

## Benefits of Faculty-Undergraduate Research Collaboration in Teacher Education

The College of New Jersey (TCNJ), a small public college, offers undergraduate students and faculty the opportunity to collaborate on research projects through the Mentored Undergraduate Summer Experience (MUSE) program. Faculty members from all academic disciplines submit research proposals to the Faculty-Student Collaboration Award Committee. For each project selected, the faculty mentors receive project expenses and stipends. The student collaborators receive individual stipends for their involvement, as well as on-campus housing.

During an intensive eight-week period each summer, faculty mentors and student collaborators engage in a variety of research activities that benefit both the undergraduates and the faculty mentors. The program offers student collaborators a rewarding learning experience, helping them grow intellectually, professionally, and personally. By attending community activities with faculty mentors and students from other disciplines, the MUSE participants network and discuss their research within the larger academic community.

In this article two faculty members and two student researchers reflect on their summer research collaboration in an effort to demonstrate the educational advantages of including undergraduate students in research in teacher education. We focus on three shared “takeaways” from our work together, related to developing collaborative skills, enhancing research and inquiry skills, and learning content (best practices in teacher education) through research. We also offer some suggestions for structuring collaborative research with undergraduates.

### The Project’s Outline

During the summer of 2012 our team conducted a research project focused on the development of pre-service teachers, specifically, the factors that contribute to successful and unsuccessful pairings of students in “field” experiences. In the Department of Elementary and Early Childhood Education (EECE) at our college, students are assigned part-

ners for three field experiences during their sophomore and junior years, before they actually do their student teaching. Such peer partnerships are generally seen as beneficial to both the pre-service teachers and cooperating classroom teachers (Bullough et al. 2003), but little is known about what factors contribute to successful and unsuccessful student pairings (Gardiner and Robinson 2009). Our study sought to determine the approaches used by faculty to create student partnerships and to examine their level of success as perceived by faculty and students.

Our research team consisted of the authors of this article—two undergraduate pre-service teachers, Jacqueline DeNarie and Tara-Lyn Farrell, and two faculty members in the EECE Department, Lauren Madden and Louise Ammentorp. Team members shared an interest in understanding how to structure successful student partnerships. Both DeNarie and Farrell had completed three courses that included student partners in pre-teaching placements. Both faculty members had previously taught courses that included such student pairings. Based on a course in which the two student co-authors had demonstrated a strong ability to work collaboratively and effectively, they were invited to participate in this summer research experience.

The team began the project with a review of the literature on student partnerships in pre-teaching placements and the administration of online surveys to students and faculty. The undergraduate researchers coordinated and conducted two face-to-face peer focus groups to gather data, and they coded and analyzed the data using a grounded thematic analysis (Strauss and Corbin 1990). Throughout the project, all members of the research team wrote reflections on the research process. The undergraduates on the research team proved indispensable in all phases of the research process. They were able to learn about their future professions and experience clear connections between research and teaching.

Our research team came into this project with varying levels of experience with undergraduate research. Before the summer of 2012, the undergraduate collaborators had limited

exposure to research. DeNarie had worked on a few research-based course projects, while Farrell had taken introductory research-methods courses as part of her second major in psychology. Each faculty member also brought different skills to the team. For example, Ammentorp had participated in the college's summer research program during the previous summer, helping to mentor undergraduate researchers on a different project. Madden, with strong qualitative research knowledge and skills, had worked with undergraduates in a variety of activities, although none in which the students played such an integral role in the research process.

During our summer research project, the whole team met once or twice weekly and communicated nearly daily via email. The team meetings provided opportunities to discuss various aspects of the study, such as any interesting findings, and allowed planning for our next steps. The students met with each other frequently, as did the faculty mentors. The faculty guided the students in the research process and provided the resources and training the students needed to complete particular tasks (for example, preparing literature reviews, conducting focus groups, analyzing data using Atlas.ti® software). The students developed formal written reflections on their research process twice during the project—once at the midpoint and again at the end—and these reflections serve as the key data for this article

### Developing Collaborative Skills

Undergraduates benefit from participating in authentic research projects as a part of their academic preparation (Osborn and Karukstis 2009). The benefits for students include gains in content knowledge and enhanced ability to put classroom knowledge into practice, as well as improved communication, collaboration, and problem-solving skills. Benefits for faculty mentors include the integration of scholarship and teaching, as well as improvements in teaching (Osborn and Karukstis 2009). Although research is often integrated in graduate-level teacher-education programs, it is not common in undergraduate programs (Thompson and Thompson 2012). As a result of participating in this project, both the faculty mentors and the students experienced the benefits of undergraduate research. In particular, we found that we developed our collaborative skills and our research and inquiry skills, while deepening our knowledge about teacher education.

