



Introducing Leadership Issues In Pre-Service Teacher Education Programs Through Instructional Technology Courses

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Leadership is the art of influencing others. It is the regulating of the behavior of others (Hackman, 1995, p. 429). "Instructional technology deals with the practice of using technology to teach, (Tomei, 2001, p. 4). This paper will discuss the dynamics of leadership and how to provide learning activities to pre-service teachers in instructional technology to afford them opportunities to become agents of change as they become leading teachers in the global community.

The use of technology in education and the global economy changes the way we work and interact with others. As the technology changes, it is imperative that instructional technology leaders are active in the development of new educational processes to educate pre-service teachers (Carbonara, 2002). The rate of technology change is commonly known as Moore's Law (Webopedia, 2002). While it specifically states that the number of transistors on an integrated circuit board will double every 18 months, it essentially states that the technology will undergo a generational change every year and a half. Duderstadt (2000, p.17) states that "at this rate, the \$1,000 computer in the year 2020 will have a computing speed of 1 million gigahertz, a memory of thousands of terabits, and linkages to global networks at data transmission rates of gigabits per second...". How will the global community use the power of these changes? What is the impact these technological changes have on the education of students? Who will lead us into this new era? How will we get there? How will we know we've arrived? What is the vision for the future?

These questions speak of leadership, leaders and change and change from our current practices. As the technology changes, the skills of the work force must change. Teachers of tomorrow must possess different skill sets than those of today in order to help everyone learn to become productive citizens in the global community. These are all elements of change. It is precisely the role of our teacher-leaders to be agents of change. They must have the skills to see the vision of the future, to articulate that vision to others and to facilitate the change to achieve the vision. These are leadership traits, knowledge and behaviors of the leading teachers of the new millennium.

Email is a technological tool that facilitates the communication of ideas between leaders and followers. It is regularly exchanged between students and teachers. Homework and papers are posted to electronic bulletin boards for future examination and collaboration. Quizzes and tests are administered via on-line environments. Grades are posted to

an electronic grade book. Additionally, the use of technology to facilitate learning "makes it possible to customize and personalize content and delivery to match individual learning styles, experience, and skills" (Pantazis, 2002, p. 23). These technological processes show the pre-service teacher how to communicate, collaborate and assess. These skills are the same skills that leaders possess. Leaders communicate their ideas, share them with others, empower others to act, and assess the situation for completion of goals.

The Leading Teacher Program at Duquesne University contains three themes to promote the growth of the pre-service teacher. The themes are leadership, diversity and technology (Duquesne University, 2001, p. 7). "A leading teacher is an architect building learning environments that acknowledge and incorporate the power of technology." At the same time, "a leading teacher is a life long learner inspiring a community of learners to pursue continuous improvement and growth." The power of inspiration consists of the leadership styles, behaviors and knowledge a leader uses to influence others. Students must acquire the knowledge of leadership styles, traits and behaviors and practice their use in learning environments.

Students in the second course in Instructional Technology are primarily concerned with mastering the tasks to create mini-lessons using word processing, graphics presentation software, and web page editors. The first course is concerned with information literacy features such as searching library card catalog systems and electronic databases of full-text journals. Students become accustomed to acquiring information and evaluating the accuracy and relevancy of that information. Lowe (1999, p. 35) describes the activities of leaders. They are constructors of knowledge, they think rationally, creatively and critically, they solve authentic problems, they retrieve and manage information and they communicate effectively. Students learn to be knowledge seekers. They gather information and decide the importance, accuracy, currency and relevancy of that information. They then learn to use that information to construct new information and to help others. The knowledge empowers them to make decisions. The next step is to become knowledge leaders (Sheeder, 2001, p. 5). Knowledge leaders empower their followers to participate in decision-making activities.

