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Determining the Role of Technology in Supporting the Professional Growth of Administrative Leadership Candidates

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Abstract: School improvement planning that is guided through data-driven decision making has been recognized as a "best practice" among educational leaders for many years. Although national standards for school administrators routinely incorporate educational and information technology components, state boards of education do not currently mandate technology training for those enrolled in programs leading to administrative certification. As a result, many school administrators may not be adequately prepared to use computer and information technologies supportive of their roles and responsibilities. This investigation examined the perceptions and current technological literacy of individuals enrolled in a university-level Administrative Leadership Program. Research focused on the context of computer use for gathering, analyzing, and reporting school-based data that facilitate decision-making and continuous school improvement.

Introduction

Research on school effectiveness has revealed that the use of data is central to the school improvement process (Connecticut State Department of Education [CSDE], 2002; National Policy Board for Educational Administration, [NPBEA], 2002). School improvement planning that is guided through data-driven decision making has been recognized as a "best practice" among educational leaders for many years. The No Child Left Behind Act (NCLB) defines requirements for successful school plan development and implementation that build upon rigorous academic content, achievement standards, and assessments based on those standards (United States Department of Education [USDOE], 2006; 2003). All schools are rated using criteria such as: percent proficient in mathematics and reading along with participation rate in state assessments (USDOE, 2003). Graduation rate at the high school level as well as writing test results at the elementary and middle school levels are additional indicators (USDOE, 2003).

One of a school administrator's key responsibilities is to build sound assessment practices into the school's culture. Administrators create the right conditions for teaching and learning when they establish a supportive climate, provide time for assessment, train teachers to use assessment data when planning instruction, and state clear expectations for student and/or teacher performance (NPBEA, 2002). Many researchers suggest that a logical first step in using data is to begin by making better use of existing data (Doyle, 2002; Information Builders, 1996-2007). A systematic analysis of data that have already been collected can reveal previously unseen patterns and reveal opportunities for continuous school improvement (eSchool News Online, 2006).

Problem Statement

The need for professional development training that enables teachers to integrate computer technology into the teaching and learning process has existed for over a decade (Education Week, 2006, March; ISTE NETS Project, 2000-2002a). Additionally, individuals enrolled in programs leading to teacher certification must demonstrate their computer proficiency by completing a minimum of one, three-credit educational technology course that has been aligned with state and national standards (CSDE, 2007; ISTE NETS Project).

Although national standards for school administrators routinely incorporate educational and information technology components (NPBEA, 2002; ISTE NETS Project, 2000-2002), state boards of education do not currently mandate technology training for those enrolled in Administrative Leadership Programs (CSDE, 2002; Lohman, 2002; New York State Education Department, 2007). As a result, many school administrators may not be adequately prepared to use computer and information technologies supportive of their roles and responsibilities.

Purpose

The goal of this research was to examine the perceptions, attitudes, and current technological literacy of individuals enrolled in an Administrative Leadership Program at a private university in the Northeastern, United States. As part of this program, two graduate-level courses are offered during consecutive semesters that guide participants as they develop research proposals and conduct research in an educational environment. Research focused on the context of computer use for gathering, analyzing, interpreting, and reporting school-based data that facilitate decision-making and continuous school improvement.

In order to achieve the goal of this research, a review of state and national educational technology standards for school administrators was conducted (CSDE, 2002; NPBEA, 2002; ISTE NETS Project, 2000-2002). Interview and classroom observation data were compared to the results of a post-course survey. Research findings led to recommendations for the continuous improvement of the Administrative Leadership Program.

Methodology

Instrument

A survey was developed and aligned with the ISTE NETS Project (2000-2002) and Educational Leadership Constituent Council [ELCC] (NPBEA, 2002) standards for school administrators. The type of survey response items varied from simple "yes or no" answers, to open-ended questions, and the use of a four point Likert-scale ranging from "4, Very well prepared" to "1, Not at all prepared". Values obtained through the survey were used to verify the presence of benchmarks for technological literacy within this university's Administrative Leadership Program.

The survey was pilot-tested during the Fall 2006 semester with a group of 10 program participants. Recommendations for improvement included reformatting the survey to enable the computer toolbar images to appear above the response items. The remainder of the survey was deemed appropriate by the respondents. Images were subsequently moved and no further modifications were made.

Participants

Data was gathered from nine individuals enrolled in the Administrative Leadership Program research courses titled *Seminar in Educational Research* and *Thesis Seminar* between the Fall 2006 and Spring 2007 semesters. As noted, program participants complete these two graduate-level courses during consecutive semesters. At the end of the Spring 2007 semester, individuals enrolled in the *Thesis Seminar* were asked to participate in this study. An informed consent form was used to document each participant's willingness to complete the survey. All nine individuals agreed to participate and the survey was reviewed with the group prior to its distribution.

The group was composed of six female (67%) and three male (33%) students. The majority of these participants ranged from 30-49 (n=6) years of age while the remainder were 23-29 (n=1) and 50+ (n=2) years old.

