

Educational Technology that Transforms: Educators' Transformational Learning Experiences in Professional Development

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Abstract: *Research conducted among 175 teachers engaged in learning educational technology reveals that transformational learning provides insights into their experiences of learning to use technology in their teaching. As facilitators and themes of perspective transformation are presented, recommendations for faculty development in educational technology are discussed.*

Purpose

Technology innovation is offering an opportunity for adult education to impact teachers' learning and practice. As changes in technology engulf us, we strive to find ways to keep pace and incorporate the new technology meaningfully and efficiently in our personal and professional lives. Like other professions, the field of education needs to respond to the demands technology innovation brings with it. This study presents grounded adult education research that can serve as a basis for making educational decisions about professional development of educators and their classroom practice.

A striking observation is that as we look at the need to incorporate technology into the education experience at all levels, adult education can play a critical role (King, 1997, 1999; Lawler & Wilhite, 1997). Adult learning theory and principles can provide a framework for examining and understanding the adult learning experiences of teachers learning educational technology, and recommend meaningful, effective, and andragogically sound guidelines for such experiences. This research study was undertaken with transformational learning theory as the perspective from which to examine educators' learning of educational technology. Research among educators and teachers-in-training learning educational technology provides answers to four research questions: 1) How many participants identified their experiences as transformational learning? 2) What do the educators recognize as promoting this experience? 3) What are the themes of this transformational learning? and 4) How might these learning experiences be characterized within the transformational learning framework?

Theoretical Framework

This research examines teachers' professional development as adult education. Therefore, just as Cranton (1996) introduced the concept of professional development as perspective transformation, this adult learning theory may be used to reveal new insights into educators' professional development in one timely and specific context, learning educational technology (King, 1999). Perspective transformation has dominated the adult learning theory literature in recent years (Cranton, 1997; Merriam & Caffarella, 1999; Taylor, 1998). This theory explains the process whereby adult learners critically examine their beliefs, assumptions, and values as they acquire new knowledge and experience a "reframing" of their perspective of circumstances, issues, and subsequent actions (Cranton, 1994; Mezirow, 1994; Taylor, 1998).

Since Mezirow first articulated the concept of transformational learning in the literature in 1978, there has been much discussion about the model in the field of adult education (Taylor, 1998). Recognizing that it has been difficult to delineate an all-encompassing definition of perspective transformation, Mezirow's definition (1990) is used in this research to offer a foundation for the initial examination of faculty development in educational technology. This on-going transformational learning research aims to further inform our understanding of educators' experiences of learning technology and its many consequences.

Research Methodology

This study was conducted with a convenience sample of 175 educators and teachers-in-training in private a graduate school of education in New York

City. A third of the participants were not matriculated in degree programs, but were participating in the courses through a subsidized program for teacher development. This distinctive afforded the investigation of the professional development experiences of teachers beyond the usual scope of traditional, matriculated graduate education students.

The participants were taking Master's level education courses where they learned, practiced, and discussed technology applications to the classroom. The courses were conducted in formats that included discussions, small groups, journal writing, synchronous and asynchronous on-line conferencing, presentations, and "hands-on" experience with technology. In addition to the 175 completed surveys, the participants wrote a total of 633 journal entries, and 19 reflective essays about the professional development learning experience. An adapted survey instrument (King, 1997, 1999) was used to initially identify those who had experienced a perspective transformation and to select 45 respondents for in-depth interviews. The final analysis of these data included individual effects, frequencies, proportions, and coding of free responses and interviews. While a causal-comparative model was used to identify effects learning activities (e.g., critical reflection, lab exercises) might have on perspective transformation, a phenomenological perspective of identifying emergent themes through constant comparison (Gall, Borg, & Gall, 1996) was used to analyze the substantial data source of survey free-responses, follow-up interviews, journal entries, and reflective essays in order to understand the adults' learning experiences. This research design of incorporating qualitative with quantitative methods offers a powerful means of examining these transformational learning experiences.

