Educational Technology: Effective Leadership and Current Initiatives

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Abstract:

   (Purpose) This article describes the basis for effective educational technology leadership and a few of the current initiatives and impacts that are a result of the aforementioned effective leadership. **(Findings)** Topics addressed in this paper include: (1) the role of the educational technology leader in an educational setting; (2) an examination of the required skills of an educational technology leader; (3) theoretical frameworks and models such as organizational change and TPCK; (4) social and emotional aspects of technology integration; (5) impacts of effective leadership; (6) distributed and distance learning technology; (7) technology initiatives focused on learning enrichment. **(Conclusions)** Although educational technology leaders have had a significant impact on the field of education, effective leaders require an extensive knowledge of the leadership process and related theory to effectively integrate technology with the goal of increasing student achievement and overall school performance.

Introduction

Within the field of education the effective use of technology can provide many benefits. Technology has a multitude of uses in such diverse areas as professional development, curriculum modifications, distance learning, and the teaching of skills necessary to have a successful career in our technologically integrated world. Yet, without educational technology leaders acting as strong advocates, the field of education would be unable to successfully integrate technology into a school system, local school site, or classroom. Thus, in order to reap the benefits of technology, there is a need for expert individuals to assume leadership roles and promote technology for educational purposes.

In this essay, the nature and impact of effective leadership will be examined within a framework of educational technology, specifically in regards to the integration of technology into a classroom or other learning environment. This examination consists of two parts. First, I will examine effective leadership by defining the roles and skills consistent with excellence in leadership; I will also examine prevalent theories, models, and other discourses from the literature on leadership. Second, I will examine the real impact of technology leadership in action, specifically how leaders use technology to achieve improvements in such areas as school performance.

Defining Effective Leadership: The Role and Skills of a Technology Leader

Educational technologists may have a multitude of responsibilities placed upon them as they are often designated as the primary educational technology leader within an educational environment. The role that these leaders serve is best represented by the way that effective

technology leadership is defined and presented within the literature of the field. The role of an

educational technology leader within a school is a unique role in comparison to that of basic

organizational management. For example, it can be expected of all leaders to be responsible for,

as Schrum and Levin (2009) state, "changing the culture of a school" (p. 104). However, a

technology leader has a further defined role from that of a general school leader or administrator.

Schrum and Levin (2009) discuss the role of the educational technology leader as one who

integrates modern technology focused on collaboration, such as wikis and online discussions,

into the school and its respective classrooms. Thus one can see that a technology leader has a

more focused and often demanding role within the school; they must continually modernize the

school in terms of its possession of technology resources and more importantly the use of those

technologies for the goal of improved, modern instruction. This role is not to be taken lightly,

and must be fulfilled by individuals who not only understand and enact effective principles of

leadership, but also have a working knowledge of technology and its classroom use.

Having defined the primary role of an educational technology leader, to integrate

technology into the classroom, one must examine the skills required to be a leader in this ever

changing field. Educational technology leaders are in a unique position and as such require a

focus on two sets of skills: organizational leadership skills and skills related to the use of

technology. One framework for viewing the required skills of an educational technology leader is

provided by Northhouse (2010) and is drawn from previous work known as the three-skill

approach (Katz, 1955). In this model, effective leaders are defined as focusing on three skill

areas, known as technical skills, human skills, and conceptual skills, in various amounts based on

their position within an organization (Northhouse, 2010). In applying this conceptual framework

from Northhouse (2010) and Katz (1955) to our studies on educational technology, one can

assume that while technology leaders must be competent in terms of human and conceptual skills, the primary focus of a technology leader is on technical skills. Thus, as a prime condition for being an effective advocate of technology within an organization, that individual must have knowledge of the existing technology and skills necessary to demonstrate and model the effective use of technology. In the case of a local school site, a technology leader must have a large knowledge base of useful technologies to draw upon to solve specific problems, such as providing teachers with professional development or using technology to improve classroom instruction.

