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Abstract

Undergraduate Research is becoming an increasingly important aspect of all academic areas in universities today, and as a result an effort must be made to understand how students feel about conducting undergraduate research. Literature suggests that students are aware of the benefits to be gained from conducting research, but there are a variety of factors holding them back from actually doing so. This particular study aimed to examine the benefits students feel they receive from conducting research as well as examine how the students feel about the availability of research opportunities at a Midwestern, predominantly undergraduate institution, Fort Hays State University. Five hundred seventy-six students responded to an e-mail survey. Results reflected that the majority of students have conducted research in some capacity. Students who had conducted research felt overwhelmingly positive about the benefits they received with regard to an increase in their understanding, an increase in their skills/abilities, and an increase in their awareness of various aspects of the research process, and an increase in their confidence and qualifications in conducting research. Students seemed very satisfied with their research opportunities. Also, students recognized that a variety of personal qualities are impacted through the process of research. Similar to the literature, though, a majority of students did not feel research was for them. Further understanding the motivations for student research will help mitigate this, and provide insight into what can be done to influence students to conduct more research. Furthermore, as a university, FHSU must strive to maintain and increase research opportunities. FHSU must research why faculty engage in research with students, and try to utilize this to further enhance the experiences for both students and faculty.

Keywords

research, undergraduate research, student research, student scholarship, undergraduate research participation

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Abstract

Undergraduate Research is becoming an increasingly important aspect of all academic areas in universities today, and as a result an effort must be made to understand how students feel about conducting undergraduate research. Literature suggests that students are aware of the benefits to be gained from conducting research, but there are a variety of factors holding them back from actually doing so. This particular study aimed to examine the benefits students feel they receive from conducting research as well as examine how the students feel about the availability of research opportunities at a Midwestern, predominantly undergraduate institution, Fort Hays State University. Five hundred seventy-six students responded to an e-mail survey. Results reflected that the majority of students have conducted research in some capacity. Students who had conducted research felt overwhelmingly positive about the benefits they received with regard to an increase in their understanding, an increase in their skills/abilities, an increase in their awareness of various aspects of the research process, and an increase in their confidence and qualifications in conducting research. Students seemed very satisfied with their research opportunities. Also, students recognized that a variety of personal qualities are impacted through the process of research. Similar to the literature, though, a majority of students did not feel research was for them. Further understanding the motivations for student research will help mitigate this, and provide insight into what can be done to influence students to conduct more research. Furthermore, as a university, FHSU must strive to maintain and increase research opportunities. FHSU must research why faculty engage in research with students, and try to utilize this to further enhance the experiences for both students and faculty.

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Introduction

Undergraduate research (UR) is becoming more common at institutions of higher education (Karukstis 2008). Halstead (1997) provides a definition applicable across all disciplines in academia: "Undergraduate research is an inquiry or investigation conducted by an undergraduate that makes an original intellectual or creative contribution to the discipline." (p. 1390). The benefits of this definition further include allowing leeway with regard to the interaction between the student and the faculty member. Also, this definition keeps standards high, as it requires work to be original.

Two benefits to undergraduate research expressed by students are increased desire to study the academic area and experience for conducting research in the future (Towl and Senior 2010). Additionally, students felt they were more involved and integrated into the research and academic community. In fact, they indicated this as a necessity in order to do the research. As a result of doing research, students felt more confidence when interacting with faculty and other members of the academic community. Finally, another major category of skills gained was the development of skills which could be transferred to their jobs after graduation. Attending conferences enhanced this. In particular, students felt they gained the ability to understand statistics in relation to the real world (Towl and Senior 2010).

In a study by Seymour, Hunter, Laursen, and Deantoni, 2004, students identified several key benefits gained from research. These included personal/professional gains, thinking and working like a scientist, skills, clarification, confirmation and refinement of career/education paths, enhanced career/graduate school preparation, and changes in attitudes toward learning and working as a researcher. Each of these major categories could then be further broken down into smaller sub-categories. Specifically, an increase in ability to communicate their findings was the most important benefit students felt they gained. Regarding career path, it was found research did not cause the students to choose a particular career; however, the research did clarify their pre-existing career directions. Certainly, this study by Seymour, Hunter, Laursen, and Deantoni indicates "undergraduate research is an educational and personal-growth experience with many transferable benefits." (p. 530). Regarding the students' professions, the students said they felt it made them more comfortable with the norms and practices in their field.

Students also expressed concerns. They expressed concerns about not being paid, and concerns about not knowing what to expect from the UR experience. The students did indicate that certain incentives might be able to counter-balance these concerns (Towl and Senior 2010).

Those who tend to participate in research are upperclassmen that had higher GPAs and had early expectations of continuing their education (Russell 2006). Undergraduate research opportunities (UROs) increased the chances of a student obtaining a PhD, positively affected understanding and confidence in research process

and abilities, and increased awareness of options and changes in what academic field and/or careers to pursue. Genuine interest, participation in the research culture, and duration of research were related to more positive outcomes.

A study of perceptions of undergraduate research was conducted at Fort Hays State University (FHSU). FHSU is a regional, predominantly undergraduate university in the western portion of Kansas. All FHSU students with a wide range of research experience were surveyed. The purpose of this study was to better understand how undergraduates view research opportunities at FHSU, their access to those opportunities, and the perceived benefits/drawbacks of conducting research.

Methods

A random sample of six thousand undergraduates across all majors at the university was used. These students consisted of those enrolled in both on-campus and virtual courses. The students were not offered any type of benefit for completing the survey. Responses were gathered over a one week period.