It did not take long for us to realize that the literature on collaboration (e.g., Gardiner and Shipley-Robinson 2009) informed our research. For example, crucial factors in the success of our research team were the dispositions and the knowledge of the individual collaborators. Although the faculty mentors had not worked together on a research project before the study began, they had overlapping research interests and complementary knowledge and skill sets. Since the students had worked as partners in a course taught by Ammentorp, that successful partnership allowed them to jump right into the project. As Farrell reflected, "It was advantageous that we already knew how to work well together and had experienced many of the points expressed in our data first hand." And as DeNarie pointed out, "Each of us brought our own strengths to the project, which I think contributed to its success."

Further, working in collaboration allowed each of the team members to work through her weaknesses. For example, working in collaboration forced Ammentorp, who can be a bit of a procrastinator, to be more efficient, due to shared deadlines and increased accountability. Similarly, Madden, who was inexperienced in mentoring undergraduates in such extensive research tasks, learned the importance of giving explicit instructions and guidelines to the student researchers when assigning new tasks.

Our research team found that successful collaboration involves a balance of flexibility and structure. Initially, the faculty mentors drafted the tasks for the week, which were then discussed and adjusted at team meetings and through emails. This afforded the undergraduates the opportunity to adjust the tasks. Over time, the students took leadership in determining their tasks and goals for the week. The student researchers met regularly and decided how to divide tasks based on their interests and skills. For example, when analyzing the data, DeNarie (whose second major is mathematics, science, and technology) took the lead in creating graphs and charts, while Farrell (whose second major is psychology) extracted sample narratives from the data.

Farrell stresses the importance of open communication, support, and trust in this process: "Depending on the tasks for the week, we chose to either work together or split up the work. Either way, we were continually communicating with each other. Our faculty mentors guided and supported us.

They trusted that we would complete our work efficiently throughout the week.”

Team members found that faculty-student collaboration allowed for innovative and exciting ideas to brew and develop in a way that would not have happened otherwise. This was somewhat unexpected. When considering research with undergraduates, the faculty mentors initially only thought about the task-reduction aspect: More people could complete more work faster. However, in the very first team meeting, they realized they had underestimated the potential of the students’ contribution to the project. The students offered insights into the peer-placement process that the faculty hadn’t considered. In addition to their conceptual insights, the students led peer focus groups that generated data that otherwise would have been unattainable.

Working together made the project more enjoyable for everyone involved. As DeNarie explained, “I really enjoyed working with a partner and as a team throughout this experience. We were always able to bounce ideas off of each other

and ask each other questions. It was helpful to converse aloud when discussing themes in the data or the logistics of running a focus group.”

Throughout this research project, both the faculty mentors and the undergraduate researchers experienced the benefits of working on a successful research team. Frequent communications provided both structure and flexibility for our collaboration, which proved to be key factors in the project’s success.

### Enhancing Research and Inquiry Skills

Over the course of the project, the faculty learned that mentoring undergraduates throughout the research process—from literature reviews and data collection to data analysis and dissemination—was considerably different from simply teaching students research methods. Like all good teaching, training researchers requires scaffolding, modeling, and frequent feedback and communication between mentor and mentee. However, when students are conducting authentic

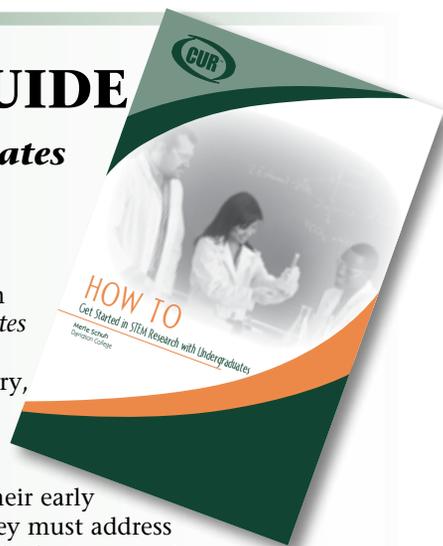
## CUR RELEASES NEW *HOW TO* GUIDE

### *How to Get Started in STEM Research with Undergraduates*

Edited by Merle Schuh

Faculty members face unique challenges and issues in doing successful research with undergraduates in STEM fields. *How to Get Started in STEM Research with Undergraduates* provides a general discussion of these special issues and discusses ways to deal with them. Examples of such issues include: setting up and managing a research laboratory, designing student research projects, working with administrators, seeking research grants, writing successful grant proposals, integrating research into the classroom, dealing with information management, and making optimal use of the primary literature. Although the monograph is directed toward helping faculty who are in their early years of teaching, it should also be valuable in showing administrators the needs they must address in providing an environment in which new faculty researchers can be successful and what expectations they can have of faculty. The appendix lists some research agencies that fund undergraduate research.

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research, the final goal is no longer a final exam or paper, but rather a tangible contribution to the broader educational research literature. As a result, the faculty mentors found their interactions with the undergraduate researchers became more focused, personalized, and specific as the project progressed and the students grew as researchers.