Data Collection and Analysis

Survey responses were analyzed using the SPSS statistical software program (SPSS Inc., 2007). Since Likert-scales are commonly considered to be ordinal in nature, non-parametric tests were utilized. Analyses included frequency distributions for each of the items along with calculations of means and standard deviations. Noteworthy response frequencies were cross-tabulated according to specific variables such as age. In order to facilitate data

analysis, a numerical value of "2" and "1" were assigned to "Yes" and "No" responses, respectively. Likert-scale responses were assigned the following numerical values; "Very well prepared = 4", "Moderately well prepared = 3", "Somewhat well prepared = 2", and "Not at all prepared = 1". Survey items were further subdivided into three categories for reporting purposes. These categories included; Basic Computer Software Competencies, Information Retrieval Competencies, and Telecommunication Competencies. Open-ended survey items were grouped according to similarities and quoted directly.

Results

Research Question 1: How well prepared are participants enrolled in the Administrative Leadership Program to use technology for information retrieval, data analysis, and telecommunications prior to the start of the first research course?

Survey results indicated that the majority of participants perceived that their technological skills had been obtained via a combination of self-instruction and/or trial and error (100%, *N*=9), along with the assistance of family and friends (55.6%, n=5). Slightly less than half of the participants indicated that their training had been the result of workshops and/or informal instruction obtained from school technology specialists (n=4, 44.4%) and classroom teachers (n=4, 44.4%). Fewer perceived that their technological skills had been the result of college coursework (n=3, 33.3%) and Grade K-12 instruction (n=3, 33.3%). It is interesting to note that, overall, this group of participants did not associate their technology training with the professional development workshops provided through local Education Service Centers (CT RESC Alliance, n.d.) (n=1, 11.1%) or students within their own schools (n=1, 11.1%).

Table 1 data reveals that prior to their participation in *Seminar in Educational Research*, these individuals perceived that they were "Very well" to "Moderately well" prepared in the use of computers in general (*M*=3.33, 88.9%) and for saving files (*M*=3.33, 77.8%). They also possessed basic MS Word formatting (*M*=3.33, 77.8%), and Internet Research skills (*M*=3.00, 77.7%). This group was also moderately familiar with the use of the Blackboard Instructional Management System (Blackboard Inc., 2003), for classroom discussions (*M*=2.89, 66.6%) and locating course content (*M*=2.78, 66.6%). Less than half possessed an intermediate level of technological skills in the use of advanced MS Word features such as formatting documents via the "Show All" button (*M*=2.44, 44.4%), inserting tables (*M*=2.56, 44.4%), setting margins (*M*=2.67, 44.4%), inserting page numbers (*M*=2.44, 33.3%), and using the drawing toolbar (*M*=2.11, 44.4%).

Descriptive Statistics

	N	Mean		Std.	Variance	Skewness	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Using Computers	9	3.333	.3333	1.0000	1.000	-1.821	.717
Saving Files	9	3.333	.3727	1.1180	1.250	-1.533	.717
Using USB Key	9	2.889	.3889	1.1667	1.361	-.947	.717
Word - Formatting Toolbar	9	3.333	.3727	1.1180	1.250	-1.533	.717
Word - Show All	9	2.444	.4444	1.3333	1.778	.152	.717
Word - Drawing Toolbar	9	2.111	.3093	.9280	.861	-.263	.717
Word - Menu Margins	9	2.667	.3727	1.1180	1.250	.153	.717
Word - Menu Tables	9	2.556	.3768	1.1304	1.278	-.176	.717
Word - Menu Page Numbers	9	2.444	.4120	1.2360	1.528	.418	.717
Internet Research	9	3.000	.3333	1.0000	1.000	-.964	.717
SHU Library Database	9	1.889	.4547	1.3642	1.861	1.011	.717
Blackboard DBoard	9	2.889	.3514	1.0541	1.111	-.552	.717
Blackboard Submit Assmts.	9	2.333	.3727	1.1180	1.250	-.153	.717
Blackboard Course Content	9	2.778	.3239	.9718	.944	-.502	.717
Valid N (listwise)	9						

Table 1: Perceived Technological Literacy Prior to the Start of the First Research Course

At the conclusion of the course titled *Thesis Seminar*, the overall perception that individuals were "Very well" to "Moderately well" prepared in the use of computers in general remained relatively unchanged (*M*=3.33) (see Table 2). Technological skills in the areas of using the Internet for research (*M*=3.33), Blackboard (*M*=3.33), and the university Library Database (*M*=3.00) increased. However, participants were not equipped with the technological skills for using MS Excel (*M*=2.55) or SPSS (*M*=1.33, Mode=1.00) for data analysis and graphing, using a scanner (*M*=1.88, Mode=1.00) to add copies of documents to the research paper appendix section, and using the narration feature in MS PowerPoint (*M*=1.44, Mode=1.00) for presenting their research findings.

