Modeling Action Research: Reflections From a Self-Study

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Abstract

Teacher preparation requires exemplary teaching that illustrates the systematic reflection encouraged among preservice teachers. This article provides an investigation of an innovative model for integrating action research into a preservice teacher education program. Through a self-study, one teacher educator presents reflections on action research. By experiencing the process of action research, preservice teachers experience both technical and reflective elements of teacher inquiry.

Many teacher educators recognize reflection as a critical component of teacher education (Loughran, 2002; Schön, 1983, Zeichner, 1994; Zeichner & Liston, 1996). Further, the reflective dimensions of action research have become the centerpiece of many preservice programs that view reflectivity as the central value of teacher education. Through the methodology of action research, teachers gain an understanding of self-assessment and reflection in order to raise questions about theory and practice (Arhar, Holly, & Kasten, 2001; Bullough & Gitlin, 1995; Sagor, 2000).

Reflectivity is sometimes difficult to define (Hargreaves & Daw, 1990), but when teaching is reflective, judgements become skilled and thoughtful, and practice is enriched and improved. Reflective practice incorporates active, persistent, and careful consideration of beliefs and practices with an understanding of the reasons behind and the subsequent consequences of specific actions (Dewey, 1933; Schön, 1983). Teaching students to become reflective practitioners includes both strategy instruction as well as instruction on decision making that recognizes the interplay between beliefs, actions, and the influence of context.

The concept of action research has become commonplace in many teacher education programs. Yet, we often fail to address the limitations of methods used to teach action research by, for example, assuming that learning the skills of action research automatically moves teachers toward reflective practice. As researchers remind us, there are many dimensions to reflectivity (e.g., making meaning through an examination of decision making in context, problem framing) (Bullough & Gitlin, 1989; 1995; Loughran, 2002; Loughran, 1996; Zeichner & Liston,1996). However, it is highly misguided to believe that reflection will naturally emerge from the accumulation of teaching strategies and techniques (Loughran, 2002; Tremmel, 1993).

Modeling the type of reflective practice expected from our students is one effective vehicle to teach both attitudes and skills (Kauchak & Eggen, 2001). Observing a model allows preservice teachers to broaden their perspectives of teaching and provides opportunities to value reflectivity (Carr & Kemmis, 1986). Therefore, teacher educators should consciously examine the extent to which approaches to teaching action research demonstrate the type of reflection encouraged in their education students.

As a teacher educator for the past ten years it was not until recently that I questioned whether I have a clear understanding of the complexity of the projects I assign. For example, when developing curriculum and instruction for beginning teachers, I carefully consider assignments and readings designed to enhance preservice experiences. When tasks are designed to promote reflectivity, I consciously evaluate the time and effort necessary for project completion, recognizing the commitment to becoming a teacher is consider-

able. I was confident that if students tackled the charges placed before them, my assignments would improve students' teaching and their approaches to reflection on practice.

Until the present study, I simply assumed that if assignments were well scaffolded and students exerted the necessary effort, my goals for assignments would be attainable. However, it was not until I examined my own teaching, using the action research format assigned to students, that I clearly understood the demands placed on preservice teachers during student teaching. I asked whether my assignment goals reflected the realities of teachers' work and the developmental readiness of preservice teachers.

Justified Resistance?

Despite teacher educators' commitment to reflection in their teaching, many recognize the sentiments of preservice teachers who believe they are being asked to "jump through one more hoop" when asked to do an action research project. As one teacher candidate in our program stated, "Action research, a nice idea but who has the time?… This was never a big priority for me. My time was devoted to teaching … This part of the course has proven to be a burr in my saddle.…"

Given the trends in contemporary classrooms and increasingly demanding licensure requirements (Jennings, 2002), these sentiments are not unfounded. For many preservice teachers, mastering the most basic teaching competencies may be overwhelming, and moving to a reflective, holistic approach to teaching difficult (Berliner, 1994). Further, there is a danger that methods designed to promote reflectivity, such as action research, will become just one more technical skill, a means to quick-fix a problem.

