Assessing Students' Perception of SURE Program at The Citadel

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Abstract

During summer 2018, ten (10) undergraduate researchers were engaged in discovery and learning in the Summer Undergraduate Research Experience (SURE) Program at The Citadel. The objective of this study is to examine the student perception of SURE Program. The effectiveness of the SURE Program in terms of skill development was investigated by analyzing a survey of student perception at the beginning and at the end of the program.

Keywords

Summer Undergraduate Research Experience, Undergraduate Research

Literature Review

Undergraduate research at all higher education institutions is being emphasized. Since undergraduate research is listed as one of five high-impact practices on student learning outcomes[1], it is beneficial to expose students to research. Undergraduate research has been linked to retention[2], improved skills in data acquisition, data reduction, and public speaking[3], and increased participation in graduate programs[4]. These might be within a single academic department at an institution [5], school wide [6], or discipline specific across many institutions.[7-8] The summer break makes the most sense for research activities since both faculty and students have greater availability. Research serves as a cornerstone in undergraduate education. Intent to pursue post baccalaureate degrees is on the rise in early undergraduates, and with it rises the importance of utilizing research programs to shape and assist a student as a candidate for such degrees.[4] While research is heavily emphasized for students entering STEM fields, surveys have shown that research can also impact the analytical, logical, and independent thinking of social science and humanities students.[7-8] As such, it is vital that the colleges and universities invest in and explore undergraduate research and its effects on their student bodies.

Institutional Context

The Citadel SURE Program had its inaugural year in the summer of 2017 and was initiated out of the Office of the Provost. The program allows students from all disciplines across campus to participate in either a 5-6 week or an 8-10 week research experience based on the preference of the student and faculty pair. Based on this selection, students are provided a stipend ranging from $2,500-$4,000 and on-campus housing and meals if needed. The faculty working with the students receives a stipend ranging from $1,000-$1,500. The final assignment of the SURE Program consists of a poster presentation summarizing each student's project, which is presented during the first week of classes at The Citadel. The participants were from School of Business, Civil Engineering Department, Mechanical Engineering Department (2 students), Chemistry

Department (3 students), Biology Department, Psychology Department, and Health and Human Performance Department. A summary of the participants' characteristics was as follow: gender (two females and eight males), class standing (2 sophomores, 6 juniors, and 2 seniors), and GPA (average GPA was 3.35).

In addition to conducting research with faculty mentors, students were required to attend four lunch meetings throughout the summer experience. These meetings focused on professional developmental, mentoring, and discussing research progress. In the first meeting, staff from the campus Multimedia Services Office conducted a poster preparation workshop in which they taught the basics of designing a research poster. In the second meeting, staff from the Career Center taught effective resume-building and interview strategies. The final meetings of the program focused on faculty/student mentoring best practices and experiences. During the last meeting, faculty mentors and mentees discussed what work well and how faculty could best support students in the mentoring experience.

Indirect Assessment of SURE Program

The effectiveness of the SURE Program in terms of skill development was examined by analyzing a survey of student perception. The student perception was measured by analyzing a '1-5' Likert scale survey ('1' indicating that students strongly disagree with the statement and a '5' indicating that students strongly agree with the statement). The survey was administered at the beginning and at the end of the program. All students (n =10) completed the survey. Students were asked to respond to the statements listed in Table 1.

Table 1. Pre- and post- survey of Student Perception of SURE.

