An Investigation into the Relationship Between Effective Administrative Leadership Styles and the use of Technology, 5(5)

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Abstract

Advances in technology have inspired a growing debate regarding effective instructional strategies in our present educational system. As the roles and responsibilities of administrative leaders shift, this research was conducted to ascertain what leadership attributes affect the integration of technology to improve teaching and learning. A survey of Ohio public educators was conducted to identify faculty perceptions of building leadership and how these perceptions influence attitudes toward innovative technology implementation efforts, and ultimately student achievement. This study focuses on the relationship between administrative leadership styles and implementation of new technological programs or instructional strategies.

Introduction

Support for the use of technology to improve student achievement is soaring. Many educational critics are viewing technology as an instructional tool necessary to increase student gains in the way students access and apply information in complex, authentic tasks (November, 2000; McKenzie, 2000; Bailey, 1995). While the nature of education remains highly conservative, experts agree that a more constructivist, student-centered view of learning is most conducive to learning (McCombs, 1997; Lemke, 1998). Administrators who promote technology as a tool for collaboration, and stimulation for authentic, learning experiences can allow for far greater student achievement than ever before. However, there is evidence of strong resistance on the part of teachers to fully integrate technology (Cuban, 1997). Research indicates that teachers need considerable support to integrate technology into the curriculum including a nurturing work...
environment that provides opportunities for teachers to take risks and collaborate with one another (Bailey, 1995). Furthermore, Bailey, Ross, and Griffin (1995) have identified ten major barriers to technology integration. Among them are the failure to develop a shared vision of how technology should be used to improve teaching and learning, the failure to design and implement effective technology staff development programs, and the failure to empower teachers and students to engage in risk-taking and experimentation with new technologies (Bailey, Ross, & Griffin, 1995).

While studies indicate that the proper and appropriate use of technology to support instruction has improved student academic gains across the curriculum, research exists which identifies factors within the school structure that promote higher student achievement (Bulach, 1994). This study attempts to identify the differences in leadership styles in better implementation of technology as an instructional tool to improve student achievement. An understanding of the relationship between administrative leadership styles and the implementation of technology would assist effective reform efforts. As researchers continue to investigate how to most effectively utilize technology to not only prepare students for the next century, but also to reframe the way we view teaching and learning, it would be reasonable to investigate the leadership qualities of productive schools through successful school reform efforts of the Information Age. Productive schools are defined as those organizations that have a clear and defined vision of high-quality learning, curriculum, instructional strategies, staff development and assessment (NCREL, 2001).

While administrators will agree that the Information Age is forcing state-wide, district-wide and even school-wide changes, they may also agree that managing school change and improvement is one of the most complex tasks they face. McCune (1998) refers to the organizational structure in the Industrial Age as a bureaucracy and indicates the need to shift to a "connected network" in the Information Age. The individual’s view of the world shifts from that of a source of security to a tool for personal contribution to the larger goal. Likewise, leaders in the educational organization must be able to shift toward a more goal-oriented, collaborative effort if they expect teachers to adopt the new or modified values, meanings, and beliefs about how children learn in this technologically advanced world.

Experts would agree that the success or failure of technology integration could be linked to the behaviors and ideologies of the instructional leader. In a survey of educators in the United Kingdom, 81% percent indicated that "more commitment" by leaders was an important component, while only 38% percent felt as strongly about more hardware and software (Cafolla & Knee, 1995). The innovation inherent in exemplary technology use requires more than hardware, software, and ongoing training. Successful leaders not only challenge the existing educational process and inspire a vision for meaningful change, but also provide the necessary support and modeling strategies to enable teachers to become part of a learning community. Modeling and coaching strategies make the vision clear and more attainable for teachers, and reinforce how others perceive what instructional leaders value.

Senge (1990) states that many of the problems organizations incur can be traced to leadership or the lack thereof. Advances in technology and changes in the goals of education are having dramatic effects on both people and organizations. Schools today have a responsibility for
preparing children to be productive, contributing members of a technological society. Senge maintains that very few schools are "learning organizations" with a shared commitment to change. His research indicates that only when members are treated as stakeholders and actively participate in articulating a clear understanding of the tension between current reality and a shared vision of where they would like to be will they develop a commitment to change.

