic information, and information related to their previous experiences with research collaborations. Immediately following the workshop, the participants were asked to complete a post-workshop survey composed of Likert-type and free response questions targeted at their new understanding

of graduate research collaborations and the effect of the workshop. Collecting both structured and free response questions allowed for a variety of data to be obtained to provide a holistic understanding of graduate student collaborations. Before being administered, both surveys were reviewed in detail by multiple members of GEECS and were pre-piloted with a group of engineering graduate students to improve readability and flow of the questions.

Of the 19 faculty and students who participated in the workshop, 15 participated in the pre-workshop survey (79% response rate) and 13 participated in the post-workshop survey (68% response rate). Faculty responses were only used in the analysis of the post-workshop survey, due to the nature of the pre-workshop survey questions. Participation was completely voluntary and anonymous, and participants were not required to answer every question. It should also be noted that while all participants were given the option to complete both surveys, there is no identifying information to link the two surveys by participant. Finally, even with the small sample size, we feel that the surveys collected for this pilot study provide an initial picture of the reasons graduate students collaborate on engineering education research.

## **Data Analysis Methods and Results**

Both quantitative and qualitative data from the surveys were compiled and analyzed to understand participants' interest in pursuing collaborative research with other graduate students. Descriptive statistical methods were used to determine how frequently graduate student collaborations occur, as well as students' perceptions of how often they occur. The qualitative data were coded to identify the most common themes among the factors that serve as bridges and barriers to collaborative research among graduate students.

### *Pre-survey analysis*

Of the 15 student participants, who completed the pre-workshop survey, 7 were enrolled in an engineering education doctoral program or related program, such as STEM education program. Five of the participants were enrolled in traditional engineering or interdisciplinary engineering doctoral programs, but were conducting engineering education research. Essentially, all of the participants were currently working on engineering education research in some capacity.

The pre-workshop survey was used to obtain a better understanding of graduate students' views about the current state of graduate student collaborations. Based on our results, the most common perception was that graduate students are indeed collaborating with peers apart from working with a faculty member. However, the students' perceptions of the frequency of these collaborations varied. Half of the participants perceived that this type of collaboration happens only once over the course of a graduate student's career, while others perceived that if graduate students are, in fact, conducting research with their peers, it happens at the most four times during the course of one's graduate career.

From the data on students' collaboration experiences, six participants indicated that they had never worked with other graduate students without the guidance of faculty members, while five participants had worked on 1-2 projects with other graduate students. Based on our sample, two

participants contributed to three collaborative research projects, but none of the responders had participated in more than three collaborative research projects with other graduate students.

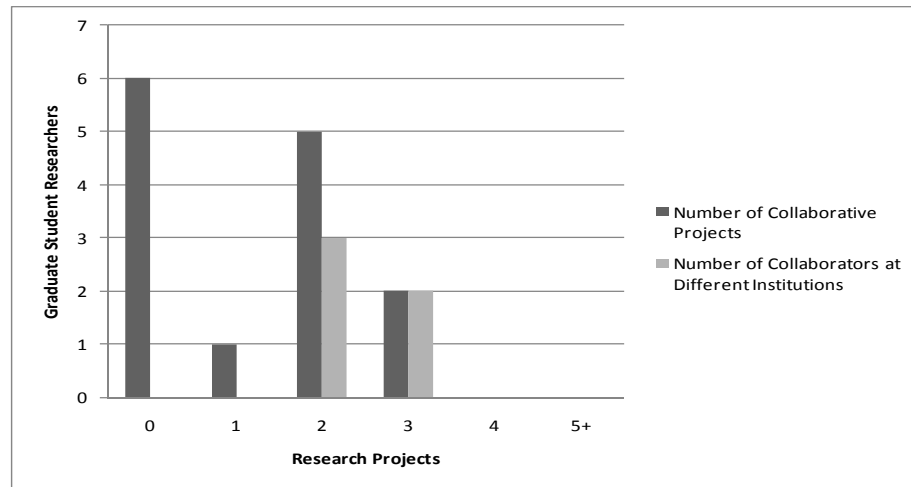


Figure 1: Workshop participants who have conducted collaborative research with other graduate students and students at institutions other than their own

In examining the characteristics of graduate student collaborations, we were particularly interested in determining whether these collaborations occurred most often within a single institution or across multiple institutions. Five of the eight participants who indicated that they have conducted research with graduates students at universities other than their own. The others participants only worked with graduate students at their home institution.

