Section III: Course and Professor Level of Assessment of Innovation

Accumulating Gains and Diminishing Risks during the Implementation of Best Practices in a Teacher Education Course

By Lori Olafson, Linda F. Quinn, & Gene E. Hall

Teacher education program revision can be initiated by an idea, a small group of people, a department or college, or by the standards demanded from the accreditation process. Whatever the catalyst, two things are apparent; that the current standards-based environment of teacher education will influence whatever shape revisions do take, and that accomplishing change will not be a simple task. Creating innovative learning environments that incorporate technology and practical experience, developing performance assessment rubrics, and collecting multiple forms of evidence that demonstrate candidates' knowledge, skills, and dispositions are essential responsibilities of the contemporary teacher education landscape. Implementing innovations requires time and support for faculty and teacher education candidates to make the necessary shifts in their thinking and in practice.

Lori Olafson is an assistant professor, and Linda Quinn and Gene Hall are professors, all in the College of Education at University of Nevada, Las Vegas.

As newly arrived teacher educators at a large, metropolitan university in the southwestern United States, the authors inherited a traditional format for the content and delivery of one of the required

courses in the elementary undergraduate program. This course, *Strategies for Effective Elementary Classroom Teaching,* is an introduction to instructional techniques and management strategies for the elementary classroom, and had been previously taught in an on-campus, three times a week lecture format with no school-based connections as context. To address these limitations, the course was revised in two ways: (1) to more strongly establish the connection between theory and practice, and (2) to integrate technology into teaching and learning.

The authors initiated a program to evaluate and document the integration of technology, supported by the institution's PT3 grant. Additionally, the instructors were supported by the department and college with a teaching load re-assignment to team teach this course. Findings from the program of research, including the impact of technology integration on the learning environment, have been reported elsewhere (Olafson & Quinn, 2003; Quinn, Olafson, Schroeder, Groves, & Wells, 2002). What has not been reported previously are the challenges and risks that were encountered across two years as both instructors and their teacher education candidates grappled with implementing and becoming accomplished with each of the innovations in the bundle. Change process researchers estimate that it takes a minimum of three cycles of use of an innovation before one becomes proficient (Hall & Hord, 2001). The authors heartily agree, now that experience has shown the time needed to implement an innovation successfully. In this paper, the authors describe their experiences with implementation, report the teacher education candidates' perceptions of the innovations, and provide evidence about the effectiveness of the course (including the decrease in candidates' ratings of instruction at the end of the first semester). The four research questions included: (1) Is there an identifiable pattern to teacher education candidates' perceptions of an innovation as it is being implemented? (2) What are the concerns that emerge for both candidates and instructors as an innovation is implemented? (3) What is the relationship between the candidates' course evaluations and the innovations implemented by the instructors? and (4) What is the relationship between candidates' perceptions of the course and their concerns?

The next section of the article describes in more detail the innovations that were implemented. The conceptual framework of concerns theory is then introduced. After describing the data collection and analyses procedures, two main findings are discussed. The article concludes with implications of the study.

The Innovations

Hall and Hord (2001) note that, in education, what is seen as a single innovation is in fact a bundle of innovations. The authors had no idea at the outset of what the impact might be for creating and implementing a bundle of innovations in revising one course in a teacher education program. In connecting theory and practice, current standards in teacher education were addressed, specifically standards specified by the International Society for Technology in Education (ISTE) and the

National Council for the Accreditation of Teacher Education (NCATE). ISTE standards related to the integration of technology into teacher education programs provided a framework for course revision. One standard, for example, states that teacher candidates should demonstrate a sound understanding of technology operations and concepts as well as the ability to plan and design effective learning environments and experiences supported by technology (ISTE, 2000).