Persuading preservice teachers to value action research as more than a simple problem solving strategy is a challenge for teacher educators. Because preservice teachers bring histories and school experiences to their classrooms (Bullough, 1994; Lortie, 1976), teacher educators must teach their students that reflection is more than applying familiar routines to classroom events. Rather, conscious reflection on teaching represents an ongoing commitment to analyzing practice and determining how these analyses affect student learning.

The present study chronicles one teacher educator's attempt to validate the merits of reflectivity through an applied model of action research. By sharing in this self-study, preservice teachers were exposed to research as more than a *product* created by others or a simple set of procedures occasionally used to study practice. Instead, action research was shared as a *process* for systematic reflection in action.

The purposes of this study were twofold: (1) to model the process of conducting a reflective action research project as a form of self-study; and (2) to evaluate whether observing action research impacts the action research practices of preservice teachers. In order to meet these objectives, I undertook a self-study using the methodology of action research. The project goals included: (a) conducting an action research project to improve the overall quality of my instruction; (b) using an instructor-modeled project as a guide for student teachers as they completed a similar project in their own classrooms; and (c) modeling and evaluating the effectiveness of data collection using video taping as a tool for teacher self-reflection.

Methods and Data Sources

The study reported here used both quantitative and qualitative methods to investigate the impact of modeling action research on preservice teachers. I included an exit questionnaire with both closed-ended and open-ended questions. The quantitative portion of the questionnaire investigated preservice teachers' perceptions of the value of observing action research as a method for teaching the technical and reflective elements of an action research project (see Table 1). Exit questionnaires were scored and quantitatively analyzed.

Table 1
Preservice Teachers' Reactions to Observing an Action Research Project

Survey Questions	0	sd
1. Observing an action research project helped me to understand the *process* required for completing a similar project on my own.	5.2	1.6
2. The *steps* required for completing an action research project seem clear to me.	6.7	1.3
3. The action research project conducted by the instructor last fall in class prompted me to think about my own project. Project on increasing students' use of course readings in a Theories of Instruction Course	4.4	1.9

n = 26

To capture the process of completing a self-study, I treated my teaching and self-reflection as case study (Merriam, 1998; Stake, 1994). Utilizing my action research project as a model for preservice teachers, the case study chronicled a year-long investigation of introducing action research to teacher education students in a fifth year, teacher licensure program. Additional analyses were conducted on the content of preservice teachers' action research projects, on transcripts from exit interviews with a representative sample of teacher candidates, and on teaching journals kept by the researcher. Open-ended questions on the exit questionnaire provided additional data for analysis (see Table 2). This case study was part of a larger study that investigated the impact of this teacher educator's action research project on he reading practices of preservice secondary teachers in a theories of instruction course.

Qualitative data were analyzed using grounded theory (Glaser, 1978, 1992; Strauss & Corbin, 1998). A matrix was constructed to facilitate data analysis (Miles & Huberman, 1994). The researcher reviewed exit interview transcripts, student work samples, and journal entries. Through a process of constant comparison (Glaser & Strauss, 1967) initial categories for coding were identified. A complex matrix was created that sought to reveal changes within preservice teachers as they experienced a modeled action research project. Triangulation was established through the examination of survey data, exit interviews, and through students' action research projects and the researcher's journal analyses.

Table 2
Open-Ended Survey Questions

Describe the ways in which observing an action research project helped you to understand the *process* required for completing a similar project on your own. Discuss your response.
Describe the ways in which the action research project conducted by the instructor in class prompted you to think about you own project. Discuss your response.
Describe whether the *steps* required for completing an action research project seem clear. Explain.
Discuss your understanding of *the role of reflection* when conducting action research. Don't worry so much about whether the project was a success per se. Explain.
Describe some of the strengths of observing the instructor's action research project.
Describe some of the limitations of observing the instructor's action research project.
How could the process of modeling action research be improved? That is, when the instructor teaches her students about conducting action research in the future, what should she do differently?
Is it important for an instructor to model an action research project? Why or why not?

