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Comparing Online and Traditional Student Engagement and Perceptions of Undergraduate Research

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Abstract

Undergraduate research benefits students by strengthening skills, providing professional growth, and improving retention. Yet significant barriers exist, including low awareness of opportunities, restrictive cultural norms, and resource constraints. The proliferation of online education potentially increases barriers, both real and perceived. This study compared participation rates and perceived barriers between undergraduate distance and traditional students. Survey results indicated no significant differences in self-reported participation or overall interest in research. Despite inherent structural limitations of online education, there were no significant differences in the respondents' perceptions of access to opportunities, physical resources, or human resources. Significant differences were seen regarding awareness of research opportunities. Although institution-specific moderating factors may influence results, this information is valuable for strategic planning aimed at increasing opportunities and awareness for undergraduates.

Keywords: *distance education, high-impact practice, online education, undergraduate research*

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Undergraduate research is noted as a high-impact activity with significant benefits to students, faculty, and institutions (Buff and Devasagayam 2016; Craney et al. 2011; Eagan et al. 2011; Shanahan et al. 2015; Szecsi 2015; Webb 2007; Russell, Hancock, and McCullough 2007). Some of the many professional and personal benefits to undergraduate researchers are improvements in disciplinary

skills, increased degree persistence, and formalization of mentoring relationships (Council on Undergraduate Research 2017; Lopatto 2006; Madan and Teitge 2013). Benefits also include refinement of transferable skills in critical thinking and problem solving, information literacy, communication, self-confidence, as well as intellectual independence and collaboration (Lopatto 2006, 2010; Council on Undergraduate Research 2017; Madan and Teitge 2013). Undergraduate research also provides opportunities to network and publish (Lopatto 2010). When undergraduate research is conducted within a mentoring framework and the nature of science is communicated, students demonstrate disciplinary learning gains (Linn et al. 2015). There are also significant benefits of undergraduate research to faculty, institutions, and fields of study, including improvements to faculty quality of work, increased graduate program enrollment, and increased diversity in scientific research (McDermott 2016; Bangera and Brownell 2014; Eagan et al. 2013; Carpi et al. 2017; Council on Undergraduate Research 2017; Gregerman et al. 1998; Foertsch, Alexander, and Penberthy 2000; Zydney et al. 2002).

The literature shows a range of participation rates in undergraduate research in a traditional educational setting, ranging from 12.5 percent to 49 percent (see Table 1). Differences in undergraduate research participation rates were noted based on student progress toward degree, research activity of the institution, and degree programs. One study noted gender differences in participation by degree program as well as a disproportionately low participation of African American students compared to Asian, Hispanic, or white students (Rorive and Brint 2013).

TABLE 1. Participation Rates in Undergraduate Research

Institution	Type of institution	Year	Participation rate (%)	Citation
UC Berkeley	Research	2006	49	Berkes 2008
Various	Mixed	2007	19	Byerly et al. 2007
Various	Mixed	2012	14–27	Wilson 2012
UC Riverside	Research	2013	12.5	Rorive and Brint 2013

Despite multiple benefits, the literature reports significant barriers to undergraduate research for residential students, faculty, and institutions. Student barriers include a lack of awareness of opportunities or a lack of knowledge of the benefits (Bangera and Brownell 2014). Students may feel uncomfortable approaching faculty about opportunities or may not grasp research cultural norms (Bangera and Brownell 2014; Morrison 2017; Kharraz et al. 2016) such as universalism, “communism” (scientific knowledge is a shared resource), disinterest, and organized skepticism (Merton 1973). Students may see the research opportunity as a financial or time burden (Bangera and Brownell 2014; Kharraz et al. 2016). Poor curricular timing is also important to consider (Wayment and Dickson 2008). Students may perceive personal barriers to research, including motivation and confidence (Bangera and Brownell 2014; Kharraz et al. 2016). Student participation in undergraduate research may also be influenced by faculty barriers such as the tenure status of faculty, preparation time, professional development, suitability of a research program, and research productivity burdens (Webber, Laird, and BrckaLorenz 2013; Wayment and Dickson 2008; Hurlburt and McGarrah 2016; Coker and Davies 2006; Buddie and Collins 2011; Brew and Mantai 2017; Malachowski 2017). Institutional barriers such as technical and staff support and financial investment may influence the amount and type of opportunities (Mateja and Otto 2007; Wagner, Garner, and Kawulich 2011; Brew and Mantai 2017; Malachowski 2017; Lei and Chuang 2009). Such investments require programmatic review to demonstrate that the costs of administering the program are balanced by value to students, faculty, institution, and others (Bauer and Bennett 2003).

