NATIONAL FORUM OF EDUCATIONAL ADMINISTRATION & SUPERVISION JOURNAL
VOLUME 28, NUMBER 4, 2011

Supporting Technology Integration: The School Administrators' Role

Lorrie Webb, EdD
Assistant Professor
Texas A&M University-San Antonio

ABSTRACT

Technology integration has long been an issue in schools (Edyburn & Gardner, 1999). In the past, public school administrators have attempted to support teachers who integrate technology into the classroom through the implementation and support of competencies and standards (International Society for Technology in Education, 2002; National Council of Accreditation of Teacher Education, 2005). This paper reviews the literature concerning school administrators' support of technology integration into the classroom learning environment. The author will discuss a study conducted to determine predictors of technology integration by new teachers. Participants were first-year, traditionally-certified, full time, regular education classroom teachers. This research study focused on the new classroom teachers' technology proficiency levels, attitudes towards technology, and integration of technology into curricula. Results may shed light on an administrator's ability to predict and encourage integration of technology by new teachers within their classroom environment. Recommendations for school administrators based on this study will also be discussed.

Supporting Technology Integration: The School Administrators' Role

Since the 1980s, when computers first became widespread in the schools, a proliferation of technology competencies and programs emerged from local to national level. The National Council of Accreditation of Teacher Education (NCATE, 2005) developed a set of technology guidelines for teacher educator programs, and the International Society for Technology in Education (ISTE) provided standards and criteria for educational technology at all levels (International Society for Technology in Education [ISTE], 2002). Technology has even become a part of teacher accreditation process and is now being woven throughout the areas of faculty development, student academics, curriculum design, and resource allocation (Cooper & Bull, 1997). This

support may be best provided by the school administrator through instructional leadership. Although the classroom teacher has been the change agent and has played the most critical role (Rudnesky, 2003) of infusing technology into learning, Kotrlik, Harrison, and Redmann (2000) noted that instructional leaders directly and indirectly determine the success or failure of teacher competencies in instructional technology. These leaders are also instrumental in integrating technology into the classroom curriculum through the teachers that are hired and support that is given to teachers.

Literature Review

School administrators who serve as instructional leaders indirectly impact students' learning environment through contact with teachers through development of "best practice" instruction and curriculum. That includes the integration of technology into the classroom environment. These elements combine to enhance the learning environment by providing training and resources directly to teachers. Daresh (1995) noted that there are leadership behaviors that have an effect on students' learning environment and that these ". . . behaviors significantly affect teacher instruction and student learning [both] directly and indirectly" (p. 33). Whitaker (1997) discussed behaviors of successful administrators and noted that these leaders master four skills which influence higher levels of student achievement in their schools. These skills were: "providing resources, supporting instruction, communicating, and always being present" (pp. 17-19). Teacher support was found to be critical in building teachers' confidence levels when first using technology (Redmann & Kotrlik, 2004).

Becker (2000) compared the impact of teaching environments of exemplary computer-using teachers with those of other computer-using teachers in presenting the same curriculum. Since policies regarding curriculum, pedagogy, and resources tended to originate in the superintendents' offices, Shuldman (2004) believed that administrative support, including that from the superintendent, played a key role in integrating technology into the classroom. Shuldman (2004) noted that there were three levels of leadership that affected technology integration: 1) superintendents, 2) campus leaders/principals, and 3) technology leadership. Shuldman (2004) found that "… a clearly defined and articulated technology message, coming from [school administrators], understood by their administrative team, and used to build broad community and school board support, is necessary to secure funding, goodwill, and buy-in" (p. 330). Shuldman also noted that direct involvement from the district leaders' levels was essential and that teachers needed more knowledge and skills to successfully implement technology integration.

Methodology

This study used a quantitative approach in comparing the prior technology experiences and attitudes of new elementary teachers with technology-integrated instruction currently used by these teachers. This approach was used to provide

administrators with the tools needed to predict the appropriate level of technology background to support a high level of technology integration in the classroom. During this study, data were gathered from two self-assessment surveys which were completed online by participants. The primary purpose for using two surveys to collect data was to determine if any associations existed between data items. A multiple regression procedure was then utilized to analyze the data. A correlational design was selected to study the relationship between teacher integration of technology and several predictor variables.

The two self-assessment, Likert scale surveys used were: the Basic Technology Competencies for Educators Inventory (BTCEI) and the Technology Snapshot Survey (TSS). Both surveys, developed by the South Central Regional Technology in Education Consortium, were completed online at a designated website. The BTCEI addressed personal experiences and uses of technology, attitudes about technology integration, and formal technology education from kindergarten through higher education. The Technology Snapshot Survey measured a teacher's use of technology in the classroom. Participants met the following three requirements: (a) a certified teacher, (b) a first-year teacher, and (c) an elementary school teacher.