This concept of "creative tension" requires an accurate view of the organization’s current reality and is energized by the picture of what the organization could be. As technology continues to drive changes in society as well as education, our educational leaders must be equipped to welcome and manage conflict. Technology integration presents a shift in values in our views of teaching and learning, and raising the level of awareness of this conflict is not only necessary, but also a fundamental component to successful change (Fullan, 1982).

A school’s structure for organizational action and the attitudes, values, and skills reflected in the professional community continually reinforce each other. To educators, the infrastructure includes the guiding ideas of the organization, the design for learning outcomes and the support for those outcomes (Senge, 2000). Perhaps the single most important thing a school leader can do is foster professional interaction and reflective dialogue where members are given opportunities to refine beliefs and skills about teaching and learning. Effective leadership is evolving to encompass a broad range of opportunities for all people in the educational community to be learners. Bailey and Lumley (1997) have identified effective technology leaders as those who value technology as the primary tool that will change the way we view teaching and learning. They maintain that leaders who will successfully integrate technology must be able to model the technology, understand how technology can be used as an instructional tool across all disciplines, and continually focus on systems thinking as they assist others through the transformation of teaching and learning. As technology increases our knowledge base rapidly, we must not only teach students how to learn rather than what to learn, we must also redefine our own roles as teachers and leaders in a society that requires all of us to be learners.

**Methodology**

The purpose of this study was to determine whether a correlation exists between teachers’ perceptions of leadership and effective integration of technology in the classroom. Ex post facto research was used in this study due to the multitude of uncontrollable variables and the scope of this area of inquiry. General demographic information was provided by most of the subjects; however, district information was optional to insure anonymity. The subjects had no prior knowledge of the study or the survey.

**Population Sample**

Of the 40 questionnaires that were randomly distributed, all 40 were returned indicating perceptions of teachers from at least 15 different school districts in Ohio. Of the general demographic information collected, 70% percent of the teachers surveyed taught in elementary classrooms and 25% percent indicated teaching in secondary classrooms. Thirty percent identified their districts as rural, 28% percent as urban, and 38% percent as suburban. Twenty-five percent of the subjects perceived their districts to be small, whereas 30% percent of the
subjects identified their districts as large organizations and 40% percent identified their districts to be average in size. Of the 40 subjects, 60% percent were female principals and 40% percent male principals.

Instrument

A survey consisting of 30 questions was administered to 40 public school teachers in Ohio to determine their attitudes and perceptions regarding leadership as it affects variables within the context of school culture. In order to delineate indications of the survey responses, the questions were categorized as they related to leadership, interpersonal relationships, and overall building climate. Ten of the 30 questions specifically addressed the attitudes and perceptions surrounding the use of technology and its implementation as an instructional tool in the classroom. Responses were then given numerical values on a scale from 1 to 7. The values correlated to the level of authoritarian leadership perceived in the building and the use of technology as an instructional tool.

Table 1
Numeric values and indications of perceptions regarding survey questions that pertain to building climate, interpersonal relationships, and leadership

<table>
<thead>
<tr>
<th>Response option:</th>
<th>Always</th>
<th>Frequently</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeric value:</td>
<td>7.0</td>
<td>5.0</td>
<td>3.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Indicates:</td>
<td>Strong facilitative leadership, positive interpersonal relationships, collaborative teams, warm building climate, high level of administrative support</td>
<td>Leadership is somewhat democratic, staff frequently has input and acts as a team, overall building climate is generally friendly</td>
<td>Leadership is more authoritarian, staff rarely gives input regarding new programs, little support from administration, low morale among staff</td>
<td>Highly authoritarian leadership, little if any collaboration among staff, no clearly defined vision, no support by administration to take risks and encourage innovation, overall climate of the building is negative</td>
</tr>
</tbody>
</table>
Table 2  
Numeric values and indications of perceptions regarding survey questions that pertain to technology

<table>
<thead>
<tr>
<th>Response option:</th>
<th>To a great degree</th>
<th>Somewhat</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeric value:</td>
<td>7.0</td>
<td>4.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Indicates:</td>
<td>High levels of enthusiasm, time and support for professional development, technology is used in a variety of ways to improve instruction</td>
<td>Some teachers are willing to try new ideas using technology, technology is beginning to change the way teachers think about instruction</td>
<td>There is little or no support for development, very few teachers are using technology with their students, technology is generally not enhancing instructional strategies.</td>
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Statistical Treatment

