Empowering Teachers Through Technology

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Teacher retention is a complicated issue involving numerous characteristics and processes (Shen, 1998). According to Certo and Fox (2002), a number of public school teachers exit the profession before completing their initial year in the classroom, more than 20% of public school teachers vacate their positions within their first three years of teaching, and almost 30% of the educators leave within five years of entering the profession. In a recent survey two out of five teachers interviewed have, at one time during their teaching careers, seriously contemplated leaving the teaching profession for teaching is "a profession where the most successful practitioners are promoted away from the heart of the enterprise; as if work in the classroom were to be despised" (Sockett, 1996, p. 25-26).

The complexity of teacher attrition and retention is based on the multiple personal factors presented by teachers for leaving or staying. Certo and Fox (2002) identify common themes and patterns related to teacher attrition and retention: (1) commitment to the profession, (2) quality administration, or (3) appreciation for collegial relationships. Educators are concerned about salary/benefits, external employment opportunities, and building level administrative issues, including teacher placement practices, unscheduled meetings, excessive paperwork, class size, lack of parental support, student attitudes, discipline policies, and resources/supplies. Focus group teachers described instructional materials and functional, current technology as inadequate.

In the field of education “getting a new idea adopted, even when it has obvious advantages, is often very difficult” (Rogers, 1983, p. 1). Technology is one of the potentially advantageous ideas yet to be fully and equitably realized within all scholastic

realms. Practicing teachers may be deficient in technological capabilities and computer skills, or lack the pedagogical foundations behind them, to implement progressive instructional strategies or support student achievement. In order to provide graduate-level students with the opportunity to acquire appropriate levels of proficiency, Drury University has developed a course, Technology in the Classroom (SCI 620), as a means of imparting both the technological skills and the pedagogical foundations to use them effectively in the classroom.

The purpose of this research is to ascertain how well graduate students are adapting to the introduction of an innovation, in this case technology in the classroom. The research is also interested in students' perceptions of empowerment relative to the use of technology in the classroom.

The Concerns-Based Adoption Model

The Concerns-Based Adoption Model (CBAM) was developed in order to facilitate the diffusion of innovations. It implies a systematic approach to getting new ideas and procedures adopted by potential clients. Within the CBAM, incremental levels that indicate how far the diffusion of the innovation has progressed include:

1. Awareness: persons indicating concerns at this level are usually non-users, they typically have no concerns about the innovation because they are not using it (Hord, Rutherford, Huling-Austin, & Hall, 1987 p. 31).
2. Informational: persons indicating concerns at this level are also non-users, but they wish to know more about the innovation. In particular they want to know what it is and how similar to and different it is to what they already use (Hord, et. al, 1987, p. 31).

3. Personal: persons indicating concerns at this level are typically non-users who wish to know when the new program will begin, the kind of preparation they will receive, the source of the new program, who is endorsing it and why, and how it is supposed to work (Hord, et. al, 1987, p. 31).
4. Management: persons indicating concerns at this level are typically those who are making final preparations to implement the innovation or are in the very beginning stages of diffusion. Concerns at this level revolve around readiness and organization (Hord, et. al, 1987, p. 31).
5. Consequence: persons indicating concerns at this level are users whose most intense concerns are how the innovation is affecting their students (Hord, et. al, 1987, p. 32).
6. Collaboration: persons who indicate concerns at this level are users who are interested in how to collaborate with others to improve the outcomes of an innovation (Hord, et. al, 1987, p. 32).
7. Refocusing: persons who indicate concerns at this level are users who have used the innovation with efficiency for an extended period and are concerned about finding even better ways to use the innovation to reach and teach students (Hord, et. al, 1987, p. 32).

Non-users of an innovation tend to have their highest concerns at stages 0, 1, and 2 and their lowest concerns at stages 4, 5, and 6. The most common concerns profiles for users of an innovation have single peaks at stages 3, 4, 5, or 6. Individuals who are actively using the innovation typically have peaks at one of these stages, although it is not

uncommon for individuals who are using the innovation to have multiple peaks (Hord, et. al, 1987).

Over the course of time innovators want to see the profiles of users demonstrating levels of concern at higher stages. This is accomplished through interventions designed to increase the use of an innovation. The diffusion of an innovation is complete when individuals reach the refocusing stage of concern.

The content of the technology courses is designed to provide practicing educators with an opportunity to refine their technological skills and develop pedagogical strategies. Graduate students are expected to conduct and present research concerning technology and the learning process. The main software programs used include Microsoft Power Point, Microsoft Publisher, Microsoft Word, and the Internet.

The Stages of Concern are determined using the Stages of Concern Questionnaire (SOCQ) an instrument containing 35 items divided into seven subscales corresponding to the seven stages of concern. The response format is an eight point Likert-type scale anchored from (0) irrelevant to (7) very true.

