

*Undergraduate Research and Grant Applications: Access and Barriers at
a Transnational University*

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Abstract

Undergraduate research is an important opportunity that students should take advantage of. The benefits of undergraduate research have been proven many times, showing benefits to both the students and faculty who participate. Research grants have been an important part of increasing participation in research by overcoming the cost barrier, however, other barriers still exist. In this study we examined obstacles preventing students from taking part in undergraduate research at a transnational university. An online survey was sent to undergraduate students at the University of Utah Asia Campus (UAC) to assess their awareness of and interest in undergraduate research. The anonymous survey was advertised to all undergraduate students at the beginning of the semester and 8% of the population responded. The data collected was analyzed by looking for key themes and organizing responses into categories. The results of the survey showed a large increase in willingness to consider research projects at the end of the survey compared to the beginning. Six perceived barriers were also identified by the participants: lack of ability, lack of knowledge, time, money, lack of interest, and difficulty. Lack of time and ability were the most common response to why participants did not participate in research. Presenting information about how to plan and complete research projects along with information about research and grant opportunities could improve undergraduate participation. UAC departments should also consider revising curriculum to integrate research discussions and projects.

Keywords: Undergraduate Research, Access, Barriers, Transnational Universities

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Introduction

The benefits of undergraduate research have been thoroughly researched, but many barriers still exist. Multiple studies have shown that students' knowledge, skills, and understanding increase when they are involved in research (Awong-Taylor et al., 2016; Kolokithas & Calderón, 2018; Peachey & Baller, 2014; Wayment & Dickson, 2008). They also learn how to collect and analyze data, as well as better understand source material. Thorough research is required in any research project. With the student being more personally involved they are more inclined to look deeply at the issue and seek out the knowledge they need (Peachey & Baller, 2014; Wayment & Dickson, 2008). They also develop a stronger sense of independence, involvement, and persistence (Awong-Taylor et al., 2016; Kolokithas & Calderón, 2018; Rosas Alquicira et al., 2022). The individual growth and learning process benefits the students while in their undergraduate programs and after they graduate. Student engagement increases with participation in research and once they graduate, their experiences improve their opportunities both in applying to graduate schools as well as in their careers (Awong-Taylor et al., 2016; Brew & Mantai, 2017; Wayment & Dickson, 2008). However, even with all these benefits, not all students have equal access to, or participation in, undergraduate research opportunities. This study investigates undergraduate students' understanding of, and perceived barriers to, undergraduate research at the University of Utah Asia Campus, a transnational university.

Historically, undergraduate research has only been available to select students mainly in Science, Engineering, Technology, and Math (STEM) majors (Brew & Mantai, 2017; Peachey & Baller, 2014). Many types of studies and programs have been implemented to try and resolve this issue. One such study focused on psychology programs and determined five barriers to students becoming involved in undergraduate research, such as lack of knowledge, lack of publicity, and unequal access. By targeting these barriers, they were able to see almost triple the amount of student involvement in two years, and 94% faculty involvement (Wayment & Dickson, 2008). Another study surveyed academics at an Australian university to determine what they perceived as barriers (Brew & Mantai, 2017). They found that structural barriers, differing attitudes, and resources were all impeding access. While some barriers remain the same between universities, unique universities need to conduct research to determine the specific struggles their students and faculty face. For the purpose of this study unique will be defined as a university or college that has a non-traditional population in terms of race, age, socioeconomic status, cultural background, or primary language spoken. Under this definition the University of Utah Asia Campus (UAC) is a unique university and needs research in order to tailor programs to its unique student population.

Research has been done at UAC before. Jordan (2022) looked at the specific situation of UAC and how the unique mix of cultures and backgrounds affects both learning and teaching at a transnational university. For the purposes of this study transnational university will be using the same definition as Jordan (2022), describing a university that combines multiple cultural identities into a new "transnational" environment that often differs from the surrounding area. The initial struggles of starting courses and departments in UAC's early years are described, as well as changes that were noticed throughout the early years. Comparisons between the more typical main campus located in Salt Lake City and the unique campus in Incheon, South Korea were analyzed, and specific needs were identified that differed between the campuses. The unique population at the Asia campus faced different barriers and required different assistance than the population at the main campus. However, the different understanding and potential barriers to undergraduate research were not

considered in Jordan's research. Therefore, this survey sent to a sample of undergraduate UAC students will fill an important gap in the current literature and increase our understanding of the challenges facing students at transnational universities.

