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Students as Researchers: A Framework for Using Action Research Principles to Improve Instruction

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Many instructors teach courses that prepare students to do research individually or in teams. These instructors also supervise their students' research projects. Continuous and systematic use of action research principles can help instructors prepare for problems that may develop when students encounter unfamiliar issues at research sites due to their lack of knowledge or to their own assumptions about the sites. Students may also encounter unanticipated difficulties in team collaborations. Action research principles include planning how and what to teach, implementing activities, observing them, reflecting on their efficacy, and then making changes in instructional practices.

While much thought is given to the contents, meaning, and philosophy of a specific course, considerably less effort may be expended to evaluate instruction and student learning during and after a course ends. This severely limits the scope of changes that can be made while the class is in progress and when planning for the next iteration of the course. It also does not help students to use methods to assess their own learning. This paper looks at how an instructor can use action research principles to systematically assess student learning in a graduate course in which students (all educators) collaborate in teams on action research studies at schools or colleges. Action research, according to McNiff and Whitehead (2006), "is a form of inquiry that enables practitioners everywhere to investigate and evaluate their work" (p. 7). It is based on a spiral of action that involves planning, acting, observing, and reflecting (Costello, 2003). The instructor plans an assessment, uses the assessment, observes (i.e., assesses the efficacy of the assessment), and reflects on changes that may be needed. Formative and summative evaluations form a continuous process that gives the instructor feedback to change the course while it is being taught and in the future. Evaluations can also provide data for students about their own thoughts, beliefs, and actions relating to coursework and to their own practice.

Between 2001 and 2006, the writer observed a variety of conflicts and problems within student collaborations and between teams and their research sites. Some issues were related to students' tightly held assumptions about sites and how to do research. Others related to the nature of the team collaborations, including processes for making decisions and resolving conflicts. To resolve these issues, the instructor needed data to understand the nature of these issues and how to help students confront and resolve them. Over the years, the instructor learned several hard lessons. It was ineffective to try to solve these issues through class or team/instructor conversations using incomplete information. It sometimes produced unintended and negative outcomes. Reflections and other types of formative assessments proved to be a good tool for doing this.

This paper proposes that continuous evaluation processes are critical to an instructor's success in a course that seeks to help educators become reflective practitioners and researchers. Many instructors in undergraduate and graduate courses do more than teach about specific topics; they also supervise their students' research. In doing this, they influence the external and internal processes that govern students' research behaviors. This calls for a different type of pedagogy. Reason and Marshall (2001) recommended process-oriented supervision for working with researchers in graduate courses. The instructor/supervisor assists students to explore themes relating to the students' own lives and to their research, and to fully engage in a personal process of inquiry. McKernan (1994) suggested that university instructors can act as second-order researchers with students to facilitate a continuous dialogue about research questions and methods.

This article outlines evaluation processes that were planned, implemented, evaluated, and modified in a two-quarter, university-based action research course that the writer taught five times between 2001 and 2006. Instructor-created evaluations, including reflections, assessed the effectiveness of reading materials, activities and assignments, mini lectures, and class discussions. Students also evaluated the efficacy of each team's collaboration, their use of research methods, their understanding and ability to deal with ethical issues in research, and the understanding of action research. In addition, assessments focused on one of the course's primary objectives: gauging the student's commitment to initiating change in his or her own workplace through a collaborative action research process.

Background

Assessment has become an important topic in higher education. Ewell (2002) dated the emergence of the assessment movement in higher education to 1985. At that time, the National Institute of Education and the American Association of Higher Education held the first national conference on assessment in higher education. The assessment movement and the scholarship of teaching have come together as the scholarship of assessment (Angelo, 2002). In 1993, Angelo and Cross published a handbook on college classroom assessment techniques. Yet, many instructors depend solely on tests for formative evaluations and on university or department course evaluations for summative evaluations.