The School Participant Empowerment Scale

The second instrument used for this study is the School Participant Empowerment Scale developed by Short and Rinehart (1992) as an instrument to determine the empowerment of school participants. The School Participant Empowerment Scale (SPES) is a 38-item instrument containing six subscales: Decision Making, Professional Growth, Status, Self-Efficacy, Autonomy, and Impact. The response format is a five point, Likert-type scale with anchors of strongly disagree (1) to strongly agree (5).

The articulation of an expansive educational vision should include the view that teachers are empowered intellectuals capable of reflective attitudes permitting them to exercise administrative influence over their domain. Short and Greer (1997) recognize teacher empowerment as a "complex construct" (p. 134) and define empowerment “as a process whereby school participants develop the competence to take charge of their own growth and resolve their own issues” (p. 134). Six dimensions of teacher empowerment have been identified to include involvement in decision making, teacher impact, teacher status, autonomy, opportunities for professional development, and teacher self-efficacy (Short, 1994).

1. Decision making is an essential aspect of teacher empowerment that promotes the direct involvement of teachers in the decision-making process as legitimate participants (Short, 1994).
2. Professional growth relates to the "teachers' perceptions that the school in which they work provides them with opportunities to grow and develop professional, to learn continuously, and to expand one's own skills through the work life of the school" (Short, 1994, p. 490).
3. Status perceived by teachers is created through professional esteem and collegial respect (Short, 1994).
4. Self-efficacy is established through the teachers' perceptive recognition that "they have the skills and ability to help students learn, are competent in building effective programs for students, and can effect changes in student learning" (Short, 1994, p. 490).

5. Autonomy includes controlling the conditions of one's professional work life through the "freedom to make certain decisions" (Short, 1994, p. 491).
6. Impact is the capability of having a tangible effect or observable influence on the areas of school life that teachers recognize as important (Short, 1994).

Literature indicates a lack of clarity regarding the role expectations and aspirations of teachers, which can impact personal self-efficacy and professionally competency (Enderlin-Lampe, 2002). Davis and Wilson (2000) claim "teacher empowerment in many schools has expanded the role and involvement of teachers" (p. 349). Shen (1998) states that "to empower teachers is one of the ways to improve teacher retention" (p. 87). Empowerment is linked to "an individual's sense of personal power and motivation" (Davis & Wilson, 2000, p. 349).

Employment-related variables associated with attrition of educators include a lack of involvement in decision-making and a dearth of support from administrators, colleagues and parents (Gonzalez, 1995). The five dimensions of empowerment identified by Short and Rinehart (1992) coincide with the attrition factors described by Gonzalez (1995). Teachers "become disillusioned with education when the people with whom they must work, administrators, parents, and others in the community, devalue their importance (Marlow, Inman, & Betancourt-Smith, 1996).

Method

Graduate level courses for the Master in Education (M. Ed) program at Drury University in the area of science and mathematics (SCI) "are designed to supplement the training of the general or specialized teacher, broadening the student's background in the

various fields of science" (http://www.drury.edu/cgcs/catalogs/gradcatalog.pdf). Technology in the Classroom (SCI 620) at Drury University's Fort Leonard Wood campus is a course that:

> is required for all programs leading to the master in education degree, and provides an introduction to educational technology. The focus includes how to operate the technologies, use the technologies to enhance personal productivity, and apply technologies in a learning/instructional environment. Students enroll for this course prior to completion of eighteen (18) hours of graduate credit. (http://www.drury.edu/cgcs/catalogs/gradcatalog.pdf)

During the 2002 fall semester, graduate level students enrolled in Technology in the Classroom (SCI 620) were asked to complete a Stages of Concern Questionnaire (SOCQ) at the beginning of the semester to gauge their levels of concern toward the use of technology in the classroom. The students also completed the School Participant Empowerment Scale (SPES). Comparisons were made between levels of concern indicated by the SOCQ and the SPES. At the end of the fall semester 2002 students responded to both surveys again.

SOCQ Results

In the fall 2002 semester the SOCQ (Stages of Concern Questionnaire) was given to students in SCI 620, Technology in the Classroom at Drury University. This questionnaire is designed to provide data allowing for the identification of stages of concern relative to the adoption of innovations. The innovation under consideration during this research project was multi-media technology applications in the classroom.

During the fall semester 2002 semester a total of nineteen students were enrolled. The SOCQ was administered twice during the semester, once in August at the beginning of the semester and again in December at the conclusion of the semester. Due to attendance and registration issues the researchers were not able to obtain a full complement of nineteen pre and post results. During the first administration of the SOCQ, 17 students completed the instrument. During the final administration, 16 students completed the instrument. Out of these students, 13 completed both the pre and post administration.