Methods

An online questionnaire was developed using Qualtrics to assess an undergraduate's understanding of undergraduate research opportunities and the perceived barriers to participating in undergraduate research. The survey consisted of 17 questions which were accessed remotely through a QR code. Students could receive different questions depending on previous answers. The survey was made up of four sections: demographics, interest in research, personal eligibility, and opportunity awareness. A consent cover letter was shown as the first page of the survey. Participants could end the survey at any time and were not required to answer any questions. The survey was advertised to all undergraduate students at UAC through professor participation, school sponsored events, and flyers placed in the hallways. The QR code on the poster linked to the online survey. It was open for four weeks and participants could respond at any time and in any location with internet access.

Qualitative data was exported from Qualtrics and analyzed after the survey had closed. Eleven questions were multiple choice and six were free response. Answers to the free response questions were categorized by matching similar and duplicate answers. For questions asking about nationality and undergraduate major answers were only grouped together if they indicated the same country or major. For questions asking about perceived barriers the answers were grouped into seven categories. Answers to the question "Why did you not apply for a grant?" were grouped into eight categories. The questions about perception of eligibility and difficulty aspects of the grant application process did not receive sufficient answers to be included in the analysis.

Results

UAC had 530 undergraduate students enrolled for the Spring 2023 semester, of which 45 participated in the study (8%). The participants were mostly South Korean nationals (81%) between the ages of 18-25. Over half the participants were female (60%) and over half were in their first year of school (63%). Eight of the nine undergraduate majors at UAC and four countries were represented. These demographics are similar to the overall demographics at UAC. Roughly 80% of UAC undergraduates are ethnically Korean with Korean passports. The remaining 20% of UAC undergraduates are considered international students with the majority of these students holding US passports. Approximately 85% of incoming students are aged 18-21.

		#	%
Age	<18	0	0
	18-19	15	38
	19-20	14	35
	21-22	9	23
	23-24	1	3
	24-25	1	3
	25+	0	0
Gender	Male	13	33
	Female	24	60
	Non-Binary/3 rd	3	8
Nationality	South Korea	30	81
	USA	5	14
	Canada	1	3
	Venezuela	1	3
Year in School	Freshman	25	63
	Sophomore	10	25
	Junior	3	8
	Senior	2	5

Table 1: Demographic information of all participants in the study.

The survey included two questions about intention to participate in. One was placed at the beginning of the survey and addressed previous consideration of participating in a research project. Participant responses to this question showed that 58% had previously considered completing a research project. At the end of the survey participants were asked about their intention to participate in research in the future. For this question 96% responded that they would consider doing research in the future. Responses of “Yes” and “Maybe” were counted as being willing to consider participating in research.

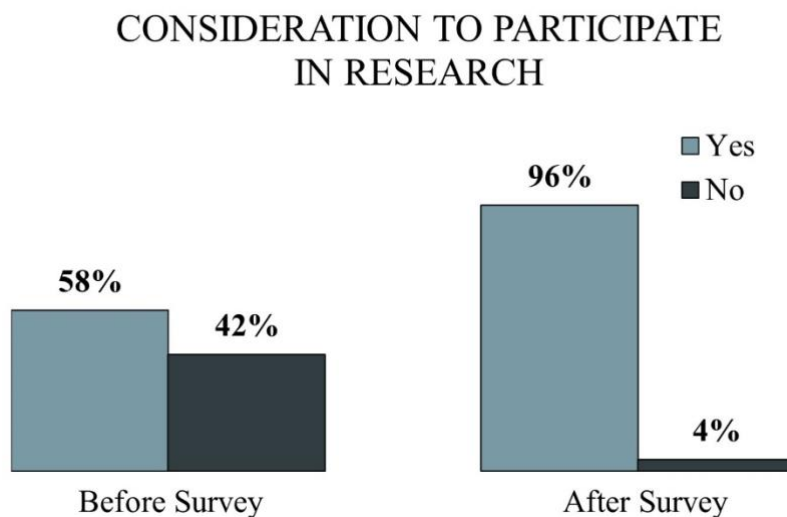


Figure 1: The difference between participants' willingness to consider participating in research at the beginning of the survey and at the end.

Six common barriers were identified by the participants; time (26%), lack of ability (22%), lack of knowledge (13%), money (9%), difficulty (4%), and lack of interest (4%). Of these, time and lack of ability were the most commonly cited reasons for not completing a research project with a difference of only 4% between the two categories. Five responses were put in the category 'Other' as they did not have a commonality with the rest of the responses. The Other category included responses such as a language barrier, too focused on academics, and issues working with others.