This paper aligns in-class formative and summative assessments to action research principles. Specifically, the purpose of formative evaluation is to identify weakness in instructional materials and methods while a course is underway. Formative evaluations provide information about implementation and achievement of goals to use to modify current elements such as staffing, activities, and materials. In contrast, "The goal of summative evaluation is to collect and to present information needed for summary statements and judgments about the program and its value" (Herman, Morris, & Fitz-Gibbon, 1987, p. 16). Summative evaluations gauge the outcome and impact of a project. They can provide data for students about their own thoughts, beliefs, and actions. Both formative and summative evaluations can advance a course's objectives and can improve the instructor's ability to influence what students learn.

A reflection can be used as a summative or as a formative assessment; according to Chiu (2006), it has a variety of meanings. He cited John Dewey as the initial source for a definition: "An active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (Dewey, 1933, p. 118). Innovative university instructors, in Cowan's (1998) words, create a "constructive occasion for 'reflection-for-action'" (p. 49). These teachers structure a learning activity that involves stages of a learning cycle. In an action research cycle, as described by Carr and Kemmis (1986), there is an analysis of the problem, a planned intervention, an evaluation of the innovation, and a reflection on the outcomes of the intervention. The process is then repeated. For Kolb (1984), the four learning cycles are concrete experience (doing), reflective observation, abstract conceptualization (learning from the experience), and active experimentation (trying out what was learned).

Reflection is a form of assessment in a variety of courses – but more so in graduate programs aimed at practitioners or those preparing to be practitioners. Using cycles of reflection can increase the meaningfulness of the students' research experiences regardless of the type of course. According to Marshall (2001), "self-reflective practice is a necessary core of all inquiry" (p. 433). She depicted deliberate and extensive "self-tracking" methods as enacting cycles of action and reflection to increase learning. From their study of the reflective practices of 6 university professors, McAlpine, Weston, Beauchamp, Wise, and Beauchamp (1999) provided a model for doing reflections based on a circle of continuous interaction between action and knowledge. Goals are at the center of the circle. The elements in the circle are iterative: monitoring, knowledge, decision-making, and action.

Reflection is a key component in the instructor's action research evaluation cycle. The phases in this cycle are planning how and what to teach, implementing these activities, observing them, reflecting on how to improve their efficacy, and then making changes to the course. The process is continuous. This is consistent with Zuber-Skerritt's (1992) suggestion that academics study their own practice with graduate students by adopting a spiral of action that involves analyzing the problem, planning interventions, evaluating, reflecting on the outcomes, and repeating the process.

When an instructor supervises student researchers, reflections can help students to express and consider how to deal with the challenges that Mary Brydon-Miller (2002) identified in her work teaching and supervising students who do participatory action research. This type of research emphasizes using research to create positive social change. These challenges include willingness to confront uncertainty, lack of control over the project, the need to be patient and assertive, willingness to be wrong, and to trust that site members are the best interpreters of their own site and of themselves. These are themes that may emerge in a variety of types of research.

Action research cycles or principles and reflective practice are intertwined in some pre-service and in-service programs for schoolteachers (Feldman & Atkin, 1995; Levin & Rock, 2003; Rogers, Noblit, & Ferrell, 1999) and for administrators (Anderson & Jones, 2000). In case studies presented by Kember and Gow (1992), action research principles are used to improve curriculum in university departments. These studies are also an "experiment into the effectiveness of action research as a staff development strategy" (p. 305). The researchers contended that the effectiveness of action research could be measured by student outcomes.

Action Research Course

Introduction to Action Research is required for each cohort of 20 to 30 students who enroll in a doctor of education program in educational leadership at a public research university. Two thirds of each cohort is employed in pre-K–12 schools or districts while the remainder are community college or university administrators or faculty. The mean age of a cohort is 34, while work experience ranges from 3 to 35 years. Only 2 to 3 members of a cohort have prior experience with action research. The course exposes students to action research theory and objectives, data collection methods, ethical issues, and collaborative team processes. The course functions as a "laboratory" for students to enact a full cycle of action research in a team. Learning from these experiences can inform students' later use of action research in their own workplaces.

