

WIP: Design and Assessment of a Centralized Website to Promote Undergraduate Research

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Abstract

This Work in Progress paper examines the design and initial outcomes of a centralized research advertising platform intended to broaden access to mentored undergraduate research across the academic year and summer. Although early research engagement supports student confidence, identity development, and STEM persistence, learning about and obtaining research opportunities often relies on institutional familiarity and informal networks such as word of mouth. A pilot platform called URConnected was developed to address the needs of faculty to advertise opportunities and students to engage with research experiences. The centralized platform with a common application was piloted at a small undergraduate engineering institution.

Findings from the three-year pilot draw on applications submitted through the system, research placement, and pre- and post-surveys to examine use of the system and outcomes. While available to all students, users of the system were predominantly first-year students. Survey results indicated that informal word-of-mouth mechanisms remained highly valued. Key constraints included voluntary faculty participation, variability in position availability, limited student awareness, and preexisting culture within the institution.

Results suggest that centralized platforms may function most effectively as supplemental infrastructure that broadens early access alongside informal pathways. Ongoing work focuses on refining implementation and identifying transferable design principles for such systems across institutional contexts.

Introduction

Benefits of undergraduate research experiences are well-studied, including personal and professional growth, development of technical and communication skills, and better understanding of educational and career plans [1] - [4]. Students who engage in research report better understanding of practices in their field and an increased tolerance for obstacles and challenges related to their work [5]. Participation in undergraduate research is correlated with higher retention and persistence in STEM careers, particularly in underrepresented groups [6]. Despite the value of early engagement, first-year undergraduate students are least likely to engage in research compared to other class years with approximately 5% of first-year students participating in mentored research with faculty based on a nationwide study [7], [8]. Early engagement in mentored undergraduate research allows students to strengthen their skills, build confidence, earn credentials, and gain practical experience. Given the benefits, increasing ways to connect students with research and improve opportunities for first-year students will help students gain academic and professional foundations earlier in their college careers. These outcomes are especially valuable to first-year students since internship and co-op programs often give priority to students with greater qualifications, and graduate programs value evidence of research output with long-term engagement.

This work was piloted at Olin College of Engineering, a small undergraduate engineering institution in the United States that is characterized by a project-based curriculum, small student body and class sizes, and close relationships between students and faculty. Undergraduate research is considered an extension of coursework and learning, encouraged by stipends for students provided as part of faculty startup packages, internal grants for faculty and students, research for credit offered as part of the curriculum, designated laboratory spaces for faculty, and support for faculty to attend and present at conferences. Research opportunities are shared in research fairs that take place approximately once per semester. Opportunities were not centrally advertised, documented, searchable, and updated. Because of the institution's small size and emphasis on close-knit community networks, reliance on informal systems for information is strong. Most research positions were filled through word of mouth, either from faculty to student or peer to peer. While this approach can serve students with existing social connections or familiarity with research opportunities through coursework, students in their first year or those new to the community can have challenges without these preexisting networks. The platform was developed to serve the needs of faculty wishing to advertise positions and to increase access and transparency for students to obtain positions.

Project Approach

The URConnected research team designed and piloted a “Research and Project Opportunities” website at Olin College for promotion of research opportunities to all undergraduate students at the institution, hereon referred to as the URConnected Platform. While this platform was designed to assist all undergraduate students, there was specific interest in the first-year undergraduate experience, given their lack of institutional familiarity. Faculty could opt-in to advertising research positions through URConnected, and student use of the platform was not required to obtain research positions. The research opportunities available included both research during the academic year for academic credit or pay and summer research positions for pay, depending on the specific research project.

The team examined outcomes of this initial pilot by asking the research questions: *Who uses a centralized undergraduate research advertising platform, and at what stages of their academic careers? How does platform use relate to students' perceived access to undergraduate research? What design constraints limit the effectiveness of such a research advertising system?*

Implementation

To set up the URConnected platform, in the beginning of the academic year, a survey was sent out to faculty members asking whether they'd like to opt in to advertise their research positions through the website and participate in a centralized application system, and if so, the following information was collected for the posting:

- Research lab and/or project name
- Faculty contact
- Short description of their lab/project and its goals with any supplemental information or resources
- Semester(s) with open positions (fall, spring, summer)

- Optionally, skills or prerequisites for engagement with the research project
- Banner image relevant to project for advertising

The URConnected platform was created using a website building platform called Notion; <https://www.notion.com/> and was populated and kept updated with information for each project by faculty and students managing the URConnected pilot. The website included a centralized application form, which consisted of short-answer questions about student interests and goals, a resume, and the student's top 3 research project choices. Once the platform was prepared for the academic year, a link to the URConnected platform was periodically provided to students through email newsletters from the institution's career services. Additionally, URConnected was advertised in a required first-year orientation course.

