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ABSTRACT

Scholarly publication of original work at community colleges is usually an elective pursuit, resulting more from a desire to learn than institutional requirements or financial incentives. At the College of DuPage, in Illinois, one faculty member has undertaken a 10-year, self-initiated research project in the biological sciences, involving students in most areas of the research, including publication. The research has focused on the dynamics of ecosystems, while funding sources have included area conservation foundations and businesses. Participating students must be science majors with a minimum background of 1 year of college-level science-based curriculum. They must also be dependable, of high integrity, patient, and tolerant of adverse working conditions. Motivations for students participating include adding to their resumes, developing interests, and enjoying an alternative learning experience. In addition, every effort is made to see that research is published. For the faculty member, each project requires 200-300 hours of donated time towards experimentation, data analyses, writing, and literature review. Faculty members interested in initiating their own research projects should schedule time for reading and exploration of potential study sites, conduct projects that can be done within the time allowances and with available resources, select reliable student participants, and write for publication. (HAA)

Publish or Perish in the Community College

By

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PUBLISH OR PERISH IN THE COMMUNITY COLLEGE

Chris E. Petersen

Abstract: Whereas the need for scholarly publication of original work is characteristic of the job description at the baccalaureate granting institution, it usually is an elective pursuit at the community college. This paper describes a 10-year, self-initiated research effort in the biological sciences at College of DuPage, Illinois. Topics of study have included plant-insect interactions and stream ecology. Interest, staff and program development, as well as offering unique experiences to student participants in the conventional classroom setting are the objectives for performing the research. Problems faced at the community college have included the ability to expand the program and have it serve as part of the faculty work assignment, biased competition with four-year institutions for grant funding, laboratory space which is reserved for regular curriculum, limited availability of reference materials in the library, and time constraints of the community service. Despite these difficulties, the research program has been successfully meeting objectives. Advice on how to get started with a research program is provided. Foremost is choosing a project that is small enough to be successfully done under the constraints of time and ability. Research at the community college level may be in essence, one of the most pure forms of human endeavor as the elective pursuit is lacking mandate. The researcher has the freedom to ponder and explore ideas, thus nurturing the enthusiasm to learn and restoring creative thought.

Scholarly publication of original work is part of the job description at a baccalaureate granting institution. Contrarily, at the community college it is usually an elective pursuit, perhaps done to satisfy staff development requirements, but having little financial gain. The objective of this paper is to describe a 10-year, self-initiated research effort in the biological sciences at College of DuPage, a community college located in Northeastern Illinois. Students have participating in most areas of the research, including publication.

The ultimate reason for performing the research is a desire to learn. I enjoy discovery and contributing to science. Alternative reasons include keeping current as research requires extensive literature review, adding another dimension to the biology program at the college, staff development and providing students with unique experiences (experimentation, writing, and publication)(Deutch, 1994; Seago, 1994).

Over 34,000 students are enrolled at College of DuPage which serves suburban

residents in the Chicago metropolitan area. Most students majoring in the biological sciences are pursing careers in the health care field. Students come from varying educational backgrounds with most continuing schooling from high school, but also returning students pursuing alternative interests or updating academic resumes.

Examples of studies and support for the research

As a graduate student, I specialized in modeling the dynamics of relatively undisturbed ecosystems. When I first arrived at College of DuPage, I was unsure of how I could continue with this type of research in a highly residential county (DuPage County) which had a population of 700,000. Immediate concerns were locating study sites and time available in view of a busy teaching load and demands of a family life. I recognized that my study sites would have to be in close proximity to the school. I spent the first year exploring local nature preserves and thinking about the types of studies I could do based on equipment available. I delved into the literature, especially periodical articles dealing, in some way, with anthropogenic disturbance and reconstructed communities. As the years passed, my work load has only become increasingly exhaustive and my teenage children more time consuming. Hence, I continue to center my research in the local area. Time constraints limit the scope of my projects and, thus, the ability to gain funding. Grant support also has been restricted to local sources having a common interest in my findings or willing to aid original student research projects. Funding sources have included the Forest Preserve of DuPage County, Conservation Foundation of DuPage County, and Abbott Laboratories.

Published research done with students have concentrated on plant-insect interactions in reconstructed tall-grass prairie, biodiversity studies, and water quality analyses (e.g., Petersen and Hinkle, 1991; Petersen and Brogan, 1992; Petersen et al., 1992; Petersen and Sloboda, 1994). Prairie studies have been located within nearby Morton Arboretum and plots maintained on the college's campus. The West Branch of the DuPage River has been the primary stream for biodiversity monitoring and water quality analyses much to the liking of the local

forest preserve district and private conservation groups which are interested in cleaning up the stream. At the onset, the objectives of a study are clear and straight forwarded, although objectives are not necessarily concrete and may change with the study. The experiments are well planned, thus helping students to understand the projects, and enabling me to budget my time. Consideration and measurement of additional experimental factors beyond original objectives are done as a form of a safety net to best insure something is to be achieved from the research. Methodology has been organized, including the assigning of jobs to each student. I have students independently analyze the data before we convene to discuss observations in an effort to encourage critical thinking.

Choosing students for participation in research

Students who I ask to participate in the research program are science majors with a minimum background of one-year of college-level science-based curriculum. Participants need to be dependable, of high integrity, patient, and tolerant of adverse working conditions (e.g., dirt, cold, heat, and mosquitoes). Common sense, independence, and confidence are also essential personality traits as the students are frequently left alone to work on particular aspects of a project. I have taught most of the participants in various courses. Thorough training is provided prior to sending students out to the field.

