

## SCHOOL LEADERSHIP AND INFORMATION COMMUNICATION TECHNOLOGY

Mojgan AFSHARI, Kamariah Abu BAKAR, Wong Su LUAN, Bahaman Abu SAMAH, & Foo Say FOOI  
Faculty of Educational Studies, Universiti Putra Malaysia  
mojganafshari@yahoo.com

### ABSTRACT

Leadership is an important component in guiding the teaching-learning process. Principal as school leaders have a major responsibility for initiating and implementing school change through the use of Information and Communication Technology (ICT) and can facilitate complex decision to integrate it into learning, teaching and school administration. Hence, educational leaders must understand, promote and implement the notion that technology integration is not about the technology; it is about focusing on the future generations and leading teachers to a change in pedagogy. However, few studies have empirically examined computer use by principals, their perceived computer competence and their leadership style. This paper will report on these issues from an initial analysis of a baseline data gathered from 30 secondary school principals in Tehran, a large province in Iran. Findings indicate that school principals are using computers for instructional and administrative purposes and they have moderate competency in computer applications. This paper also suggests that the idea of transformational leaders can enhance the computer use in schools. Hence, policy makers must design professional development programs, such as leadership studies, in order to teach the components of transformational leadership; idealized influence, inspirational motivation, intellectual stimulation and individual consideration to future administrators.

**Keywords:** school principal, Information Communication Technology, technology integration

### INTRODUCTION

Technology involves the application of knowledge, resource materials, tools and skills in designing, producing and using products and also it is used to extend human capability to control and modify natural and human-made environments (Raizen et al, 1995). In other words, technology offers new capabilities that lead to significant changes in the organization. It shows the new way of distributing information throughout the organization.

In discussion about the potential role of technology in education, Fiske and Hammond (1997) stated that instructional technology is considered to be a key to educational quality as we enter the new millennium. Many educators believe that computer use for instructional purposes can be employed effectively to enhance teaching and learning. In other words, computer technologies can change the teacher's role from information giver to facilitator, counselor, advisor, guide, coach, co-learner, mentor, resource and technology managers, and mediator to the students (Jonassen et al., 1999). Similarly, Attaran and Vanlaar (2001) pointed out that technology reduces record keeping time in schools and simplifies administrative tasks. Also, computer networking is creating a professional band between teachers and administrators. On the other hand, it offers teachers valuable methods of enhancing successful instructions. Besides, computer use assists students in meeting basic educational requirements and it fulfills an instructional need by individualizing the material to the competency level of the learner. In this way, computer use provides an active cooperative learning environment and offers the flexibility that is now mostly absent in the traditional classroom.

In addition, Otto and Albion (2004) reported that although ICT are now widely available in schools, it does not integrate fully into teaching and learning. In line with this idea, Sheingold and Hadley (1990) pointed out that integrating technology is not about helping people to use computers but it is about helping teachers to integrate technology as a tool for learning. In fact, in the ideal teaching and learning setting, technology should be as transparent a tool as a pencil. Therefore, technology integration in classrooms is more about teaching and learning than it is about technology (Mills & Tincher, 2002).

Based on research studies, a wide range of factors has been found to affect technology integration in the school. Of these, leadership role of principal is the single most important factor affecting the successful integration of technology (Byrom & Bingham, 2001). School principals have a major responsibility for initiating and implementing school change through the use of ICT and therefore facilitate complex decisions about integration of ICT into learning and teaching (Schiller, 2003). Although the role of the principal in supporting ICT integration is critical, much of the ICT literature has tended to overlook the role of the principal (Michael, 1998) and the principal's current technology leadership capabilities and the necessary role the principal must play as technology leader. This gap in the research is rather strange because many studies relating to school effectiveness, school improvement and change show that principals play an important role in creating successful

change in schools (Schiller, 2003). However, little is known about the use of ICT by Iranian principals, their perceived computer competence, and their leadership style that they should play in the area of technology leadership. Therefore there is a need to investigate the role the principal should play in the area of technology leadership.

Ultimately, this paper will provide some preliminary findings on the efficacy of our expectation. The remainder of this article is organized as follows. The next section provides an overview of the relevant literature. Then, the method is discussed followed by presentation of the findings. The final section provides a summary and discussion for future research.

### **The importance of leadership role of principals in technology integration**

Leadership is a key component in guiding the teaching-learning process necessary for preparing today's students with relevant knowledge and skills in today's society to become a productive citizen of the 21<sup>st</sup> century. According to Dinham (2005), leadership is important in developing effective, innovative schools and in facilitating quality teaching and learning. Today's principals must not only manage the day to day activities of a school but also focus on student learning, standards, data driven decision making and restructuring efforts.

As stated above, the principals play an integral role in technology integration (Wilmore & Betz, 2000). This role is crucial in helping teachers create today's ideal learning environment for students. In line with this idea, Wilmore and Betz (2000) stated that "Information Technology will only be successfully implemented in schools if the principal actively supports it, learns as well, provides adequate professional development and supports his/her staff in the process of change" (p. 15). Hence, principals are one of the key leaders of change at the school level. Their actions, interests and self-efficacy can have a profound impact on program change and instructional practice. Therefore, effective administrators must have knowledge, dispositions, and performance. The knowledge are those things that an effective administrators should know; the dispositions are what an effective administrators should believe or value; and the performance are what an effective administrator should do.

