Miss Jiabin Zhu, Purdue University, West Lafayette

Jiabin Zhu is a Ph.D. student in the School of Engineering Education at Purdue University. She obtained a B.S. in physics from East China Normal University, a M.S. in optics from Chinese Academy of Sciences (CAS), and a second M.S. in biomedical engineering from Purdue University. Her primary research interests relate to the cognitive development of engineering graduate students, global engineering, professional development, and mentoring of engineering graduate students. She is a student member of American Society for Engineering Education (ASEE).

Ms. Cyndi Lynch, Purdue University, West Lafayette

Dr. Monica Farmer Cox, Purdue University, West Lafayette
Facilitating Graduate Students’ Professional Development: 
Implementation and Evaluation of Learning Activities

Abstract

Doctoral education is criticized for its lack of preparation of doctoral students for careers outside of academia. Multiple stakeholders including researchers, educators, administrators, and industry leaders have pointed out the necessity to offer systematic training and professional development opportunities to doctoral students to prepare them for a broader range of academic as well as nonacademic career opportunities. In this context, “Preparing Future Professionals”, a graduate-level course, was designed and implemented to facilitate the development of graduate students in their skills, roles, and responsibilities as global citizens and future professionals in business and corporate environment. In the process of facilitating graduate students’ professional skills and attributes, the research team developed interactive learning activities that centered on the theme of helping the transition of graduate students’ roles to future professionals in businesses and industry. These learning activities cover a variety of critical aspects in the transition to business and industry, such as skills and competencies, career management, organization types and cultures, roles and responsibilities, and balancing career and personal life. These interactive learning activities include, Cultivating Your Professional Identity; CARS (Context, Action, Result, Skills) Impact Statements; Creating a Networking Map; Job Description Analysis; Developing Job Search Strategies; Self-Assessment; Institutional Profile; Individual Development Plan and Career Strategic Plan. The implementation of these activities aims at addressing the different aspects of graduate students’ professional development. These activities have been piloted among 34 graduate students. This paper provides an overview of the design and implementation of these learning activities and the analysis of students’ deliverables in the evaluation of students’ learning outcomes.

Project Significance

The global challenges facing society are more complex than ever and require a highly educated and skilled workforce. Society’s ability to address these global challenges requires the technical knowledge of scientists and engineers with master’s or doctoral degrees. These global challenges will not be addressed solely by Ph.D.s in the academy but also by Ph.D.s in business, government, and non-profit organizations. Over the past decade, doctoral education has received national attention with the discussion focusing on criticisms and reform efforts. One of the criticisms argues that there is a lack of focus on career preparation, specifically that doctoral education does not prepare students for nonacademic careers in business, government, or non-profit organizations.

The literature on career preparation of doctoral students is sparse. The research conducted focuses on doctoral student career preparation for faculty careers with minimal focus on the skills and competencies needed for careers in business, government and industry. The majority of STEM doctoral students transition to careers outside the academy and should be able to function effectively across disciplines. Doctoral students are criticized for their inability to communicate the importance and impact of their research. The National Academy of Sciences, in Reshaping the Graduate Education of Scientists and Engineers,
identified several issues with doctoral education and the career preparation of graduate students, particularly doctoral students, including the lack of exposure to the diversity of careers, beyond the academy, in business, government, and non-profit sectors. Recommendations included increasing the exposure to the diversity of careers along with the skills and competencies required in these employment sectors. This could be accomplished through interactions with alumni and other industrial leaders with advanced degrees.

Austin (2010, p. 101) recommends that the career preparation process be implemented in a “systematic, developmental way” in order that doctoral students receive “developmentally progressive learning opportunities” (2010, p. 102).

A professional development course was developed and implemented to address the issues of career preparation, including a systematic and developmental approach, with a focus on the skills and competencies needed for the diversity of careers in business, government, and non-profit organizations. Preparing Future Professionals (PFP) is a two-credit hour, pass/no pass course that posts to the transcript but cannot be used to fulfill the plan of study requirements. PFP facilitates doctoral student transition to careers in business, government, and non-profit organizations weekly mentoring sessions with industry leaders, and university faculty and administrators. Learning activities were designed to guide and prompt (1) student self-reflection on their roles and responsibilities as global citizens (2) identification of strategies for skill development and enhancement and (3) strategic career planning. These activities have been piloted among 34 graduate students. This paper provides an overview of these learning activities and a preliminary analysis of students’ deliverables in to assess students’ learning outcomes.