Responses from the surveys were assigned numerical values in order to derive mean scores for interpersonal relationships, building climate, leadership and technology. The mean scores for interpersonal relationships, building climate, and leadership were then averaged to find a single value representative of the perceptions of the overall organization. Those numerical values and the values determined by the technology scores were used to plot points on a scattergram in an effort to determine a correlation between leadership styles and the implementation of new technological programs or instructional strategies. The scores were also used to determine the percentage of teachers who perceived their leaders to be either authoritarian or democratic and the percentage of each group who exhibited positive attitudes regarding their positions, the implementation of technology, and the overall building climate.

Results and Discussion

The data reveals some significant findings regarding the extent to which leadership styles impact the implementation and use of technology as an instructional tool in the classroom. The random sampling of subjects consisted of 40 teachers in public schools in Ohio. Twelve of the 40 subjects indicated authoritarian leadership exists in their building. Furthermore, of those 12, only 6 subjects (50%) indicated positive attitudes toward the implementation and use of technology as an instructional tool. However, 19 of the 40 subjects perceived their leadership to be more democratic, and 17 of those 19 subjects (89%) indicated positive attitudes toward the implementation and use of technology as an instructional tool.
Table 3
Percentage of subjects within each leadership style that indicated positive attitudes (values greater than 4.0) in areas of technology, building climate, and overall learning community.

<table>
<thead>
<tr>
<th>Leadership style</th>
<th>Authoritarian</th>
<th>Facilitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Range</td>
<td>1.0-3.5</td>
<td>3.6-4.5</td>
</tr>
<tr>
<td>Positive attitudes toward technology</td>
<td>50%</td>
<td>44%</td>
</tr>
<tr>
<td>Positive perceptions about the building climate</td>
<td>8%</td>
<td>44%</td>
</tr>
<tr>
<td>Positive attitudes regarding the overall learning community, leadership, and innovative change</td>
<td>0%</td>
<td>56%</td>
</tr>
</tbody>
</table>

These statistics could imply that, given the subjects in this study, facilitative leadership qualities could prove to be more effective in the implementation of new programs or innovative instructional practices involving technology. Furthermore, 18 of the 19 subjects who indicated their principal was a facilitative leader demonstrated through their responses that they had positive attitudes regarding the overall learning community. This percentage is sharply contrasted with teachers who identified themselves as having authoritarian leaders. These findings indicate a positive correlation between the perception of administrative leadership styles and the perception of the learning conditions that exist within the building with regards to technology integration.

The mean scores of the data were compiled into scattergram graphs to identify correlations between leadership styles and teachers’ perceptions of conditions that exist within their buildings. The results indicate a positive correlation between positive attitudes regarding the implementation and integration of technology as an instructional tool. Furthermore, there is a positive correlation between facilitative leadership and positive perceptions of overall building climate.
Figure 1

Correlation between Leadership Styles and Teachers' Attitudes toward Technology Implementation
The dramatic differences in teacher attitudes suggest that this issue needs to be explored further. The data presented here demonstrates a direct correlation between the attitudes educators exhibit about the educational culture of the building, the learning environment, and the type of leadership under which it operates. It is logical to assume that in order for teachers to evaluate their own instructional strategies and collaborate on the utilization of new programs or methods, they must be positive about their role in the organization and the organization as a whole. The attitudes indicated in the authoritarian group could suggest a more pessimistic view regarding teachers’ perceptions of their role in the educational community, their relationship with the leader of the educational community, or the value of their role in the process of change as it relates to the implementation of innovative technology programming. If it could be proven that specific leadership styles or qualities contribute to the overall attitudes the staff has regarding the learning community and further, that these attitudes contribute to the success or failure of student outcomes, further investigation on this issue is most certainly of paramount importance.
Conclusion

Undoubtedly, innovative change efforts in the area of technology are presenting enormous challenges for educational leaders. Researchers maintain that as administrative responsibilities increase and technology continues to grow at a rapid rate, leaders are depending more and more on teachers and technology specialists to utilize technology and model its use (Cafolla & Knee, 1995). Enabling teacher-leadership is another way that leaders can make technological innovation a reality in our schools. Not only does it require collaboration and team building, but also it extends the traditional sense of governance and decision-making to individuals who would not necessarily serve in an administrative role. Those administrators who allow others to contribute to innovative instructional practices and learn how to incorporate technology in their own work demonstrate the value they place in members of the organization as well as the integration of technology. Furthermore, educational leaders who effectively utilize the expertise of teachers in the area of technology are likely to recognize specific strengths and contributions of staff members in other areas.