Although benefits of undergraduate research are clear, the barriers cannot be ignored. Student barriers are possibly even greater for those enrolled in online or distance education programs. At this time, there is no literature reporting participation rates of online and distance students in undergraduate research or the ways in which their perceptions of benefits and barriers to undergraduate research may differ from traditional students. This gap in research is particularly compelling given the level and range of participation in distance education. In 2017, 5.5 million of the 16.8

million undergraduate students in the United States were enrolled in some form of distance education, with 2.2 million enrolling exclusively in distance courses (National Center for Education Statistics 2019). Nontraditional students also make up a large proportion of distance education students. The National Center for Education reports 50.7 percent of students in the United States aged 24–29, and 53.8 percent of students aged 30 and older, enrolled in distance courses (National Center for Education Statistics 2019). Comparatively, no more than 13 percent of students enrolled in nonprofit, postsecondary degree programs are more than 25 years of age (National Center for Education Statistics 2019). With an increasing number of institutions offering online courses and enrollments in existing online courses on the rise (Online Learning Consortium 2016), it is important to explore high-impact practices such as undergraduate research in this educational setting.

Such issues lead to the following research questions: (1) are undergraduate students enrolled in online programs less likely to be engaged in research? and (2) are the perceived barriers faced by these students similar to those faced by students enrolled in a traditional program? In this study, students enrolled in both a traditional and online undergraduate course were surveyed to measure engagement, interest, and perceptions of undergraduate research.

Methods

Participants

This study was conducted at a medium-sized, private university with two residential campuses (8,300 students) and one distance campus (23,000 students). The distance campus (DC) is ranked second nationally for best undergraduate online program (*U.S. News and World Report* 2018). In 2018, 15 percent of classes hosted through the DC met in a traditional lecture at satellite locations, whereas 85 percent of classes occurred in nontraditional modalities, including asynchronous online, at-home synchronous video, or on-campus synchronous video.

Residential campuses (RC) used a traditional 16-week semester, whereas DC courses used a 9-week format. Most DC in-person classes met one time per week for 3 hours

and 20 minutes, plus 90 minutes of asynchronous online engagement, although a small percentage were “nonblended” and thus met for 4 hours and 45 minutes.

The RC support primarily traditional students, typically in their twenties and at the pre-career stage. The DC support primarily nontraditional students who are aged 25 or older and at the mid- or late-career stage.

Procedure

Using nonprobability sampling, participants were recruited by disseminating the survey in a 3-credit-hour, upper-division, undergraduate course on ethics. This course was selected because it is required of nearly all majors across all campuses, ensuring a representative sample. This course is also often placed later in the degree map; without an undergraduate research program, participation in undergraduate research in the beginning of a degree program is assumed to be less likely. Students were asked to complete a survey to determine their perceptions of awareness, interest, and engagement in research. The survey was reviewed by an institutional review board prior to administration and deemed exempt.

The survey tool consisted of 21 questions, including 10 demographic questions, administered anonymously through QuestionPro. Several types of closed survey questions were used. A dichotomous question asked respondents, “Are you aware of undergraduate research opportunities available to you at [INSERT INSTITUTION NAME].” Response options were *yes* or *no*. A semantic differential scale question asked respondents, “Indicate your interest level in performing undergraduate research embedded within a course,” with the answer options of *very interested*, *interested*, *if the right project came along, it does not fit in my plan*, and *unsure*. The answer option *if the right project came along* was included to address students who may not have significant motivation to seek out opportunities but may be enticed by a specific project. Demographic questions were multiple choice.