While the number of actual research collaborations between graduate students was rather low, no more than three for any participant, all of the participants indicated a high interest in conducting collaborative research. Of the participants, 86% were either interested or “very interested” in collaborating with other graduate student researchers on a project of their choice, while only 14% were “neither interested or uninterested”. No participant said they were completely uninterested in collaborating with other graduate students on a research project.

Lastly, participants were asked to rank the top three positive and negative factors that would affect their willingness and desire to collaborate. The responses were given a weighted score from 1-3: the factor rated a one was given three points, the factor rated a two was given two points, and the factor rated a three was given one point. Scores were summed across participants (see Table 1). Factors with the largest scores (including those with equivalent scores) are the top reasons presented in Table 1.



Table 1: Top bridges and barriers to collaborative research among graduate students

	<b>Bridges</b>	<b>Barriers</b>
#1 Reason	You and your potential collaborator have the same research interest	The personalities of potential collaborators
#2 Reason	The personalities of potential collaborators	The support of your advisor
#3 Reason(s)	<p>The possibility of adding conference proceedings and/or publications to your CV</p> <p>The time commitment required to successfully complete the project</p>	The time commitment required to successfully complete the project

“Shared research interest” is the factor that influences graduate student research collaborations the most positively. On the other hand, the “personality of potential collaborators” is the largest barrier to collaborative research among graduate students. Surprisingly, the “personality of potential collaborators” and “time commitment required to successfully complete the project” show up on both sides of the table. Advisor support is also among the top barriers cited by the graduate students.

#### *Post-survey analysis*

Immediately following the workshop, participants were asked to complete a survey designed to elicit their perceptions regarding graduate student research collaborations and the extent to which their perceptions of these collaborations had been affected by the workshop. Participants were asked to what extent the workshop had increased their awareness of the opportunities for graduate student research. The majority of participants, 79%, indicated that the workshop increased their awareness of opportunities for collaboration. Participants were also asked about their interest in pursuing collaborations with other graduate students. Again the majority of participants, 85%, expressed a strong interest in participating in collaborative research.

All of the respondents indicated that they saw the benefits of participation in collaborative graduate student research. Participants were also asked whether there were too many barriers to these collaborations. Approximately 23% of the respondents thought that there were too many barriers to collaboration, while another 31% thought that the barriers to collaboration were not significant. Finally, 46% of respondents expressed neutrality on the question of barriers (see Figure 2).

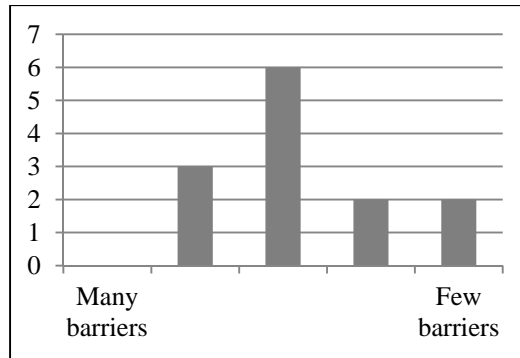


Figure 2: Students' perceptions of the barriers to pursuing collaborative research among graduate students

The post-workshop survey also asked participants to describe ideal collaborations and how these successful collaborations could be promoted. Four factors emerged from their responses as being the most important elements of an ideal collaboration. These four were that (1) collaborations should not be stressful, (2) the time requirements should be reasonably low, (3) all the collaborators should have clear roles in the project, and (4) all the collaborators should live up to their commitments. In order to achieve these ideal collaborations, seven factors were identified as being most important, namely: (1) compatible interests/passions; (2) shared goals; (3) complimentary skills; (4) compatible personalities; (5) compatible work ethic; (6) a shared understanding of rigor; and (7) a desire to learn from each other (see Figure 3). Common to these seven factors was the notion of sharing and compatibility.

