



Long-Term Benefits of Undergraduate Research in Economics: A Dialogue

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While undergraduate research has been embraced in the sciences for decades, undergraduate research in economics is nascent (DeLoach et al., 2011); indeed, McGoldrick (2008) finds that in the mid-2000s only a small fraction of economics departments considered doing undergraduate research to be an important goal for their programs. The appearance of several undergraduate economic research journals and a few undergraduate sessions at professional conferences may indicate a growing interest in undergraduate research in economics¹. Since 2002 and before this increased interest in undergraduate research in economics emerged, the economics program at Minnesota State University Moorhead (MSUM) made undergraduate research an important and required component of its curriculum.

The purpose of this manuscript is to describe the undergraduate research program in economics at MSUM and to present a dialogue between two former students and two faculty members about this program. Papers featuring student-faculty dialogues usually involve students who have recently participated in a research project (see Enquist et al., 2013; Ingebretson, Sjoberg, & Larson, 2014; Mina, McAfoose, Moulden, & Zilavy, 2003). It is possible that with the passage of time, participants may have a different perspective about the undergraduate research experience and its effects. Establishing a dialogue with former students who had their undergraduate research experience years ago may provide a glimpse about the long-term effects of participating in undergraduate research. To that end, the students engaged in this dialogue participated in undergraduate research three years ago (2012-2013) and eleven years ago (2004-2005). In addition, we discuss important additional benefits of undergraduate research not discussed in the literature; these benefits are external to the students currently participating in research. What follows is a description of the undergraduate research program in economics at MSUM, a dialogue among former students and faculty, and concluding comments by faculty.

By informal agreement among the program's faculty members, most upper level courses in economics at MSUM require what DeLoach et al. (2011) classify as course-based projects; while most of these projects are term papers, service learning is also used. Many of these courses require

¹ Peer-reviewed undergraduate journals include *Issues in Political Economy* and the *Undergraduate Economic Review*. The Eastern Economics Association has regularly scheduled the *Issues in Political Economy* sessions for well over a decade; More recently, the Missouri Valley and Midwest Economics Associations have added several undergraduate student sessions.

a synthesis of literature on a particular topic. The undergraduate research component, as defined by the Council on Undergraduate Research (Beckman & Hensel 2009), where students are expected to pursue research that makes an original contribution to the discipline occurs in the Introduction to Econometrics and Economics Seminar courses; both are requirements of the major. The courses are scheduled such that students complete Introduction to Econometrics in the fall semester and Economics Seminar the following spring semester.

Introduction to Econometrics

The aim of the Introduction to Econometrics course is to provide a solid intuitive, technical, and practical introduction to econometrics. This focus on an intuitive and practical introduction to econometrics stems in part on the likely career paths of students in the program; nearly thirty percent of graduates pursue masters in applied economics, a number pursue law school, and most choose professional careers in the private sector. While most students in the class are senior economics majors, a number of business, political science, and mathematics majors regularly enroll in the class because Introduction to Econometrics is designated as “writing intensive” and thus helps fulfill writing requirements at the university.

As part of this course, students are required to write a paper using econometrics that advances knowledge in the field; forty-five percent of the overall grade is based on the research component ensuring that students take research seriously. Since virtually no student that enters this course has written an original research paper, they are provided with a detailed document explaining the components of a research paper, expectations of the paper, and two grading rubrics, one focusing on writing style and the other on the research component. Students are allowed to select their own topic; occasionally when individual students have shown an effort in selecting a topic but are still undecided, the instructor will suggest a specific topic. A draft of the paper, worth fifteen percent of the course grade, is required three weeks before the final paper is due; at this point, it is expected that the paper includes the following sections: introduction, review of literature, theory, data, and an initial regression. Suggestions for improvements, both in writing style and content, are provided promptly. The final draft is worth thirty percent of the grade and students are advised that not improving their paper from the draft will result in a lower grade than they obtained in the draft as expectations between a draft and a final product are different.