Leadership in Action: Theoretical Frameworks

While there are many different theories on leadership in general, there is one specific theoretical framework that continually presents itself within the literature dealing with technology leadership. Because of the focus on innovation and the adaption of new technology, technology leadership is often viewed within the theoretical framework of change leadership. For example, Schrum & Levin (2009) view technology leadership within a framework of change because of the need to master the unpredictable nature of new and emerging technology. After recognizing the field of technology as being in a state of constant innovation and accepting the premise that technology leadership is essentially leading through consistent change, one can look to the academic works of leadership advocate Fullan (2001). Fullan (2011) has devoted a significant amount of his academic writing to developing leaders who can effectively adapt to change and promote their organizational goals within a changing environment. Fullan (2001) recommends that in order for leaders to be effective they must, "understand the change process" (p. 5). Fullan (2001) further defines the change process as one where a leader must first develop a reasonable implementation process aligned with the leader's goals. The development of a plan

within a changing field may be difficult. For example, within technology, if plans are not enacted quickly enough, the technology implemented through those plans may become obsolete. This phenomenon of rapid change may produce leaders and organizations that are simply in a state of constant change, scrambling to keep up with the latest and greatest technology. In fact, Fullan (2001) cautions against those leaders caught in the whirlpool of change by stating," the goal is not to innovate the most and it is not enough to have the best ideas" (p. 34). Taking lessons from Fullan's (2001) work means that technology leaders must pace themselves and the implementation of technology within their organization. Prospective leaders should beware as there is a dichotomy of failure within this theoretical model of change. Those who are educational technology leaders will exhibit failure if they do not change enough to adapt to the modern times or if they change too much. All technology leaders must be wary of the tendency to sacrifice the goals of their position or organization to pursue change for the sake of only innovation and not the proper and effective use of technology.

Another leadership theory that is highly applicable to educational technology leaders is that of path-goal theory (Northhouse, 2010). In essence, path-goal theory explains that the focus of a leader is to marshal their co-workers or subordinates towards a certain organizational goal (Northhouse, 2010). It is therefore the focus of the leader to ensure that the goal the organization is moving towards is free from any barriers along the path that would interfere in the organization's goal achievement (Northhouse, 2010). This theoretical framework can also be applied within a school setting in order to further guide and assist educational technology leaders.

As mentioned before, an educational technology leader at a school is often charged with the goal of integrating technology into the classroom. However, this integration into multiple

classrooms will surely be dependent on motivating teachers towards a goal of technology

integration. In this manner, an educational technology leader must assist others in their

integration of technology in order to have a significant impact on the entire school. By following

path-goal theory, the educational technologist can use various actions such as technology

training or support systems to assist teachers in utilizing technology in their classroom. Thus,

educational technology leaders must recognize that they do not act in isolation and may have to

lead as a facilitator for the technology integration of their teachers.

Leadership in Action: Modeling Effective Technology Leadership

In order to provide further guidance to technology leaders in navigating the proper use of

technology, one can turn to specific models which assist in designing and evaluating technology

integration. One of the most popular technology integration models is known as the

technological pedagogical content knowledge (TPCK) model (Mishra & Koehler, 2006). The

basic premise of this model is that effective technology integration requires the content one

teaches and the way one teaches it to be aligned with the technology one uses; this alignment

creates a mastery of technological integration known as technological pedagogical content

knowledge (Mishra & Koehler, 2006). If a technology leader is lacking in any of these areas,

whether it is technology, content, or pedagogy, then they will not have the knowledge required to

have truly effective teaching through technology. For example, if a teacher has immense

technological resources and a substantial background in the content they are teaching, but they

do not have the required foundations in pedagogy, then that teacher will not have the knowledge

to effectively teach their subject in a modern technological framework. This model also gives

educational technology leaders a means to evaluate teachers based on their technology use. For

example, researchers Hofer and Swan (2006) use TPCK as a model for evaluating the

effectiveness of middle school teachers who used student video projects in their social studies and English classes. By demonstrating the requirements of classroom teachers to effectively integrate technology into their teaching, TPCK also serves as a model by which technology leaders can view and evaluate effective teaching.

