

KU BEARS Final Report – Summer 2016

There were 9 faculty and 10 students involved in the first year of KU BEARS. All the faculty stated that they would involve students again in research and all of the students stated that they would participate in research again if provided the opportunity.

Below are questions and summaries from the final reports submitted.

Questions that the Student Answered

How has this experience contributed to your undergraduate education and your life goals?

Main points students discussed in the reports:

- Developed research skills
- Greater appreciation of research
- Gained experience that could not be obtained in the classroom
- Made connections between lecture and its application
- Better prepared for graduate studies
- Decided to continue research after graduation

Quotes from students:

“First and foremost, this project has given me a great deal of experience with regards to real life scientific research. Prior to this past year, my personal research experience has been limited to predetermined laboratory experiments done in class, and most, if not all of these experiments, had been done before and were meant to teach a specific principle. This has been invaluable in reassuring me of my choice to pursue science and showing me what a career in scientific research could be like.”

“This gave me the confidence I needed to pursue more internships and job opportunities within my field. I was nervous about participating in this research project but after the training I thoroughly enjoyed the work I was completing.”

“The experience has inspired me to work harder and gave me a goal to work harder to make new discoveries. Before this opportunity, I was not sure about what route I want to go down with a Biochemistry degree, but now I know that I want to pursue a career in scientific research.”

“This research has given me experience that could never be learned in the classroom. A student can learn theories about research and how to conduct it in class, but, the student cannot really understand it until he or she goes out and finds out about all of the challenges and limitations that make research much more complicated than it looks. This research has helped me understand the research process and how extensive it has to be to get reliable data.”

“This research also helped me figure out which path I would like to follow later in my life.”

“This experience helped me expand what I learned in the classroom to the actual field. Since I enjoyed myself doing so much while working on this project I want to work as a researcher after I graduate.”

What experiences will you take from this summer's research that will impact your future in education, research, or professional career?

Main points students discussed in the reports:

- Be prepared
- How to be a better writer
- Professional connections
- Critical thinking
- Knowledge and experience to continue to conduct research
- Collecting, analyzing and interpreting data
- Laboratory techniques
- Research techniques and methods
- Survey development and implementation

Quotes from students:

“This project has given me the knowledge and experience that I will need for conducting my own research projects in the future.”

“I have had practice with tools, equipment, and protocols that are integral to the field.”

“I have learned the importance of being organized and taking meticulous notes, and that the answer to a question is only as good as how thoroughly it has been investigated.”

“I have acquired practice with collecting, analyzing, and interpreting data, which is a fundamental skill in every science field. I have also seen some of what it takes to be a researcher outside of the laboratory, like drafting grant proposals and publishing a journal article.”

“I will take this experience with me to remind me of how important it is to work with others when working with vulnerable populations. Multiple professionals with different skill sets can help clients more effectively than one person on their own.”

“Through the research I performed over the summer, I actually had to put it into practice, which for me helps in taking data and determining meaningful results from that data. These critical thinking skills are much needed in the physical sciences.”

Has the research experience met your expectations? Why or why not?

- Students indicated that the experience exceeded expectations

Quotes from students:

“This experience has been better than I thought. I have learned so much about research. I have read many articles and sat in on many of the steps that go along with research as well as made connections and analyzed the data. This experience has been so rewarding and exciting.”

“This research experience has exceeded my expectations. It has enabled me to acquire a hands on experience in research. It has also taught me how to think critically, how to collect, analyze and present scientific data.”

“The experience I have gained from this research has surpassed my expectations. It was hard work, and definitely rewarding.”

“This research has exceeded my expectations. I did not think of research as something that could be so challenging and rewarding. No one could have taught me how much effort goes into research in a classroom. I am glad that I’ve had the pleasure of spending my time on this research.”

“Yes, because I was not just observing, I was getting hands-on experience with the research.”

“This research experience has greatly surpassed my expectations. I did not think I would be able to grasp the new material I have learned so quickly and obtain results on it just a few days later.”