Participants

In order to fully understand and interpret the findings of this study, the participants are described by several demographic characteristics. These descriptors will assist in determining similarities and differences to other groups of educators. The sample was predominantly female (75.4 %, 132/175). Racial identification followed the distribution of White, non-Hispanic, 71.3%, Black, 10.9%, Hispanic, 8.4%, Asian or Pacific-Islander, 6.6%, and other, 2.4%. The mean age range was 30-39. In addition, prior levels of educational achievement were

primarily distributed among Bachelor's degrees (55.5%), Master's degrees (38.7%) and Doctorates (2.9%). While 34.6% of the participants were in their first semester of study at the university, 69.2% were in their first three semesters and a cumulative 91.2% were there six or fewer semesters. This demonstrates that the sample was composed of primarily new students as would be expected in Master's degree programs and courses. The mean number of years teaching was $M = 10.334$, with the range extending from 0 (teachers-in-training) to 40 years.

Findings

The following captivating quote is excerpted from a participant's reflective essay about her experience of personal and professional change while learning educational technology.

For the past five years, I have attempted to become familiar with computers. I wanted to learn about the Internet and bring its resources in the classroom but felt anxious about developing these skills. Needless to say, deciding to take a course in technology proved to be difficult because I was concerned about taking the risk and finding myself lost in technological jargon. At the beginning, the textbook readings were difficult to understand until I started doing my readings after our class discussions. I found that class discussions helped clarify many misconceptions I had about technology by allowing me to ask questions. Based on the challenging experience of writing the proposal, I learned to utilize and evaluate educational technology. I also learned to plan and use technology to enhance the curriculum through software and the Internet.

As a result of these changes in my understanding and views of technology and education, now I use technology in the classroom, help the children and their parents engage in internet based activities and provide them with web sites that correlate to the texts we use in class. I work with the children who do not have computers at home. I am beginning to display their "Story Soup" activities inside and outside the classroom. I have observed teachers and other students reading the stories. This is good! Hopefully by next year, the

children, parents, and teachers will be involved in several technology projects over the course of the year. Now I can share what I know with my colleague who is in the same situation I was four months ago, only now it won't be the blind leading the blind so much .

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This teacher describes her personal experience as she confronted her "disorienting dilemma" of learning technology and participated in the graduate education course. There were many results from this experience, but notably they include changes in how she involves her very young learners and their parents, plans her teaching and the curriculum, and seeks to assist her fellow teachers in doing the same. This educator aptly captures the experience that was recounted by many of the participants in this study.

Perspective Transformation

Analysis of the initial screening data suggests that 89.1% (156) of the 175 educators and teachers-in-training indicated having experienced a perspective transformation in the context of learning technology for educational purposes. At the very least, these findings indicate that some prominent aspects of perspective transformation are frequently experienced among this specific group of adult learners, teachers learning technology. Examination of these learning experiences from the perspective of transformational learning can assist us in understanding the profound changes educators experience in this setting and what facilitates the transformation.

Facilitators

Perspective transformations may have many contributors, however this study gathered information about three major categories of facilitators that were relevant to the teachers' learning and teaching experiences: learning activities, people, and the teaching situation. Participants indicated which learning activities contributed to their perspective transformation at the following frequencies: class discussions (40.6%), special computer-based projects (38.3%), "hands-on" lab experiences (37.7%), reflective activities (32.0%), assigned reading (30.0%), class exercises (28.0%), and below 25%, class presentations, journals, structure of the class, self evaluation, writing, and papers. (Please note that the respondents could indicate more than one con-

tributor, therefore, the total of percentages exceeds 100%.)

The educators repeatedly mentioned that the exchange of ideas among learners and professor were critical in revealing new possibilities for using technology in education. They learned a great deal by reading and hearing how other educators use technology and benefited from the opportunity to discuss possible applications for themselves. Such discussions and reflective processes were facilitated through several means including class discussions, electronic journals, reflective essays, small groups and online postings. In these ways, and as illustrated by our first quote, it is evident that the learning activities might not have impacted learning individually, or as discreet units, but instead worked in synergy to facilitate reflection, assessment, and transformation of views and perspectives.

Themes

The predominate theme of the educators' perspective transformation was empowerment. The teachers gained great confidence and expertise in using technology for educational purposes and the result was an excitement and empowerment in teaching.

Now that I'm comfortable with the Internet and have your web page as a guide I find myself investigating all sorts of educational sites - I've found some great sites for my teaching and I'm bookmarking them for myself. I also find myself looking ahead as to how the computer could be utilized in different educational scenarios.... I really liked the idea put forth in one of the articles we read where the author describes the computer not as just a "tool" but as a learning environment. I think that kind of describes the leap I made in this class - it can really be more than a tool - it's a challenge for educators to use technology this way - and I'm glad that I got to see that.