Another useful model, known as the holistic model, examines technology integration as the adoption of innovation within an educational organization (Dooley, 1999). This model contrasts high rates of technology diffusion with low rates of diffusion, and also notes the impact of several factors such as the leadership of the principal and technology trainers on those users who implement change (Dooley, 1999). This model helps successfully explain why some individuals within an organization easily adapt to new technology while others fail to implement the same technology, as it requires an integration approach that encompasses both training and leadership (Dooley, 1999).

Additional Factors for Successful Leadership

Besides the more traditional discourses on aspects of leadership such as the role of the leader, required skills, theoretical frameworks, and models, there are other avenues of thought on leadership that may be advantageous for adoption by technology leaders. Two additional factors for successful leadership are the use of a moral imperative as a leadership goal and the social emotional awareness of a leader in relation to their colleagues.

Fullan (2001) advocated the use of a moral purpose for leaders as a way to both organize their goals and to motivate their followers. Fullan (2001) also provides a moral imperative applicable to educational technology leaders when he states, "an important end is to make a difference in the lives of students" (p. 13). Thus, leaders in education can spur their followers

into action by motivating them towards improvements in their student populations. This goal of student achievement can be placed in terms related to technology leadership in education; the implementation of technology can be placed in the perspective of improving student performance. In addition, this moral imperative can be applied to all actions of the technology leader, not just those actions directly involving student learning. For example, actions such as providing professional development on technology for teachers or using technology to assist teachers in grading, lesson planning, or classroom management can be viewed within a moral perspective of providing for more effective instruction through an investment in teachers. Providing a moral purpose also allows for consensus and support from others, which only serves to benefit the goals of any leader. By tying their advocacy of technology and their actions pertaining to integration to a common central goal of student performance, educational technology leaders can use a moral purpose to persuade others to their cause.

In addition, any effective leader must be aware of the social and emotional repercussions of their actions. For example, when dealing with technology implementation, technology leaders may face disagreements from those who feel threatened, overwhelmed, or confused when faced with the adoption of new technology. Those who have negative emotions or disagreements towards a leader's actions or goals will put up physical and emotional barriers to the leader's ambitions. Thus, the relationship between leaders and their awareness of the emotions of those in their organization or affected by their policies is an important factor in goal attainment. Goleman, Boyatzis, and McKee (2002) discuss the emotional intelligence of a leader and note:

 "Under the guidance of an EI leader, people feel a mutual comfort level. They share ideas, learn from one another, make decisions collaboratively, and get things done" (p. 21).

Goleman, Boyatzis, and McKee (2002) further define four components for effective emotional leadership and the development of emotional intelligence as self-awareness, self-management, social awareness, and relationship management. For the educational technology leader, focusing on being aware of the collective feelings of an organization in response to any leadership initiative, such as the adoption and use of new technology, allows the leader to respond and pacify any concerns. If teachers are able to emotionally accept the same technological advocacy promoted by the educational technology leader, then there is more room and opportunity for initiative and action on the leader's part. If individuals' emotional concerns are not met, then a leader may be unable to take any initiative, manifest change, or react to external change, as no leader can truly act alone.

The Complete Educational Technology Leader

Having examined several areas of thought, one can now have a more complete view of the educational technology leader and several key factors relating to their effectiveness. First, the educational technology leader is an individual who promotes the integration of technology in a school system with the moral imperative of improving the learning of students. The improvement of the learning environment through technology can be achieved through a focus on the needs of teachers or students. Specifically, we can view the educational technology leader through a theoretical framework of path-goal theory, wherein the technology leader must assist teachers in the organizational goal of technology integration.

Educational technology leaders also require a higher level of technical expertise than other leaders, as they must be aware of both the emergence of new technology and the means by which it can positively affect student academic achievement. For example, a technical

knowledge of models for technology integration may serve educational technology leaders. The TPCK model provides a framework by which technologists can evaluate their efforts in regards to the effective integration of technology within a learning environment. While TPCK provides a model for technology integration within the classroom, the holistic model serves technology leaders by providing an awareness of the factors that lead to successful adoption of technology within an organization.

