Utilizing the Concerns-Based Adoption Model to Facilitate Systemic Change

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Technology plays an integral role in American life. Technological tools have become essential for the effective operation of businesses and as a primary means for people to acquire information. The technological age has increased the demand for well trained, highly educated personnel. Education has long been attracted to technology's promise and potential. The hope is that computing and instructional technologies will yield new levels of educational productivity and excitement for the learner.

The American educational system has a responsibility to prepare students to live and work in this technological age. As K-12 instructional technologies expenditures rise over $2 billion (Green & Eastman, 1994), some worry that training teachers may be an afterthought. For technology to have an impact on education, more than access to equipment is required. Educators need to learn to effectively use these new instructional tools. The integration of technology needs to be a systemic change effort.

There are significant pressures to prepare new teachers to effectively use technology (National Council for Accreditation of Teacher Education, 1993). Some have called for systemic restructuring of our educational system so that it can better meet current and future educational needs. The ultimate goal for many educators is to seamlessly integrate technology in the classrooms so it becomes an integral part of the educational environment.

To prepare preservice teachers to work in a technologically rich environment and become part of a systemic change effort, ways to infuse effective uses of instructional technologies into teacher preparation programs must be developed. However, little evidence exists to show that computers and information technologies have become an integral part of the classroom (Denk, Martin & Sarangarm, 1993). The promise that technology would aid student learning, nurture professionalism and allow teachers to become facilitators of learning, instead of providers of knowledge, has yet to be realized in most educational settings.

LeBaron and Bragg (1994) state that current preservice teachers graduate with skills similar to those of teachers who graduated thirty years ago. With few exceptions, instructional technologies are typically presented to preservice teachers in a manner which fails to model the seamless integration of technology into the classroom (Lampert & Ball, 1990; LeBaron & Bragg, 1994). For instructional technology to truly become integrated within the school classroom and achieve a systemic restructuring of education, appropriate integration of these technologies must be defined, modeled, and mentored for the preservice teacher. The systemic integration of technology requires time and carefully planned strategies to facilitate the adoption process.

Systemic Change

Systemic change can be facilitated by promoting a mindset that includes strategies or methods that are used to understand education (Jenlink, Reigeluth, Carr, & Nelson, 1996). Systemic change 'recognizes the interrelationships and interdependencies among the parts of the educational system, with a consequence that desired changes in one part of the system are accompanied by changes in other parts that are necessary to support those desired changes" (Jenlink, et al., 1996, p. 22). The premise presented in this paper is that preservice teacher education, by following these guidelines, promote and support systemic change efforts.

The purpose of this study was to use the Concerns-Based Adoption Model (CBAM) to evaluate a systemic change effort which promotes the integration of technology abilities of entry level teachers (teachers moving from the preservice learning environment to positions as first-year teachers). This study involved identifying preservice teachers concerns about integrating technology into the classroom and their ability to integrate technology with their instruction.

Methodology

Subjects

Subjects were 27 preservice teachers in urban public schools along the Colorado Front Range. The student teaching program is designed to mentor the development of effective teaching strategies and the use of technology in the classroom by preservice teachers. The program utilizes an on-site cooperating teacher and a consultant from the university to mentor the student teacher. The mentor's work is supplemented by bi-monthly seminars which the student teachers attended during the semester. Further, the university consultant visits the student teacher a minimum of six times during the semester and evaluates the student's teaching during a minimum of four of those visits. A standardized form is used to evaluate the student's performance and is designed to provide the student with constructive feedback, both positive and negative.

Concerns-Based Adoption Model (CBAM)

The Concerns-Based Adoption Model (CBAM) was used to evaluate the participants' concerns and level of use of technology within the classroom. CBAM was developed by the staff members of the Research and Development Center for Teacher Education at the University of Texas. They recognized that educators involved with change were having the same types of concerns about innovations that Fuller (1970) had identified in her studies relevant to teaching. The concerns that arose were not limited solely to teaching but related to concerns which developed during the adoption of any educational innovation (Hall & Hord, 1987).

CBAM sets forth several assumptions and assertions based upon the implementation of innovations in colleges and school settings. They established the following perspective for observing the change process (Hall & Hord, 1987):

1. Change is a process, not an event, and it takes time to institute change;
2. Individuals must be the focus if change is to be facilitated and institutions will not change until their members change;
3. The change process is an extremely personal experience and how it is perceived by the individual will strongly influence the outcome;
4. Individuals progress through various stages regarding their emotions and capabilities relating to the innovation;
5. The availability of a client-centered diagnostic/prescriptive model can enhance the individual's facilitation during staff development; and
6. People responsible for the change process must work in an adaptive and systematic way where progress needs to be monitored constantly.