Correlational statistics were used to address relationships among these variables. Descriptive statistics were used to analyze the demographics. The dependent variable was technology integration, and the independent variables included number of technology courses attended, types of technology courses attended, attitudes of teachers regarding technology, and teachers' technology proficiency level. A multiple correlation coefficient was determined to assess the strength of the relationship between the independent variables and the dependent variable. A coefficient of multiple determination (R^2) and an adjusted R^2 were reported to address the occurrence of sampling errors. This identified the "percentage of variation of the dependent variable that is directly attributable to the variation of the independent variables" (Bluman, 2001, p. 504).

Findings

Though the main focus of the study was designed to address three research questions: 1) what are the characteristics of technology-using teachers; 2) what are the characteristics of non-technology-using teachers; and 3) to what extent is the number of technology courses attended during preservice reflective of the teacher's use of technology in the classroom. Only the technology proficiency levels predictive of new teachers' integration of technology into the curriculum is addressed in this report in order to guide administrators who provide support to new teachers and who promote integration of technology in the classroom.

Results indicated that 18 of the 69 participants were high-level technology-use teachers. These participants ranged in age from 22 to 37 years and taught grades two through six. These teachers had taken at least one college technology course and averaged three courses. These technology-using- teachers also averaged at least one skills-based technology course, as well as one integration-based technology course. According to data collected from the surveys, proficiency levels of technology-using-

teachers fell just short of proficiency levels of non-technology using teachers; however, the attitudes of technology-using-teachers concerning technology were far more positive than non-technology-using teachers.

In this study, the analyses suggested that attitudes about technology use in the classroom, number of technology courses attended, and proficiency levels were statistically significant in predicting technology integration. The type of technology courses attended did not appear to be significant in predicting technology integration as indicated in this research study.

Only three of the independent variables contributed significantly to prediction of technology integration by new teachers: they were 1) number of technology courses attended, 2) attitudes of technology, and 3) technology proficiency level of the new teacher.

The number of technology courses attended did indeed have a somewhat positive effect on integration of technology projected by a correlation of .241 and was significant at the 95% confidence level (.023). Attitudes about technology were heavily correlated with integration of technology by new teachers with $r = .600$ and significant at the 95% confidence level (.000). The attitude of new teachers concerning integration of technology in relationship to the number of technology courses taken was not a significant factor in technology integration. Proficiency levels and technology integration by new teachers were negatively correlated and not statistically significant at the 95% confidence level. Proficiency levels were positively correlated with attitudes of technology and statistically significant at the 99% confidence level with number of technology courses taken, indicating that those teachers with high proficiency levels though might like to integrate technology in their classrooms; in reality might not integrate technology into the classroom and curriculum.

A final word of caution is needed here: the results of this particular design must be interpreted in terms of correlations; no causal inferences can be drawn. Thus, while it is possible to assert that the number of technology courses attended and attitudes toward technology were associated with technology integration by new teachers, it is not possible to assert that these variables caused the teachers to integrate technology into their classroom and into their instructional methodology.

Conclusion, Implementations, & Summary

Administrators generally expect that new teachers entering the classroom for the first time will be fully prepared to integrate technology into the curriculum and their classroom. However, prior research suggests that this may not be the norm. The findings from this study moves this analysis one step further and suggests that those who are somewhat proficient in technology may choose to forego integration in the first years. This could be due to the time and effort being placed on classroom “start up” activities and the minimal level of direct support that administrators offer new teachers for technology integration.

Conclusion

Integration of technology into the curriculum by new teachers may be positively affected by teachers' own attitudes about technology. The more positive the teachers' attitudes about technology, the more these teachers are prone to attempt integrate technology into their classroom. The present study found that attitudes about technology were a strong predictor of technology integration by new teachers. In other words, those teachers who were positive, and possibly positively supported by administrators in their belief that student learning was more efficient when technology was used, indicated that it was important to take the initiative to integrate the needed technology and these new teachers seemed to do so from the beginning. The more positive a teacher's attitudes about technology, the more he or she integrated technology into the curriculum was also cited and supported by Wang, Ertmer, and Newby (2004).

In the present study, technology proficiency levels of participants were also found to be a significant predictor of technology integration; however, high proficiency levels negatively impacted technology integration. At higher proficiency levels, new teachers tended to integrated technology less. This is not consistent with other studies which suggested that greater computer proficiency contributed more to technology integration than attitudes (Albion, 2001). Proficiency levels could have negatively impacted integration of technology in the current study due to teachers, who are highly technology proficient, realizing how complex technology is for all students to use and concentrating on new teacher "start up" procedures which left little time for integration. It could also be that new teachers are not provided the time management skills required to integrate and/or were not privy to mentor teachers, who integrate technology, as role models. Inadequate knowledge-base and negative experiences could make new teachers resistant to technology integration into an already complex curriculum. One other explanation for this outcome could include the various resources configurations available from district to district and the "where there's a will, there's a way" attitude in some districts. Resources and the lack thereof can be overcome if the desire to utilize existing resources is strong enough and administrators support integration and the use of technology. Administrators who emphasize the importance of technology integration may find that new teachers will make the added effort during their "start up" procedures to follow through with integrating technology. Administrators may also need to provide new teachers with the extra time to integration technology.