Survey data was collected between March 2018 and May 2018. Student responses were divided into two major categories: residential and distance (students) to evaluate the research hypotheses. This division was achieved through the course enrollment using course designation.

Data Analysis

All survey research data were treated as nominal. Hypotheses were evaluated with Chi-square ($\alpha = 0.05$) with the appropriate degrees of freedom (Gay, Mills, and Airasian 2009). Similar categories of answers (e.g., *very likely* and *likely*) were combined to facilitate effective statistical analysis. Data testing was performed using StatCrunch Data Analysis on the Web and Statdisk (Triola 2013).

Results and Discussion

Response Rate

The response rate for RC students was 36 percent ($n = 49$), whereas the response rate at the DC was 17 percent ($n = 40$). These fell below the ideal sample-size parameters. Given the population size, actual response rate, and a 95-percent confidence level, the margin of error was 14 percent for the DC and 15 percent for the RC.

Demographics

Key differences in the RC and DC student groups include average age, career progress, and military affiliation (veteran or current service by the student). These factors may be considered as influencing the access to, interest in, and resources (especially time) for research opportunities. In this study, both samples consisted of a similar gender ratio that was predominantly male (67.6 percent RC and 71.4 percent for DC), which aligned with the expected ratio from the population. As predicted, 68.6 percent of DC respondents were 25–44 years old, whereas only 14.3 percent were 18–24 years old. In contrast, RC respondents had an average age skewed lower (75.7 percent were aged 18–24, and 24.3 percent were aged 25–34, whereas none reported an age above 34 years old). Also predicted was the skewing of career experience between the campuses. More distance students reported that they were at a mid-career (31.5 percent) or late-career stage (20 percent), whereas the majority of RC students reported a pre-career stage (64.9 percent). Only 20 percent of DC students reported a pre-career stage. Respondents from the DC also reported a higher level of affiliation with the military, with only 42.9 percent reporting civilian status, whereas 81.1 percent of RC respondents reported no military affiliation.

Hypothesis Testing

1. Measures Where There Were Statistically Significant Differences between Groups

Distance students were less aware of research opportunities than residential campus students (see Table 2). Of the respondents from the DC, 52.5 percent were not aware of undergraduate research opportunities available at their institution. Only 26.5 percent of RC respondents indicated that they were not aware of research opportunities.

2. Measures without Statistically Significant Differences between Groups

Participation rates. The difference in participation in undergraduate research between campuses is not statistically significant (see Table 2). Engagement in research was gauged by questioning student experiences that may not be expressly recognized as undergraduate research. Survey responses that indicated *unsure* were excluded from the hypothesis testing. Some students reported more than one method of engaging in undergraduate research.

For the purpose of hypothesis testing, responses were categorized as *yes* or *no*, despite the multiple options for students in stating their method of engagement. A high percentage of respondents from both DC (54.05 percent) and RC (46.94 percent) reported no previous engagement with undergraduate research. Course-based undergraduate research experience (CURE) was a common type of engagement in undergraduate research. Students at both campuses tended to engage in a CURE that involved performing a literature review, data mining, or designing a questionnaire (37.77 percent DC and 44.66 percent RC), whereas fewer students participated in a CURE that generated novel data or a publishable product (24.44 percent DC and 21.88 percent RC). Engagement in an independent study, voluntary work with a research team, and activities with a research-active student club were uncommon methods of participating in undergraduate research.

Student interest. The idea that undergraduate students at the DC were significantly less interested in undergraduate research was not supported by the data (see Table 2). Survey responses that indicated *unsure* were excluded from hypothesis testing. Most responses regarding interest from all campuses was *[i]f the right project came along*. At the RC, 57.77 percent of respondents indicated they were conducting or interested in undergraduate research. At the DC, 43.24 percent of students responded similarly. Very few students reported undergraduate research did not fit their plan or that they were unsure.