A timeline for the process is shown in Figure 1. Applications were accepted on a rolling basis throughout the academic year. The application responses were linked to a spreadsheet accessible to participating faculty members to communicate about updates on student placements. The URConnected research team was responsible for maintenance of the website and notifying faculty members of new application submissions.

Over the academic year, as students applied through the URConnected platform, emails were sent by the URConnected research team every two weeks to faculty members with a list of students who indicated interest in their research. Faculty were then responsible for reaching out to the students and making notes in the shared spreadsheet for any hiring and placement updates. Once the academic year ended, an email announcing the end of the central application system was sent to students and faculty members. Specific logistical details of each research project, such as whether it was for pay or credit, when a student could start or join a research lab, and more, were left to the discretion of each faculty member. The process ran for three academic years to understand the impact of the system. The URConnected platform was designed to be flexible for changes. For example, starting in year 2, an automated system was developed for notifying faculty when students submitted applications and reminders to meet and reply to interested students.

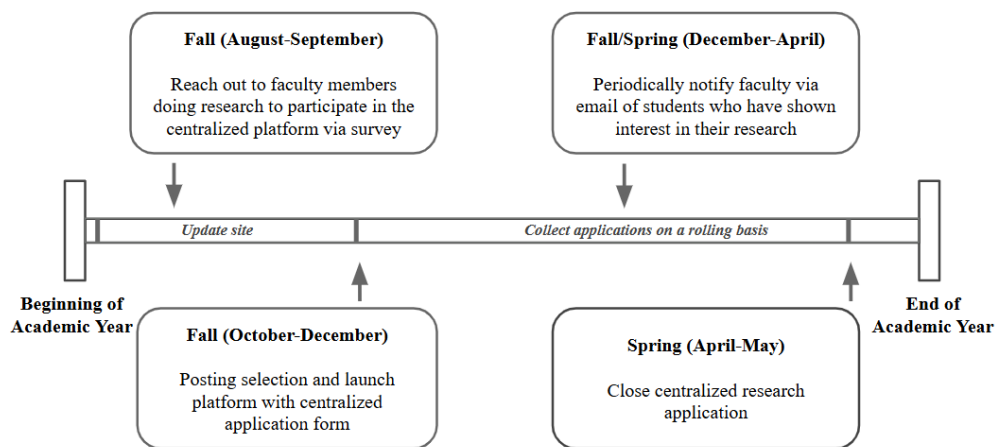


Figure 1. A timeline of the URConnected centralized website over an academic year.

Pre- and post-surveys

Student engagement with the platform and student perceptions of access to undergraduate research were analyzed through pre- and post-surveys (Appendix 1). At the beginning of each academic year before the annual URConnected platform launch, a survey was sent out to first-year students via email to collect information on their prior research experiences, desire to engage with research, perceived challenges for gaining research experience, and self-reported skills. This pre-survey gathered a preliminary understanding of the first-year students' relationships to research prior to engaging with mentored research at the institution.

At the end of each academic year, a post-survey was presented to students of all years that included additional questions about how students accessed research positions and their perceived ease of obtaining research experiences. This survey was used to examine the year-long development of student attitudes towards the URConnected platform alongside their broader experience in the research community. The URConnected research team additionally assessed how many students across class years utilized the system and were placed in research positions through applications submitted and institutional hiring data.

Results

Engagement with the research advertising platform

Examining the applicants to the research advertising platform, the majority of applicants across all three years of the pilot were first-year students (Figure 2). Year 1 saw the highest summer placement rates, with 34% of applicants hired for one of their top three choices. Years 2 and 3 saw lower placement rates with 12% and 11% respectively. This decline was in part due to uncertainties around project funding decreasing the number of available positions. Over the

course of the three-year pilot, the summer cohort saw a growing percentage of underclassmen students, with over 80% of the 2025 cohort being first-years and sophomores (Figure 3).