Because hands-on, candidate-centered approaches to learning are an essential condition for creating learning environments conducive to effectively using technology for teaching and learning (ISTE, 2000), performance assessment tasks were developed to evaluate candidate use of technology. The performance assessments were expected to allow the instructors opportunities to accomplish desired goals for authentic candidate learning tasks and the integration of technology. The instructors began using more and varied forms of technology tools when delivering content to the university teacher education candidates. Carlson and Gooden (1999) noted that it is critical for teacher educators to model technology use in order to prepare teacher candidates to integrate technology into their instruction. Field experiences for teacher candidates are regarded as central to the development of knowledge and skills (NCATE, 2000). A partnership with a professional development school would allow candidates to develop and utilize their knowledge of both effective teaching strategies and technology skills. The innovation bundle consisted of five elements: (a) addressing two sets of national standards, (b) linking on-campus course content with school-based experiences, (c) faculty integration of technology while teaching, (d) candidates using technology to complete their assignments, and (e) developing and implementing performance assessment tasks.

The course was taught on a weekly basis in the professional development center adjacent to the professional development school on campus, where a computer lab was also housed. There was easy access to elementary classrooms and to technology. Candidates were organized into teaching teams and assigned to a teacher at the professional development school. Within these classrooms, teaching teams were expected to become familiar with the teacher, the students, and the curriculum currently being taught in the classrooms. Each team completed two projects to demonstrate knowledge, skills, and dispositions toward using technology to develop an understanding of effective teaching.

For the first project, candidates completed a "Video Case" by using digital cameras to photograph a lesson taught by the assigned teacher. To demonstrate an understanding of one of the dimensions of effective teaching (i.e., grouping for instruction), teaching teams selected images from their collection of photographs and created PowerPoint presentations to show evidence of students being grouped for instruction. One of the teaching teams, for example, observed and photographed a first grade class working in math centers. For the second project, teaching teams taught and videotaped two lessons, and created digital movies of their teaching experiences. Completed projects included their lesson plans, digitized and edited

images of teaching, and a commentary and reflection on practice. In these ways, technology was integrated into the course content.

Conceptual Framework

The Concerns Based Adoption Model (CBAM) described by Hall and Hord (2001) formed the conceptual framework for this study. Two of the diagnostic dimensions from this model, Stages of Concern (SoC) and Level of Use (LoU), are used to characterize the experiences of both candidates and instructors. This paper examines some of the effects that occurred during implementation of a particular innovation bundle in teacher education. In addition to documenting and describing the impact of the innovations on teacher education candidates and instructors, a critical yet unintended consequence of a political nature that affected the authors is described.

Concerns Theory

The pioneering work on concerns of student teachers was conducted by Frances Fuller in the 1960s. Fuller asked students to write open-ended statements describing their concerns about teaching and conducted interviews with student teachers about their concerns. Analysis of these data led Fuller (1969) to describe three different phases of concerns, self, task and impact. Self concerns are those that deal with the candidates' feelings of adequacy and competence, e.g., "Do I know enough to teach these students?" When task concerns are intense, candidates are preoccupied with the task, time, and logistics of teaching, e.g., "I have to stay up late at night to grade papers and prepare for tomorrow." Impact concerns are those that focus clearly on student learning and what the candidate/teacher can do to enhance student learning, e.g., "If I were to bring in a different set of manipulatives, I think it would help Johnny and Maria understand better."

Fuller hypothesized that the concerns of teacher education students would develop from self to task to impact as they moved through their teacher education program and entered their teaching careers (Fuller & Bown, 1975). This developmental progression is the hypothesized ideal, but does not always occur. Since the 1960s, teacher concerns have been studied extensively. Extrapolations of Fuller's work were launched in the early 1970s when Hall, Wallace and Dossett (1973) hypothesized that Fuller's theory of different types of concerns was applicable to anyone who was engaged in a change process. Peoples' feelings and perceptions about an innovation and the change process could be sorted and classified in the same way. Concerns became so central to understanding and facilitating the change process that the overall framework was named the Concerns Based Adoption Model (CBAM).