Incentives. Students were asked to rate the influence of the following incentives on their decision to participate in undergraduate research: stipend, for-credit course assignment, course credit (e.g., independent study), and institutional recognition. More than 75 percent of respondents from both campuses selected *likely* or *very likely* for all incentives with the exception of institutional recognition. This was less valued at both campuses, with just

over half of students (54.3 percent DC, 51.4 percent RC) reporting this incentive would be likely or very likely to influence their decision. Differences between campuses were minimal.

Differences in Perceived Barriers to Undergraduate Research

Survey respondents were asked to rank the degree to which various factors would hinder their participation in undergraduate research. Aligned with previous literature on undergraduate research barriers, all campuses perceived the following as significant barriers: knowing where to start, knowing who to reach out to, time commitment, and costs of research (see Table 3).

Beyond Table 3, confidence level was *likely* or *very likely* to be a significant barrier regardless of campus affiliation (68.6 percent DC, 62.9 percent RC). Institutional programs to foster connections and scaffold projects may boost confidence and make research more tangible. Despite inherent structural limitations of a distributed campus, there were no significant differences in the respondents' perceptions of access to opportunities (62.9 percent DC indicated *likely* or *very likely* versus 61.8 percent RC), access to physical resources (71.4 percent DC indicated *likely* or *very likely* versus 67.7 percent RC), or access to human resources (60.0 percent DC indicated *likely* or *very likely* versus 57.1 percent RC) across the campuses.

Differences in Perceived Benefits of Undergraduate Research

Survey respondents were asked to rank the perceived value of various potential benefits of undergraduate research. The perceived benefits identified in this survey supported key benefits identified in the literature. The benefits with the highest perceived value showed alignment between campuses: gain practical experience (91.4 percent DC, 94.6 percent RC); gain feedback from experts (85.7 DC, 94.6

TABLE 2. Testing the Differences between Residential Campus and Distance Campus Respondents

		Distance campus	Residential campus	Chi-square	P value	Significant?
Aware of opportunities	Yes	19	36	6.291	0.0121	Yes
	No	21	13			
	Total	40	49			
Engaged in research	Yes	17	26	0.1837	0.669	No
	No	20	23			
	Total	37	49			
Conducting or interested in research	Yes	16	26	1.717	0.19	No
	No	21	19			
	Total	37	45			

Note: $\alpha = 0.05$, Distance Campus respondents $n = 40$, Residential Campus respondents $n = 49$. Responses of *unsure* were not counted.

TABLE 3. Student Ranking of Factors That May Hinder Research Participation

Knowing where to start		
	Distance campus	Residential campuses
Very likely	40.0%	42.9%
Likely	42.9%	37.1%
Neutral	11.4%	11.4%
Not very likely	–	5.7%
Irrelevant	5.7%	2.9%
Knowing who to reach out to		
	Distance campus	Residential campuses
Very likely	45.7%	45.7%
Likely	37.1%	28.8%
Neutral	14.3%	20.0%
Not very likely	–	5.7%
Irrelevant	2.9%	–
Time commitment		
	Distance campus	Residential campuses
Very likely	45.7%	54.3%
Likely	31.4%	22.9%
Neutral	22.9%	17.1%
Not very likely	–	5.7%
Irrelevant	–	–
Costs of research		
	Distance campus	Residential campuses
Very likely	45.7%	34.3%
Likely	22.9%	42.9%
Neutral	22.9%	20.0%
Not very likely	2.9%	2.9%
Irrelevant	2.9%	–

Note: Response rates differed slightly from Table 2 because some questions were not answered by all students.

percent RC); learn new instruments or techniques (82.9 percent DC, 91.9 percent RC); and make connections with faculty, peers, and leaders (82.9 percent DC, 89.2 percent RC).

There were differences between campuses for some perceived benefits. Although highly valued by the majority of students at all campuses, determining fit of field was ranked by DC students as the third most-valued benefit (85.3 percent) compared to tenth for RC (78.4 percent). Research as a “resume-builder” was valued as *important* or *very important* at the RC by 91.9 percent or respondents, compared to 71.4 percent at the DC. Just 45.7 percent of DC respondents identified publication

authorship as a valued benefit. Conversely, 70.3 percent of RC respondents valued this potential benefit. A similar trend was reported for valuation of conference presentations (57.1 percent DC and 73.0 percent RC).