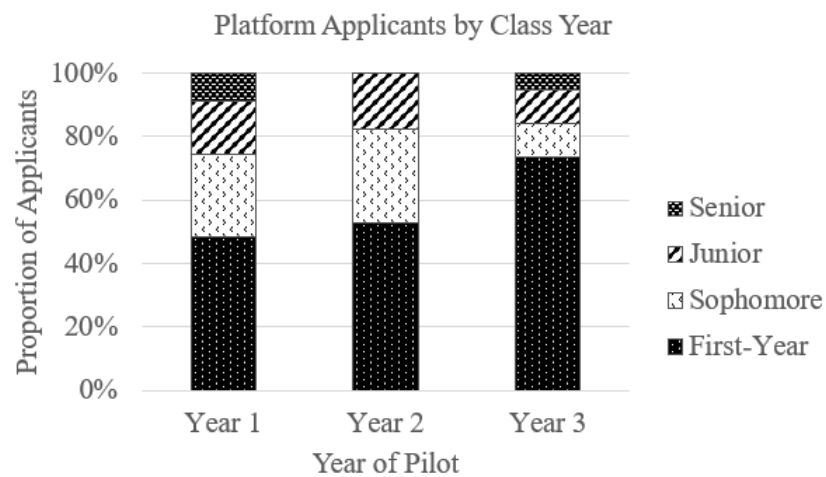


Figure 2. Usage of the research advertising platform by class year for academic years 2023-2025 as measured by applications submitted.

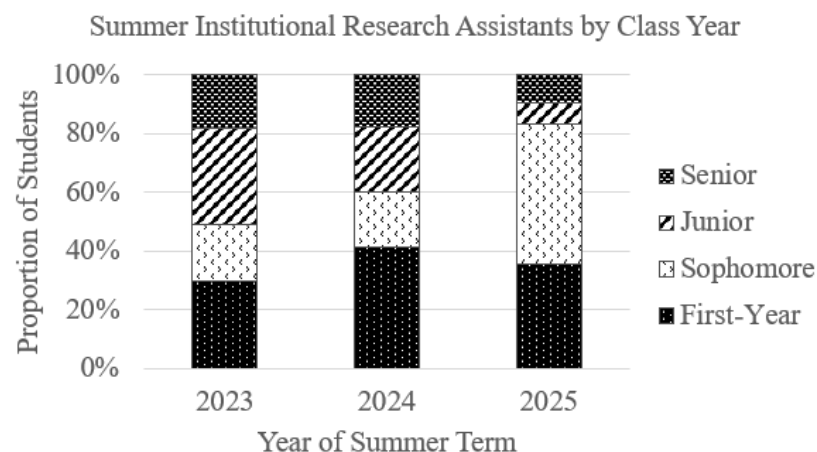


Figure 3. Undergraduate summer research cohort by class year for summers 2023-2025.

Access of institutional research

Survey respondents indicated that “word of mouth” and “talking to faculty” were consistently the most useful mechanisms for learning about research opportunities across the years of the pilot for this institutional context (Figure 4). Among the other mechanisms are yearly research fairs, through courses, and through the new research platform.