Concerns Based Adoption Model (CBAM)

In the CBAM, Fuller's three phases of concerns have been further divided and defined as Stages of Concern (SoC) about the innovation (see Table 1). The SoC

Table 1
Stages of Concern about the Innovation

Stage of Concern	Category of Concern	Focus of Concern
Impact	6 - Refocusing	Exploration of more universal benefits from the innovation
	5 - Collaboration	Coordination and cooperation with others
	4 - Consequence	Impact of the innovation on students
Task	3 - Management	Processes and tasks of the innovation
Self	2 - Personal	Uncertainty about the demands of the innovation
	1 - Informational	Interest in learning more detail about the innovation
	0 - Awareness	Little concern or involvement with the innovation

preserve the self, task and impact levels and add further refinement by identifying sub-clusters, or stages. The SoC can be applied to the analysis of teacher education candidates concerns about their experiences in a particular course or a complete program. In the study reported here, the SoC provided a way to categorize open-ended statements that the candidates wrote on their course evaluation forms.

A second construct from the CBAM was applied in this study, Levels of Use (LoU) of the innovation (Hall, Loucks, Rutherford & Newlove, 1975; Hall & Hord, 2001). LoU refers to the behavior of individuals as they develop from being nonusers to skilled users of an innovation. Instead of use being seen as dichotomous, (a teacher does or does not use the innovation), in the Levels of Use, there are eight behaviorally different ways that a person can be a user/nonuser as shown in Table 2. Instead of considering all nonusers as one category, the Levels of Use inventory identifies three different behavioral profiles: LoU 0 Nonuse where the person takes no action to learn about the innovation, LoU I Orientation where the person is taking actions to learn about the innovation, and LoU II Preparation where the person has decided to use the innovation and is preparing for first use. Five different behavioral profiles of users have been identified, including LoU III Mechanical Use where there is disjointed, inefficient use, and LoU IV A Routine Use where the innovation is used the same way from term to term. With the current study, Levels of Use refers to the instructor's attempts to implement the innovations. Levels of Use (LoU) became a very useful heuristic for reflecting on the course instructors' behaviors as they developed and implemented the revised course.

Data Sources

Participants included 62 teacher education candidates across three semesters

Table 2
Levels of Use of the Innovation

	Level of Use	Operational Definition
Users	VI - Renewal	Reevaluates quality of use of innovation, seeks major modifications or alternatives
	V - Integration	Combines efforts to use the innovation with related activities of colleagues
	IVB - Refinement	Varies the use of the innovation to increase impact on clients
	IVA - Routine	Use of the innovation is stabilized
	III - Mechanical	Effort focuses on short-term, day-to-day use of the innovation
Nonusers	II - Preparation	Prepares for the first use of the innovation
	I - Orientation	Acquires information about the innovation
	0 - Nonuse	Little knowledge of the innovation and doing nothing towards becoming involved

(Fall 2000, Spring 2001, and Fall 2001) of the Strategies for Effective Elementary Classroom Teaching class. Because the course is a pre-requisite to methods courses and practicum experiences, none of the participants had completed any field-based teaching experiences. Demographically, the participants in these three sections reflected the college's trends in that the majority (69%) of the candidates were white females (University of Nevada, Las Vegas, 2003). At the beginning of each term, after reading the Consent to Participate form, candidates were given the option of transferring to another section of the course. Over all semesters, four candidates chose to move to another section.

Method of Analysis

The program of research was conducted over three semesters to evaluate and document technology integration. The larger, qualitative, study was approached through participant-observation; that is, classroom observations, in-depth interviewing, and document collection were conducted. While collecting information as an observer, the researcher can choose from several stances that involve various degrees of participation (Merriam, 1998). In the case of the current study, the researchers were complete participants, and the identity of the researchers was completely known to all participants. This is a stance that Merriam (1998) calls the "collaborative partnership" (p. 101).That is, the teacher education candidates were aware that research was being conducted by their instructors as evidenced by their signatures on the consent forms.