In addition, one should also view the leadership component of an educational technology leader as a position that requires knowledge of the change process. This expertise in organization change also includes the ability to guide an organization through the perpetually changing field of technology. Finally, like all truly effective leaders, educational technology leaders should be aware of and adjust their leadership style to accommodate certain factors that can impact their own performance as a leader. Specifically, educational technology leaders would benefit from leadership practices that define a clear moral purpose, such as connecting technology to school improvement or student achievement. Additionally, a focus on the emotional aspects of leading can assist the technology leader in persuading others to adopt new technology and build collaboration within an organization.

The Impact of an Educational Technology Leader

Assuming that an educational technology leader is well-versed in the aforementioned principles and theories of technology leadership, one would expect those leaders with such expertise to make a significant impact on their field. Indeed, educational technology leaders can and have made strong contributions to the realm of education. For example, researchers have found that educational technology leaders, specifically those in positions such as a school level

educational technologist or a technology coordinator, are strong advocates for the further use of technology and have significant influence in how a school's principal approaches and uses technology (Bangolu, 2011). These findings also help support the theory that technology leadership requires a great deal of expertise, as it is shown that the technology coordinator, and not the principal, is often the primary instigator of technology integration in the classroom (Bangolu, 2011).

However, to truly gain a perspective on the impact of current leadership and any initiatives within future generations of educational technologists, one should examine the contributions of educational technologists on present approaches to education. As the goal of an educational technologist is to integrate technology in the classroom in an effort to increase student learning, one should examine their continual work and progress within the field. As such, educational technology leaders are responsible for several areas of innovation within the educational field. These initiatives have had a significant impact on the way teachers presently educate their students; these initiatives deserve an overview in any discussion of technology leadership and the effects it has had on the field of education.

Current Research Based Technology Leadership Initiatives

Now that I have defined those critical aspects which define effective educational technology leadership and its impact, I must examine the current wave of modern technology initiatives within schools. By viewing these initiatives and programs through the lens of the research literature one can find how educational technology leaders are positively effecting their organizations through specific practices. Given the multitude of individual programs, practices, and methods it is far simpler to organize current educational technology into two dichotomous

categories. These categories are defined and organized based on the manner and purpose by which their technology is utilized. First, I will examine distance learning technology and its use in overcoming barriers to education as well as its ability to provide novel distance learning experiences. Second, I will examine enrichment technology, such as simulations and virtual laboratories that provide a technological enrichment to existing lessons or activities.

Distance Learning

In regards to distance learning through modern technology, there are several technologies associated with the use of distance learning, such as web conference software, video chat, learning management systems, or discussion boards. All of these technologies decentralize instruction to deliver information to students. The primary advantage of this technology is that previous barriers to learning, such as the physical distance between the student and a teacher, distance between a student and a school, resources to offer courses at a local school, or the scheduling of coursework at a school, can all be overcome through the use of decentralized learning technologies.

Without the advocacy of educational technology leaders, distance learning would not have been seen as a viable alternative worthy of development and implementation. Now, the field of education is able to use distance learning technologies in a way which benefits a multitude of individuals, who may not have normally be able to be a part of an educational process. For instance, working adults may not have the time within their work schedule to pursue coursework, but distance learning courses can allow traditionally marginalized groups such as high school dropouts the opportunity to pursue a diploma or its equivalent (Olsen-Tracey, 2010). In a survey of severely remote areas in Scotland, researchers found that those students in hybrid

courses, where instruction was given online and exams were given in person, actually felt like they were part of a university environment despite their distance from the university itself (Macintyre & MacDonald, 2011). In addition, distance learning is only continuing to develop and merge with other modern technologies. For example, distance learning programs and curriculum, being predominately web based, are now able to be accessed through mobile devices, which frees students from requirements such as computer access (MacDonald & Chiu, 2011).

