ENCOURAGING STUDENTS RESEARCH

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Abstract

Undergraduate education in research universities requires renewed emphasis on a point strongly made by John Dewey almost a century ago: “learning is based on discovery guided by mentoring rather than on the transmission of information. Inherent in inquiry-based learning is an element of reciprocity: faculty can learn from students as students are learning from faculty”. Doing research can be a valuable and enlightening experience for students. Many benefits can be derived from doing research. By engaging in research, students will learn to analyze problems, develop critical thinking skills, and think creatively. These are skills that will help them in life. The purpose of this paper is to explore what is undergraduate research and how student’s involvement in research can benefit students, faculty and university.

Key Words: Student Research, Learning experiences, Research project, Personal growth, Capacity for understanding.

INTRODUCTION

A subtle, powerful shift has been taking place over the past two decades as the emphasis in higher education has focused less on teaching and more on learning, less on what the teacher does and more on what the student does. A valuable, often overlooked component of a learner-centered institution is undergraduate research. Undergraduate research can provide one of the most compelling activities to help students learn about a subject in depth.

I have been involved in undergraduate student research since 1997. The research projects area are investigations of the society and social welfare, in particular, how to manage a social institution and effective delivery of services. I have been fortunate enough to have received funding for my works, and as a result, am able to employ student each year to
become Research Assistant. I strongly believe in the importance of undergraduate research for several reasons:

- It greatly enhances classroom learning because students can see how concepts can be applied to the real world.
- Its practice provides a path to independent thinking and intuition.
- Research experience is highly regarded by graduate programs or industrial institutions.
- At today's tuition rates, students deserve something more than coursework. Research is one way of giving them "something extra".

The ability to do research as an undergraduate is a wonderful opportunity that university can offer students, and they should make use of this opportunity. Undergraduate research activities are an essential and integral part of a good curriculum and are vital to a university’s success in preparing students for graduate studies and for an ever-changing marketplace. I believe that undergraduate research is the pedagogy for the 21st century. As an increasing body of evidence makes clear, inquiry-based learning, scholarship, and creative accomplishments can and do foster effective, high levels of student learning at a variety of public and private postsecondary locations, including doctoral and research institutions, comprehensive universities, and liberal arts colleges.

**UNDERGRADUATE RESEARCH**

Over the past 20 years there has been a tremendous growth in undergraduate research at all types of institutions from community colleges to research universities. What once was primarily an activity undertaken by faculty, has become an important pedagogy for teaching and engaging undergraduate students and revitalizing the curriculum. Government agencies and private foundations have recognized the important role of undergraduate research in helping to diversify the science pipeline, the humanities and creative arts are developing and implementing their own models of undergraduate research, and more and more curricular reform has included incorporating undergraduate research into the curriculum. As undergraduate research programs have grown exponentially, there have been many discussions about the definition of undergraduate research.

**What is Undergraduate Research?**

Undergraduate research is a student-faculty collaboration to examine, create, and share new knowledge or works in ways to commensurate with practices in the discipline (Hakim, 2000). Three critical elements of this definition of undergraduate research are:

- **Collaboration** - the work requires significant faculty-student interaction
- **New** - the work is partially or totally new, enriching the field of inquiry
• **Share** - the work is presented to peers, professionals, and/or other researchers in the field

As an academic endeavor, undergraduate research focuses primarily on student learning. As such, it complements and enhances the effectiveness of classroom learning. Current educational theory states that the traditional classroom is not the optimal setting for student learning. Barr and Tagg (1995) call for a shift from the prevailing instructional paradigm to a learning paradigm in which the primary mission of undergraduate education is no longer to provide and deliver instruction but to produce student learning.

Undergraduate research includes research, and scholarly and creative activities conducted by undergraduate students, in collaboration with mentors, for the purposes of examining, creating or sharing knowledge or works in ways consistent with practices within the discipline. Undergraduate research is oriented toward a student’s intellectual growth and development, and is as much about effective teaching and learning as it is about contribution to knowledge. Therefore, the role of the mentor is both that of chief researcher and lead teacher.

Undergraduate research requires an educational collaboration between students and faculty members. Research experiences may be initiated by students who seek out faculty supervision for their projects or by faculty members who involve undergraduate students in their research teams. Research can culminate in a written or oral presentation as a means of making the body of academic knowledge or creative exploration accessible to other investigators in the field, as well as to the general public. Research apprenticeships with faculty mentors give talented, motivated undergraduates a chance to see and take part in what is happening on the front lines of discovery at most universities today. Interested students can get their hands on the source of learning and explore the many challenging options they have for bringing learning to life.

As a conclusion ‘undergraduate research’ is an inquiry or investigation conducted by an undergraduate student that makes an original, intellectual, or creative contribution to the discipline/program they are studying. Their research contributes to an expansion of knowledge through inquiry, investigation or experimentation aimed at the discovery of facts, theories, or laws. It spans inquiry from isolating a specific gene to identifying themes of masculinity in dance choreography or to determining if older computer users are put off by fancy graphics.