Data collection, ongoing throughout each of the three semesters, included: a technology use survey, the Epistemic Beliefs Inventory (Schraw, Bendixen, & Dunkle, 2002), individual interviews, and artifact collection (e.g., statement of philosophy, in-class assignments, responses to reading, and technology products). At mid-term and at the end of semester candidates completed written reflections that were intended to evaluate the course. At the end of each term, candidates completed the required instructor evaluation form. For this paper, the primary data source reported is the instructor evaluation forms. Excerpts from the other data sources are used to support findings resulting from the analysis of the instructor evaluation forms.

Document collection is viewed as one of the four primary types of data collected in qualitative studies (Creswell, 1998). The course evaluation forms can be considered documents that are a "primary source" because the originator of the document is recounting firsthand experience (Merriam, 1998, p. 122). Using a five point Likert scale, where one represents inferior and five represents superior, candidates assessed the course in six areas: (a) presentation of goals and purposes, (b) command of subject matter, (c) presentation of course material, (d) evaluation methods, (e) provision of opportunities to increase candidate's knowledge, and (f) overall performance of the instructor. When faculty report evidence of teaching performance on a yearly basis, an average score for each of the six areas is calculated to create an overall average for the course. In addition to the six qualities assessed, space is provided at the end of the form for candidates to write comments.

In the Fall 2000 semester, 15 candidates completed the course evaluation with 14 candidates (93%) providing written comments. Nineteen candidates out of 28 (68%) provided written comments for the Spring 2001 semester, and 18 candidates (95%) from the Fall 2001 semester provided written comments. A total of 51 written comments over the course of three semesters were received from 62 candidates (representing an 82% response rate).

In qualitative studies, a form of content analysis is used to analyze documents (Merriam, 1998), and it is permissible to report frequency (Berg, 2001; Creswell, 1998). In a deductive approach to content analysis, researchers used a categorical scheme suggested by a theoretical perspective (Berg, 2001). In the study reported here, each of the 51 comments written by candidates was analyzed using Hall and Hord's (2001) Stages of Concerns from the Concerns Based Adoption Model. Written statements were coded according to the definitions of each Stage of Concern (SoC). A percentage for each SoC was calculated by totaling the number of written comments at each stage of concern for each semester, dividing by the total number of concerns, multiplied by 100.

At times in a change process, and especially at the very beginning, participants may reflect few concerns about the innovation because they have limited awareness of the innovation or they are concerned about other things. Concerns of this nature are placed in Stage 0 Awareness. In the current study, no Awareness concerns were stated by the teacher education candidates. This can be attributed to the fact that the course evaluations occurred at the end of the semester, after the candidates had

participated in the full scope of the innovations. Self concerns are comprised of Stage 1 Informational and Stage 2 Personal. Informational concerns indicate interest in knowing more about the innovation(s), e.g., "*I need to know more about how this program works*." Personal concerns reflect uncertainty about the demands, expectations and the person's ability to succeed, e.g., "*I felt in the dark so much of the time*," and "*It was very frustrating at times not knowing how to do something*." Task, or Stage 3 Management concerns, are those where attention is focused on the time and tasks of using the innovation. In the current study, candidates' comments were coded as Task concerns when they expressed concerns related to their use of technology, e.g., "*Putting the I-movie/Power Point together was trying*," and "*The instructors expected us to learn Dazzle*."

There are three stages of Impact concerns: Stage 4 Consequence, Stage 5 Collaborating, and Stage 6 Refocusing. These are the areas of concern that focus on reflections about what can be done to further enhance student learning. Candidate comments were coded Stage 4 Consequence when their expressions dealt with what they were learning and how it could be applied to their teaching students, e.g., "*I learned new strategies for my kids and I learned new ways to use technology*." There were no candidate statements that suggested concerns related to Stage 5 Collaboration or Stage 6 Refocusing.This makes sense in that they were at the beginning phase of learning about teaching, schools, and uses of technology.