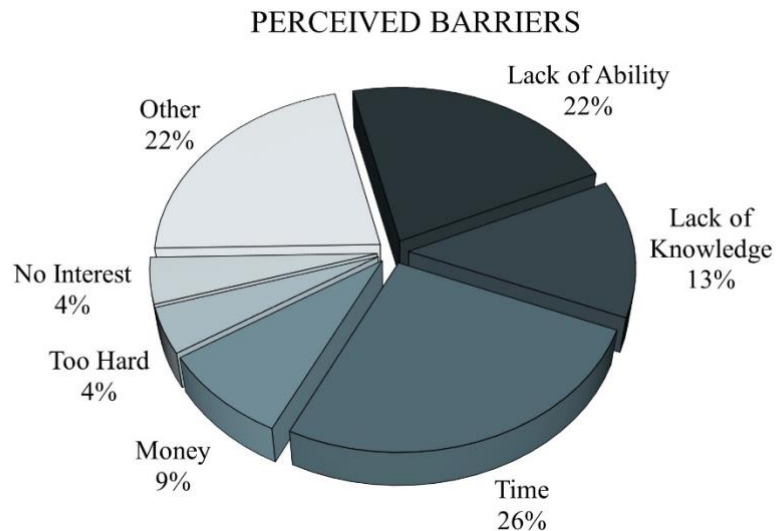


Figure 2: Breakdown of the responses identifying perceived barriers in each category.

UAC has an office for undergraduate research grants called UROG. When asked about grants and grant opportunities 45% of participants responded that they had heard of UROG. Eleven (11%) selected maybe, with 45% saying that had not heard of UROG. A few more participants were aware that UAC offers undergraduate research grants with 53% saying yes. However, 24% of participants selected that they did not think they are eligible to apply for research grants. Only three participants had ever applied for a research grant at UAC, with two receiving the grant. Answers to the question “Why did you not apply for a grant?” were grouped into five categories; lack of knowledge (25%), unprepared (35%), lack of interest (15%), missed the deadline (10%), and other (15%). The most common reason, with 35% of participant responses falling this category, was that the participant felt unprepared to apply.

Discussion

The results of this study show that simply being introduced to the idea of undergraduate research can improve the desire to participate in research. At the beginning of the survey only 58% of students selected that they had ever considered participating in a research project. Most of these students who had not considered research were freshman (81%). This accounts for approximately half (52%) of the total freshman participants and suggests that freshman were the most likely to have not considered a research project. However, at the end of the survey 96% of participants responded that they would consider doing a research project in the future. This suggests that discussing research even generally with students can inspire consideration of participating in research. Therefore, research discussions should be implemented at the very beginning of the college experience.

Increasing consideration of new students is important as the low desire of freshmen to participate in research could be detrimental to the students. Research projects require time and effort to plan and execute. If undergraduate students are not thinking about research from the beginning, they may not be able to complete a research project, denying them the opportunity to develop skills and build their resumes. Undergraduate research has been shown to help students develop better technical and personal skills, analytical, logical, and independent learning skills, and increase persistence and problem-solving skills (Kolokithas & Calderón, 2018; Wayment & Dickson, 2008). Research also builds a student's professional qualifications and increases student retention and engagement (Brew & Mantai, 2017; Peachey & Baller, 2014).

A correlation between awareness of university specific opportunities and willingness to consider participating in research was also shown. Among the participants who selected they had considered a research project at the beginning of the survey 68% responded that they had heard of the undergraduate research opportunity grant (UROG) program. Seven participants (32%) who had previously considered a research project had not heard of UROG. This indicates that unless undergraduate students being made aware of opportunities for undergraduate research and the benefits to them, can increase their likelihood to participate in research. Conversely, undergraduate students who are not introduced to research opportunities and their benefits may not have the desire to do research thus creating a barrier. However, more research with a larger sample size is needed to solidify the significance of these findings. Specifically, future research needs to explore a large sample size in transnational universities.

In the meantime, undergraduate institutions can begin to use these findings for implementations. Electronic communication, social media, presence at events, and information sessions are all ways that a university can promote research. Department involvement can augment these efforts by sharing the information to students in classes and other required meetings. This will reach students that do not have time or desire to attend extracurricular events.

Many studies have been done on the effectiveness of integrating research into existing curriculum and adding additional courses and workshops (Awong-Taylor et al., 2016; Kolokithas & Calderón, 2018; Peachey & Baller, 2014; Wayment & Dickson, 2008). These studies found that integration of undergraduate research into existing curriculum increases student involvement, reduces structural barriers, and increases students' confidence in their ability to do research. These benefits relate to the perceived barriers of time and lack of ability. Increased involvement and increased confidence can help overcome these barriers. However, these studies were done at traditional universities and focused on STEM fields. To account for the differences that can be found at a transnational university as well as include non-STEM fields, the incorporation of courses, presentations, and workshops may need to be adjusted.