The impact of these initiatives is evident. Individuals today have more access to educational resources than individuals from previous generations before the advent of modern distance learning technology. Advocates of educational technology have successfully taken technologies such as video conferencing and websites and used these tools to impact the way individuals receive instruction. Without educational technology leaders these technologies would not have been able to be successfully integrated and utilized within an educational setting.

Technology for Enrichment

Technology can also be used to enhance education. Researchers on Web 2.0 tools, within a TPCK framework, have found that the use of such technology results in a better learning environment by promoting an increase in communication and feedback between students and teachers (Archambault, et. al, 2010). Tools such as wikis, blogs, podcasts, and social networks allow students to not only create and publish their own thoughts, but to share those thoughts with their classmates (Schrum & Levin, 2009). These tools also provide an opportunity for students to receive comments and feedback from their teachers and classmates, which can turn something as simple as a report into an interactive, communicative, and discussion-based learning activity

(Schrum & Levin, 2009). All of these tools directly change the way a teacher conducts a lesson or involves students within an activity. For example, additional classroom discussions may be conducted through an electronic medium or students may build websites as a means to present information. Since these technology tools require such a change in the methodology of a teacher, strong leadership and advocacy must exist to ensure that teachers are comfortable with the presence of these tools as well as the effective use of these technologies.

Educational technology leaders, however, are not just impacting the classroom of today, they are also busy researching and developing technology that will have an impact on future generations. For example, there are emerging online initiatives which promise to take collaboration and interactivity to the next level. One such initiative is known as three-dimensional multiuser environments, which allows individuals to collaboratively interact through an avatar as they solve problems and take on learning tasks together (Qian, 2009). Two examples of learning oriented three-dimensional environments that aim to develop science inquiry skills are River City, which has since closed from funding issues, and Quest Atlantis (Qian, 2009). Initial surveys of those involved in these virtual reality problems solving situations, show that students have a higher degree of motivation towards learning when participating in these activities (Qian, 2009). While these initiatives may be promising, they are still an emerging field and work is still being done to make them less costly and more accessible to students.

Thus, another major impact of educational technology leaders is the enhancement of educational practices through technology integration. By providing teachers with novel means of teaching, technologists enable students to truly learn more of the content, as well as the skills necessary to use subject specific knowledge in a modern context. This impact is nearly boundless, as one cannot even begin to predict the wondrous innovations that will spawn from

future educational technology leaders who have been directly impacted and inspired as today's students.

Conclusions

Already, educational technology leaders have had an impact on the field of education, specifically in the use of technology as a means to enhance learning. However, there are highly demanding requirements to be an effective educational technology leader in the present, as well as in the emerging technological future. Given the unique and promising technologies which can provide for both distance learning and enrichment, a special type of leader is needed to ensure that technology integration can effectively occur on multiple levels from the individual classroom to an entire school. This leader must be able to understand and adapt to changing technologies and guide an organization towards accepting and implementing that change. This leader must also have knowledge of technology and its relationship to content and pedagogy in order to have an effective integration of technology into teaching. This leader must have the emotional awareness to assist those who are struggling or apprehensive in regards to integration. In short, the educational technology leader is an individual who must bring together several areas of leadership theory and utilize these theories to achieve a difficult goal of effective technology use for student achievement. Only by developing educational technology leaders who are well-versed in leadership practice as well as strong advocates for technology integration, can our educational field hope to keep pace with the development of new technology, and use technology in an effective manner within our schools.

However, if an educational technologist is able to be an effective advocate for technology, then they can truly change the entire means by which a school operates. The impact

of integration gives teachers other effective means by which they can instruct their students. Thus, through the enhancement of the education of current students an educational technology leader, both within and outside of the classroom, prepares students for a technology integrated life. An effective leader of technology leaves a lasting impact on future generations of students, by providing an exceptional education which provides those students with the skills, knowledge, and mastery necessary to operate in the new emerging technological world.

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