First Administration

In August 2002 students (n=17) demonstrated their highest concerns at Stage 0 (awareness). The concerns lessened through Stages 1-3 (informational, personal, and management), bottoming out at Stage 4 (consequence) before rising at Stage 5 (collaboration) and declining slightly at Stage 6 (refocusing). Table 1 shows the percentiles obtained during the first administration of the SOCQ.

Table 1

Stages of concern at first administration (n=17)

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Percentiles	89	84	78	65	30	44	42

Second Administration

In December 2002 students (n=16) demonstrated their highest concerns at Stage 0. The concerns declined at Stage 1 and rose slightly at Stage 2 before dropping through Stage 3 and bottoming out at Stage 4. Concerns rose markedly through Stages 5 and 6. Table 2 shows the percentiles obtained during the second administration of the SOCQ.

Table 2

Stages of concern at second administration (n=16)

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Percentiles	91	75	78	65	38	52	65

Discussion

In both samples the highest concerns appeared at Stage 0 (awareness), in fact, the percentile increased slightly between the first and second administration. This result is typically inconsistent with intervention strategies designed to diffuse innovations. A possible mitigating factor is that the composition of the two samples is not identical. Stage 1 concerns (informational) declined throughout the semester in response to material presented in class. The Stage 2 (personal) and Stage 3 (management) concerns were identical between the first and second administration. While this result is typically inconsistent with intervention strategies designed to diffuse innovations, the fact that concerns were higher during the second administration at Stages 4 (consequence), 5 (collaboration), and 6 (refocusing) indicate that students were focusing more closely on these stages in response to the diffusion process. This indicates that students had "bought-in" to the use of multi-media technology in the classroom.

Paired Responses

During the fall semester a total of 13 students completed both the first and second administration of the SOCQ. This enabled a true comparison on the results of the diffusion process attempted during the SCI 620 course.

First Administration

In August 2002 students (n=13) demonstrated their highest concerns at Stage 0. Concerns gradually declined through Stages 1-3 before bottoming out at Stage 4. This was followed by a marked increase to Stage 5 and a much slighter increase to Stage 6. Table 3 shows the percentiles obtained during the first administration of the SOCQ.

Table 3

Stages of concern at first administration (n=13)

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Percentiles	89	84	76	73	27	40	42

Second Administration

In December 2002 students (n=13) demonstrated their highest concerns at Stage 0. This was followed by a decline to Stage 1 and a slight increase to Stage 2. Lower concerns were indicated through Stages 3 and 4 with a strong increase through Stages 5 and 6. Table 4 shows the percentiles obtained during the second administration of the SOCQ.

Table 4

Stages of concern at second administration (n=13)

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Percentile	89	75	78	56	38	48	65

Discussion

In both samples the highest concerns appeared at Stage 0 (awareness). In the paired sample the percentile of concern at Stage 0 neither increased nor decreased. In a diffusion situation a reduction of awareness concerns is expected. There was a definite decrease in concerns at Stage 1 (informational) due to material presented in the course.

The slight elevation of concerns at Stage 2 (personal) indicates that the students, most of whom were classroom teachers were actively involved in cognition of the diffusion process. An elevated concern at Stage 2 indicates that respondents are processing how the innovation directly affects them. There was a dramatic reduction in Stage 3 (management) concerns during the course of the semester. This was in response to the course requirements that are designed to facilitate multi-media abilities in the classroom. The lowest concerns in both administrations were found at Stage 4 (consequence), this is typical for an SOCQ administration. The much higher levels of concern exhibited for Stages 5 (collaboration) and 6 (refocusing) during the second administration demonstrate that the interventions provided in the course were successful. Students in the SCI 620 course were actively involved in the diffusion process and were actively engaged in utilizing multi-media technology in the classroom.

SPES Results

The School Participant Empowerment Scale (SPES) (Short & Rinehart, 1992) is a 38-item instrument containing six dimensions: Decision Making, Professional Growth, Status, Self-Efficacy, Autonomy, and Impact. Each of the SPES statements is assigned to a particular dimension. For example, the dimension of Decision Making is determined by reviewing the responses to statements 1, 7, 13, 19, 25, 30, 33, 35, 37, and 38; whereas, the dimension of Autonomy is identified through statements 5, 11, 17, and 23. The responses are established through a five point, Likert-type scale that ranges from strongly disagree (1) to strongly agree (5).

The mean provides a sense of the arithmetical average score as “the best indicator of the combined performance of an entire group” (Ary, Jacobs, & Razavieh, 1996, p.

142). The total participant scores in the pre-assessment and the post-assessment, are illustrated in Table 5 and Table 6.