For instance, Farrell commented on learning to use a qualitative analysis software package, Atlas.ti, noting, “I learned how to use Atlas.ti to code our surveys and focus groups, but more importantly I learned what those codes meant and how they could help support or discredit the purpose of our research.” Similarly, DeNarie commented on learning how to moderate focus groups: “As a focus group moderator, I posed the questions and allowed a free-form discussion to take place. Transcribing the data was a time-consuming process, but it allowed us to see many of the themes in the discussion.”

The undergraduate researchers developed critical perspectives on data analysis and a stronger appreciation for the process of research and inquiry. Through participating in the research project they experienced the value of research for informing their professional practice and the importance of an evidence-based approach to knowledge about teaching and teacher education. As DeNarie summarized the project, “Now that I have experienced the research process first hand, any studies that I read about will be more meaningful to me. I will also be more likely to work on another project in the future.”

### Learning Content Through Research

By conducting research with undergraduates the faculty members learned new ways to explore the content of teacher education. Similarly, in their reflections, the students emphasized that the content learned through the project will positively inform their future practices in teaching children. Farrell noted, “I think the most valuable aspect of this process for me has been the content knowledge I have gained. As a future teacher, I will be responsible for creating pairs in my classroom. Prior to conducting this research, I did not give it much thought. However, throughout this process, I learned about the importance of taking into account many different factors when creating pairs so that each student can benefit.” DeNarie added, “After conducting our

study on paired peer placements, I will take special care in pairing my own students in my future classroom. I will know what aspects to take into account when pairing or grouping children and know that where I place them will make a difference in their educational experience.”

All aspects of the research process, from conducting the literature review, to analyzing the data, to writing the results, broadened both the faculty and students’ knowledge beyond the classroom walls. As DeNarie explained, “It has been insightful to view the field of teacher education from the outside in. After participating in MUSE, I will be more in tune with educational research. I think advances in educational research are very important for the future of teacher education and K-12 education.” Her comment reflected a conceptual framework that teacher educators strive to develop in students—the importance of going beyond the immediacy of the classroom and drawing connections to the profession as a whole.

Beyond the topic of peer placements, the faculty mentors learned valuable skills from mentoring student research that can be applied to their teaching, including being reminded of the benefits of using the research literature to inform their own practices. They learned first-hand how authentic research can enhance students’ content knowledge in a more complete and meaningful way than simply learning about teacher education in a classroom setting. They realized the importance of providing structured and specific feedback throughout the research experience. Although their experience with undergraduate research in teacher education is limited, they found many benefits from working as a team on this project, and their collaboration reinvigorated and strengthened both their teaching and scholarship.

### Conclusion and Recommendations

The literature shows that undergraduate research experiences, although rare in teacher education (Thompson and Thompson 2012), are beneficial to the undergraduates and faculty members alike (Osborn and Karukstis 2009). Throughout this research project, the faculty mentors found themselves drawing upon many of the skills they had developed as educators: providing specific and individualized feedback, developing structured collaborations, and using research to inform practice. In the end, the faculty learned

that experience is indeed the best teacher. Based on the team project, following are several suggestions for teacher-education researchers and others engaging in research collaborations involving undergraduates.

- **Structure collaborative teams.** Throughout our work, we capitalized on the strengths of each team member to differentiate project tasks based on those strengths. Early in the research, the faculty mentors provided substantial leadership in developing the tasks and goals for the students. As the research collaboration progressed, the students' leadership increased in both the practical tasks and conceptual work. Regular meetings among all team members, frequent communication, and feedback allowed us all to collaborate successfully throughout the project.
- **Emphasize teaching and learning authentic research skills.** Since teacher-education programs often lack research components or even coursework, it is critical that faculty teach their undergraduate mentees about the actual process of conducting research when working in partnerships with undergraduate researchers. Because faculty mentors used modeling, scaffolding, and individualized guidance to teach research skills—from reading about research methods and writing literature reviews to analyzing data—the undergraduate research partners were able to successfully complete a multitude of tasks during the project.
- **Highlight the connection between learning content and doing research.** Teacher educators often note that research should inform teaching practice, which should then inform future research and teaching efforts. Both faculty members on our team encouraged all team members to reflect on their research process both formally and informally throughout the project. All four team members cited lessons learned that would inform future work, ensuring that participation in this project helped each to see the scope of her work in light of the bigger picture—both in the field of teacher education and in our profession as educators.

To conclude, it is apparent that, like other fields, pre-service teacher-education programs would benefit immensely from incorporating more undergraduate research. Focusing educational research with undergraduates around the specific key ideas defined above can result in beneficial experiences for all involved. These benefits can also be extended to those participating in faculty-undergraduate research collaborations in fields outside of education.

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