Selected students from Introduction to Econometrics are invited to improve their work and to present at the *Issues in Political Economy (IPE)* undergraduate sessions of the Eastern Economics Association. Since 2003, twenty-seven students from MSUM have presented at these sessions.

Economics Seminar

Economics Seminar is a one-semester capstone course requiring a research paper using tools of economic analysis and both written and oral presentations. Unlike many economics seminar research courses where a primary topic of inquiry is introduced by the professor teaching the course and individual students complete economic analyses related to this topic or subtopics, the research topics and associated analyses in the Economics Seminar course originate exclusively from students' interests and inquisitiveness. Students are allowed to continue researching the same topic selected in the Introduction to Econometrics course if they extend their research in an innovative manner. Each year, less than five percent of students pursue this path, suggesting either a fatigue associated with the original topic or a desire for exploring an alternative interest. This decision, replicated by students year after year, is noteworthy, given the efficiencies associated with maintaining an ongoing focus on a topic where some expertise has already been established.

Ethridge (2004) is the text required of students in Economics Seminar. Ethridge states, “Economic research methodology is, in a sense, the science and art of economics rolled together, with its goal

being both to expand (and confirm) our knowledge and to make that knowledge relevant to the contemporary world” (p. 5). The active learning process of students in Economics Seminar mirrors this definition. Chapters of the Ethridge (2004) text are discussed intermittently during class meetings and in combination with a library lab experience in the first week of class. Students engage with their self-selected research question independently outside of the classroom setting. Some access Greenlaw’s (2006) pragmatic approach to economic research for additional guidance in this process. Another supplemental course reading (Mittelhammer, 2009) exposes students to the diverse research methods used (and not so often used) when completing economic research. The unique research writing style of economists is highlighted by including the perspectives of McCloskey (1987), McCloskey (2000), and Nikolov (2013) as supplemental course readings. Simultaneous exposure to these readings, class discussion, and their own research equips students to review a peer’s research paper draft submitted at the midterm of the semester. The faculty mentor reviews all papers in the course at the midterm also. Consequently, each student receives two sets of reviewer comments which serve as a springboard for the research in the second half of the course.

A final unique facet of the Economics Seminar course is the expectation that students will present research on multiple occasions *and* to multiple audiences during the semester. Students deliver three types of presentations: (1) class presentation of a published article that is central to the student’s independent research; (2) class presentation of the student’s independent research; and (3) public presentation of the student’s independent research at MSUM’s Student Academic Conference (SAC). Using a presentation rubric, students peer review (anonymously) both types of in-class presentations for all of their classmates. All presentations are also evaluated by the faculty mentor using the same rubric. Economics faculty members, in addition to the faculty mentor teaching the course, use a presentation rubric to evaluate the students’ public presentations at the SAC.

The faculty mentor reviews final papers of all students using research and writing rubrics. The final event of the course is a conference in which the faculty mentor and each student identify additional opportunities for publication or presentation of the student’s research. On average, 15 percent of students pursue these activities independently after the course ends each year. Since 2005, six MSUM students have been published in the *Undergraduate Economic Review*.

Dialogue

A dialogue between program graduates, Derek Hagen and Rachel Hettich, and faculty members, Drs. Oscar Flores (Introduction to Econometrics, ECON 370) and T. J. Hansen (Economics Seminar, ECON 498), considers how undergraduate research in economics contributes to student growth and career preparation. Derek Hagen graduated in 2005 and immediately after graduation pursued a career in asset management companies; he is currently Vice President of Investments and Planning at Marquette Asset Management in Minneapolis, MN. Rachel Hettich graduated in 2013, obtained a Masters in Applied Economics from Purdue in 2015 and now is an Investigator at the Chicago Mercantile Exchange. Both presented at the *IPE* sessions as undergraduates. This dialogue allows us to compare and contrast the views on undergraduate research of a recent graduate with those of a graduate from a decade ago; their viewpoints also represent alternative transitions to the labor market since Derek pursued a career immediately after graduation while Rachel attended graduate school prior to beginning a career. In order to facilitate the dialogue, Oscar and T. J. developed specific questions to which Rachel and Derek replied. The questions and former students’ answers followed by comments from the faculty members comprise this section.