Although not reaching top rankings, personal growth in pre-professional skills was ranked equally by respondents at all campuses (80.00 percent DC, 86.49 percent RC). Also ranked equally were the following elements: honing research skills (77.14 percent DC, 78.38 percent RC) and learning cultural norms within the field (80.00 percent DC, 83.78 percent RC). Small differences were seen between campuses regarding the perceived value of making a contribution to the field (77.14 percent DC, 89.19 percent RC)

TABLE 4. Student-Ranked Interest toward Formats for Undergraduate Research

Embedded within a course				
	Distance campus		Residential campuses	
Very interested	9	23.7%	12	27.9%
Interested	7	18.4%	16	37.2%
If the right project came along	16	42.1%	12	27.9%
It does not fit my plan	5	13.2%	2	4.7%
Unsure	1	2.6%	1	2.3%
Independent study course				
	Distance campus		Residential campuses	
Very interested	3	7.9%	5	11.9%
Interested	11	29.0%	10	23.8%
If the right project came along	14	36.8%	20	47.6%
It does not fit my plan	7	18.4%	2	4.9%
Unsure	3	7.9%	5	11.9%
Non-credit-earning opportunities to volunteer with a research team				
	Distance campus		Residential campuses	
Very interested	3	7.9%	3	7.1%
Interested	7	18.4%	7	16.7%
If the right project came along	12	31.6%	21	50.0%
It does not fit my plan	11	29.0%	8	19.1%
Unsure	5	13.2%	3	7.1%
Non-credit-earning opportunities to volunteer with a student club				
	Distance campus		Residential campuses	
Very interested	4	10.5%	2	4.8%
Interested	4	10.5%	9	21.4%
If the right project came along	9	23.7%	16	38.1%
It does not fit my plan	16	42.1%	10	23.8%
Unsure	5	13.2%	5	11.9%

Note: Response rates differed slightly from Table 2 because some questions were not answered by all students.

and expanding disciplinary knowledge (80.00 percent DC, 88.89 percent RC).

Differences in Desired Structure of Undergraduate Research

Format. There were marked differences in interests regarding research options by campus (see Table 4). The CURE format was less popular with distance-campus respondents, possibly due to the shorter semester length compared to the RC. The CURE option seems to be the best understood format, based on the low reporting of *unsure* interest for this format. A marked difference in interests between campuses is seen in the indication that a research-based independent study course did not fit

student plans, with only 4.9 percent of the RC indicating a poor fit, whereas 18.4 percent of respondents from the DC felt it was a poor fit.

Non-credit-earning research experiences were relatively unpopular. The opportunity to engage in research through a student club was the least popular option for DC and RC respondents. This option also seems to be poorly understood by respondents, according to the *unsure* responses. The responses to this question could be skewed by the larger presence of student clubs at the RC, compared to the DC.

Research products. The survey asked students at each campus to indicate their interest in common research

products (see Table 5). Grant proposals were popular at both campuses (48.6 percent DC and 57.5 percent RC indicating *interested* or *very interested*), although DC students were more likely to report this product did not fit their plan (16.2 percent). Distance students showed more interest in review articles, editorials, manuals, and standard operating procedures than RC students. Research articles, technical reports, and conference presentations did not have interest that varied by campus.

White papers, meta-analyses, and trade journal articles were poorly understood (ranked *unsure*) or identified as a poor fit for the respondent's plan regardless of campus affiliation.

Research team role. Students at both types of campuses have many options for roles within a research team. Survey respondents were asked to rank their interest in various roles. Hands-on research and data analysis were the most popular roles. Laboratory-based, hands-on research garnered 43.2 percent interest for DC respondents and 55.3 percent interest for RC respondents. Field-based research showed a similarly high interest (51.4 percent DC and 63.2 percent RC). When considering interest to include the "right project," hands-on research demonstrated more than 75 percent interest for both DC and RC respondents. Of note, 16.2 percent of DC respondents identified a poor fit for field research, whereas no RC respondents felt similarly. The overwhelming interest in hands-on research is important for institutional consideration when designing undergraduate research experiences. Students at all campuses showed similar moderate interest in data analysis (36.1 percent DC and 44.4 percent RC) and project management (33.3 percent DC and 36.1 percent RC).