Between 2001 and 2006, there were 26 student action research teams composed of 4 to 7 students. They collaborated on an action research project at a school, college, or other type of educational organization. A few teams did research at a site where one of their members was employed, but most projects were done at sites selected by the instructor. Sites were chosen based on the following criteria: several representatives of the site, one or more with positional authority, agreed to provide continuous access and collaboration; sites presented problems that they wanted assistance in studying; and they expressed a need to use research findings.

The action research processes in Introduction to Action Research are consistent with the ones outlined by Costello (2003): "It has a practical, problem-solving emphasis. It involves research, systematic, critical reflection, and action. It aims to improve educational practice. Action is taken to understand, evaluate, and change" (p. 5). The course builds a scaffold around five topics relating to course objectives:

1. Research methods, which include learning how to do interviews, focus groups, transcripts, participant observation and field notes, surveys, and data analysis and presentation.
2. Team collaborations, which emphasizes mindful listening and communication, conflict management, equity in work distribution, leadership and "followership", making decisions, solving problems, and creating and using a team charter.
3. Ethical issues, put in the context of readings and discussions relating to teamwork and doing research at an educational site. Students also analyze mini cases involving ethical issues in action research and team collaborations.
4. Action research project management, which includes project planning, preparing a memorandum of understanding that includes a project timeline, and doing progress reports.
5. Students' understanding of action research, which includes their commitment to using action research at their own site to improve practice.

During class sessions, teams reflect on the progress of their action research projects. Students begin to explore practitioner research through reflecting on the pros and cons of doing research at their own workplaces. In class, students discuss issues in doing research at their own sites from the instructor's content analysis of their reflections. This brings to light some issues that factor into practitioner-based research efforts. Students also review articles written by school and college practitioners about their experiences using action research in their own workplaces.

Course Evaluation Processes

Targeted formative evaluations give instructors just-in-time data to help them to understand students' immediate needs. It can also provide data for students to reflect about their beliefs, assumptions, and actions and to make their own changes. Students do two-to-three page reflections on collaboration in an action research team and collaborations in their workplaces. A content analysis of these reflections provides individuals and teams with information that they can use to assess their own work and the work of members of their team. Students also examine their beliefs and feelings about action research and those of their peers. Redacted information is given to the team after each member of the group completes an emailed assessment (Individual Team Assessment) of his or her roles and work on the team, the quality of the collaboration, and characteristics of their work with the research site.

Individual Team Assessments illuminated both successes and failures of team collaborative processes. Between 2001 and 2006, 4 of the 26 teams encountered serious difficulties in their collaborations. These were identified through the Individual Team Assessments and requests for help from some team members to the instructor. In three cases, all members (except for the "offender") traced the source of the problem to one team member who was not doing the work and missing meetings. In the case of the fourth team, one member expressed attitudes that were inconsistent with collaboration. These conflicts were resolved to varying degrees through consultation with the instructor and problem solving involving all members of the team.

Summative assessments explore the impact and appropriateness of reading materials, class discussions and activities, and assignments. This information is used to improve the second quarter of the course and the next course sequence. Near the end of the second course, students do a two-to-three page reflection on the pros and cons of studying their own workplace. This may include a consideration of such factors as politics; leadership; and social, cultural, and structural issues. This information is redacted and the whole class discusses the problems. At the end of the second quarter, each team evaluates the quality of its action research project and the effectiveness of its collaboration on the project. The students also complete a university evaluation form at the end of each quarter. This is used by the university and indicates to faculty how the students rated the class and the instructor on a 3-point scale. It does not present specific information about what succeeded and what did not succeed in a specific course.

The nature of some of the formative and summative methods is metacognitive. They encourage students to examine their own thinking processes and to monitor and modify them. Redacted information on members' assumptions about working in teams enables team members to examine how their assumptions influence their collaborations and their research at their site.