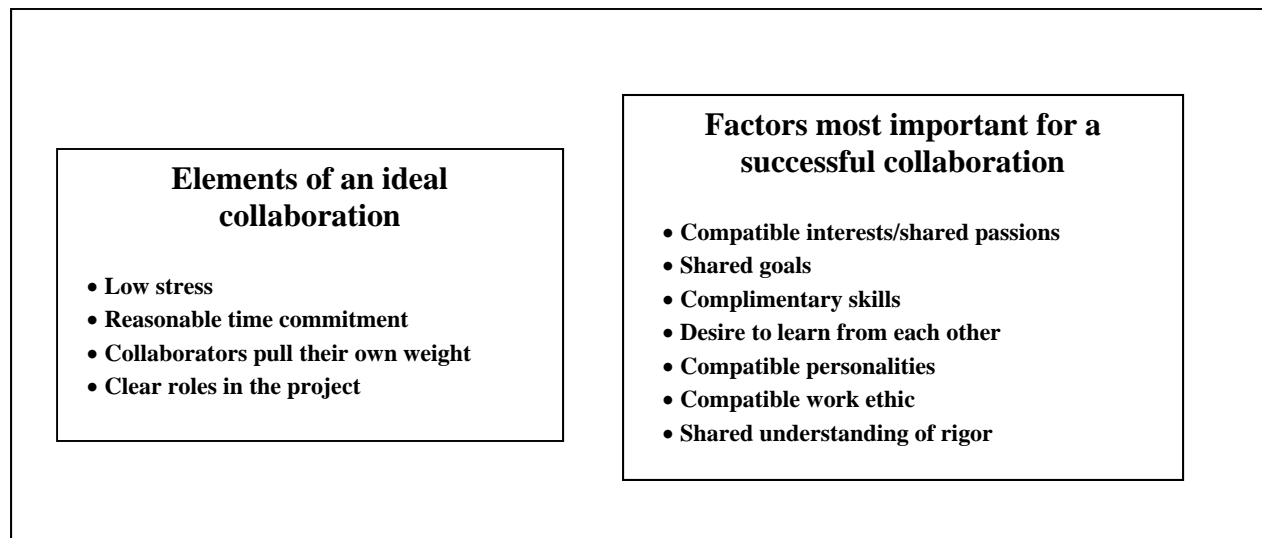


Figure 3: Participants' opinion of the elements of and factors most important for a successful collaboration among graduate students

The final question on the post-workshop survey asked participants how they thought collaborations among graduate students could be promoted. The following were suggested:

- Establishing a list containing contact information and research interests available to all engineering education students so that potential collaborators can be easily identified
- Creating and maintaining a secure online space suitable for facilitating collaborative work
- Allowing for the possibility of collaborative dissertations
- Establishing starter grants incentivizing collaboration
- Providing venues specifically intended for student interaction at conferences

## Discussion

Through this exploration of collaboration literature and this study of a small sample of engineering education graduate students, we can begin to observe which factors have the greatest effect on collaborations amongst graduate students and mechanisms for promoting future collaborations. In the review of the literature, complex layers of bridges or barriers were observed, but it was unclear which factors directly impact peer collaborations at the graduate level. The results of the pilot study, on the other hand, provided insights about the current context of graduate student collaborations as well as more details about the factors, which affect the overall context. The graduate students in this study clearly perceived collaborations as important. The pre-workshop survey results indicated that more than half of the participants had previously worked on projects with other graduate students. Following the workshop, 85% expressed a strong interest in participating in collaborative research with other graduate students. However, the overall level of awareness of graduate student collaborations and opportunities for collaborations was low among the students in the sample.