**How to do research?**

Often students, scientists and young researchers who are new to the field of research face problems on how and where to begin with. Research is either difficult or not interesting because they do not know the true meaning of research. This problem is further compounded because important reviews on the subject are not freely available online. How does a student learn to do research? As teachers of students, we are faced with the task of transmitting our research skills. There are many ways to get involved in research.
and you will be able to find research opportunities in any field or discipline. The research process can be divided into three stages: the planning stage; the execution stage and peer-review.

The first thing to do is to decide what interests you:

- Make a list of your interests, even though they may not all fall within your major.
  Research web sites and visit some of the links
- Start looking for research opportunities.
- Attend department, college, and university research forums to get a sense of the scope of research that is happening at your university. Talk to students whose research interests you about how they became involved in the.

The second task is to identify a potential faculty adviser for your work:

- Take advantage of office hours and talk with professors who teach on topics that interest you. Visit their web pages and read some of the work they have published.
- When communicating with professors, it is imperative to be respectful and to be prepared. Keep your messages as concise as possible, and it may take more than one attempt to contact a busy faculty member. Also, you may be asked to provide a resume.
- If the faculty member you are approaching is not able to partner with you, ask for recommendations of labs or other faculty that might provide you with the opportunity to become involved.

Look for supervisors who have track record in supporting their students’ projects in a timely fashion with resulting publications.

Finally, it is important to recognize that research is not for everyone. If you like research then you could go on working on the project but if feel pressured then you are not inclined towards research.

**What Benefits and Experience/s Do I Get By Doing Research?**

The experiential learning approach is widely accepted as a means of enabling learners to apply theoretical framework with real-life experiences. This learning by doing research approach has emerged as the preferred pedagogy in higher learning institutions. According to Kolb (1984), learning is an unbroken, cyclical process grounded in experience. He describes the process of experiential learning as a four stage cycle involving concrete experience, reflective observation, abstract conceptualization and active experimentation. He believes that people learn from their experiences and that learning is enhanced through realistic experiences. Therefore, students who do research would benefit from being able to do hands-on research from an early career stage. Those students who have become committed to scientific research early in their programs study
are often able to perform and pursue their own research projects. Students who do research will usually present their findings in class or at conferences. This is another co-curricular activity that benefits students. By sharing research with a broader audience will provide students with feedback from attendees and they could develop better oral communication skills and also develop confidence through presentations.

Learning through involvement in research and creative work has many pay-offs. Some research students are able to travel to national and international meetings to present papers or posters. Many research endeavors involve work in teams that might include faculty members, graduate students, technical staff, postdoctoral fellows, or undergraduate students working on a project together. Therefore, when undergraduate students do research, they will have collaborative experience.

Research opportunities are also available largely through collaborative work with peer and faculty mentors. Working with faculty mentors enables the student to develop a professional relationship where the students will gain contacts to learn about other projects, meet peer with similar interest and other opportunities. The old saying: “Give me a fish and I eat today. Teach me how to fish and I will eat for a lifetime”, can be applied to research training in education. According to Barrows (Ryan, 1993), higher education is dedicated to giving students large quantities of fish, but little or no skill in fishing. This implies that transmission of knowledge does not mean that the learner will actually be able to do research. The lecture method, for example, promotes passive learning and it may be less effective than practical work for promoting and understanding research. So by learning how to do research and by examining issues and topics that are important to them and their communities, students can actually create a new knowledge. This rarely happens in the traditional curriculum. By teaching them the tools of research, we actually empower them to explore issues that matter to them and seek solutions.

Many students find that engagement in research provides a context and meaning to their academic program; course material makes more sense once a connection to the real world is recognized. Frequently, students find their grades rising. Students learn as much about their strengths and interests as they do about some new area of study, making future career choices easier. I know this personally. Had I not tasted research as an undergraduate I would have followed a different career path. Like me, student research experiences will expose them to faculty and others who can serve as valuable guides and counselors/mentors who will be in strong positions to write meaningful letters of recommendation to future employers.

Participation in undergraduate research benefits students educationally, professionally, and personally.

Educational benefits for students include:

- working closely with a faculty mentor
- learning about issues, methods, and leaders in students’ chosen field
- applying concepts learned in coursework to ‘real-life’ situation
• sharpening problems-solving skills
• learn to read primary literature

Professional benefits for students include:

• exploring and preparing for future careers
• developing marketable skills
• enhancing professional communication skills
• collaborating with others and working effectively as part of a team

Personal benefits for students include:

• growing as a analytical and independent thinker
• strengthens student’ critical thinking, writing, and speaking
• meeting challenges and demonstrating the ability to complete a project
• discovering personal interests and increases student interest in their disciplines
• developing internal standards of excellence

As for the faculty, undergraduate research may assist in the retention of talented students. It may also lead to these students having an interest and passion for research. This would assist them in their decision to go on to graduate school. By having undergraduate research in the curricula, the faculty: (i) can provides a mechanism to pursue research all year round; (ii) keep faculty members in closer touch with their fields; provides an environment to allow for greater funding possibilities and allow close collaboration with other faculty and students.