Findings

From the analysis of the data, two major findings emerged. As shown in Table 3, there is a trend from lower evaluations of the course in the first term to higher evaluations in the third term (see Table 3)**.** This trend suggests several important considerations:

1. Course evaluations of faculty who are in the early stages of implementation of an innovation are likely to be low.

2. It is possible to see a positive trend in course evaluations over time.

3. There is a risk for instructors and teacher education candidates in implementing innovations.

Concerns of Candidates

The first finding is that there was a qualitative shift in the concerns expressed by candidates. As summarized in Table 3, in the first semester of the implementation, the majority of candidate concerns were Self oriented. In the second semester, even though the candidates were a new cohort, their concerns were more varied and included Self, Task, and Impact concerns. By the third semester of implementation of the innovation bundle, the majority of candidate concerns were Impact concerns.

Table 3
Percentages of Written Comments for Self, Task, and Impact Stages of Concern

Term	Overall Course Rating	Self Concern Statements	Task Concern Statements	Impact Concern Statements
Fall 2000	n = 15 3.76	71%	14%	14%
Spring 2001	n = 28 4.23	58%	5%	37%
Fall 2001	n = 19 4.71	17%	17%	63%

This pattern of concerns is supported by other sources of data. Results from an open-ended question on the Fall 2000 technology use survey indicated that all of the candidates saw a need for increased technology training during the semester, especially in the areas of PowerPoint and creating digital movies. Technology concerns in the third semester were less frequent. Candidates in the third semester indicated a high perceived ability to engage in video production and in presentations skills. Additionally, candidates in the third semester were better able to articulate how they would use technology in their classrooms to facilitate learning. During the Spring 2001 midterm interviews, for example, candidates noted that they would use technology for a variety of purposes: to reinforce material, to enhance student learning, and to motivate students. One candidate commented that she would use technology in her classroom "*when it can help students in their learning and understanding of concepts I am trying to teach*." Using technology to enhance student learning is certainly a goal of technology integration, and as the candidates' comments reflect, these kinds of Impact concerns had been aroused by the third semester.

Level of Use Related to Stages of Concern

The second finding suggests that there is a relationship between candidates' Stages of Concerns and instructors' Level of Use (LoU). Levels of Use (LoU) researchers have documented that nearly all first time users of an innovation will be at Level III, which is called Mechanical Use. When the innovation user is learning how to use the innovation, they can be inefficient in using the innovation. They are unable to predict typical candidate mistakes and find it difficult to plan more than one or two class sessions ahead.

In the first semester, the instructors' Level of Use was Level III Mechanical. They focused on how to use the technology; planning was on a day-to-day basis. Candidate written comments on the instructor evaluation forms corroborated this

(e.g., "*This class needs to be more organized*," and "*I felt that the professors should have had a better understanding about the technology so the class would have run smoother*" [sic]).

In the second and third semesters of implementation, the instructors' LoU could best be described as Level IVA Routine (Hall & Hord, 2001). The instructors became more proficient in using the technologies that they expected their candidates to use and routine ways of working with the technology were established. Candidate concerns were no longer as focused on uncertain demands regarding technology use. Instead, candidates were able to devote more of their energies toward thinking about ways to use the technology within their future elementary classrooms.

Levels IV B Refinement and V Collaboration are important in this study since both instructors operated at these two levels in their teaching in general. However, their Level of Use varied significantly as they went about developing and implementing the innovation of a different approach to a teacher education course. In addition, their LoU changed as they gained experience from semester to semester in delivery of the new course. When comparing instructor Levels of Use to candidate Stages of Concern, it appears that when level of use is Mechanical, candidates' concerns tended to cluster at the Self stage. As their instructors became more competent, however, candidates' concerns moved to Task and Impact concerns.