Based on the participants' accounts, learning educational technology truly transformed many of them into empowered professionals who look at the many tasks involved in teaching from a new frame of reference. Their journal entries, essays, and interviews confirm several themes of perspective transformation regarding educators' educational preparation, research, choice of learning activities,

objectives, and their worldview of education. Notable among these are three areas: an increased emphasis on both critical thinking skills and learner-centeredness, and a broader scope of education. As the accounts of these teachers are examined, it is evident that they are embracing a new perspective of their classrooms and the learning process. Educational technology is a means for them to transform their teaching from what they term "traditional," "teacher-centered," or "restrictive" to teaching and instruction that challenges students to explore, examine, and construct new knowledge. These teachers repeatedly state that technology is much more than a "tool" and instead affords a new way of thinking about and practicing teaching. As an adult educator, it is exciting to see that what we value in the andragogical model is not only being experienced by these teachers in their educational technology courses, but also being incorporated into their teaching practice.

Additionally, the theme of a changed worldview, or perspective, of education was prominent in the respondents' accounts. Rather than viewing technology as just an entryway to accessing information, one teacher points out that she sees a whole new world of opportunity: "My view of technology and the Internet has changed radically. I saw it as a highway, now I view it as a landscape." Related to this, many of these teachers see technology as the opportunity to not only bridge, but also immerse their classrooms in real life applications; their goals and practice of teaching are shifting as they explore the means to do this.

I am attempting to get more inside the heads of students and I am also teaching them that there are alternative points of views, I am attempting to prepare them for the real world. I am spending more time counseling students and see this as more of the teachers' responsibilities. I am trying to teach the students more real life experiences through the use of technology. Technology has opened the doors for me to do all of the above.

Characteristics

The respondents widely identified with Mezirow's stages of perspective transformation as represented in this study. As mentioned, some find that the challenge, even fear, of learning technology creates a "disorienting dilemma" in which they are over-

whelmed and intimidated. The act of taking control by enrolling in courses to learn educational technology is a first step to overcoming these hesitations. As they carefully explore new technologies in a supportive environment, they engage in "trying out" new teaching strategies and teacher roles. Beyond this level of expertise and comfort lies the opportunity of "finding new ways" to incorporate their new knowledge of technology, their teaching methods and teaching styles. Reflective activities and class discussions appear to be critical in assisting the realization of the changes they have experienced. The respondents frequently voice great surprise and pleasure at the immense changes in their perspective and practice of teaching.

Discussion

Through the examination of teachers' professional development in educational technology, a unique and timely setting for the perspective transformation of adult learners is revealed. Standing, as many adult learners do, on the brink of new experiences, many educators hesitate and turn back from learning technology. However, for those who confront the uncertainties, an environment of support, exploration, and dialogue can contribute to a new perspective of their teaching and broad-based changes in their practice. While perspective transformation is a deep, fundamental change of one's frame of reference and worldview that is not commonplace, the tension and urgency of technology learning is apparently distinctly fertile ground for such experiences. Given this state of disequilibrium, professional development that incorporates hands-on learning, substantial content, collaborative inquiry, peer-to-peer dialogue, and reflective practice can facilitate transformational learning experiences.

For many years, administrators, professional associations, departments of education, accrediting organizations, and teacher educators have desired to see classrooms incorporate student-centered learning and cultivate higher order thinking skills. Based on this research, learning educational technology appears to be an effective way to promote these changes through the teachers themselves. By participating in specifically designed professional development opportunities to learn educational technology, educators can gain insight into new teaching objectives, teaching strategies, and their worldview of education. Educators participating in such settings lucidly describe how their teaching

and classrooms are transformed because of what they have learned. Fundamental changes in these aspects of the educational process suggest far-reaching consequences that merit further investigation.

Implications for Adult Education Theory and Practice

Examining the educational technology learning experiences of educators from the perspective of adult learning generates implications for theory and practice. As we examine educators as adult learners, we begin to view professional and staff development not just as an institutional requirement, but as an opportunity to transform practice. Understanding educators from this vantage point also reveals the needs and concerns that they have in facing the sometimes intimidating challenges that technology brings to education, from students who are more technology knowledgeable, to meeting technology standards imposed by administrators. As we understand the needs and possibilities for educators, we are laying a foundation to bring adult education research, and practice into faculty development for teachers of all grade levels into the *21st Century* with best practice. These findings can change the way those responsible for professional development perceive teachers as adult learners, conduct classes, and plan programs.

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