Reasons why students want to participate include adding to the resume, developing interests and enjoying an alternative learning experience. The former reason is that which I urge students to consider. I do my best to see that participation is just not for experience, but also for resume building. Every effort is taken to see that the research is published.

Contributions of the faculty researcher

Each project requires 200-300 hours of donated time towards experimentation, data analyses, writing and literature review. I am involved in most aspects of the research (design, experimentation, analyses, and writing). Community college students tend to move on and the faculty member is left to finish projects. Those student participants who remain another year

are consumed with course work. However, I still subject these students to editing the numerous drafts of the paper prior to attaining the final copy. Thus, these students can see the "evolution" of a scientific paper from the data to publishing.

Student evaluations of the experiences

Experiences have developed interests and expanded knowledge in prairie ecology, plant-insect interactions, stream ecology, pollution, insect taxonomy, experimental design, data analyses (including statistics), literature research, writing for publication and the publication process. Three-quarters of the students have now earned BS degrees and half MS degrees. The remainder are continuing with undergraduate programs.

Problems faced with researching at a community college

Expansion of student involvement in the research program is improbable. In our department, only two more full-time faculty have been added over the past 14 years despite an increase in enrollment of 14,000 students. I have been unable to include the research as part of my faculty assignment as emphasis for full-time faculty assignments, including overloads, are the first-year and prerequisite courses which draw the vast majority of students. In addition, declines in state support and local tax caps necessitate improving cost efficiencies in other ways.

It is very difficult to receive funding and time consuming to write grants. Competition for available funds is especially steep with four-year institutions. Time to write grants must be budgeted in respect to the required duties of the community college professor, i.e., teaching, advising, writing letters of recommendation and contributing to college function through committee work. Even if more equipment could be purchased, storage space is limited in laboratories. Laboratory space is reserved for learning activities in the conventional setting. Periodicals required for literature review at a professional level are lacking in the library as research is not the focus of the community college. Hence, time needs to be spent visiting more substantial libraries, hunting through abstracts and requests via interlibrary loan. Finally, lags

in creativity of new research efforts have occurred due primarily to the exhausting pace of trying to handle work, the research, and other time constraints. I am alone in providing new ideas to pursue in research that can be done with the limited resources at the level of the community college.

Rewards to the faculty member

The research has provided a sense of contributing to science. My experiences have most definitely helped in terms of professional development. I have a good understanding of the analytical and writing skills required to publish a scientific paper. As I am forced to keep current by the research, my knowledge of statistics and biology have grown beyond that which I would have otherwise gained if I did not research. I better understand the abilities of students at an early stage of their college careers in the biological sciences, and very much enjoy helping to develop interests, skills, as well as resumes. Overall, the research has been a rewarding way to meet staff requirement hours.

Evaluation of the research program

Achieving funding will continue to be difficult and the research program is unlikely to grow as few students can be involved at any one time. The creativity of making due with available equipment and supplies will continue to be required. However, based on satisfying the reasons for performing the research, the program has been successful. The research has provided students and myself alternative learning experiences. I would like to believe that the academic success of former student has in some way been aided by their participation in the past. Methodology employed in research has been reworked as part of new and original laboratory exercises.

How to get started

1. Schedule time for reading and exploration of potential study sites.

Become acquainted with libraries of baccalaureate institutions to explore what they

contain in terms of potentially strategic literature. I travel to a local college to consult the Biological Abstracts in efforts to keep current with periodical publications. I find the Biological Abstracts more useful than computer searches of topics or computer services that provide abstract listings although I also take advantage of the latter resources. The Biological Abstracts are very comprehensive concerning coverage of periodical publications and associated topics are easily explored. Information needed to request reprints of articles from authors is provided.

2. Think "small" in terms of a project that can be done within the time allowances and resources available.

Smaller projects are more easily handled with the time allowances and resources available to the typical community college professor. Explore sources of funding, but try not to be entirely dependent on funding to conduct the research as you may never get the research project off the ground (Hence the value of smaller projects).

Choose journals of which to publish papers carefully. Local or state journals are commonly good choices to publish papers as these journal tend to be more receptive to smaller scale studies. Consider subscribing and joining the societies that publish journals of interest. Publication charges are reduced for society members. Ask colleagues who you believe are tough reviewers to examine a paper prior to submission to the editor. Look at rejections as learning experiences.

3. Organize the study and select student participant who you feel can contribute.

I limit the time demands of the research to what I can manage as a solitary researcher. Student participants may offer to reduce some demands of the projects, but add to the work as they require training and guidance. Though enthusiastic, students are inexperienced and lack the knowledge base at this stage of their college careers. I choose students dependent on their potential to contribute and not necessarily according to their grade point average.

4. Conduct the study and extensive searches of the literature for related papers.

Again, literature resources are not readily available at the community college level.

Knowing where to locate these resources facilitates literature investigations.

5. Write for publication and be open to oral presentations of your work as these can lead to contacts useful for future research projects.

The writing skills required for publication only come with practice. Take criticism as a learning experience. Oral presentations have offered to open doors of communication to fellow research colleagues and potential funding agencies. I try to take advantage of the opportunities that seem to have fallen in my lap unexpectedly. The number of contacts seem to have been proportional to the number of opportunities that I have come across.

Research at the community college level may be in essence one of the most pure forms of human endeavor. The research is an elective pursuit lacking mandate other than at times meeting staff development requirements. Hence, I have the freedom to ponder and explore ideas through my research efforts. This nurtures my enthusiasm to learn and to encourage others to learn with me.

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