While formative evaluations include reflections and team assessments, summative evaluations take place at the end of the quarter or at an interval afterwards. They consist of the Presentation Evaluation Form used by students to evaluate team presentations of the completed action research report. For the Assignment Assessment Form, students rate instructional units, readings, and assignments for each quarter. In the Assessment of the Action Research Project, each team evaluates its experiences collaborating on research and working with the site. It also assesses the quality and usefulness of its work. In a two-to-three page reflection on the pros and cons of doing action research at the student's workplace, the objective is to have students apply what they have learned about action research to the feasibility of doing action research in their own workplaces.

Two evaluations are done one year after the course ends. The status of the implementation of the action research project recommendations at the site is assessed in the Action Research Site Use Survey. Representatives of the sites complete three open-ended questions about how the site used the team's recommendations. This information is given to the teams. The Student Post-Course Evaluation is a questionnaire that includes five short answer questions, two multiple choice questions, and a question that is scaled 0 (no impact) to 10 (very high impact) about the impact of the action research course on students' abilities to collaborate successfully with colleagues. This was done in 2005 for action research projects completed in 2004. The 2007 evaluations for the action research projects done in 2006 are in progress.

Tables 1-5 describe the alignment between course topics, learning activities, and formative and summative evaluations. Instructor feedback on some assignments is not included as it lacks a specific evaluative format.

The 2005 Student Post-Course Evaluations for 2004 projects suggest that some students perceive that the action research course influenced some collaborative and research practices at their workplaces. Findings from the Student Post-Course Evaluations are based on questionnaires completed by 27 of the 29 students one year after the end of the course. Forty-four percent of the 27 students said they had done action research at their own worksites in the year since the course ended, while 22% said that they had done action research during the year and planned to do it again. An additional 15% said that they planned to do it in the future. Five students (19%) said that they could not do action research at their sites because of a job change, lack of encouragement from the site, disinterest on the part of the leader, and time constraints. One respondent did not give a reason.

Students reported that after completing the class, the importance of improving their work sites was much higher (7%), higher (30%), and somewhat higher (22%) than prior to the class. None reported a decrease in importance. The impact of the action research course on students' ability to collaborate successfully with colleagues was reported as very high (11%), high (44%), and somewhat higher (26%). Respondents could select from very high impact to no impact.

As an assessment tool, the post-course evaluation was perceived as helpful in evoking suggestions for changes in the course. Suggestions included new types of small and large group processes, action research case studies, additional research articles providing examples of action research, doing pilot action research project at the students' own workplace, and developing ways to be more sensitive to stakeholders. After planning and implementing these suggestions, they were assessed and modified.

The post-course data suggest that the course was perceived as useful to some student/practitioners in one or more ways: in developing collaboration skills, in commitment to change, and in doing action research. It is not known from the data if these practitioners have continued to do action research or the success of their efforts. The responses led to additional class time focusing on workplace action research, including developing a climate for collaborative action research.

Table 1
Course Topic: Research Methods

Activity	Assessment Processes	
	Formative	Summative
Readings, lectures, discussions		Assignment Assessment Form, University Course Evaluation
Practice interviews, focus groups		Interview transcript
Participant observation		Fieldnote assignment
Design project with site	Discussion of content analysis of reflections	
Data analysis and conclusions		Team Assessment of Action Research Project, Site Use Survey

Table 2
Course Topic: Working in Teams

Activity	Assessment Processes	
	Formative	Summative
Readings, lectures, discussions		Assignment Assessment Form, University Course Evaluation
Team Charter		
Assumptions worksheet	Team discussion of redacted team assessments and assumptions	
Individual Team Assessments	Team discussion of redacted team assessment	
Team designs and carries out project	Reflections	Team Assessment of Action Research Project
Case study analysis of ethical issues in action research	Team discussions	

Table 3
Course Topic: Ethical Issues in Action Research

Activity	Assessment Processes	
	Formative	Summative
Readings, group discussions, examples of ethical issues in practitioner research, in-class team status reports		Assignment Assessment Form, University Course Evaluation
Analysis of case study	Evaluation by instructor	
Respond to ethical issues at action research site	Reflections	Team Assessment of Action Research Project