The following roles were identified as likely to be a poor fit at both campuses: literature review (29.7 percent DC and 23.7 percent RC) and the development of survey tools (27.0 percent DC and 23.7 percent RC). Roles that appear to be a poor fit for the DC were computer coding (47.2 percent) and manuscript preparation (35.1 percent), whereas consulting (29.0 percent) and safety management (26.2 percent) were a poor fit for RC respondents.

A key takeaway from the analysis of survey responses for this question is the response "for the right project." Most roles attract the majority of students if the "right project" is presented. It is important to keep the interests of the key stakeholders—the undergraduate researchers—in mind when designing opportunities.

Despite the prevalence of military-affiliated students at the DC, Spearman's rho revealed a very weak, nonstatistically significant correlation between military affiliation and any studied aspect of undergraduate research (such as interest,

engagement, desired role, or barriers). No correlations were stronger than ± 0.38 .

Limitations of This Study

There are two primary limitations of this study. The margin of error is large due to the sample size. Executing the survey again would provide a more robust sample size and allow for stronger conclusions to be drawn from the data. It is important to note that student age and campus affiliation (RC versus DC) could be confounded variables.

This study did not analyze dimensionality or reliability. Ideally, the results of this study would align with those of other studies. Undergraduate students in the United States are diverse (for example, the institutional environment can vary from place to place), and this sample may not be representative of all undergraduate research students. For example, the university examined in this survey had a large majority of male students. The RC students tend to be under age 34, with the majority having ties to the military. It is acknowledged that these demographics are different from most universities in the United States.

Internal validity of the survey was attained through multiple reviews by faculty versed in undergraduate research before the survey was distributed. Although this study's results provide important insights into undergraduate research culture at the test university, they do not necessarily describe undergraduate research culture at other universities, even of similar size and composition.

Because students may not fully understand the concept of undergraduate research, student surveys may be somewhat unreliable as an indicator of undergraduate research involvement. Arguably the most important aspect of survey research is the careful creation of questions that adequately measure the opinions and experiences of the survey respondents of interest to the researchers. Despite the research team's careful efforts to clearly express and define the key research terms employed in the survey, students' unfamiliarity with more specialized research vocabulary, such as what "data analysis" describes in terms of undergraduate research or what a "trade journal article" describes, may have created confusion. Due to differences between disciplines and instructor pedagogical choices, student familiarity with terms could not be predicted.

Next Steps

This study served as an initial exploration into differences between traditional and online students in regard to participation rates and perceived benefits and barriers. The numbers within ethnic groups were too low to allow for an analysis. Diversity is important in undergraduate research. Future work should further explore differences between subgroups of the population and include multiple

TABLE 5. Student-Ranked Interest in Research Products

Grant proposal				
	Distance campus		Residential campuses	
Very interested	9	24.3%	7	17.5%
Interested	9	24.3%	16	40.0%
If the right project came along	11	29.7%	15	37.5%
It does not fit my plan	6	16.2%	0	–
Unsure	2	5.4%	2	5.0%
White papers				
	Distance campus		Residential campuses	
Very interested	3	8.6%	2	5.0%
Interested	7	20.0%	5	12.5%
If the right project came along	9	25.7%	13	32.5%
It does not fit my plan	8	22.9%	8	20.0%
Unsure	8	22.9%	12	30.0%
Meta-analysis				
	Distance campus		Residential campuses	
Very interested	1	2.9%	0	–
Interested	8	23.5%	10	25.0%
If the right project came along	11	32.4%	11	27.5%
It does not fit my plan	7	20.6%	9	22.5%
Unsure	7	20.6%	10	25.0%
Review article				
	Distance campus		Residential campuses	
Very interested	4	11.8%	1	1.5%
Interested	9	26.5%	6	15.0%
If the right project came along	11	32.4%	17	42.5%
It does not fit my plan	5	14.7%	5	12.5%
Unsure	5	14.7%	11	27.5%
Research article				
	Distance campus		Residential campuses	
Very interested	6	17.1%	5	12.8%
Interested	7	20.0%	9	23.1%
If the right project came along	12	34.3%	16	41.0%
It does not fit my plan	5	14.3%	1	2.7%
Unsure	5	14.3%	8	20.5%
Editorial				
	Distance campus		Residential campuses	
Very interested	3	8.6%	0	–
Interested	8	22.9%	7	18.4%
If the right project came along	10	28.6%	14	36.8%
It does not fit my plan	7	20.0%	8	21.1%
Unsure	7	20.0%	9	23.7%