Table 5.

SPES: Total Dimension Pre-Assessment and Post-Assessment Mean Scores

EMPOWERMENT DIMENSIONS	PRE MEAN	POST MEAN
Decision Making	2.804196	2.958042
Professional Growth	4.24359	4.025641
Status	4.358974	4.230769
Self Efficacy	4.384615	4.294872
Autonomy	3.615385	3.788462
Impact	4.333333	4.320513
Total	3.927126	3.919028

Table 6.

SPES: Individual Dimension Pre-Assessment and Post-Assessment Mean Scores

	DIMENSIONS											
	Decision Making		Professional Growth		Status		Self-Efficacy		Autonomy		Impact	
RESPONDENT	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	4.33	5.00	2.73	3.55	4.17	4.50	4.33	5.00	3.25	4.25	4.17	4.83
2	4.33	4.33	3.00	3.27	4.00	4.50	3.00	3.33	3.00	3.00	3.83	4.33
3	4.50	5.00	3.00	3.19	4.33	4.83	4.33	5.00	3.74	4.50	4.67	5.00
4	4.00	4.17	2.45	2.90	4.00	4.33	4.00	3.83	3.00	4.25	3.83	4.33
5	4.67	3.83	3.18	2.73	4.50	4.33	5.00	4.83	5.00	4.50	4.67	4.50
6	2.67	2.00	1.82	1.09	4.17	4.00	4.67	4.67	1.75	3.75	4.33	4.33
7	4.00	4.83	3.27	4.00	5.00	5.00	5.00	4.83	4.75	3.75	4.67	5.00
8	5.00	5.00	2.64	3.82	5.00	4.83	5.00	4.83	5.00	5.00	5.00	5.00
9	5.00	3.00	3.45	2.09	5.00	3.67	5.00	4.00	4.25	3.00	4.83	4.00
10	4.33	3.17	2.90	3.27	4.00	3.17	4.17	3.50	3.00	3.25	3.83	3.17
11	4.17	4.17	2.63	3.27	4.00	4.00	4.17	4.00	3.75	4.00	4.17	4.00
12	4.83	3.83	2.36	2.00	5.00	4.00	4.67	3.83	2.75	2.50	4.67	3.83
13	3.33	4.00	3.00	3.27	3.50	3.83	3.67	4.17	3.75	3.50	3.67	3.82

The pre-assessment and post-assessment mean scores of the SPES provide pertinent perspectives regarding the specific dimensions. The total dimension pre-assessment and post-assessment mean scores (see Table 5) for the SPES shows an increase between the pre-assessment and post- assessment mean scores in the dimensions

of decision making and autonomy. Decision making promotes the direct involvement of teachers to resolve issues directly affecting their professional involvement in the education process. Technology has the potential to help teachers effectively collect data, access current research, and disseminate their ideas thereby empowering educators. Autonomy complements the decision-making process by giving teachers the personal control over the conditions of their professional work life. Teachers are able to use technology to contact students, parents, administrators, and peers through email messages and website components. They can also use the Internet to investigate issues on which they must make decisions.

Several of the individual scores (see Table 6) demonstrate increases in other dimensions defined by SPES. The respondents showing an increase in the dimension of Status might recognize the value placed on technology skills in education, as well as in other professions. Teachers are preparing students for employment positions that may not yet exist; therefore Self-efficacy allows teachers competently create effective technologically-based programs of learning for their students. Impact is having a tangible effect or observable influence on the areas of school life believed to be important to a particular teacher. The pervasion of technology in both societal and educational arenas allows teachers to use technology to achieve the influence deemed imperative to their professional fulfillment.

Concluding Observations and Prospective Research Goals

Teachers who consider leaving their positions if they are somewhat satisfied or dissatisfied with their careers cause schools to face the possible loss of significant professional talent. Empowerment is one element that has been associated with the

retention of teachers. Teachers constitute the core of any educational system. The retention of competent staff members to maintain professional and academic continuity is the goal of successful scholastic sites. Strategies, especially in the area of technology, to effectively retain educators in the teaching profession could be created through further investigation of teacher empowerment.

Additional data will be collected to continue to investigate the relationship between the Levels of Concern and the Dimensions of Empowerment. Additional plans for the on-going study will include collecting data from the SOCQ and the SPES instruments to address the following questions:

1. Which of the Levels of Concern correlate with the specific Dimensions of Empowerment?
2. Can a significant predictive association be determined between the Levels of Concern and the Dimensions of Empowerment?
3. Is there a significant difference between pre-service teachers and practicing teachers in their Levels of Concern and Dimensions of Empowerment?
4. What qualitative documentation can be used to record the Levels of Concern and the Dimensions of Empowerment?

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