CBAM addresses three assumptions: the individual's concerns about the innovation, the particular manner in which the innovation is delivered or implemented, and the adaptation of the innovation to the individual through three diagnostic dimensions. The Stages of Concern (SoC) measure addresses the intensity of the feelings and perceptions that the individual adopting the technology is expressing. The Levels of Use (LoU) measure addresses behaviors related to how the individual uses the technology. Finally, Innovation Configuration Maps (ICMs) require the development of word maps that describe the operational components of an innovation and how each can be adapted, re-invented, or in some cases mutated (Dirksen & Tharp, 1996). In the following sections, the SoC and LoU dimensions of the diagnostic measures will be described in greater detail. The ICM dimension was not used in the present study.

Stages of Concern. According to Hall and Hord (1987) the process of change can be more successful if the 'concerns' of the individual, as identified in CBAM, are considered. The concept of concerns is defined as: "The composite representation of the feelings, preoccupation, thought, and consideration given to a particular issue or task" (Hall, George, & Rutherford, 1979, p. 5). The SoC Questionnaire provides a quantitative measure of the intensities of the seven Stages of Concern dimensions (Hall & Hord, 1987):

0. Awareness—concern or involvement with the innovation.
1. Informational—gaining more information about the innovation such as general characteristics, effects, and requirements for use.
2. Personal—how the innovation relates to the individual (i.e., role, decision making, consideration of potential conflicts).
3. Management—the mechanics of using or integrating the innovation.
4. Consequence—the effect of the innovation on students.
5. Collaboration—coordinating efforts in using the innovation with others.
6. Refocusing— the exploration of other ways to utilize the innovation or improve upon the innovation.

The SoC Questionnaire contains 35 items representing the seven stages. Respondents are asked to rate each item on a scale of zero (not true of me now) through seven (very true of me now). Peak or predominant Stages of Concern, and the relative intensity of the other concern stages, are plotted from the percentile scores (Hall & Hord, 1987).

A Stages of Concern profile graphically represents the relative intensities of each concern toward an innovation in each of the seven Stages of Concern. The profile pattern, taking note of the highest peaks, characterizes the concerns of a nonuser, inexperienced user, experienced user, or a renewing user. The shape of the concerns profile typically

changes as the user moves through the change process, shifting from on emphasis on self concerns to task to impact concerns.

During the course of this study, SoC Questionnaires were administered to participating student teachers on three separate occasions. The questionnaires focused on the student teacher's concerns about integrating technology in the classroom. Questionnaires were administered during the student teacher's regularly scheduled seminars. The first questionnaire was used to establish a set of baseline data; the remaining two questionnaires were used to determine how their concerns changed during the course of their student teaching experience.

Levels of Use. Levels of Use provides a key ingredient for understanding and describing the implementation process of an innovation. Data collected from LoU interviews can provide useful insights about staff development, evaluation, planning and facilitation for leaders and change facilitators. According to Hall and Hord (1987), Levels of Use focuses on the behaviors that are or are not taking place in relation to the innovation. The Levels of Use include three nonuser descriptions:

0. Nonuse—little or no knowledge of the innovation.
I. Orientation—acquiring information about the innovation.
II. Preparation—preparing to use the innovation and five user descriptions (Hall & Loucks, 1976):
III. Mechanical—focused on the mechanical day-to-day aspects of using the innovation.
IVA. Routine—comfortable with the innovation with little preparation and not planning to change how the innovation is used.
IVB. Refinement—working to improve their personal use of the innovation.
V. Integration—is working with colleagues in a collaborative effort to use the innovation.
VI. Renewal— reevaluating the innovation seeking to make major modifications to the innovation.

Typically a person will move in sequence from Level of Use 0, Nonuse, to Level of Use IVA, Routine; assuming that the innovation is appropriate, the leader and other change facilitators fulfill their roles, and time is provided.

In this study, an LoU Interview was conducted with each student teacher at the conclusion of their student teaching experience to determine their Level of Use upon exit from the program. The student teacher's Level of Use will, in part, determine their ability to integrate technology within the classroom as part of a greater systemic change.