Would you participate in research again if given the opportunity? Why or Why not? What skills do you think you developed or strengthened through the research experience?

- All students indicated that they would participate again if given the opportunity

Skills developed or strengthened:

- Critical thinking and attentiveness to detail
- Time management
- Information literacy
- Oral presentation
- Coding data
- Formulating a research question to answer
- Communication
- Proposal writing for a conference presentation
- Research techniques specific to the field

Quotes from students:

“Yes, I would gladly participate again as I think that this is an invaluable opportunity to work alongside other researchers, learn from their experience and get to contribute to the scientific community.”

“I would absolutely participate in research again if given the opportunity.”

“I strengthened my skills in critical thinking and attentiveness to detail through this research experience.”

“If I was given the opportunity to participate in research again, I would do it in a heartbeat. I have learned so much, not just about the project’s subject, but also research skills necessary for me in the future. It is a fulfilling experience that I believe no one should pass.”

“If I was given another opportunity to participate research, I would graciously take it without a second thought based off the experience I had this past summer. The opportunity has exceeded my expectations, because I started the research with a closed mind, but with time I had grew a love for research.”

“The area I could notice the most growth was in critical thinking. The ability to look at the reduced data and make semi-accurate inferences from them is an extremely valuable skill to have.”

Questions that the Faculty Member Answered

What skills did the student learn, what skills did they obtain, and can the student demonstrate those skills?

- Students learned more about the research process; skills and techniques needed for research in their selected fields of study; and how to use equipment.

Quotes from faculty:

“Prior to joining my lab, the student had no experience working in a laboratory setting and conducting research. The various responsibilities that he undertook throughout this project, provided him with a better understanding of the complexity and context of science and a deeper appreciation for the research process. Furthermore, he learned various laboratory techniques. I believe that this research opportunity helped him develop his independent critical thinking skills as well as oral and written communication skills.”

“By the end of his time working on his project, the student could successfully perform procedures on his own, demonstrating that he had mastered these skills.”

“All of the skills that the student learned and obtained are highly valued by professional researchers and will give him an advantage when he applies for summer research positions (REUs) and graduate schools.”

“Learned how to construct and revise surveys, develop focus group interview protocols, ethical concerns in research, qualitative analysis of survey data and to a lesser extent quantitative analysis, cross-cultural and linguistic research considerations, how to assist participants in completing surveys (research collection), how to identify and contact potential research sites (including preparation of phone scripts and emails), and how to write a conference proposal.”

Would you involve an undergraduate student again in your research? Why or Why not?

- All faculty indicated that they would involve students again in research.

Quotes from faculty:

“I absolutely would love to do this again. Our students can learn so much by being involved in genuine research that they cannot learn just from sitting in our classrooms. Undergraduate students who participate in research will be more prepared to consume and produce research as practitioners. I believe this will lead to stronger practitioners in the field. The student clearly benefited greatly from this project and I did as well.”

“Mentoring the student in research and seeing him develop as a scientist was very rewarding. He also made a real and significant contribution to advancing the project.”

“Yes, I would gladly involve another undergraduate student in my research as they provide me with an additional teaching and mentoring opportunity. I also enjoy sharing my enthusiasm and passion for science with undergraduate students. They can contribute greatly to the research through their creativity and critical thinking.”

“The student developed critical thinking skills and made a great scholastic progress, and it was a very rewarding experience as the student’s advisor.”

“I would love to involve more undergraduates in research. I feel that they are at the right stage to be learning these skills. In addition, these students are sponges for experiences. They are excited to be working in their chosen field and enjoy talking about it with an expert.”

“Yes, I will certainly continue to involve an undergraduate student again in my research. It is important to let undergraduates start having research experience at an early stage. Conducting research is very different from studying from books, since there are no known answers to the questions we are asking. Besides, apart from answering questions, we also need to learn how to ask good questions when conducting research. Involving undergraduates in my research will strengthen the education of our undergraduates at Kutztown University.”