Participants

Twenty-eight preservice teachers were enrolled in a year-long, secondary licensure program. The preservice teachers were post-baccalaureate students across multiple content areas (e.g., health, math, English, science, English as a Second Language, art, and Spanish). All sought secondary licensure and were participants in a program in which cohort students completed course work in curriculum and instruction, action research, and student teaching.

Participants ranged in age from 22–52. Twenty-seven were Caucasian and one student of color was of East Asian decent and fluent in multiple languages, including English. Of the 28 students there were 9 males and 19 females. Student teaching placements included 15 placements in urban high schools and 13 placements in urban middle schools.

Program Description

Students admitted into a department of education's secondary teacher licensure program at a western university completed an intensive cohort program by participating in classes held on both the university campus and at selected sites within local school districts. These sites, known as Professional Development Schools (PDS) (Darling-Hammond, 1994), allow university faculty to work collaboratively with school practitioners with the goal of improving teaching and learning for preservice teachers. In addition to providing an environment for preservice teaching, professional development for experienced teachers is offered through field-based research and inquiry.

As members of a secondary cohort, preservice teachers completed curriculum and instruction courses designed to characterize teaching as a process based upon the relationship between multiple variables (e.g., school culture, curricu-

lum, instruction, and classroom management). By providing students with an understanding of the nature of these relationships, students are led from the view that teaching is simply "fixing" isolated problems in the classroom to a broader understanding of the complexities of teaching. Students are encouraged to examine teaching as, "more than mastering supposedly proven techniques ... and [teachers must] become suspicious of the comfort that comes from the pronouncement, 'it works.' Many things work, but not everything that 'works' is morally, socially, or educationally defensible" (Bullough & Gitlin, 1995, p. 17).

As the student teaching experience proceeds, candidates identify areas in their teaching in need of improvement for the focal points of their action research projects. For example, discrepancies between teacher expectations and student performance are identified through reviews of personal journals and data gathered from peer and/or site teacher interviews and teaching self-analyses. Following this baseline data collection, teacher candidates complete a four-stage process which includes the identification of a problem statement, the development of a plan of action, further data collection, and finally, an evaluation of outcomes in their teaching.

During Phase I, candidates describe a relevant concern or issue that addresses the relation between instruction, students, school culture, and curriculum. Following problem identification, candidates begin Stage II which includes developing a plan of action. Data collection (Stage III) may have included samples of students' writing, performance on subject area tests, degree of student inquiry during class discussions, and/or levels of student engagement. Data gathering may take place through portfolio reviews, student feedback, or video taping. During the final stage of the project, candidates gather and evaluate data stemming from their problem focus while evaluating the relationship between instruction, curriculum, and students. That is, candidates are asked to evaluate the merit and outcomes of systematically evaluating their teaching over time.

Project Implementation and Analysis

Modeling Action Research

As a teacher educator for the past ten years it appeared that while the technical elements of action research were certainly mastered by most teacher candidates, many preservice teachers reacted negatively to completing a project *while* student teaching. For many, action research takes away from time spent preparing lessons, grading papers, or commiserating with peers. At best, projects rarely extend beyond fixing isolated problems. Yet, some students also gain a more holistic understanding of the interaction of the multiple variables in classrooms that are often messy and complex.

Armed with the knowledge that *some* students valued and recognized the merits of reflection using action research, I found myself brushing off students' negative feedback as typical whining or resentment about *any* requirement involving efforts to think critically. I often asked myself, "How hard can reflection on practice really be?" "Is daily documentation of a project really that difficult or intrusive?" or "What can I do to convince students that action research is more than marking off tasks on a checklist?"

With these questions in mind, I conducted a self-study in order to explore explicit ways of linking my goals for reflective practice with the "survival" needs of my preservice teachers. Funded by a college Research on Teaching grant, I conducted an action research project to improve the overall quality of my instruction and to model the process of reflecting in action using the systematic framework of traditional action research as a reference for students.

I initiated the project for two purposes: (1) to serve as a general guide for student teachers as they completed a similar project of their own by demonstrating how reflection in action can change the direction of one's teaching; and (2) to evaluate the effects of observing action research on the action research projects of preservice teachers. Although my initial goal was to provide preservice teachers with a tool for linking theory to practice in their teaching, I personally learned

much about the value of action research, including both its merits and its demands.