The barriers and bridges that graduate students self-report affecting the success of a collaboration of graduate students are similar to those bridges and barriers found in studies of faculty research collaborations and course-related student collaborations. The most significant factors, which appeared as both barriers and bridges, were the time commitment to complete a project successfully and personalities of the potential collaborators. Each of these factors reappeared among the elements of an ideal collaboration and the factors most important for successful collaborations. For graduate students, time commitment is a crucial component of a potential collaborative project, as it can influence advisor support for the project and the individual's accountability. In regards to the personalities of potential collaborators, collaborations require that the colleagues participating have or are able to negotiate agreements on the major points of the research. Therefore, to increase the frequency of graduate student collaborations and maintain a high level of rigor with the research, it is critical to keep these factors in mind and consider ways to minimize their potentially detrimental effects.

While the graduate students indicated that advisor support was a barrier to collaboration, this factor did not appear in elements of an ideal or a successful collaboration. It may be that this barrier is among the first hurdles faculty and student organizations need to cross to increase graduate student collaborations across institutions. To overcome such barriers, advisors can encourage collaborations and lead by example. Other critical components to promoting collaboration come from connecting graduate students who have similar research interests and providing settings to publish the results of graduate student collaborations. Both of these factors

were strong positive influences on students' willingness to participate in collaborative work with other graduate students, according to the pilot study. Advisors and student organizations (e.g. Graduate Engineering Education Consortium for Students or Student Platform for Engineering Education Development) can continue to foster these influences by finding ways to connect students to other students at conferences or workshops. As one student participant suggested, "a list containing contact information and research interests" could help identify potential collaborators among graduate students in engineering education. The use and advertisement of existing resources (e.g. CLEERhub.org and LinkedIn) and the development of other resources of this nature are potential mechanisms for furthering graduate students' awareness about potential collaboration opportunities. The promotion of graduate student collaborations may also require the assistance of national and international engineering education organizations (e.g. ASEE, Research in Engineering Education Network). For example, at the annual conference and exposition, the ASEE Student Division as well as ASEE National can publicize the collaboration efforts of graduate students and advertise future collaboration opportunities.

## **Conclusion and Future Work**

The future of engineering education research will depend on collaborations among educators, researchers, and students. Currently, student interest in engineering education research is steadily increasing, which can be observed through the increase in engineering education programs and organizations at local, national, and international levels. As a community, graduate student collaborations offer an opportunity to enhance the graduate student experience in the field, through experiences that will further broaden students' perspectives and develop their professional identities. The results of this study describe an interest on the part of the graduate student population in participating in graduate student collaborations. The next steps are for faculty members and students to begin promoting collaborative research efforts of this kind and for researchers to continue research in this area to further understand the context surrounding these collaborations.

This initial exploration of graduate student collaborations, while beginning to unravel the factors affecting graduate students' willingness to collaborate with other graduate students, also unveiled more questions about the bridges and barriers to collaborations. The existence of engineering education departments at some institutions introduces questions about the potential variance of barriers different across institutions and the effect of an established cohort of engineering education graduate students. Factors such as stage of program and frequency of attendance at national and international engineering education conferences may also play a role in graduate student collaborations. Engineering education student organizations, which provide an avenue for connecting with other students in the engineering education community, raises questions about the level of student involvement in these groups and the composition of these groups as other potential factors. To truly understand the context of graduate students collaborations and its effect, it will be necessary to consider these factors in future research and in designing mechanisms to promote future collaborations.

Beyond the continued examination of potential barriers and bridges to graduate student collaborations, future work in this area could include studying the benefits of graduate student collaborations, similar to Borrego & Newswander's study of journal clubs.<sup>2</sup> Researchers could

also consider analyzing previous examples of graduate student work and interviewing those authors to further understand their motivation and their experiences. Ideas such as collaborative dissertations and grants to fund student collaborations could be explored as potential opportunities for the graduate student community. Overall, the involvement of graduate students in organizing and leading research projects with their peers is important in preparing them to enter a field based on multidisciplinary collaboration. Research in this area will help ensure that graduate student researchers in engineering education are better prepared for their future roles, while introducing new types of innovative research into the field.