Question
Q1. I am considering applying for and attending graduate school. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q2. I understand the research process. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q3. I am confident in my ability to analyze data. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q4. I am confident in my research ability. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q5. I have good communication skills. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q6. I have good critical thinking skills. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q7. I am confident in my problem solving skills. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q8. I think it is important to learn about the work conducted by other researcher or peer. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q9. I am interested in the subject that I am researching. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q10. I am able to work independently & collaboratively. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q11. I know how to connect theory with practice. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q12. I am able to develop my active learning attitude. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q13. I am able to enhance my lifelong learning skills. Strongly Disagree 1 2 3 4 5 Strongly Agree
Q14. I have positive working relationships with faculty mentor (s) and peers. Strongly Disagree 1 2 3 4 5 Strongly Agree

The mean and standard deviation of each survey response was determined and the results are shown in Figure 1. The students participating in the program showed higher scores across all survey questions during the post-survey compared to the pre-survey, indicating increased confidence in their abilities for many areas of research. On average, the mean perception changed 18% from pre- to post-survey. Question 9 (I am interested in the subject that I am researching) resulted in highest post-test mean. Question 5 (I have good communication skills resulted in lowest mean. It can be seen from Figure 3 that Questions 7 and 13 had the highest (26%) and lowest (12%) percentage increase from pre- to post-survey, respectively

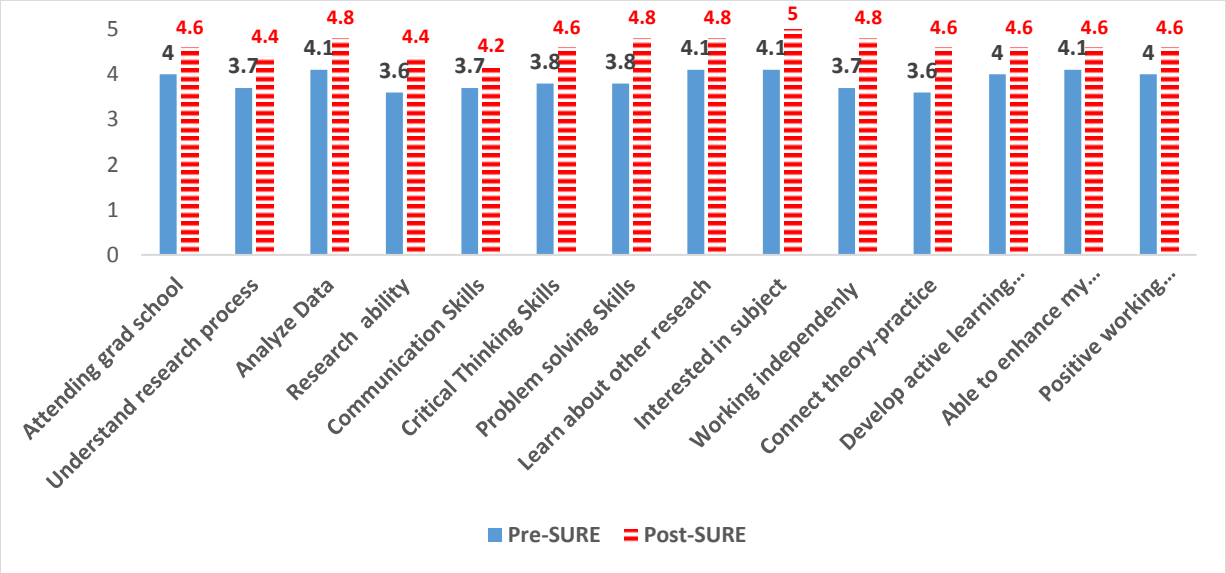

Figure 1. Mean of pre- and post- survey of Student perception (n =10)