Data Analysis

A percentile score was determined for each of the seven stages in the SoC questionnaire. Participant's scores formed a profile that was examined qualitatively. The LoU Interviews were scored using a rubric created by Hall and his associates at the University of Texas. The rubric provides a behavioral description of each LoU relevant to: (a) knowledge, (b) acquiring information, (c) sharing, (d) assessing, (e) planning, (f) status reporting, and (g) performing. The data obtained from individual student teachers were compiled and comparisons made between student scores. Trends were identified and outliers explored in greater depth.

Results

Stages of Concern

For students entering the student teaching experience, their Self concerns (awareness, informational, and personal) were high. Task and Impact concerns were less evident. Previous research, indicates that this should be expected. "Concerns at this point have to do with feelings of potential inadequacy, self-doubts about the knowledge required, or uncertainty about the situation they are about to face. Typical statements reflecting these types of concerns are: 'I wonder if I know enough to teach them.' 'Will I be able to control them?'" (Hall & Hord, 1987, p. 57).

The results of the second SoC indicated higher Task concerns (management). This instrument was administered midway through the semester. As student teachers transition into the role of teacher, concerns regarding: logistics, classroom management, and preparation are expected to increase (Hall & Hord, 1987). As students begin to observe the new role of the student teacher, they place added demands on the student teacher's time and on their ability to manage the classroom.

As the student teachers progressed through their student teaching experience, Impact concerns (consequence, collaboration and refocusing) increased in intensity. "Ultimately, teachers can become predominately concerned about how their teaching is affecting students and about how they can improve themselves as teachers" (Hall & Hord, 1987, p. 57). At the conclusion of the experience their overall concerns regarding instructional technology were intensified.

Levels of Use

Upon exiting their student teaching experience, the student teachers' LoUs ranged from Level I through Level IVA. The percentage of nonusers was 20%, while the users were 80%. However, the heaviest grouping of users were Level III, Mechanical, at 54%. The remaining student teachers were at Routine LoU. Only 26% of the entry level teachers are prepared to integrate technology within the classroom.

Discussion

The first use of an innovation tends to be disjointed and erratic. Most new users cling to the user's guide and concentrate on the day-to-day uses more than considering long term uses. Hall and Hord (1987) indicate that individuals typically remain at the mechanical level for an

extended period of time. As the user becomes experienced, they move into Level of Use IVA, Routine. Once a user reaches a Routine Level of Use**,** they typically fall into a comfortable pattern for using the innovation. As users move toward the higher Levels of Use (IVB Refinement, V Integration, and VI Renewal), adaptations are intended to improve the effectiveness and positive outcomes of using the innovation (Hall & Hord, 1987). The user's focus is on increasing effects with students.

Systemic integration of technology depends upon the faculty and staff receiving training and guidance if the vision is to become reality. This is a process that should begin with student teaching and extend through the first few years of actual teaching. Many preservice teachers leave college using the skills they have learned at a mechanical level of use. This level of use is easily deteriorated (Hall & Hord, 1987). Mechanical level users fall back on their most comfortable methods which are not always productive. To ensure that novices progress beyond a mechanical level of use so that they can participate in a systemic change effort involving the integration of technology within the classroom, a procedure for mentoring them in the continued use of instructional technologies should be instituted. In this program, student teachers progressed through the Stages of Concern as expected. During the mentoring process the concerns of the student teacher must be addressed to help them adopt the innovation.

Teacher preparation programs must model the integration of instructional technologies within effective instructional practices that will prepare preservice teachers to facilitate classrooms which are rich, informational, computer-mediated environments (Bandura, 1986; Fullan, 1993). Research on educational change strongly supports the notion that innovations will not be implemented in schools simply because the change makes sense and meets specified needs (Fullan, 1991). Modeling promotes adoption by socially instructing people about new ways of thinking and behaving as they demonstrate the innovation.

Summary

The adoption of instructional technologies and the movement through the change process requires time and appropriate intervention strategies to be successful. This study has presented a perspective for the integration of technology within the classroom through a systemic change process. One means of achieving this is through modeling and mentoring technology integration within the teacher preparation program. The components of CBAM can be used to bring about systemic change in education by evaluating progress in the change process. The concerns-based approach requires the understanding that a school does not change until each individual changes throughout the whole system (Hall & Hord, 1987). Concerns and use data, along with the mentoring of preservice educators, can provide a foundation for a ground-up approach to effect systemic change in education.

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