Table 4
Course Topic: Managing the Action Research Project

Activity	Assessment Processes	
	Formative	Summative
Readings, lectures, discussions		Assignment Assessment Form, University Course Evaluation
Project management		
Create a problem statement and memorandum of understanding	Feedback from instructor	Assessment of Action Research Project
Oral team status reports (reflective)		
Written team progress reports		
Team report presentation		Presentation evaluation form
Individual team assessments	Team discussion of redacted team assessment data	Team Assessment of Action Research Project

Table 5
Course Topic: Understanding Action Research

Activity	Assessment Processes	
	Formative	Summative
Readings, lectures, discussions		Reflection – Pros and Cons of Doing Workplace Action Research
Team presentations of Action Research Project		Presentation Evaluation Form
Action Research Project Report		Team Assessment of Action Research Project, Site Use Survey, Student Post-Course Evaluation

The six research sites varied in how they used the action research reports. Research on student recruitment for high school academies was done for a large school district. Feedback included, "The outcomes of the action research project were helpful in helping us to obtain additional hard data on the academy as it relates to student outcomes," and, "The academy teachers used some of the data in their year-end reports and to help with summer planning." The site representative was an assistant superintendent who noted, "It confirmed some things and helped us to look at others differently." The district planned to use data from the report to recruit students. A college residential life office used the report to implement training for staff and for campus safety officers. The site representative gave the action research report to the college's senior staff but said, "I do not know if it was read." The college's image emerged as a theme during the study. The site representative was surprised to find out that data included information about a topic that was not part of the original charge but was of great interest to the college.

Two of the research sites were units within a university medical school. One study looked at professionalism and contributed to the school's database for a self-study. The other studied the use of problem-based learning by medical school faculty in terms of how specific faculty implemented an effective problem-based learning discussion group. The findings informed the development of a workshop that trained facilitators to use problem-based learning. The site representative said that the data would be used in future faculty development workshops.

The fifth site was an organization that employed evidence-based research to create online professional development programs for K–12 teachers. The study looked at what motivates educators to enroll in and complete an online course. Results were shared with program development personnel to use in creating new online programs. The sixth action research team worked with a teachers union to identify key factors that influence work life in a school district. The union wished to use this data to create a survey instrument to

gather district-wide data on teacher work life. It is not known if this instrument was developed or used.

Information from site representatives suggests that the action research reports were helpful in supporting activities that were already planned or underway. Data is limited in that it does not indicate if the reports led to any changes beyond those already planned. A more in-depth survey or a survey done several years after the completion of the action research project may get at this type of information. Responses from the representatives led the instructor to communicate additional information about action research before the start of projects.

Conclusions and Implications

The reader might well ask why more instructors don't systematically make use of course assessments that go beyond tests and university or department course evaluations. Potential responses include time constraints for students and instructors, organizational culture, lack of knowledge about assessment, and lack of a method for doing assessments. Using a plan, act, observe, and reflect process adopted from action research principles offers college faculty a vehicle for better understanding and improving their own practice and the work of their students both in and out of class. Use of a continuous process involving formative and summative assessments enables instructors to reflect on the course as a whole and on specific aspects of the course. For instance, the teacher can examine readings, large and small assignments during a course, and make appropriate changes. A continuous process can also examine the quality of students' work, including their research efforts. Through email, the impact of the course can be explored at intervals after the course ends. These assessments can help the instructor estimate the effectiveness of the assessments themselves and of the changes implemented because of the assessments.

In-class discussions of assessments and the continuous use of assessment data by instructors and their students provide a model for improving practice in a wide range of professions. Assessment of practice can become a habit that informs practice. Focused formative and summative assessments offer alternative sources of data for practitioners that cannot be elicited solely through tests. They can be developed and monitored by faculty and hold the promise of aiding teachers and students to use a metacognitive approach to their own learning. This helps both students and their instructors to understand their own actions and responses as they occur. Through a continuous assessment process, practice can be data-driven.

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