Methods

These learning activities developed by the research team cover a variety of critical aspects in the transition to business and industry as informed from the literature. A framework, developed and implemented to guide students and industrial speakers, focused on research and technical competencies, (2) leadership, management, and organizations, (3) interpersonal, communication, and professional skills, (4) career management and advancement, and (5) career and life balance. These interactive learning activities include,

- Cultivating Your Professional Identity;
- CARS (Context, Action, Result, Skills) Impact Statements
- Creating a Networking Map;
- Job Description Analysis;
- Developing Job Search Strategies;
- Self-Assessment;
- Institutional Profile;
- Individual Development Plan;
- Career Strategic Plan.

These activities have been piloted among 34 graduate students. These graduate students were advanced students pursuing masters’ or Ph.D. degrees, representing different academic
disciplines, including engineering, science, liberal arts, education, etc. All of the learning activities were introduced within the first five weeks of the semester.

Sample Learning Activity--Cultivating Your Professional Identity
Here, the research team uses the learning activity—Cultivating Your Professional Identity, to demonstrate the process of implementation of designed learning activities. The activity sheet used for Cultivating Your Professional Identity learning activity is shown in Figure 1. The activity was the first activity introduced in PFP. The instructor stated that the reflective process about the students’ own professional identity was one of the most essential tasks in their professional development. It directly addresses the “tell me about yourself” or “why should I hire you” type of questions. In this activity, the students take 3-5 minutes to reflect on three to five or more points that they would like their audiences to remember about them after their interaction. The audiences can be interviewers, potential employers at a career fair, or professionals with whom they network in venues like conferences. After the reflection, the students paired with another student and shared their skills, then came together for a large group discussion. Students shared among the class skills or abilities that they would like their audiences to remember about themselves.

Figure 1. Cultivating Your Professional Identity learning activity worksheet

Some of the activities were used as in-class activities. Some of them were introduced in the class session and made available to students online for the students. Students selected three learning activities that were most useful to them and submitted at the end of the semester. We also encouraged students to design activities that are useful for their professional development and submit those activities for review of the instructor team. We made the worksheets of Cultivating Your Professional Identity mandatory for submission at the end of our semester in order to understand their current status of professional identity.


**Preliminary Results**

From the distribution of submission of learning activities worksheets (Table 1), several learning activities were identified as more useful for students’ professional development than others based on students’ responses in utilizing the learning activities. The *Cultivating Your Professional Identity* activity was required of all students (6 out of 34 students missed this activity), therefore, the number of counts presented here does not reflect the active choice of our students. Among the rest of the learning activities, the *CARS (Context, Action, Result, Skills) Impact Statements* and the *Job Description Analysis* have higher counts than other learning activities.

<table>
<thead>
<tr>
<th>Learning Activity</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cultivating Your Professional Identity</em></td>
<td>28</td>
</tr>
<tr>
<td><em>CARS (Context, Action, Result, Skills) Impact Statements</em></td>
<td>12</td>
</tr>
<tr>
<td><em>Creating a Networking Map</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Job Description Analysis</em></td>
<td>17</td>
</tr>
<tr>
<td><em>Developing Job Search Strategies</em></td>
<td>6</td>
</tr>
<tr>
<td><em>Self-Assessment</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Institutional Profile</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Individual Development Plan</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Career Strategic Plan</em></td>
<td>2</td>
</tr>
<tr>
<td><em>Other</em></td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1 Distribution of Submission of Learning Activities Worksheets. “Other” refers to the learning activities students designed themselves.

*CARS (Context, Action, Result, Skills) Impact Statements* is an activity in which we asked the students to think about the work experiences they had before. Instead of listing duties, we use the CARS (*Context, Action, Result, Skills*) format to help them thinking about the impact of certain tasks that they were involved.

*Job description Analysis* is an activity where a worksheet was used (as shown in Figure 2). The students were asked to find a certain job post that they were interested in. The worksheet serves as a guide for them to structure their thinking. Finally, they were asked, “How does the job suit me?” and “How do I suit the job?” This allows them to understand how well the student’s qualification match the job requirements match and whether the potential job position will allow students to fully display skills and talents.
Based on the distribution of learning activities submissions, students seemed to be using the above-mentioned two learning activities and other job searching or networking related learning activities more than the ones that are related more to their long-term development, such as, *Career Strategic Plan, Individual Development Plan*. This finding raised a possible concern, that is, the students seemed to be more concerned about finding a job rather than laying out their long-term development. If this holds true, this will potentially hinder their long-term career management and career advancement.

**Conclusion and Next Steps**

Based on our preliminary effort of assessment, we identified the most used learning activities by our students. This finding raised a potential concern about students’ focus in job searching process. In next steps, the research team will focus on the analysis of these worksheets. Artifact analysis methods in qualitative research will be used. Analyses from worksheets, such as *Cultivating Your Professional Identity* will potentially provide further understanding about students’ current understanding about their own professional development. This understanding can be further enhanced with a larger number of data set from graduate students. Meanwhile, to facilitate students’ professional development, the research team will apply these learning activities to a larger student population.
Bibliography