The question is not "if" technology will impact our educational system and student learning, but rather how we can most effectively utilize technology as an instructional tool to improve student learning, and under what conditions that learning occurs. Experts are conducting qualitative research to determine what differences exist in learners, environments, policy, and leadership to identify what indicators are necessary to bring about positive changes in learning with regards to the use of technology (Lemke, 1998). Furthermore, leaders in the field who have examined teachers’ resistance to accept technology as an instructional tool indicate that often the people who are making decisions about the classroom don’t understand the needs of the teachers. Many technology initiatives are top-down. In hierarchical structures, teachers often view the pressure to use technology as a minimization of their role in the organization (Cuban, 1998). Technology integration at the district, building and classroom levels require changes at all levels. While there may be a host of administrators at the apex of the hierarchical structure imposing change on classroom teachers, implementation strategies ultimately rest with the teachers. The literature confirms that school improvement efforts are largely dependent upon the role of the administrator (Bailey, 1995). Unless leaders value the beliefs, constraints, and learning opportunities of their teachers, they are not likely to enlist support of organizational changes.

November (2000) maintains that while adults are paper trained, our children today are children of the digital age, and preparing them for the Information Age means shifting our focus about technology and teaching and learning. Today’s school leaders must be prepared to think systemically as they address the overall goals of the educational community. Integrating technology in a meaningful way is not as simple as using new tools to perform the same tasks. When organizations begin to reevaluate the role of technology, a critical component should also be to examine the culture of both student learning and adult learning. The difference between organizations that "automate," or use technology to more efficiently manage existing procedures, and organizations that "informate," those that truly integrate technology and create learning communities is a shift in control. As roles and responsibilities change, interdependent relationships are created between students, teachers, administrators, and the community outside the school walls. Given this to be true, the progressive nature of these innovative instructional strategies requires attention to professional growth opportunities for teachers, technical support
and a sense of collegiality in a learning community where decision-making is shared and risk-taking is encouraged. Leadership is extended to give more people the opportunity to collaborate and examine how the computer literacy can impact education. Furthermore, teachers’ motivation for professional development is refined when they share the organizational "vision" and assume ownership over improving instructional strategies and student learning.

Experts agree that leaders must be equipped to create the kinds of conditions that allow for technology integration efforts to be successful. Effective leaders are those who encourage individual learning and promote a sense of collegiality, open communication, and value for professional growth. Furthermore, teachers must be given opportunities to examine their beliefs about teaching and learning in a supportive environment that encourages risk-taking and reflection (Fullan, 1991; November, 1993, 2000; Topper, 1998).

As technology becomes more and more prevalent in our schools, and as districts and policymakers determine the most effective ways to provide access to technology and meaningful learning experiences in the classroom, this issue represents perhaps one of the most ideological shifts in educational history. Innovative changes in instructional strategies involving technology are defined in national and state educational standards as well as district-level curriculum plans. However, it is unlikely that technology integration will be successful in schools that have developed plans simply because there is an expectation to have a plan (Oakely, 1998). For technology to be used successfully as an instructional tool in the classroom, teachers must be willing and able to construct pedagogically sound reasons for doing so. Moreover, their own knowledge and beliefs about teaching, learning and technology will lead to the real changes in the classrooms. It is up to the leaders in our educational communities to align those changes in meaningful, productive directions for the future.

References


Author Notes

Melissa Hughes has earned a master’s degree in Instructional Technology from the University of Akron. As she completes her master’s degree in Educational Administration, Melissa has continued her study of leadership and the impact our educational leaders have on the improvement teaching and learning. She is the co-author of The Elementary Teacher’s Guide to Parent and Student Communication. Melissa is currently the Technology Resource Teacher in the Manchester Local School District in Akron, Ohio.

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