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## Appendix A

### Pre-Workshop Survey

1. What type of program are you a part of?
  - a. Ph.D. Program in Engineering Education or related (e.g., STEM Education)
  - b. Traditional Engineering Ph.D. Program where I do Engineering Education Research
  - c. Traditional Engineering Ph.D. Program where I do Traditional Engineering Research
  - d. Master's Program in Engineering Education or related (e.g., STEM Education)
  - e. Traditional Engineering Master's Program where I do Engineering Education Research
  - f. Traditional Engineering Master's Program where I do Traditional Engineering Research
  - g. Other \_\_\_\_\_
2. Over the course of a Ph.D. program, on average how often do you think a typical graduate student collaborates with other graduate students on a research project not lead by a faculty member?
  - a. 5 or more times
  - b. 2 to 4 times
  - c. 1 time
  - d. Graduate students do not collaborate on projects that are not lead by faculty members.
3. How many collaboration research projects have YOU worked on with other graduate students that were *not* led by a faculty member?

0      1      2      3      4      5+
4. Of those research projects, how many were with graduate students from universities besides your own?

N/A    0      1      2      3      4      5+
5. Rate your interest in collaborating with other graduate students on a research project of your choice
  - a. Very interested
  - b. Interested
  - c. Neither interested or uninterested
  - d. Uninterested
  - e. Very uninterested

6. Select the top three factors that would **positively influence** your willingness or desire to work on a collaborative research project with other graduate students.

(Please rank your responses with “1, 2 or 3” with “1” being the most influential factor.)

- a. ☐ You and your potential collaborator have the same research interest
- b. ☐ You and your potential collaborator have the same expertise in methodologies
- c. ☐ The distance between you and potential collaborators
- d. ☐ The personalities of potential collaborators
- e. ☐ The time commitment required to successfully complete the project
- f. ☐ Your stage within your degree program (e.g. after dissertation proposal, qualifying exams, etc.)
- g. ☐ Potential collaborators’ extent of knowledge about the topic
- h. ☐ Your level of knowledge about the topic
- i. ☐ The support of your advisor
- j. ☐ Funding for the collaborative research project
- k. ☐ Your personal funding status
- l. ☐ The possibility of adding conference proceedings and/or publications to your CV
- m. ☐ Differences in the stage of degree progress between you and your collaborators (e.g. you are finishing your dissertation and someone else is just starting the program)
- n. ☐ Other (please describe)  
\_\_\_\_\_
- o. ☐ I am not interested in working on a collaborative project with graduate students

7. Select the top three factors which would **discourage you** from working on a collaborative research project with other graduate students.

(Please rank your responses with “1” being the most deterring factor.)

- a. ☐ You and your potential collaborator have the same research interest
- b. ☐ You and your potential collaborator have the same expertise in methodologies
- c. ☐ The distance between you and potential collaborators
- d. ☐ The personalities of potential collaborators
- e. ☐ The time commitment required to successfully complete the project
- f. ☐ Your stage within your degree program (e.g. after dissertation proposal, qualifying exams, etc)
- g. ☐ Potential collaborators’ extent of knowledge about the topic
- h. ☐ Your level of knowledge about the topic
- i. ☐ The support of your advisor
- j. ☐ Funding for the collaborative research project
- k. ☐ Your personal funding status
- l. ☐ The possibility of adding conference proceedings and/or publications to your CV
- m. ☐ Differences in the stage of degree progress between you and your collaborators (e.g. you are finishing your dissertation and someone else is just starting the program)
- n. ☐ Other (please describe)  
\_\_\_\_\_



## Post-Workshop Survey

1. This session increased my awareness of the opportunity to collaborate with graduate students on projects not lead by a faculty member.

Strongly Agree                      1            2            3            4            5            Strongly Disagree

2. I am interested in pursuing collaboration with another graduate students

Strongly Agree                      1            2            3            4            5            Strongly Disagree

3. I do not see the benefit in pursuing collaboration with another graduate student.

Strongly Agree                      1            2            3            4            5            Strongly Disagree

4. There are too many barriers to graduate student collaboration.

Strongly Agree                      1            2            3            4            5            Strongly Disagree

5. Describe your ideal collaboration with another researcher. What factors are the most important to have a successful collaboration?

6. What do you believe could promote more collaboration among graduate students?