Discussion

The authors agree with the assertion by Morey, Bezuk, and Chiero (1997) that technology can be a valuable resource for improving teacher education. In particular, the use of technology can ground the program in real-life situations (Kenny, Andrews, Vignola, Schilz, & Covert, 1999). The teacher education candidates in this study observed and participated in real-life situations that required the use of technology. This participation was likely made possible only through the use of technology. However, it is also important to recognize the several challenges and risks that are associated with implementing innovations as discussed below.

Change is a Process, Not an Event

One of the principles of change outlined by Hall and Hord (2001) is that "change is a process, not an event" (p. 4). Although the original innovation bundle remained constant, implementation of the innovations required revisions in each semester. For example, the instructors found it necessary to introduce the technology skills involved with imaging devices more gradually, instead of bombarding the candidates with consecutive days of workshops and lab time immediately prior to their teaching projects. This was accomplished by introducing a simple imaging device early in the semester and providing time in-class for groups to experiment with the technology prior to using it in their elementary classrooms.

Attending to Candidate Concerns

In retrospect, the authors became aware of the importance of attending to candidates' Stages of Concerns when implementing an innovation. In the first semester, for example, candidates' Self concerns as reflected by their comments on the instructor evaluation forms were not addressed. The candidates were uncertain about the demands of the technology projects they were expected to complete. Simply reassuring candidates that they would be successful over time did little to resolve their feelings of frustration. By the third semester, however, candidates could review technology products that were completed by candidates in the earlier semesters. Providing concrete examples, along with detailed criteria for grading, seemed to decrease candidates' Self concerns. Self concerns in the third semester decreased to 17% compared to 71% in the first semester.

Task concerns about using the technology fell to 5% in the second semester. The decrease in Task concerns is attributed to the instructors' increased focus on trying to help candidates become more proficient with using imaging devices and editing software. The graduate assistant for the second term, a Ph.D. candidate in Educational Technology, provided technology workshops during class time and procured more access to the computer lab for the candidates. She was available during open lab time to assist candidates. Having ready access to a technology expert seemed to reduce candidates' Task concerns. When this particular graduate assistant was no longer available for the third semester, there was a return to candidates voicing more Task concerns.

In the final semester, the majority of candidate concerns (63%) were Impact concerns. This represents tremendous growth for candidates and for instructors. As the instructors became more proficient with using the imaging devices and editing software over the course of three semesters, they were able to assist candidates with more of their questions and glitches, thereby reducing their Task concerns. Self concerns were attended to by making explicit the criteria for success and offering encouragement. As the instructors advanced beyond LoU III Mechanical, they focused more effectively on addressing candidate Impact concerns. The instructors described ways that candidates could use technology with their elementary school students. The candidates were engaging in a high level of professional dialogue as evidenced by their rich discourse about specific strategies, why teachers teach the way they do, and how they might use similar technologies in their own classrooms.

Stages of Concern and Levels of Use

The relationship between instructors' Level of Use and candidates' Stages of Concerns has been interesting to explore. In the first semester, it is clear that the instructors were not effective at attending to candidates' concerns because they were so heavily focused on their own Task concerns and their efforts to revise the course. When instructors try a new approach that is not familiar to their candidates, it seems that both will have concerns, especially Self and Task.

Given the uncertainties and lack of finesse in teaching the revised course, if the instructors had understood Stages of Concern, they could have predicted that candidates would have higher Self and Task concerns. Even though the instructors viewed themselves as excellent teachers, their focus on their own Self concerns meant that they did not anticipate and address the Self and Task concerns of the candidates. That initial course evaluations were disappointingly low should not have come as such a surprise. In the future, when implementing any innovative approach, the instructors will be more attentive to addressing the concerns of teacher education candidates. Still, it seems reasonable to expect two things: a) the first time an innovative approach is tried, it will be at a Mechanical Level of Use, and b) no matter how well instructors design the innovations, course evaluations are likely to be lower than they will in subsequent semesters when instructors are more proficient in using the innovations.