After the students construct a lesson using these technology tools, they must share that information with the members of their class by posting their documents to electronic bulletin boards. The act of shar-

ing information is a leadership trait. By sharing information, students are learning how to become leaders that use technology tools. The students then collaborate with each other to improve the lessons. Thus, they are sharing their own thoughts and expertise with others. Shasek (2000, p. 51) writes about students sharing their expertise with others. This is another leadership activity. Students are collaborating with each other by using technological tools. More importantly, they are learning about and practicing their leadership skills. They are connecting each other with the information in the documents by using technological tools. Dearstyne (2000, p.34) states that this connection process is a leadership activity. Leaders connect knowledge, people and technology together. Leaders empower the people to seek knowledge and to share that knowledge with the global community. With this in mind, one can reasonably conclude that the use of technology permits not only the gathering of information but also empowers the user to construct new knowledge to improve the global community. Because these new processes are learned behaviors (methods to gather, analyze and communicate information), it is imperative that teachers facilitate the acquisition of these processes by their students. Faculty, in the Leading Teacher Program at Duquesne University, infuse these technology skills into all classes. This communication and collaboration process builds leadership skills. Thus, teachers become agents of change. They need to acquire these new skills themselves so that they can help their students acquire them. This change process that influences others is a leadership activity. Thus, teachers in the Leading Teacher Program are learning to become leaders and change agents in the global community.

As New Zealand changes from a rural economy to a knowledge economy (Cohen, 2000, p. A57), the realization that the way one conducts business in the future will be drastically different from the way one conducted business in the past. Communication with government officials, banking and learning institutions about new procedures in sheep farming are different with the incorporation of the Internet. The learning of new information acquires a new sense of importance. While the attainment of a high school diploma was once considered a sufficient qualification to lead a productive life in New Zealand, it is no longer believed to be true. Thus, all students must prepare for life where the citizens communicate and collaborate using the technological tools of today and prepare to use the tools of tomorrow. The teachers and trainers will help to prepare students to enter that world. The colleges and universities must prepare the teachers and trainers to be instructional technology leaders so they can properly apply the technological tools to solve learning environment problems.

Instructional technologists are individuals that are skilled in the theories and practices of applying technology and learning theory to learning environment activities. These activities may take place in traditional classrooms or they may be experienced in on-line learning environments. The tasks of acquiring information from electronic databases, analyzing, synthesizing, and compiling that information in a word processed document and communicating that document by way of email and discussion boards to colleagues in a collaborative way are all entry-level activities that demonstrate fundamental leadership skills. Students in the Leading Teacher Program use email and asynchronous bulletin boards to communicate ideas and to collaborate on problems and their solutions. The second semester course for freshmen education students includes activities in which students construct interactive presentation shows. The shows are posted to a bulletin board so other students can use a rubric and to critique them. In a graduate class, students have to construct a technology plan for a building or a district. The plans are posted to an asynchronous bulletin board and other students have the opportunity to critique the postings. In both cases, students create documents that help the reader move from a lower level of understanding to a higher level of understanding. This movement is a growth in learning. Any time a growth in learning occurs, the student solves a problem of not knowing about a topic or process. Technology tools are used to bridge the gap of time and space to help others learn. When the pre-service teacher creates these documents, she is learning about leadership skills of communication and collaboration. These leadership skills must be acquired by the student and then passed on to future

students. Thus, the teachers of the new millennium must be educated in these skill sets. It is not enough to just acquire these skills, but it is imperative that these skills are transferred to future generations of the global community so that they may change and improve upon them. This collaboration is important for the survival of the planet.

Leadership and technology skills are presented to university students in a school of education. The technology skills of email, word processing, synchronous and asynchronous chat and presentation software can also be used to build leadership skills in pre-service teachers. Students learn to communicate their ideas and to collaborate on the solution of problems by using the technology tools mentioned above. As students increase their quantity and quality of communication and collaboration activities using technology tools, they also improve the development of their leadership skills. Leaders communicate their ideas with their followers. They empower others to make decisions. They form communities to support each other and to collaborate with each other to solve problems. The use of technology tools helps to improve communication and collaboration skills. As the quantity and quality of communication and collaboration skills increase, then the quality of leadership skills also increase. These skills are part of a teacher preparation program that helps to prepare students to be leading teachers in various learning environments. These students are prepared to take their place in the global community to be leading teachers.

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