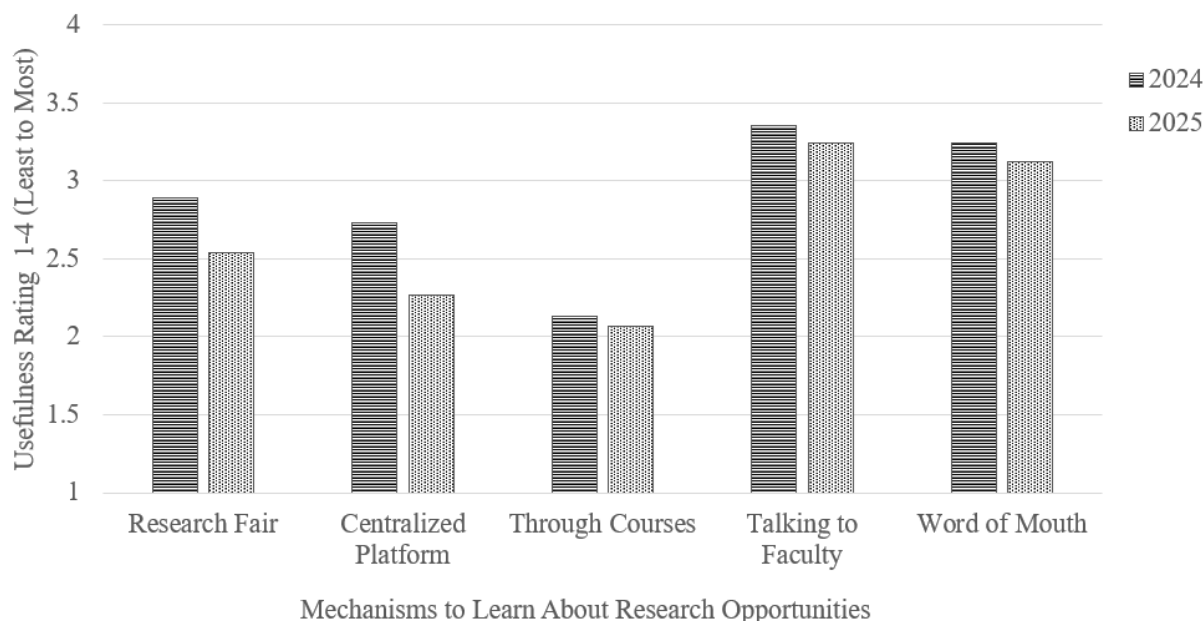


Figure 4. Student-reported usefulness of mechanisms to learn about research opportunities (Likert 1-4). Averages of student responses are shown for year 2 (n = 22) and year 3 (n = 37).

Survey respondents rated the centralized research advertising platform as less useful than informal mechanisms such as word of mouth and direct faculty conversations (Figure 4), though students were interested in the platform’s intended functions. Of the students that responded to the survey during the three-year pilot, 43% reported they had not engaged with the platform at the time of responding. Respondents could optionally provide written feedback for the mechanisms to learn about research, and despite relatively low engagement with the centralized platform, the feedback voiced a strong desire for the platform’s aspired properties, specifically a robust list of available research opportunities that are curated and updated regularly. Several students who reported not engaging indicated in written response that they were not aware of the URConnected platform, suggesting that avenues to promote the new research platform were not sufficient. The main criticisms of those who did engage with the platform were inconsistencies in level of detail between project descriptions, missing projects that required seeking opportunities beyond the platform, lack of publicity for the platform, and slow faculty response times to inquiries through the platform compared to direct faculty engagement. In the survey data, no significant correlation was found between perceived usefulness of the platform and class year.

Discussion

Although the URConnected platform was designed to support all undergraduate students, the majority of users during the pilot were in their first year. This pattern is consistent with the idea that newer students may experience greater uncertainty about institutional research culture, expectations, and conventions for contacting faculty. A centralized platform may therefore reduce barriers by providing a formalized way to learn about and obtain research positions.

Several implementation factors influenced the platform's performance. Most prominently, faculty participation was voluntary and non-standardized, and available opportunities varied by year based on faculty opt-in and project funding approval. These fluctuations affected placement rates and potentially perceptions of usefulness.

Design considerations regarding institutional culture and context prove significant in formalizing research access systems. For institutions where strong interpersonal channels already exist, a centralized platform may best serve as supplemental infrastructure that bolsters transparency and visibility, particularly for students with fewer established connections. Word-of-mouth dissemination and direct faculty conversations remained the most cited mechanisms for discovering research opportunities at this institution. Students consistently favored these informal pathways, even though the centralized platform offered features they identified as desirable, such as searchable listings and a common application. In other institutional settings, such as larger or less networked campuses, a centralized system has potential to play a more dominant coordinating role.

These results suggest that centralized platforms can broaden early access to research opportunities, but their efficacy is shaped by institutional norms, resource availability, and implementation choices. This study suggests that a centralized platform can support existing mechanisms for sharing undergraduate research opportunities, with particularly strong use by newer students.

Next Steps

This project remains ongoing, and the pilot phase highlighted several areas for growth. Increasing faculty participation and establishing clearer expectations for communication about applications may improve reliability and trust with usage of the platform. Coordinating expectations across projects with varied circumstances while maintaining faculty autonomy could help strengthen the student experience and normalize engagement with the system.

To further increase student awareness of the platform, the URConnected research team will continue partnering with the College's Career Services and integrating it into the first-year orientation, while also advertising through channels such as academic advising. Future surveys will gather feedback on reasons for lack of engagement to better distinguish between limited exposure for students, unsatisfactory function, and disinterest in a platform of this type.