How did you identify a topic for the undergraduate research setting? As an undergraduate, was it more difficult to identify a general area of interest or to define a researchable question? Explain.

Hettich: My experiences in ECON 370 and ECON 498 differed. At the time I took ECON 370, I was

able to identify broad research ideas. However, it was more difficult to develop them into researchable questions that were suitable for econometric analysis. I believe that the difficulty of defining a research question was due to my limited exposure to economic research leading up to that point. By the time I enrolled in ECON 498 in my final semester at MSUM, I had been exposed to much more economic research and felt more confident identifying a research topic. One resource that I learned about in my economics courses, which helped immensely, was the electronic journal article database provided by the university library. I used one of the ideas presented in the “further research” section of a journal article as the starting point for my research.

Hagen: I cannot actually remember how I came up with my topic. I can say, however, that I found it difficult to come up with a research topic. I think I was too young or inexperienced to have any particular interests.

Hansen: In the Economics Seminar course, I find that identifying a topic can challenge different students for different reasons.

Some students struggle with the “freedom” of selecting a topic because it is easier to let the topic expand in an attempt to incorporate everything the undergraduate researcher can imagine, rather than analyzing the literature critically as a means of focusing the topic to a central theme or question. At the onset of one’s first independent research project, reading the literature seems labor intensive with limited or no immediate reward. However, failing to read the literature thoroughly prevents an undergraduate researcher from accruing the benefits associated with fruitful, unfruitful, and unexplored paths detailed within the existing literature. A topic lacking the focus that the existing literature can provide becomes unwieldy and unmanageable. Unfortunately, it is not until this point that an undergraduate researcher realizes that (s)he underestimated expected benefits and overestimated expected costs of reading the literature at the onset.

Other students struggle with identifying a topic because their academic experience to this point has involved limited choice. Students have identified a paper topic in other courses; however, in most of those courses, the paper was required to relate to that course’s content. While this directive seemed restrictive when the student was in the earlier course, such externally-imposed restrictions are longed-for by some students overwhelmed by the task of identifying a specific, unique topic of their choice for the first time.

Another common challenge among students is that research topics can be a bit like bubble gum in that what is flavorful initially can become tasteless and hard to chew as time passes. Students may misdirect their *perceived* frustration with identifying and narrowing their topic from their *actual* frustration of maintaining clear and ongoing focus in the research process from start to finish.

Flores: Perhaps the most common difficulty students have in their research paper in Introduction to Econometrics is selecting a topic. It may be a combination of insecurity about their own abilities in economics and econometrics and ignorance of what has been done in the field that causes them to be unable to settle on a topic. So I find my job as mentor is often focused on helping them find a topic.

To help students settle on a topic, generally I spend class time early in the semester gently asking each one if they have selected a topic or not. I do this because it is important for each student to know that (s)he is not the only one struggling to identify a topic. Another tool I use is to ask them whether there is an important issue in the student’s hometown or state, whether the student has an interest outside school, or whether the student cares about a particular issue, etc. In the process of asking them these questions, I do show them how to search EconLit for the subjects they are

mentioning. This requires a lot of patience and time. Through this process they generally find a topic, and this is one of the aspects I find most rewarding. Often the research question they select is a topic that has rarely, if ever, been studied in the economics literature. Some examples of such topics include a study of factors affecting public library usage, a study on the demand for abortion, whether the presence of Indian casinos affects high school graduation rates, and peer-to-peer file sharing to mention just a few such topics.

Occasionally, when I know a student has made a good faith effort in selecting a topic of their own and time is getting short for them to complete their work, I suggest a few topics and allow the student to select from there.

What was rewarding to you about learning economics by conducting research as an undergraduate? Explain.