Will Research Help Me Get A Job/Into Graduate School?

Probably it can. There are many skills you are likely to improve as you work on a research project such as thinking independently; writing, working with others; creating new knowledge; synthesizing information and creating organizational skills. Employer looks for students who took advantage of a variety of learning opportunities and who demonstrated they were successful at them. As for entering graduate school, today student’s own undergraduate research project is a significant contributing factor to acceptance into and success in graduate school.

The process of conducting undergraduate research is not just research; it is also a pedagogical process that can (i) change the students’ peer group into one that values the world of ideas; (ii) increase faculty-students interaction outside the classroom, and (iii) promote student engagement and intellectual development by increasing hands-on. In conducting research students are transformed from passive to active learners, better organized and more independent, and they become more systematic. Their self discipline and self-confident grew as a result of research activities experiences.
INVOLVING UNDERGRADUATES IN THE RESEARCH PROCESS

Within the tertiary education system, research by universities plays an important role in training the professionals and scientists. In this context, many governments are making sure their top universities are operating at cutting edge of intellectual and scientific development. An institution with undergraduate research program does not only address the issues raised above but also provides additional positive outcomes for the learning institution. First of all, an undergraduate research program facilitates the creation of “powerful learning environments” in all disciplines by encouraging dynamic interaction between faculty mentors and undergraduate students. Secondly, the faculty mentors and students can make collaborative contributions to their field of study. Finally, through the acknowledgement and dissemination of the results of undergraduate research, the academic reputation of the institution is enhanced.

Much literature on undergraduate research activities has demonstrated its value as a learning experience, claiming a wide range of potential benefits from participation in research for students, their research supervisors, undergraduate institutions, funding agencies, employers, and society at large. In a study by Seymour (2004) to analyze the benefits of undergraduate research, she found that undergraduate research experiences increased students’ confidence in three areas:

- Their ability to do research;
- Their professional self-image; and
- Their skill in presenting and defending research.

In addition it provided a venue for establishing a mentoring relationship with faculty. Students involved in research have the opportunity to develop skill beyond those usually learned in the classroom. They can refine their cognitive and interpersonal skills, enhance their personal growth, and incorporate management habits. In today world, experience is a necessity for university students. Employers and graduate programs seek candidates who have demonstrated skills and experiences.

In summary, there are numerous reasons for students to seek experiences in doing a research. Students gain a strong level of knowledge and professional level experience when they work as a research assistant, collaborating with experts in field directly relevant to their studies. They also gain great networking opportunity as the research experts are connected to the key people and key organizations related to careers that students pursue.

CREATIVE OUTLET FOR STUDENT RESEARCH

Publication is a key aspect of research. It concern letting other people learn about your research endeavors, finding and ideas. In addition, there are obvious benefits to publication that relate to strategic issues such as research finding or promotion, gaining more research funding, building a research profile, and so on. In today’s multimedia
culture, methods of publicizing research are diverse, ranging from traditional outlets such as an article in a learned journal, or a research monograph, to popular media such as newspaper, radio and television, to more recent invention such as the internet. It can also take visual or oral, such as a poster or presentation. Given that there is a range of media through which research can potentially be published, student research will not face any problem to publish or present their research.

For postgraduates, the journals chosen for submission need not necessarily be the most important in a field. They might choose a departmental or society based journals. The main aim is to demonstrate potential and build confidence. Similarly when choosing conferences they can start with postgraduate only conferences, smaller regional and specialist conferences or postgraduate session at major conferences.

At present there are not many opportunities for undergraduates to publish their research. This is unfortunate since web publishing is now very inexpensive. To overcome this problem, the university could establish a student edited in-house journal. By promoting students journal, students will do better work when there is a good chance that their work is appreciated and acknowledge by a wider audience. In-house undergraduates journal are also a great tool for maintaining alumni relations. The journal can feature news on co-curricular activity, notes about alumni achievement, stories and interview about faculty members. All graduates then can received a copy of the journal in the mail/email and the journal can keep graduates connected with their departments. Student research journal can provide an incentive for students to improve writing and research skills since they are now writing to a broader audience. It also encourages alumni to stay in touch with the department and to interact with current students.

Published students article can be used in the classroom assignments as sample of quality undergraduate research. Students would enjoy reading the article because it is being produced by peers and it is written in proficiency that is understandable to undergraduates. Also, student authored articles often deal with issues that are of interest to other students (Carlson et. al, 1998).

CONCLUSION

In conclusion, there are a variety of research opportunities for students. Faculty should keep an open line of communication with their students and offering them assistance. Universities can offer unique advantages for their undergraduate students by having supervisors who are scholars, vitally interested in their areas of expertise. These supervisors often are top in their field, enabling them to inform students of the latest discoveries. It should be noted that undergraduate research is not a new phenomenon. It has been traditional within many disciplines for students to complete some final year research project. Initiating, designing and completing an individual research should be viewed as first opportunity for students to gain initial research experience. Projects of this nature could also provide a basis on which postgraduate work could be grounded (Conway, 1988).
REFERENCES