After studying district superintendents, Shuldman (2004) concluded that administrative support, along with the resource of time, strongly impacted integration of technology by teachers. In 2005, Murphy, Richards, Lewis, and Carman noted that the more the teachers shared and supported each other, the more risks they took in integrating technology into the curriculum. Administrators, who provide resources such as mentoring teachers who are themselves proficient in technology, and the time needed to integrate the technology as basic support to new teachers, may likewise promote higher levels of technology integration in the classroom on their campuses.

Implementations

Administrators have both direct and indirect impact on integration of technology on their campus through both teacher-use and the classroom. Administrators who wish to raise the level of technology integration on their campus may predict those new teachers who will most likely use technology, and can promote new teacher technology integration. The following are recommendations for specific actions which can be taken to promote the use of technology and an administrator's campus.

1. Administrators should review past records of new teachers looking for backgrounds in technology. Teachers with a positive attitude about technology will more likely want to use technology in their classroom.
2. Administrators and school district personnel should encourage and support new teachers in technology integration in order to positively affect new teachers' attitudes about technology. Providing mentor teachers who themselves have integrated technology successfully and have positive attitudes in this area will significantly support new teachers.
3. Administrators and school districts should provide opportunities for new teachers to attend training in technology and technology integration. Specific training which integrated technology into content areas and aligned with standards would be of great benefit.
4. Administrators should provide incentives for the difficult job of technology integration for new teachers during "start up" procedures. Setting aside time for new teachers in the form of extra planning periods and providing resources such as materials for technology-using teachers to incorporate technology into the classroom will encourage teachers to take on the burden of integration.
5. Administrators should be knowledgeable about technology and those who have technology skills on their campus in order to provide guidance concerning technology use and integration.

Summary

Since positive attitudes toward integrating technology, the number of previous technology courses taken, and training in technology integration are indicators of technology integration of by new teachers, the implications are that administrators who provide positive reinforcement through mentors, resources, incentives, and staff development for integration of technology in classroom will promote successful technology integration into the curriculum. Selecting new teachers who will integrate technology depends heavily on the new teacher's attitude about technology and technology training. In conclusion, this research suggests that district leaders and administrators who are instructional leaders, need a comprehensive understanding of technology integration, and must be willing to use their knowledge and resources to promote technology integration by providing new teachers with resources, funding for staff development, and time to integrate technology.

References

Albion, P. R. (2001). Some factors in the development of self-efficacy beliefs for computer use among teacher education students. *Journal of Technology and Teacher Education*, 9(3), 321-347.

Becker, H. J. (2000). The "exemplary teacher" paper – how it arose and how it changed its author's research program. *Contemporary Issues in Technology and Teacher Education* [Online serial], *1*(2). Retrieved from http://www.citejournal.org/vol1/iss2/seminal/article2.htm

Bluman, A. G. (2001). *Elementary statistics: A step by step approach*. New York, NY: McGraw-Hill.

Cooper, J. M., & Bull, G. (1997). Technology and teacher education: Past practice and recommended directions. *Action in Teacher Education, 19*, 97-106.

Daresh, J. (1995). Research base on mentoring for educational leaders: What do we know? *Journal of Educational Leadership, 33*(5), 7 - 16.

Edyburn, D. L., & Gardner, J. E. (1999). Integrating technology into special education teacher preparation programs: Creating shared visions. *Journal of Special Education Technology, 14*(2), 3-20.

International Society for Technology in Education. (2002, February). *Educational computing and technology standards*. Eugene, OR.

Kotrlik, J. W., Harrison, B. C., & Redmann, D. H. (2000). A comparison of information technology training sources, value, knowledge, and skills for Louisiana's secondary vocational teachers. *Journal of Vocational Education Research, 25*(4), 396-444.

Murphy, K. L., Richards, J., Lewis, C., & Carman, E. (2005). Strengthening educational technology in K-8 urban schools and in preservice teacher education: A practitioner-faculty collaborative process. *Journal of Technology and Teacher Education, 13*(1), 125-139.

National Council of Accreditation of Teacher Education. (August 16, 2005). *Research Supporting the Effectiveness of Teacher Preparation.* Retrieved from http://www.ncate.org/public/summaryData.asp?ch=48

Redmann, D. H., & Kotrlik, J. W. (2004). Technology integration into the teaching-learning process by business education teachers. *Delta Pi Epsilon*, *46*(2), 76-91.

Rudnesky, F. (2003). From vision to classroom. *Principal Leadership, 3*(6), 44-47.

Shuldman, M. (2004). Superintendent conceptions of institutional conditions that impact teacher technology integration. *Journal of Research on Technology in Education*, *36*(4), 319-343.

Wang, L., Ertmer, P. A., & Newby, T. J. (2004). Increasing preservice teachers' self-efficacy beliefs for technology integration. *Journal of Research on Technology in Education, 36*(3), 231-250.

Whitaker, B. (1997). *Instructional leadership and principal visibility*. *The Clearinghouse, 70*(3), 155-156.