Hettich: I have always loved learning, but I am also the type of person who thinks about whether I can actually apply what I am learning to a real situation. Conducting economic research was the perfect way to not only make sure that I really understood the concepts I was learning in courses throughout the program, but also to apply them to a practical research question, which was very fulfilling.

Hagen: I enjoyed doing something, as opposed to reading books. The challenges that surface during the research process offer a great learning opportunity in terms of problem-solving and analytical thinking.



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Hansen: Student autonomy associated with conducting undergraduate research can manifest itself initially as uncertainty, indecision, and inaction. Students stay in this phase for different lengths of time. The research experience becomes more comfortable to the student once (s)he identifies a manageable research question and can envision how to proceed. As a student’s focus shifts from everything (s)he does *not* know to viewing him/herself as an expert on the research topic, the student begins to view the research experience as rewarding. The outward appearance of this transformation is a research presentation in which the student is confident presenting the research because his/her findings are the culmination of coursework completed, literature reviewed, data gathered, methods applied, and findings reported.

Flores: While I agree with T. J., I would suggest that students find satisfaction in the sense of ownership that comes from having selected their own topic. Also, I am convinced students find satisfaction in having successfully achieved something they perceived as a difficult task. This is a point that Rachel makes in her reaction to another question later in this paper.

What was challenging to you about learning economics by conducting research as an undergraduate? Explain.

Hettich: I think the biggest challenge to me about conducting economic research also became the biggest lesson I learned throughout the process. I was very focused on the analytical results I was getting, which was very frustrating at times. I became very passionate about the research topics I was working on, and when the results were not what I had originally expected, I tended to get discouraged. However, one thing I can remember Dr. Flores saying over and over is that “no result is

a result.” This is something that made me more confident as an undergraduate researcher, and I have thought back on many times since graduating from MSUM.

Hagen: One of the biggest challenges that arose was fighting the temptation to data mine. It was very easy to run regressions and look for correlations without any basis for causation. I came to realize that much of what was rewarding was also challenging. That is likely because it was something I had not encountered previously. Having said that, the rewarding experience that came with starting a project from scratch also masked the challenges.

Hansen: The challenges arise early and often while the rewards are not visible until the research process is near completion. This is one reason I use part of the last day of class to ask every student who completes the Economics Seminar course to write a one-page, anonymous letter to next year’s class. I seal the letters in an envelope and do not open them until the first day of classes the following year. Students appreciate hearing their peers’ reaction to the process and I appreciate the candidness of their responses in relation to both the challenges and rewards.

Flores: As Rachel points out, students often feel discouraged with the results of their regressions; they often think that it is a “bad result” if the coefficients are not statistically significant or worse yet if the signs are opposite those expected. When a student has such concerns, I make sure we review the theory and the literature to see if the expected signs make sense, we review the data, we test for econometrics problems, and make corrections if necessary. Then, as Rachel points out, I say “no result is a result” meaning if the coefficient is not statistically significant, that is the result, report it, and contrast it to past findings in the literature.

A challenge many students face is, as Derek points out, a tendency to data mine in an attempt to get “better” results sometimes because they are searching for higher R^2 s and sometimes because the signs of the coefficients are zero or “wrong”. When a student has such concerns, it is important to guide him/her back to the theory and past research on the topic and ask for the theoretical reasons for the different regressions. It is important to do so in a conversational, gentle and non-threatening way so the student feels comfortable coming back for more advice.

What skills surfaced due to your immersion in the undergraduate research process that you had not used previously in other undergraduate economics courses? Explain.

Hettich: Creativity is definitely a skill that I developed through immersion into the undergraduate research process. Skills such as critical thinking and analysis, which are also essential for research, were skills that I learned through other economics courses. However, creativity is not really a teachable skill, but I believe that it is vital in order for the research process to be successful. I think that the professors in the MSUM economics program are very confident in their students’ ability to conduct research, which I believe goes hand in hand with creativity and trusting your own ideas. Another skill that I believe I developed through undergraduate research is the ability to write clearly and concisely. Again, writing is a hard skill to teach without actually doing it and being critiqued. The undergraduate research process at MSUM was very collaborative, and I knew I would always receive very detailed constructive feedback from my research advisors. Through the writing and editing process, I learned how to present my ideas and results effectively, which has been a valuable and transferrable skill.