(table continues)

TABLE 5. (cont.)

Manuals or standard operating procedures				
	Distance campus		Residential campuses	
Very interested	5	14.3%	1	2.6%
Interested	10	28.6%	10	25.6%
If the right project came along	12	34.3%	11	28.2%
It does not fit my plan	3	8.6%	6	15.4%
Unsure	5	14.3%	11	28.2%
Technical report				
	Distance campus		Residential campuses	
Very interested	6	17.1%	5	12.8%
Interested	9	25.7%	9	23.1%
If the right project came along	12	34.3%	12	30.8%
It does not fit my plan	3	8.6%	5	12.8%
Unsure	5	14.3%	8	20.5%
Trade journal article				
	Distance campus		Residential campuses	
Very interested	0	–	2	5.1%
Interested	10	29.1%	7	18.0%
If the right project came along	13	38.2%	13	33.3%
It does not fit my plan	4	11.8%	9	23.1%
Unsure	7	20.6%	8	20.5%
Conference paper or presentation				
	Distance campus		Residential campuses	
Very interested	5	14.3%	4	10.3%
Interested	4	11.4%	6	15.4%
If the right project came along	15	42.9%	14	35.9%
It does not fit my plan	6	17.1%	5	12.8%
Unsure	5	14.3%	10	25.6%

Note: Response rates differed slightly from Table 2 because some questions were not answered by all students.

institutions, with careful attention to distinguish between confounding variables such as campus affiliation and age.

The literature suggests that CURE could help students overcome some barriers to undergraduate research (McDermott 2016). Now that the engagement with, interest in, and perceptions of undergraduate research for distance students is better understood, a future study could investigate impacts of specific types of research experiences on DC student perceptions.

Conclusions

In general, this study indicates that, regardless of campus association (and the assumed category of traditional or nontraditional student), undergraduate students express both similar overall interest levels and engagement in

research activities. As such, the statistically significant finding that residential students were more aware of undergraduate research opportunities than distance students represents a strong call to action for faculty and institutions to make more opportunities available and readily accessible.

The key benefits of undergraduate research were supported by student perceptions in this survey: to gain practical experience; gain feedback from experts; learn new instruments or techniques; and make connections with faculty, peers, and leaders. Of note, distance students valued publication authorship at a significantly lower level than residential students.

This survey identified three key incentives for promoting undergraduate research: a stipend, for-credit course

assignment, and course credit. Institutional recognition for undergraduate research was the least-valued incentive for participation.

Key barriers to overcome, regardless of student category, are knowing where to start, knowing who to reach out to, time commitment, costs of research, and confidence. Surprisingly, campus affiliation did not influence the perception of access to opportunities, access to physical resources, or access to human resources, which were identified by more than half of respondents at all campuses to be potential barriers.

This work confirms previous findings regarding undergraduate research participation, benefits, and barriers for traditional students. It also establishes a basic understanding of how an undergraduate research program for a distance campus may be structured to best support the students. These insights can serve to help tailor research opportunities based on specific demographics and/or potential real-world applicability.

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Recognizing and Valuing the Mentoring of Undergraduate Research, Scholarship, and Creative Activity by Faculty Members: Workload, Tenure, Promotion, and Award Systems

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