Additionally, documentation for future implementations of the system will continue to be developed and advanced. Along with insights from this pilot experience, the URConnected research team will provide a standard operating procedure with templates for the website, forms, and surveys for assessing engagement. Afterwards, the research team will be following up with other institutions who have connected with us to express interest in the platform or similar interventions. Ongoing analysis into implementations at different institution types would further clarify how centralized access systems could support transparent and early engagement in undergraduate research.

IRB Statement

The study was reviewed and approved under IRB protocol #23017R-E “Research For All (R4A) Study: Expanding and Improving Undergraduate Participation in Research” with Olin College, Valparaiso University, and George Washington University.

Acknowledgments

We thank our R4A partners and students for their collaboration that shaped the URConnected project.

Appendix 1.

Pre-survey:

- What is your name?
- What is your gender identity?
- Are you a first-generation college student?
- What is your race/ethnicity? (Check all that apply)
- Are you of Hispanic or Latino/a origin?
- Have you engaged in research-type activities before [institution]? (The definition of research includes any learning opportunities that build on existing work and create new knowledge in a given field. This can include experiences with a faculty mentor or open-ended experiences with courses.)
- What research type activities interest you?
- What previous research type activities have you participated in?
- Please describe the most impactful experiences below by providing information about 1) how you were connected to the experience and 2) a short description for each experience.
- How strong is your interest in future research opportunities?
- How much do you identify with being part of a research community at [institution]?
- What is your interest in future careers where research is a component?
- Please rank how confident you are for the following skills:
 - 1) Recognize and explore knowledge gaps in literature
 - 2) Identify and evaluate sources of information
 - 3) Connect content from multiple courses to solve a problem
 - 4) Identify the needs and motivations of various stakeholders
 - 5) Critically evaluate the consequences (whether positive or negative) of research
 - 6) Work with individuals who have complementary skill sets and expertise
 - 7) Apply research work to inform a holistic solution to a problem
 - 8) Articulate how a potential discovery can impact society from multiple points of view (technological, societal, financial, environmental, etc.)
 - 9) Communicate your ideas and findings from your area of study to a diverse range of stakeholders
 - 10) Craft solutions based on your work that directly benefit relevant stakeholders
- How comfortable would you feel to obtain a research position through engaging with the following:
 - Directly reaching out to faculty who I know

- Directly reaching out to faculty that I don't know
- Submitting an online centralized application through a website
- Through college facilitated events (i.e course fair, research fair)

Post-survey:

- What is your name?
- What is your expected graduation date?
- Are you a first-generation college student?
- What is your gender identity?
- What is your race/ethnicity? (Check all that apply)
- Are you of Hispanic or Latino/a origin?
- Have you engaged in research activities before [institution]?
- Have you previously engaged—or have you made plans to engage in the near future—with a research experience at [institution]?
- Please describe what research you have or will be engaged with:
- Were you offered a summer research position at [institution]?
- In a few words: why did/didn't you apply, and if offered, why did/didn't you accept?
- If you have previously engaged with research at [institution], what were important skills that you learned from your research experience?
- Please rank how confident you are for the following skills:
 - 1) Recognize and explore knowledge gaps in literature
 - 2) Identify and evaluate sources of information
 - 3) Connect content from multiple courses to solve a problem
 - 4) Identify the needs and motivations of various stakeholders
 - 5) Critically evaluate the consequences (whether positive or negative) of research
 - 6) Work with individuals who have complementary skill sets and expertise
 - 7) Apply research work to inform a holistic solution to a problem
 - 8) Articulate how a potential discovery can impact society from multiple points of view (technological, societal, financial, environmental, etc.)
 - 9) Communicate your ideas and findings from your area of study to a diverse range of stakeholders
 - 10) Craft solutions based on your work that directly benefit relevant stakeholders
- What is your interest in future careers where research is a component?
- On a scale from 1-4, how accessible is it to get research experience at [institution]? Select N/A if you did not engage with that method.
 - Research fair
 - Research opportunities and common application ([institution] Notion Site)
 - Through coursework
 - Talking to faculty
 - Word of mouth
- Could any of the above be improved? If so, how?
- Do you identify with being part of a research community at [institution]? (1-5)
- How can we better connect students to research opportunities at [institution]?

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