Reactions from a Self-Study

During Phases I-III of my action research project, *Increasing Students' Understanding of Content in a Theories of Instruction Course,* I guided students through each project stage during a semester-long course prior to student teaching. In addition to discussing a general goal, rationale, and plan of action, I shared teaching notes (i.e., lesson and unit plans) and demonstrated the systematic process of evaluating my teaching through deliberate lesson planning, journal writing, and daily video tapings as forms of self-reflection. Approximately twenty minutes of each week's three-hour class were spent updating students on the progress of my project by sharing multiple forms of data and highlighting specific components of lessons that illustrated connections to the project goal. E-mail and class agenda notifications provided students with daily and weekly updates on how I had integrated key points from readings into daily lessons.

Throughout a sixteen week semester (i.e., Phase III), I privately and publically examined my teaching "in action" (Schön, 1983) and not as an after-the-fact, byproduct of a lesson. Periodic sharing of daily/weekly journals within the context of a three-hour course provided preservice teachers with additional data on my reactions to lesson effectiveness and updates on my plans for changing lessons based upon my self-analyses and student feedback. Through the process of sharing journal entries, students were made aware of my successes and failures within the context of specific lessons as well as my rationale for curricular and instructional decisions. If I felt the direction of the project was not moving as planned, I shared ways in which I tried to make content relevant through specific lesson plans. As noted in the following journal entry, I continually reflected on the ways in which class activities were designed to link course readings in personally meaningful ways.

> Well, my teaching is progressing. As usual we are not moving through content at the rate I would like. I guess that's just the way it always is when I'm trying to make curriculum connections for my students — but I never feel like I have enough time. One idea that I may try with the classroom management models is to have groups work on the pros and cons of various arguments using small groups in a debate style format. This format may be a useful way of looking at the content both as a review and as a mechanism for applying content to real classroom situations. (Journal #5, Fall 1999)

Examining my teaching in multiple ways was not without its frustrations. At times, I felt as though I was pulling teeth when illustrating how systematic reflection can be used to inform practice.

> I have really been struggling this year more than others. The dynamic of this class is one that I can't remember in quite some time. I don't believe students are able to visualize how my analysis of data drives my decision making. I think I'm being explicit in my discussions but sometimes my students are clueless! I'm really struggling to get anywhere with some of my students. I must examine ways of seeing my teaching from the students' perspectives. (Journal entry #3, Fall 1999)

Perhaps my most dramatic awakening was recognizing that while there were specific benefits to the project, there were also definite challenges. Adjusting my teaching based upon feedback and remembering to implement the plan were among the demands. However, lack of time to reflect on the project was most significant.

> As a result of my self-study, my attention to course content has been much more pronounced this year, but I am just amazed by the amount of work it takes to keep track of one of these projects.… It's really hard to make a deliberate attempt to consider the project on a

> daily basis. While I only have students 2–3 days a week, it would be much harder to keep a journal, say at the end of every day if I were teaching 5 days—ALL day, every day. Just keeping up on the days I teach is tough. (Journal entry # 9, Fall 1999)

While the limitations of action research centered around time and general commitment to the project, the process of systematically reflecting on my teaching and examining new ways of improving instruction was personally satisfying and even exciting.

> The end of the first month. I've learned so much about my teaching and the complexity of action research as a result of my study. I must think carefully about how to encourage greater participation, given the demands of the curriculum and the needs of my students. I've never really thought about the ways in which my teaching is perceived by students in such a fine-tuned manner. This group's level of involvement seems strong, but I suspect there are a few who are getting bored quickly.… The activities on 'What did you learn from yesterday's discussion?' worked very well. Perhaps this was because the activity was new and I deliberately discussed my own struggles with lesson content. (Journal entry #4, Fall 1999)

The process of conducting action research proved challenging and invigorating. Planning and executing the project required a concerted effort to implement the plan, evaluate outcomes, and adjust my teaching accordingly. As a veteran teacher, I was able, with considerable effort, to address the multiple components of my action research project while simultaneously maneuvering through the technical elements of daily planning, grading, and lesson implementation.