Implications

Based on the experience of implementing a bundle of innovations in one teacher education course, several implications emerge. First, early in implementation, it is necessary to spend time and energy focusing on the "low-level, nitty-gritty tasks" (Hall & Hord, 2001, p. 84) that are a naturally occurring part of the change process. Rarely will first use of an innovation be highly polished. Second, implementation of innovations in teacher education must accommodate the Stages of Concerns for both candidates and instructors. Developing instructor competence in technology use was a key to moving beyond students' concerns about Self, for example. As unrealistic as it is, if the instructors had been able to solve more of the low-level tasks associated with their own technology use, perhaps the initial semester would have met with more success from the candidates' perspective. As one candidate noted, "*Had they known more about the technology, I would given them the highest rating*." Alleviating students' concerns became possible as the instructors gained technology competence.

Reviewing teacher education literature and the literature on integrating technology can help to anticipate candidates' concerns regarding the innovation. Kagan (1992) asserts that it is important to take into account the developmental needs of preservice teachers when considering program revision. For example, Kagan found that candidates are obsessed with classroom management. This was reflected by a statement from one of the candidates in the current study, who commented that "*to make this class better maybe we should spend more time concerned with classroom management instead of the technology aspect*." Addressing management concerns within the context of teaching with technology might be one strategy for responding to candidates' concerns.

Candidates have a tendency to judge the quality of what they encounter on the grounds of perceived practicality (Stuart & Thurlow, 2000). It is important then, to make explicit connections between technology learned at the university to the ways in which the technology can be used in elementary classrooms. For example, one

candidate made the university-elementary school connection by stating, "*We had the opportunity to work with new technology that we can use when we are teachers*." In their report of an approach to integrate technology into field experiences, Strudler and Grove (2002) noted that while program planners tend to focus on a project's overall goals, candidates are often concerned with logistical issues, requiring clearer expectations and communication between the university and the field. Some of the candidates' written comments seemed to echo this finding, e.g., "*Instructors need to be a little more straightforward with students*," and "*The assignments needs to be explained more fully and in more detail.*" By examining the developmental aspect of candidates' Stages of Concerns as well as the literature, it is possible to anticipate more accurately the concerns of teacher education candidates.

An unintended consequence of the commitment to innovation in teacher education emerged as a result of the relationship between Levels of Use, Stages of Concern, and overall course evaluations. Other researchers have documented that when instructors implement new approaches, there are likely to be more Self concerns expressed by students. The combination of instructor Mechanical Use and candidate Self concerns seems to be related to lower overall course ratings. When this occurs, there are risks for those instructors who engage in implementing innovations. When course evaluations are used as the basis for making merit pay decisions or as part of promotion and tenure decisions, there is risk if the context of change processes is not appreciated. If faculty teaching performance is appraised one year at a time, instructors who are in the early stages of implementing reforms are likely to be penalized because of low evaluations. Unless members of the peer review committee, and the chair or the dean, recognize what is occurring, the decreased ratings on course evaluations can be a disincentive for those who are attempting innovation in teaching. In particular, when new and untenured professors implement innovations, they may be discouraged from continuing innovations when low course evaluations are the result.

As has been reported elsewhere, candidates are exiting with higher levels of skill and competence in their use of technology in teaching (Olafson & Quinn, 2003; Olafson & Quinn, 2002; Quinn & Olafson, 2002; Olafson & Quinn, 2001). The authors appreciate what it takes to implement major changes in a single course. National standards of ISTE and NCATE provide expectations for what quality teachers need to know and be able to do. The results of the current study emphasize the developmental nature of the effects of an innovation; that is, progress occurs incrementally for both instructors and teacher candidates. The end result is that teacher education candidates are better prepared and more confident about using the innovation.

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