Hagen: The research process definitely refined skills relating to error-checking. Questions about whether results make sense and whether anomalies are present were always at the front of my mind. Those skills have been very valuable in my career. Although those skills are helpful in other undergraduate economics classes (for instance, when using a formula to answer a question), the other undergraduate classes did not refine those skills much; it only benefited those that already

had those skills. The research process helped to build on those skills.

Hansen: The most unique skill that I observe emerging among Economics Seminar students is the ability to manage a long-term deadline independently. In most other courses, the faculty member outlines a daily roadmap for the semester to ensure that course objectives are achieved even if unexpected events occur in the life of the student. However, undergraduate research courses are often the first time that students know what is expected of them at the conclusion of the course, but they also know that no one will be monitoring completion of every intermediate step of the process.

An individual trained in the economics discipline is often expected to work independently, but in alignment with the long-term goals and timeline of his/her team or company. Economics Seminar offers each student a glimpse of how to navigate this landscape as a professional, particularly if (s)he is the only economist or economic analyst employed in a multidisciplinary career setting.

Flores: As stated before, Introduction to Econometrics is designated as a Writing Intensive course and thus I pay much attention to students' writing and make it a significant part of the paper's grade. Indeed, part of the purpose of requiring a draft is to give students feedback on their writing so it can be improved for final draft. Derek states that the research process aided him in double checking for errors. Frankly, I had not thought about this benefit from undergraduate research. Another benefit is that students engaged in research also learn to use STATA and thus have at least a beginning understanding of data analysis tools which can be useful in their professional life.

Peer review (reviewing the papers of other students using writing and original research rubrics; critiquing other students' presentations using a presentation rubric) was included as part of the Economics Seminar. How did serving as a peer reviewer enable you to mature as an undergraduate researcher and professional?

Hettich: Through peer review, I was able to develop the skill to review my own work with an objective lens, which served me well as an undergraduate researcher, as well as in graduate school and my career. During my research as a graduate student, I was working on the same topic for two years, which is long enough for a significant bias to potentially form. However, I was able to take a step back periodically and review my work from an impartial standpoint, which was a skill that stemmed from the peer review I did as an undergraduate student. Further, in my current career, periodic reviews are conducted, in which I am required to reflect on my strengths and weaknesses as an employee, which is another place where my peer review experience has been helpful.

Hagen: This was among my first experiences with critiquing someone else's work. I think it was good exposure to be able to look for positives and negatives in someone else's work that I then had to bring up face-to-face. The ability to offer constructive criticism is an essential skill in the workforce (criticizing too negatively will upset those being criticized while not criticizing enough will lead to not getting a voice in projects).

Hansen: Peer review offers unique short and long-term benefits. In the short-term, peer review introduces a societal pressure to the research process because each student approaches the deadline knowing that a peer will read and review his/her draft. Peer review motivates students differently than the "threat" of a professor reading the draft. Most students, whether they are willing to admit it or not, are in competition with their peers and desire for their own draft to be better than the one they peer review. This is a powerful incentive for each student to submit a high-quality draft. In addition, as Rachel corroborates, the act of reviewing another student's research increases a student's objectivity toward his/her own work. After a student reviews another student's paper using the writing rubric, it becomes easier for the student to assess his/her own research relying upon the same rubric. Students may or may not recognize the importance of establishing a standard, in this

case the assessment rubric, to achieving a constructive process and performance review. Ideally, after serving as a peer reviewer and being the recipient of peer review comments, students begin to appreciate the tact and tenacity essential to being a constructive reviewer of output and individual performance in professional settings.

Flores: Because of time constraints I do not formally include peer-reviewing in Econometrics. However, while I am not surprised to see students benefit from it, I am still very glad to see both Rachel and Derek do see long-lasting, important benefits from it.