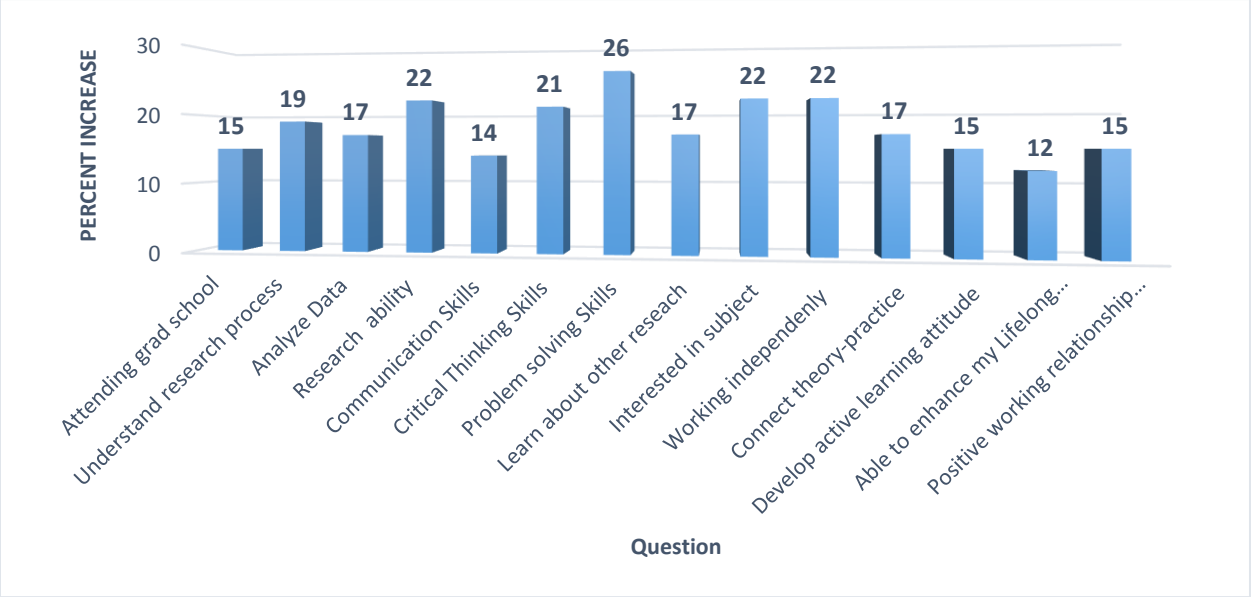

Figure 2. Percent change from pre- to post- survey for each question

It can be seen from Table 2 that the scores on the post-survey had lower standard deviations, showing more consistency in scores from student-to-student. Standard deviations of the pre- and post- survey ranged from 0.48 to 1.05 and 0.45 to 0.88, respectively.

Table 2. Standard deviation of pre- and post- survey

Question	Pre- Standard Dev (n =10)	Post-Standard Dev (n =10)
Attending grad school	1.05	0.55
Understand research process	0.67	0.55
Analyze Data	0.74	0.45
Research ability	0.96	0.55
Communication Skills	0.95	0.45
Critical Thinking Skills	0.79	0.55
Problem solving Skills	0.79	0.55
Learn about other research	0.88	0.45
Interested in subject	0.74	0.45
Working independently	0.48	0
Connect theory-practice	0.97	0.45
Develop active learning attitude	0.67	0.55
Able to enhance my Lifelong learning	0.88	0.55
Positive working relationship with mentor	0.94	0.89

Direct Assessment of SURE Program

The goal of the program was for each participant to present his or her research in the form of poster at the beginning of fall 2018 at The Citadel. The goal set by the program at the local level was achieved, since 100 percent of the participants presented their posters. At the regional level, three posters were presented at the Southern Conference Undergraduate Research Forum at Wofford University in fall 2018 and one student will present his research at the 2019 ASEE-SE Conference in March 2019 at Raleigh, NC.

Conclusions and Potential Future Improvements for the Program

The 2018 The Citadel SURE Program was effective in raising the confidence of the undergraduate participants in every area of the given survey representing traits that are beneficial in graduate school. In addition, the students held a wide range of ratings for themselves during the pre-survey before coming to a positive consensus in the self-assessment following the program. Through all post-surveys, no average appeared below a 3.0, suggesting that the effects of the program were generally positive on its participants. The results of the survey show that the student's perceptions of their ability to perform research changed as a result of their participation in the SURE Program. Specifically, this study found that the SURE Program increased students' confidence in research ability, problem solving skills, interest in subject, and working independently.

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