General demographic information was obtained followed by a brief note to respondents explaining how they should interpret the word "research". The following definition was given "Research can take many forms. Research may be done in museums, archives, and neighboring communities, as well as in scientific laboratories. Researchers might be reading historical texts, developing and administering a survey, analyzing data, creating sculpture or photography, or building and testing equipment." This definition fits Halstead's (1997) because it crosses all disciplines and research may be in any form as long as it is original and creative. By giving students a more specific definition, with examples, it ensured all students are clear when responding to survey questions about their research experiences. After giving this definition, a series of questions were asked to obtain students' perceptions.

Results

The five hundred seventy-six respondents were primarily upper-class (seventy-three percent), female (sixty-six percent) students. Ninety percent of the respondents said, based on the definition given, they had previously conducted research in some form. Analysis of the results seems to support the general ideas found in the literature review. Students feel there are many benefits of doing research.

The first matrix of the survey asked students to rate the level of increase they felt research may have brought about in four different areas: their understanding, their skills/abilities, their awareness of various research related aspects, and finally a broad category capturing confidence and qualifications. Respondents felt very strongly about the research experience increasing their understanding of the research process and items commonly associated with research. Seventy-four percent of students who had conducted research felt their understanding had increased by either a fair or a large amount. Particularly, students reported a fair or large amount of increase in

understanding particularly with regard to how to plan a research project and how to conduct a research project (roughly eighty-four percent for each).

In the skills/abilities section, the particular skill for which students felt they increased the most was their ability to work independently, with about eighty-four percent of students indicating a fair or large amount of increase in this area. The awareness students felt they gained was overwhelmingly positive, although the increases are not as large as those for increased understanding and increased skills/abilities. Approximately sixty-five percent of students who had conducted research said they felt they had increased their awareness of the variety of fields in which they could specialize in by either a fair or a large amount, making this the most significant increase in awareness the students had gained. Finally, when it came to increased confidence and qualifications, the students were more positive than ever. Approximately eighty percent of respondents indicated a fair or large amount of increase in their general confidence in research skills, approximately seventy-eight percent of respondents indicated a fair or large amount of increase in their confidence in their ability to succeed in graduate school, and approximately seventy-nine percent of respondents indicated a fair or large amount of increase in their qualifications for jobs in related fields.

The second matrix of the survey asked students to rate their satisfaction level with regard to various items related to research at FHSU. Over seventy percent of the students were either satisfied or very satisfied with how well informed they are about research opportunities, the variety of opportunities at FHSU, the relevance of their opportunities, the amount of support/guidance from faculty, and their research experiences overall. In fact, more than eighty percent of students rated their overall satisfaction as either satisfied or very satisfied.

On the last matrix of the survey, students had to state whether they agreed or disagreed with how a wide variety of personal qualities are affected by research. Ninety-five percent of students agreed or strongly agreed that research allowed for practical application of concepts learned inside and outside of the classroom. Students also felt very strongly about research enhancing critical thinking skills and research enhancing problem solving skills. Surprisingly, more than fifty-two percent of students concluded this section by agreeing or strongly agreeing that they value research, but it is not for them. This is somewhat contradictory from the final two questions where approximately sixty-seven percent of students felt research is either fairly or extremely important, and nearly seventy-nine percent of students said they would consider participating in research in the future.

Discussion

Further review of the perceived benefits of research held by students, can help understand the motivation students have to participate in UR (Towl and Senior 2010). Based on the results, respondents have had some form of research experiences and are aware of the benefits gained from conducting research.

Over half of the FHSU students said they did not feel research was for them. This complements the findings in the literature as students may feel overwhelmed by the research process (Towl and Senior 2010). Also, while we do not know the degree to which many students have done research, the fact many students do not feel research is for them supports the idea that even doing limited research can help students to clarify their goals, and determine what types of things they may or may not be interested in doing in the future (Seymour, Hunter, Laursen, and Deantoni 2004). Additionally, despite over half of the student saying research is not for them, over 75% of the students said they would consider participating in research in the future. While the students may not particularly enjoy it or feel they are good at it, the potential opportunities and benefits gained by doing research may outweigh the negative perceptions. Often in the comments section, students said they didn't have enough time, and this lack of time was their primary reason for not doing research. To enhance both the number of students who would consider research in the future and the number of students who might feel research is for them, the university might offer more incentives for the students to participate. Perhaps providing some form of compensation or benefit to outweigh this cost might improve the outlook students have regarding research.

While the majority of students were either satisfied or very satisfied with the opportunity for research at FHSU, there is significant room for improvement. As a university, FHSU must constantly work to make available and to provide the best possible opportunities for its students, and this is certainly no exception. Because we live in a world today where it seems to be largely based on marketability, both for the university's sake and for the sake of the students upon graduation, it seems obvious FHSU would want to focus on anything possibly affecting the marketability for itself and its students. Clearly, there are a myriad of research opportunities that could be conducted regarding how undergraduates view research opportunities at FHSU, their access to those opportunities, and the perceived benefits/drawbacks of conducting research. Research on the undergraduate research experience is only in the early stages (Crowe and Brakke 2008). Understanding the attitudes/beliefs of the students, the available opportunities, and the potential benefits of UR all create a complex issue. This study helps to fill some of the existing holes regarding the research in this area. However, certainly more can be done. One particular area of interest might be what specific incentives would entice students to participate in more UR opportunities. Another area of interest might be the faculty role in UR. Faculty advisors are aware of the benefits their students gain, and this influences their encouragement of certain students to further engage in undergraduate research (Seymour, Hunter, Laursen, and Deantoni 2004). Furthermore, although a strong relationship was not found, a common suggestion to improve UR was to increase and make more effective the guidance given by faculty. Faculty motivation for undergraduate research was found to be personal satisfaction (Russell 2006).

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