Presenting your research to specialized (IPE sessions at the Eastern Economics Association conference) and general (SAC sessions including the public and MSUM undergraduate students from various fields of study) audiences was part of the undergraduate research experience in ECON 370 and ECON 498. How did presenting your research to different audiences enable you to mature as an undergraduate researcher and professional?

Hettich: The importance of considering your audience, both as a researcher and in a professional capacity, is a concept that was taught in every undergraduate economics course that I took. Presenting my undergraduate research at different venues, specialized and general, was the perfect way to put the concept of considering alternative audiences to practice. I learned that thinking of the audience is not something that should be done once the research is completed, rather it should be considered from the point of research conception and followed all the way through. As a graduate student, I presented my thesis research a few times, and each time, the audience was slightly different. Because of my experiences at MSUM in presenting to different audiences, I knew that I needed to keep each potential audience in mind at every step of the research process and presentation preparation.

I also do a lot of writing as part of my current job, and I always consider whether my audience will be internal to our company or external, and the writing varies drastically depending on the answer to that question. I know the ability of understanding my target audience will continue to help me throughout my professional career.

Hagen: This was among the biggest benefits that accrued to me as part of this process. Being able to explain difficult concepts to a variety of audiences is critical in my profession (investment advice and financial planning).

Presenting to specialized audiences allowed me to keep it more detailed, because concepts did not have to be explained each time. Since I did not have to explain heteroscedasticity and multicollinearity (because the audience was assumed to know those terms), I was allowed to get on with the results and/or get into the research methods I used. The flip side is that the questions that arise from the specialized audience are in-depth and require more knowledge.

Presenting to general audiences required a more basic presentation approach. These presentations were broad (focusing on the inputs and the outcomes), but less technical. The questions were a little more basic, but required a different set of explanations than would be required in a specialized audience.

Hansen: I focus students' attention on the importance of clarifying their research contribution throughout the research process. Students first gain an understanding of previous researchers' contributions when reading the literature and refining their own research questions to fill a gap or void. Clarity with respect to one's contribution in terms of both process and output is a prerequisite to conveying one's findings to alternative audiences. As students practice communicating to different audiences about their research in ECON 370 and 498, they learn from both their own successes and

failures and those of their peers. Clear communication is rarely accidental; students learn that what appears spontaneous is the result of planning, anticipation, practice, and more practice.

Flores: When the economics program included undergraduate research in the major, we deliberately designed it in a way that presentations at the SAC were a requirement, and if possible some students, like Rachel and Derek, could present at the *IPE* sessions because we knew that public speaking was an essential skill for our majors to have. In the process of preparing students for the presentations, we always ask them to keep the audience in mind. It is rewarding to see Rachel and Derek agree that this has had the intended results and that it has served them well in their careers.

As you reflect on your experiences in the ECON 370 and ECON 498 courses, what do you view as the immediate benefits of conducting economic research as an undergraduate student?

Hettich: I believe that the most important short-term benefit for me of conducting undergraduate research was the sense of accomplishment that I received from it. To be able to have two original research papers as a tangible takeaway from my degree as I graduated made all of my hard work pay off immediately. Further, having that research experience definitely helped immensely on my graduate school applications because it showed that I had experience developing a researchable question and following it through every stage of the research process.

Hagen: The short-term benefits were having the ability to put research and presentation experience on my resume. I think these items are differentiators for job searchers, especially for those entering the labor market directly from college.

Hansen: Over the course of the semester, students' emotions related to conducting undergraduate research run the gamut from frustrating to demanding to achievable to rewarding. Most students describe this progression at the end of the semester in our final one-on-one research conferences. Many students state that the undergraduate research experience gives them confidence to enter graduate school or career settings because they have tangible products (papers, presentations, etc.) to include on their resume or experiences to describe within an interview. The undergraduate research experience decreases apprehension of being a new entrant to the labor market because students can better articulate their value to prospective graduate schools, professional schools, or employers.