Lack of awareness, time, money, and lack of ability were identified as perceived or actual barriers to undergraduate research in previous studies (Brew & Mantai, 2017; Wayment & Dickson, 2008). However, the high percentage of students who identified time as a perceived barrier is less commonly found in the previous studies. For example, this study found that time was the number one barrier, whereas Brew & Mantai (2017) found it to be third on the list. In their study it was also linked together with the financial barrier and was not assessed separately. It is unclear as to why time is considered a more significant barrier in this study.

Further investigation should be done to identify whether the time correlates with transnational universities, small universities, or other possible variables.

Other barriers that have been found in previous studies such as unequal access, uneven incentives, and lack of resources were not identified in this study. This could have been due to the small sample size or the nature of a transnational university and the difference in challenges and needs compared to more traditional universities. More research is needed to discover why certain barriers were so commonly cited in this study and other barriers were not identified.

Almost half (48%) of responses addressing perceived barriers fell into the categories of time and lack of ability with 26% and 22% respectively. The students expressed that they did not feel confident in their ability to manage their time or successfully complete a research project. Whether the students actually lack the skills or only lack confidence needs more investigation. However, this concern for time management and skills can be addressed at the curricular level by offering and/or requiring course(s) where the learning objective is to conduct research, such as a Research Methods course. These courses designed to educate students about research help introduce research skills as well as force learners to manage their time to include research projects.

Additionally, research workshops, Q&A sessions, presentations, and clubs would help students learn about research skills and time management outside of the classroom. Incorporating targeted research training in these areas could help build both competency and confidence in undergraduate students. Faculty involvement is also essential in these efforts to give the students the support they need. When research is taught and promoted, there will be an increase in awareness of opportunities and participation in research. And as faculty are actively encouraging and mentoring research, then students can build the confidence to do research (Brew & Mantai, 2017; Wayment & Dickson, 2008). The students will also have the knowledge of who they can turn to for questions and assistance when embarking on research.

As these findings have shown, when students are introduced to the idea of research they can be inspired to participate in a research project. Awareness of university specific opportunities is important in cultivating that desire. Integrating research into existing courses and offering workshops, presentations, and other opportunities outside of classes also fill the role of discussing research and can encourage students to complete their own research projects. At the same time they are being introduced to the idea of research they are also being taught the research skills and confidence needed to participate in research.

Limitations

This study was completed at a small transnational American university in Asia with an 80% ethnic minority undergraduate student population. While many of the perceived barriers identified (lack of awareness, money, lack of ability, and time) were the same as previous studies (Brew & Mantai, 2017; Wayment & Dickson 2008), some barriers such as unequal access and limited faculty availability were not seen that are normally present at other universities (Wayment & Dickson, 2008). The variability in barriers identified could be due to the small size and transnational nature of the campus, however more research is needed to confirm the causation.

The prevalence of certain barriers, specifically time, was also different from previous studies (Brew & Mantai, 2017). This could have been due to cultural differences, perceived support, or sample size. Additional research is needed to identify why time was more prevalent in this study than previous studies.

While it is important to acknowledge that this is one of the first studies on research barriers to examine a transnational higher education environment, the number of participants was limited. Due to the small sample size, a duplicate survey of this study at the same small transnational university or the same survey at a larger transnational university would be beneficial in confirming these findings.

Conclusion

In conclusion, undergraduate students are not completing research projects simply because of low desire. There are diverse barriers undergraduate students face, and it is important to identify which barriers exist. Participants of this survey identified barriers such as a lack of time, lack of ability, lack of knowledge, money, difficulty, and a lack of interest. There are several possible methods of addressing these barriers. Barriers such as a lack of knowledge and lack of interest can be overcome by general discussions about research. Many students have not been introduced to the idea of doing a research project or are unaware of the opportunities available. They have not had the chance to learn about the benefits of undergraduate research or considered how they could participate themselves. This study showed that a general discussion on research and the opportunities available increased desire to do research.

Once they have learned about research, they still face perceived barriers such as a lack of time and a lack of ability. Universities and faculty can work together to bring the information to the students and teach them how to successfully complete a research project. Integrating research into existing courses and holding presentations, workshops, and Q&A sessions outside of classes all contribute to overcoming these barriers.

Overcoming these barriers and encouraging students to participate in research will bring many benefits to undergraduate students. They will learn valuable skills such as technical and personal skills, analytical, logical, and independent learning skills, and increase persistence and problem-solving skills (Kolokithas & Calderón, 2018; Wayment & Dickson, 2008). They will also be better prepared for attending graduate school and for employment (Rosas Alquicira et al., 2022). Student engagement and retention will also increase (Brew & Mantai, 2017). There are many benefits to undergraduate research, however barriers exist that need to be overcome for undergraduate students to be able to receive these benefits.

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