

Integrating Professional Abilities and Interaction with Employers in an Outcomes Assessment Plan: An Example from Professional Science Master's Programs

Introduction

Because the majority of graduates with master's and doctoral degrees become professionals in non-academic positions, there is increased demand by students and employers to integrate appropriate professional skills and employer interaction in graduate education. Professional Science Master's (PSM) programs are a case in point. They prepare students to enter industry, non-profit, and government careers by including in their curricula both scientific and pre-professional education, the latter stressing the development of management skills and professional qualities that lead to success in careers outside the university. In this way PSMs are leading the way in integrating professional skills into their curricula and establishing educational alliances with employers. Following close behind are professional doctoral degrees, graduate certificates in professional skills, and Professional Master of Arts programs.

A major challenge in the development of such programs is how to assess professional skills and the benefits of interaction with employers. Such assessment is critical for program success because directors of programs must be able to track their effectiveness in order to improve them and to demonstrate accountability to stakeholders. In addition, accreditation agencies are demanding compliance with outcomes assessment of academic programs.

An Outcomes Assessment Plan

As a way of addressing the challenge of assessing professional skills and employer interaction in graduate programs, we have developed an assessment plan for PSMs that could also be used as a guide for other kinds of programs with a pre-professional focus—and those that do not offer one now but would be interested in doing so. The plan consists of assessment of three objectives, i.e., broad goals that the program seeks to attain, and for each objective a set of outcomes or operational definitions of the objective, indicators that allow a director to monitor how well the program enables students to meet the objectives. These outcomes make explicit what is important for the program's stakeholders, showing students, their parents, potential employers, and others what they can expect of the program. The assessment plan also includes data to be collected for evaluating each outcome, the source of the data, and frequency of collection.

We have not included in this plan outcomes specific to a program's scientific field of study; these should be generated by people in the program. In addition, management skills and professional qualities may also vary among programs. Thus, the plan can be used as a template to be tailored according to an individual program's projected career trajectories. The plan described below can be found in its entirety at www.ncsu.edu/grad/psm/assessment.html.

Program Objective #1

To develop in students the scientific knowledge, managerial skills, and professional qualities necessary to excel in employment in their fields, students should be able to:

1. Meet employers' needs for scientific knowledge in the specific field.
2. Meet employers' needs for managerial skills by:
 - a. applying basic accounting and finance concepts and tools
 - b. effectively managing projects and people
 - c. analyzing markets and displaying knowledge about development and marketing of products
3. Meet employers' needs for professional qualities that lead to success by:
 - a. valuing employer goals and working to improve their own performance toward these goals
 - b. working productively on teams both as leaders and members
 - c. applying certain traits toward achieving employer's goals such as discipline, flexibility, innovative thinking
 - d. speaking and writing effectively in employment settings
 - e. making a constructive contribution to an employer through their interpersonal skills, positive attitude, conflict management abilities, strong ethics, effective mentorship, knowledge of their own personality, ability to make a favorable impression and engender trust, and a sensitivity to and a value of cultural difference
 - f. explaining and honoring the legalities of knowledge production, including intellectual property, confidentiality, invention disclosure, and field-specific rules and regulations
 - g. managing their own careers effectively

Data to be collected: Assessment of scientific knowledge depends on the outcomes defined by individual programs. To assess managerial skills, the program director, teaching faculty, students, and internship directors may collect student and project evaluations at the end of a project or term or at the end of an internship. To assess professional qualities, program directors, internship directors, and students may use the Employment Readiness Survey.*

Program Objective #2

To strengthen employment-related problem-solving abilities of students, students should be able to:

1. Define a problem in a way that provides a direction toward its solution, describing the present state or what is given, describing the goal state, and identifying the critical differences between the two.

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2. Establish the criteria for an optimal solution to the problem.
3. Produce a variety of possible solutions to the problem.
4. Determine which of the possible solutions is the optimal by evaluating all the possible solutions against the criteria.

5. Make a convincing case for the chosen solution to the problem.

Data to be collected: To assess problem-solving experiences (e.g., internships, projects, case studies), program directors or internship directors may use a problem-solving rubric.**

Program Objective #3

To improve the quality and economic impact of the program, it will:

1. Develop, expand, and strengthen employer alliances and use those alliances to generate student activities.

Data to be collected: These include the number and type of active alliances (instructors, mentors, internship providers, advisory board members, sponsors, research collaborators, etc.), the type and number of student activities (internship, case study, research collaboration, etc.), and the number of faculty and alumni involved in creating alliances. The data should be collected annually by the program director.

2. Provide economic impact for employers who participate in student projects. Employers and internship directors are well suited to provide information about the economic impact*** for their organizations.

Data to be collected: These include student hours, number of projects, dollar value of contributions, and number of projects and internships leading to job offers. The data should be collected within 0–6 months post-project.

3. Provide economic impact for universities that house program(s).

Data to be collected: These include fellowships, grants, collaborative research projects with employers, and access to new technology and knowhow.

4. Increase the number and quality of students in the program and increase the number of students who graduate in a timely manner.

Data to be collected: These include annual changes in the number of applications, enrolled students, graduates, time-to-degree completion, and the GPAs at graduation.

5. Place graduates in appropriate positions in the field or further education.

Data to be collected: These include the number of graduates employed within 0–6 months, the number of graduates employed after 6 months; the types of positions the new employees hold (local, regional, national, international); level of employment; relation to the PSM career path; and the

number of graduates seeking additional graduate education and their fields of study.

6. Meet employers' needs for an improved workforce.

Data to be collected: These include a survey of workforce skills needed and the performance of graduates after one year's employment.

Applications of Assessment Plan and Data

An outcomes assessment plan is a tool that allows stakeholders of a program to determine how effective the program is in enabling students to meet expected outcomes and then to make evidence-based decisions for improving the program. Assessment plans may be useful also for helping employers and internship directors understand their roles in a program. In addition to providing a foundation for assessment, program outcomes can be used as a basis for creating or revising a program so that it provides learning experiences necessary for students to achieve the outcomes. The plan we describe here emphasizes professional abilities and interactions with employers as a goal of a graduate program. As such, graduate deans may find the plan useful as a template when encouraging new or existing programs to include this emphasis in their curricula. Faculty may have difficulty in imagining how professional abilities could be included in a program much less assessed. The plan we provide here may guide faculty in doing both.

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*A rubric to score the level of employment readiness can be found in Lisbeth Borbye, *Out of the Comfort Zone: New Ways to Teach, Learn, and Assess Essential Professional Skills*, Morgan and Claypool Publishers, 2010. A description of this resource is found at www.ncsu.edu/grad/psm/teaching-tools.html. Students can use the rubric as a self assessment tool and directors can use the rubric to assess student learning or develop new assessment tools.

**A problem-solving rubric is included in the online assessment plan at www.ncsu.edu/grad/psm/assessment.html.

*** An Economic Impact Analysis instrument is in progress.