Flores: Derek, Rachel and other former students have commented over the years that including the undergraduate research experience and papers on their resume helped them differentiate themselves from other applicants when applying for a job or to graduate programs. Numerous program alumni stated that when interviewing they were able to emphasize their research experience in ways that allowed them to offer tangible examples of their problem-solving abilities, creativity, and communication skills, among others.

As you reflect on your experiences in graduate school and/or the career setting, what do you view as the long-term benefits of conducting economic research as an undergraduate student? Does your foundation in undergraduate research impact your approach to solving problems and communicating your findings today?

Hettich: Being able to think abstractly and critically is something that I learned from my undergraduate economic research, and I have continued to benefit from that skill, both in graduate school and in my career. Each new research idea has to be approached with an open mind because you cannot predict where it will lead. In graduate school, I was assigned to a research project that was not well developed, so it required significant abstract thinking to be able to put together a research plan. The fact that I had previous research experience to draw from was a significant advantage throughout my time as a graduate student.

Also, organization of ideas was a critical part of the undergraduate research process, and that is a skill that I still use on a daily basis. My career involves working on investigative cases, and each case is similar to a research project, ending with a comprehensive report. Organization of ideas at each stage of the case makes the resulting report much easier, and the same was true for the projects I did as an undergraduate researcher. In addition to abstract thinking, critical thinking, and organization of ideas, my research experience at MSUM provided numerous other benefits such as the ability to collaborate, write concisely, present publicly, convey results concisely, connect ideas, manage time, and ask effective questions. The experience was invaluable and definitely shaped the way I approach problems today.

Hagen: I would reiterate that the experience and exposure to presenting to audiences with different levels of knowledge was the biggest benefit I received. A close second is the ability to identify results that do not make sense. The research that I did as an undergraduate gave me a great foundation in presentation and analytical skills that have been a large part of my career path. All in all, this process gave me a great foundation in my problem-solving and communication skills.

Hansen: I believe the research experience reveals to students how they grew intellectually and personally as undergraduates. The career skills (organization, time management, focus, collaboration, critical thinking, problem solving, communication, etc.) required simultaneously within the undergraduate research setting can be further refined throughout one's life. Ultimately, the sense of accomplishment associated with completing an undergraduate research project, that seemed challenging or even impossible initially, offers a powerful platform for challenging oneself professionally and personally on an ongoing basis.

Flores: There is very little I can add to what Rachel, Derek, and T. J. have said.

Conclusions

The story of undergraduate research in the economics program at MSUM began partially in response to a mandate to assess our students; we thought that undergraduate research would provide a way to improve and assess economics majors' writing, oral, and quantitative skills as well as their ability to understand and apply economic theory. The undergraduate research program also began because we foresaw benefits as those described in the literature on undergraduate research. The focused emphasis on undergraduate research in the curriculum has resulted in richer assessment data and in the professional growth and development for economics alumni as chronicled in the dialogue.

MSU Moorhead alumni that participated in undergraduate research identify many of the same benefits as others have noted previously (DeLoach et al., 2011; Ingebretson et al., 2014; Mina et al., 2013). Former students highlighted the importance of several skills (creativity, ability to collaborate, problem solving, abstract thinking, critical thinking, communicating concisely in written form, presenting to alternative audiences, organization, etc.) to their success as undergraduates and career professionals. The National Association of Colleges and Employers (2016) defines "career readiness" by seven competencies: Critical Thinking/Problem Solving (demonstrate originality in one's ability to combine data and reasoning in analysis and decision making); Oral/Written



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Communication (convey thoughts and ideas with clarity to those internal and external to an organization); Teamwork/Collaboration (relate to diverse colleagues and customers in a collaborative environment); Information Technology Application (apply technology appropriately to solve problems); Leadership (motivate, organize, and prioritize goals to achieve them as an individual or team); Professionalism/Work Ethic (display integrity and respect for people and processes and learn from one's mistakes); and Career Management (identify opportunities for professional growth and align with a path for career advancement). MSUM faculty and student reflections affirm that the undergraduate research experience achieves "career readiness" as defined by NACE. Career placement and advancement of program alumni, using starting and mid-career salary data, may offer an opportunity to quantify this effect.