Preservice Teachers' Responses

In addition to exploring the personal relevance of self-reflection through action research, I also examined the extent to which preservice teachers were impacted by my project through two methods: 1) through an exit questionnaires from all teacher candidates; and 2) through an analysis of projects and interview data from four focal students who represented those who found success in their projects as well as those who struggled to move beyond technical mastery of the action research.

Survey questions addressed the technical elements of completing an action research project, and interview questions generated in-depth data on the complexity of preservice teachers' understandings of action research and reflection. Additional analyses were conducted on the action research projects from a representative group of teacher candidates who successfully or unsuccessfully demonstrated the technical competencies of completing a project, as well as an ability to reflect critically upon the interactions between multiple variables.

Quantitative data. As Table I shows, data from the exit questionnaire, using a seven-point Likert scale where 1 represented *strongly disagree* and 7 *strongly agree*, indicated that, in general, preservice teachers benefitted from observing an action research project in that they understood: 1) the purpose; 2) the steps required for completing an action research project; and 3) the utility of observing action research as a prompt to think about their own project (i.e., = 5.2; = 6.7; and =4.4, respectively).

Each of the twenty-eight participants in this study were required to implement an action research project in their own teaching. An action research seminar during student teaching guided them through the components necessary for completing a project within their classrooms. Candidates' topics of study included, "Examinations of Multiple Teaching Methods in a Middle School Science Classroom," "Building Effective Leaning Communities in Secondary Classrooms," "Evaluating the Effectiveness of Peer Critique Rubrics in a High School Art Class," and "Increasing Peer Collaboration in an English as a Second Language Classroom." While it is apparent that preservice teachers understood the technical elements of completing action research (i.e.,

survey questions 1 & 2), quantitative data on item number 3 revealed differences across individuals. A closer look at the open-ended data identified distinctions in candidates' understandings of how their observations would transfer into their own practice.

Qualitative data. Qualitative data indicated that students differed in their understandings of the purposes of action research and the relationship between the technical elements of action research and reflection-on-practice.

> When we first heard about the [action research] project I wasn't exactly sure what it was. I needed to be walked through step by step, sort of like getting into my mind what is going on. She probably did something like that, but I didn't get it. I thought to myself, why go through all that trouble if it's only going to acquire a sliver of information at the end? I expected that action research projects were going to be bigger and cover more and be more ground breaking than they were … I thought well, so what? If we read this stuff we'll do well in class. We'll learn more. If we don't, we don't do well, we learn less. (Patti, final paper)

For another candidate, observing action research resulted in a narrow, technocratic conception of the project's purpose.

> If the project had a more dynamic result and demonstrated how these things were actually playing out in a real world classroom, the project would have been more effective... When we watched it, it kind of seemed like something she was kind of like doing and we were like, okay, you do that, it's cool that you're thinking about your teaching, but what does the project have to do with problem solving? (Barbara, final paper)

Though many preservice teachers such as Barbara focused primarily on the technical elements of action research, they were also able to identify a number of critical project strengths related to the process of systematic, reflective inquiry.

> Some of the strengths were she went over it and she tried to show us everything that she was thinking... It was interesting to see how she tried to go about figuring out what we were kind of thinking about as far as like her lesson plans or the survey that she would give us and how she was going to integrate the readings more. It was interesting to see how she'd go about doing stuff like that. (Barbara, interview)

For those who were successful with their projects, reactions captured a broader understanding of action research as more than problem solving and as a process of reflection on practice.

> … one thing that was very good for me was watching the instructor doing her project. I realized it's kind of an evolutionary process... I think her project kind of evolved along the way. And also just watching her do it kind of helped me to see that it doesn't necessarily have to be cut and dried all of the time. You might have to change the course or you just may need to take things into consideration you hadn't considered before… And at the end when she went into some of her conclusions with us if was helpful to see that she gained some valuable information but then she still has a lot of points or steps she wants to go back and review again, if she did it again … so you don't really fail … you just know something different. (Molly, final paper)

For students such as Molly, the impact of observing the deliberate process of stepping back to review teaching outcomes, and reflecting again, was apparent both in her interview and in her own project. For students such as Barbara, who continued to grapple with the technical elements of teaching, observing the self-reflection of action research provided the procedural elements of action research and, to some extent, an under-

standing of action research as more than skill mastery.