Descriptive Statistics

	N	Mean		Std.	Variance	Skewness	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Using Computers	9	3.333	.2357	.7071	.500	-.606	.717
Using MS Word	9	3.444	.2422	.7265	.528	-1.014	.717
Internet Research	9	3.333	.2357	.7071	.500	-.606	.717
SHU Library Database	9	3.000	.2887	.8660	.750	.000	.717
Blackboard	9	3.333	.2887	.8660	.750	-.825	.717
Using Excel for Statistics	9	2.556	.3768	1.1304	1.278	-.176	.717
Using Excel for Graphs	9	2.556	.3379	1.0138	1.028	-.655	.717
Using SPSS for Statistics	9	1.333	.2357	.7071	.500	2.121	.717
Using PowerPoint for Presentations	9	3.000	.3727	1.1180	1.250	-.690	.717
Adding Narration to PowerPoint	9	1.444	.3379	1.0138	1.028	2.506	.717
Printing PowerPoint Slides	9	2.889	.4231	1.2693	1.611	-.683	.717
Printing PowerPoint Handouts	9	3.222	.2778	.8333	.694	-.501	.717
Creating CD Roms	9	2.333	.4714	1.4142	2.000	.265	.717
Using a Scanner	9	1.889	.4231	1.2693	1.611	1.203	.717
Valid N (listwise)	9						

Table 2: Perceived Technological Literacy Prior to the Start of the Second Research Course

Research Question 2: Which technology competencies for school administrators should be fostered throughout the Administrative Leadership Program in general?

The following responses to the open-ended survey questions are indicative of participant concerns:

- Technology should be incorporated in all classes so there is no SHOCK when students begin the research course;
- Had no exposure to SPSS;
- My technology skills are very inadequate. Technology in any course would be a huge help;
- If it is truly integrated but not for creating PowerPoint etc. for the sake of PowerPoint;
- I had no idea how to use Excel for the statistical calculations. I feel that computer programs like Excel and PowerPoint should be integrated into other courses; and
- Using technology in these courses forced me to practice what I knew, explore new areas, and gain confidence/competence on the computer.

Discussion

Research Question 1: How well prepared are participants enrolled in the Administrative Leadership Program to use technology for information retrieval, data analysis, and telecommunications prior to the start of the first research course?

NCLB (USDOE 2006; 2003) has led to a sharp rise in the collection of school and student achievement data. These data include statistics on attendance, grades, referrals, retentions, and standardized-test results that are

disaggregated by ethnicity, disability, gender, socioeconomic level, migrant status, and English proficiency. When compiled and reported on a regular basis, these data provide a baseline of school operations and can be used to make district and statewide comparisons among similar schools.

Within the limitations of this study, data provide evidence that participants hold perceptions that barriers impede their use of technology for data analysis and reporting. A failure to recognize and reduce these barriers will limit the abilities of these individuals to improve the effectiveness of the profession through research and continuing professional development for self and staff.

Research Question 2: Which technology competencies for school administrators should be fostered throughout the Administrative Leadership Program in general?

Recommendations for benchmarks are offered that can be used to evaluate the technological literacy of those enrolled in the Administrative Leadership Program. Although the benchmarks are based on ELCC (NPBEA, 2002) and ISTE NETS Project (2000-2002) program standards for school administrators, educational outcomes have been modified to meet the particular learning needs of students enrolled at the university where this research was conducted. The degree to which individuals enrolled in the Administrative Leadership Program have mastered the skills, knowledge, and dispositions that will enable them to use of technology for school improvement can be measured through the use of a matrix developed as a result of this research. In order to be considered technologically literate, program participants can be evaluated according to the following three benchmarks:

I. Computer Competencies measure a mastery of computer skills and software at the basic, intermediate, and advanced levels. These computer competencies relate to the use of technology for resource allocation, accountability for teaching and learning processes, and results. The focus of this benchmark is on the use of MS Office (Microsoft, 2003a) and SPSS (SPSS, Inc., 2007) in addition to basic computer operation skills such as saving files and using a scanner.

II. Information Retrieval Competencies introduce techniques for using technology to locate information and conduct research. The focus of this benchmark is on the use of the Internet and university library database.

III. Telecommunication Competencies provide an overview of the basic skills and knowledge for using technology such as Blackboard (2003) to facilitate instruction, communicate, and collaborate with others.

Conclusion

If school administrators are to be successful in using and integrating technology into their daily practices, it stands to reason that well planned and conducted experiences at the graduate level should provide opportunities that foster their technological literacy skills. No claim is made that the participants in this research study represent a typical group of school administrators. Nevertheless, it is likely that their responses are not entirely atypical and as a result, this investigation has raised several issues that may guide Administrative Leadership Program re-evaluation efforts at the university level.

This research provides a preliminary analysis of the perception and attitudes of Administrative Leadership Candidates towards their technological literacy. Data can be extended through the administration of the survey to additional sections of these research courses. This process would result in a larger sample of the population for gathering baseline technological literacy data across the program.

The benchmarks and matrix proposed as the result of this study should be further developed and validated. Due to the three year rate at which current computer technologies become obsolete, participants enrolled in the Administrative Leadership Program should be re-evaluated every three or four years. The timely identification of new problems, state and federal mandates, and opportunities is necessary and will lead to recommendations for maintaining and/or improving the quality of current and future school administrators.

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