Alumni respondents also emphasized the value of being exposed to the peer review process as an undergraduate. This experience prepared them to be critical, yet constructive when evaluating their own output or that of their peers or employees in graduate and career settings. The intentional focus on audience and research contribution within the Introduction to Econometrics and Economics Seminar courses also proved important to program alumni beyond the classroom experience. The alumni respondents noted how the audience is a relevant consideration at all stages of the research process, including when conducting the research as well as when presenting the findings and anticipating audience questions.

The existing literature is heavily focused on returns to students in identifying and articulating the benefits of undergraduate research. However, do benefits extend beyond students? Are there benefits to faculty members or programs which focus on research within the undergraduate economics curriculum? Our experience since 2002 says, "Yes!"

First, as Oscar stated above, the freedom afforded students in the undergraduate research courses fosters unique topics of inquiry, many of which are underrepresented in mainstream economic journals and classroom textbooks. MSU Moorhead students pursue wide-ranging topics, some of which are either rarely explored in the discipline (Banksy artwork, medical tourism, NCAA sanctions, etc.) or controversial (religion, abortion, gambling, campaign finance, etc.). A list of student research topics is available at: <https://www.mnstate.edu/economic/studentresources/student-research.aspx>. Students' willingness to pursue interdisciplinary topics, despite the challenge, enhances the learning experience of each individual researcher and his/her academic peers. Faculty members mentoring this research are likewise afforded the opportunity to advance creatively and consider pursuing research interests which may differ considerably from their original graduate school focus.

Second, a discipline-specific learning community develops among economics students at MSUM as they complete the two research courses. Uniquely, this community of research scholars is not bound by the time students are present on campus physically. The common experience of past and present students of the program creates a bond which results in collegiality and networking opportunities for students in different academic cohorts who are aware of the implicit expectations and tangible outcomes of the undergraduate research experience. Since 2002 when we implemented the research requirement, attendance at economics alumni gatherings has grown continuously and we find that the shared research experience provides alumni from different years a bond and a topic of conversation as they learn about each other's papers. In turn, different cohorts are engaged in mentoring one another in career opportunities and professional networking, suggesting that the original learning community associated with undergraduate research is not bound by space or time.

Third, undergraduate research provides a tangible result that has aided the program in recruitment of majors, raised the standing of the program within the university, and advanced the program's

friend-raising and fundraising efforts. Undergraduate research has contributed to the recruitment of majors as it is a tangible way to support our claim of a student-centered education. Undergraduate research has increased the standing of the economics program within the university because faculty in other departments and administrators notice our majors' presentations at the university's SAC and their research publications featured in the campus news service, Dragon Digest. Moreover, many MSUM alumni who once traveled to local or national conferences to present undergraduate research contribute to the economics program's fundraising efforts in support of similar experiential opportunities for students on an ongoing basis. Some alumni, even those who graduated before research was a program requirement, see the benefits of undergraduate research and are willing to assist the program with donations for scholarships and travel; indeed, one such alumnus has funded the travel costs of students to present at the *IPE* sessions for the last eight years. Other alumni have supported the program with their time and expertise by collaborating with faculty on grants to secure software updates to advance the program's research goals in a data-driven society.

Fourth, undergraduate research has been the main vehicle for student assessment for the program. The rubrics used to evaluate research, writing, and presentation skills of students in ECON 370 and 498 are complementary to our program's efforts to assess students' understanding of economic theory. Assessment is an integral component of today's academic landscape, suggesting this benefit should not be overlooked.

The economics program at MSUM was an early adopter of undergraduate research. The students in this dialogue participated in research years ago and report important long-lasting benefits from their participation in research. Furthermore, we identify several benefits that go beyond the student and benefit the program as a whole. While undergraduate research may not be appropriate for all economics programs, we suggest that it should be given serious consideration as it does have great benefits for the students participating in it *and* for the program.

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