The differences between individual approaches may be due, in part, to factors such as past teaching experiences, familiarity with the logistical demands of classrooms, and an ability to examine classroom teaching as more than the application of tools. Additionally, previous research at the secondary level reveals that subject matter, or content area, has substantial influences on instruction (Stodolsky, 1988). Differences between the candidates could also be due to the content areas in which they worked.

Beginning teachers struggle with a multitude of issues (e.g., classroom management) (Veenman, 1984). Berliner (1994) suggested that beginning teachers proceed through several stages beginning with concern about issues such as management, followed by concerns about personal performance, and finally evolving to concerns about learning and the effectiveness of instruction on students. While the idea of discreet stages of teacher development has been criticized by some (Howey, 1996), the progression of beginning teachers through different kinds of teaching challenges resonate with many who have worked with beginning teachers (Borich, 2000; Burden, 1986; Ryan, 1992). Beginning teachers have difficulties thinking about the complexities of self- reflection if they are wrestling with classroom management or their own instructional routines and procedures (Berliner, 1994).

Putting Reflection into Practice

Data from this study indicate that preservice teachers differed in their understandings of reflection in action. Specifically, while the technical elements of the project were mastered by all class members, some, but not all projects moved beyond technique. As one student remarked when asked to respond to the effectiveness of her project,

> While I hardly feel like my research is complete, I have learned a great deal from analyzing my own methods, looking back into the research again, talking to students and teachers, and listening to my peers has helped me to see my teaching in new ways.… Although I was not able to ascertain as much as I had hoped, I found that my attempts to apply research-tested practices were more consistent and thoughtful.… When I felt as though I was veering off, I backed up, I made note, and tried again. (Frances, final paper)

For the author of the project, "Examinations of Multiple Teaching Methods in a Middle School Science Classroom," the reflective elements of action research provided insights into techniques necessary for improving her teaching methods as well as a forum for reflection.

> The personal reflection of my project was extremely valuable in that it allowed me to systematically examine my teaching techniques and procedures … too my project helped me to see into the minds of my students…. My personal reflection/critique forms helped me to determine which techniques were working and which needed to be tweaked based upon my students and their needs. (Molly, exit interview)

Discussion

Data from the present study provide evidence of the value of action research for both teacher educators and their preservice teachers. For teacher educators, action research self-studies provide insights into their curriculum and instructional methods and offer perspective into the complexities of examining teaching in systematic ways. Specifically, while my views on the merits of self-reflection and action research have been strengthened, my self-study also revealed a process that is demanding in both time and effort. Researchers argue that while elements of action research, such as data collection, are potentially daunting, teachers have the luxury of data surrounding them in multiple formats (e.g., tests, discussions, and questionnaires) and data access is relatively straightforward (Sagor, 2000). Sagor also suggests that by efficiently and effectively collecting data, the analysis process can be simpli-

fied. He reports that, because teacher research typically follows less traditional statistical/scientific methodologies, researching data "story themes" can be accommodated in manageable ways.

Data availability is certainly a convenience; however, proponents of teacher research grossly underestimate the complexity of teachers' lives and the enormity of their work. Based upon my self-study we must consciously consider whether leaps from technical to more reflective teaching are manageable for many beginning teachers. My own experience with action research illuminates the complexity of the process of systematically reflect on practice. To "efficiently and effectively" organize and analyze data is extremely time consuming from this teacher researcher's perspective. To assume that teachers will find or make the time to implement and analyze project components such as journal writing, video taping, or completing survey data analysis may be highly misguided. Preservice and inservice teachers must be provided with the necessary time and resources to meet the demands of reflective teaching.

For preservice teachers three outcomes were observed. Observing action research provided an effective way to systematically present the technical elements of completing an action research self study. Second, sharing the process of teaching, reflecting, and re-teaching modeled the struggle that often accompanies systematic reflections on practice. Finally, while each of the preservice teachers in this study demonstrated technical competencies, reflection was limited for some. As a result, questions were raised regarding the developmental appropriateness and feasibility of a truly reflective approach to action research for all preservice teachers.

Implications

The merits of action research cannot be underestimated in terms of its ability to provide preservice and inservice teachers with useful structures for inquiry into practice. However, unless teacher educators are willing to undertake efforts that involve systematic reflection over time, using multiple formats, it is highly unlikely that students will internalize the "mindfulness" that extends the process beyond technical competencies (Tremmel, 1993).

The present study focused on ways of building connections between the technical elements of teacher research with elements of reflectivity using a teacher-initiated model. Results indicate that a self-study provides both an effective vehicle for studying curricular components of a teacher education program as well as an instructional methodology for modeling the systematic process of conducting action research. Equally significant was the increased awareness of the complexities, and time demands placed upon preservice teachers who are completing an action research project while teaching. By completing the same projects assigned to students, teacher educators are provided with new understandings of the complexities of tasks and the kinds of questions we must ask of ourselves when assigning those tasks (Perrone, 2000).

Data also indicated that the developmental levels of preservice teachers may have influenced their receptivity to reflectivity as a component of action research. For some preservice teachers, attending to the immediate, technical aspects of teaching was foremost in their minds and participation in action research, while simultaneously familiarizing themselves with the pressing logistical and instructional demands of teaching, may have been overwhelming (Berliner, 1994; Feldman, Rearick & Weiss, 1999; Veenman, 1984). Lacking from the current study is an in-depth investigation of the degree to which the developmental needs of participants can be addressed throughout the process of conducting action research. That is, how can we, as teacher educators create supportive learning environments where we alter curriculum and instruction in such a way that students' experiences within action research are more individualized to each student's needs (Zuber-Skerritt, 1992)?

As findings indicate, there were differences in the needs of participants in terms of the necessary instructional scaffolds needed for understanding the complexities of action research. In addition,

the current study did not address the long-term effects of action research instruction for preservice teachers. In essence, we must ask what happens to preservice teachers' knowledge of action research once they become practicing teachers.

Previous research suggests that in order for teachers to incorporate self-reflective practices such as action research, teaching communities must also systematically embrace the notion of sharing in reflective ways. For example, when preservice teachers observe inservice teachers who model a reflective practice through activities such as action research, preservice teachers are more likely to engage in similar practices on their own (Gitlin, Barlow, Burbank, Kauchak & Stevens, 1999). Additionally, action research teaming among cadres of teachers provides opportunities for reflection on practice in systematic, collaborative ways. Teacher action research teaming is particularly effective when the developmental needs of participants are considered as teams are established (Burbank & Kauchak 2001; Burbank & Kauchak, in press). Future studies should investigate additional ways of bridging individual needs to advanced levels of reflection within the contexts of school communities.

It is often assumed that participation in activities such as action research increase teachers' reflectivity. However, simply learning the procedures of the action research process does not guarantee the development of a critical analysis of teaching practice within the wider educational context (Loughran, 2002; Gitlin et al. 2000; Zuber-Skerritt, 1992). Preservice teachers who engage in both the procedural elements of action research, as well as the process of planning, acting, and reflecting, experience a dynamic method for linking theory to practice (Kemmis & McTaggert, 1988). Teacher educators must actively expose action research as more than skill acquisition.

Providing a model of teacher research offers students an effective portrait of the technical aspects of action research. Additionally, modeling teacher research illustrates the process of reflecting on technique while rethinking goals and objectives within lessons over time. Equally significant are the benefits gained when preservice teachers observe educators who legitimize students' needs and abilities and consciously link those needs and abilities to curriculum and instruction. When teacher educators share their awareness of the developmental and experiential differences of learners with their students, it is hoped that preservice teachers will transfer a similar process of reflective examination in their experiences with K–12 students.

The current research study provided valuable insights into both the complexities of the curriculum of teacher education as well as the learning demands placed upon its students. Future research should examine how teacher educators can use similar methodologies to examine other taken for granted aspects of their curriculum.

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