In the age of information, principals must be able to integrate ICT into their daily practice and to provide consistent and positive leadership for technology use in the teaching-learning process. In fact, they must be technology leaders. According to Hope, Kelly and Guyden (2000) technology leadership involves both understanding the technologies and how they can be applied to accomplishing tasks. In a study that examined the role of administrators in the integration of technology into the learning environment of three United States school districts, Gibson (2002) stated that school principals must focus their energies on ten technology categories: existing practice, planning, curriculum, resources, staff issues, communications, support, obstacles, staff development, and implementation. In this way, principals need to understand the capacities of the new technologies, to have a personal proficiency in their use, and be able to promote a school culture which encourages exploration of new techniques in teaching, learning and management (Schiller, 2003). Therefore, schools need leaders who can facilitate the change process and support a learning community for technology integration.

According to Fullan (2003), no successful large-scale change or school reform effort has advanced very far without the support of the school leaders. Similarly, Schiller stated that "principals have a key role to play in the facilitation of educational change" (p. 4). In his studies of the elementary school principal as a change facilitator for ICT, Schiller (2003) concludes that principals who take an active approach to innovation can foster an environment that has greater benefits for their students and staff. Hence, principals' awareness, understanding and use of ICT are essential for effective use of computers in the school (Smith et al., 1999). A school administrator needs to be familiar with ICT and know what to look for in the classroom if effective supervision, evaluation or support for a classroom teacher is to be made (Fleit, 2000). This view is supported by Hope, Kely and Guyden (2000) who noted that school leaders should use technology themselves, developing an awareness of how technology can be used and modeling the practice to the school staff. Similarly, Stegall (1998) stated that it is important for principals to use computers, to seek assistance and advice from experts, from a technology committee, visit other schools, brainstorm ideas and hire and train technology 'savvy' teachers. Therefore, successful ICT development within the school will require the leader to be aware of the possibilities and future development of technology and how the school might integrate these into teaching and learning.

As leaders, the principals must create supportive conditions to foster the integration of technology (MacNeil & Delafield, 1998). According to Yee (2000), successful school principals should inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision. Also, these principals should portray passionate commitment to providing appropriate ICT

professional staff development for their staff members (Yee, 2000). In this way, the principal's role changes as she/he leads technology integration. Similar to Yee's research, Schiller's findings highlight the key role that the principal must play not only in supporting technology, but also facilitating change and intervention strategies in the teaching-learning process (Schiller, 2003). Also, he stated that principals must work collaboratively with the teaching staff to effectively lead the integration of technology in their schools. To lead this integration, they must be trained and continually supported on the use of technology. Hence, administrators who are informed and comfortable with technology become key players in leading and supporting technology into the schools. Then, principal must act as a role model and they should be competent users of ICT tools.

As described above, leaders who are using technology while they are studying theory are much more successful at understanding it and then placing it in the context of teaching and learning. In this way, leaders must know how to use technology to change practice to reach new goals as a catalyst for change and as a tool in creating, implementing, managing, and communicating a new conception of teaching and learning (Johnston & Cooley, 2001). These new models share instructional practices that include active engagement, communication, collaboration, problem solving, critical thinking, independent exploration and real life tasks (Johnston & Cooley, 2001). Hence, leaders must be able to adapt to change as the environment shifts and develops. Then, the question becomes what leadership style is needed for principal to help teachers cope with the demands of this technological and pedagogical change.

According to Northouse (1997), one of the best styles of leadership is transformational leadership that can change and transform individuals. Transformational leadership occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality (Burns, 1978). An important goal of a transformational leader is to develop followers beyond their potential (Lee, 2005). Hence, transformational leaders try to develop and satisfy the higher-order needs of followers to gain their followers' commitment to the organization (Rowden, 2000).

The concept of transformational leadership has acquired wide popularity among leadership researchers during the past decade (Lowe, Kroeck et al., 1996) because of its qualitatively different approach to motivating followers as compared with other leadership styles (Howell & Avolio, 1993). Bass and Avolio (1994) described transformational leadership as being composed of four unique but interrelated behavioral components: inspirational motivation, intellectual stimulation, idealized influence, and individualized consideration. Several empirical and theoretical studies have found that leaders who display these four behaviors are able to realign their followers' values and norms, promote both personal and organizational changes, and help followers to exceed their initial performance expectations (e.g., Jung & Avolio, 2000). Therefore, transformational leader is noted as one of the most important factors affecting the integration of educational technology and has input into all the essential conditions that promote the integration of educational technology (Brooks-Young, 2002; Ross, McGraw & Burdette, 2001).

Also, the importance of transformational leaders regarding ICT use is supported by Jung and his colleagues (2003) who conducted a research on the role of transformational leadership in enhancing organizational innovation. Their findings supported a direct and positive link between a style of leadership that has been labeled as "transformational" and organizational innovation. Also, they indicated that transformational leadership has significant and positive relations with both empowerment and an innovation-supporting organizational climate. Therefore, transformational leader is noted as one of the most important factors affecting the integration of educational technology and has input into all the essential conditions that promote the integration of educational technology (Brooks-Young, 2002; Ross, McGraw & Burdette, 2001).

Similarly, Schepers and Wetzels (2005) found that there is a positive relationship between transformational leadership and technology usage. They added that if a leader encourages creativity and open-mindedness, employees will be more used to experimenting with new technologies and procedure. Hence, a leader should facilitate conditions and events that create a positive environment for technology adoption such as training and education and organizational technical support (Frambach and Schillewaert, 2002; Schillewaert et al., 2005). In this way, we need proactive leaders who see the present as a springboard to achieve future aims (Popper & Zakkai, 1994).

In fact, technology is about change and change requires strong leadership. Leadership "is not mobilizing others to solve problems we already know how to solve, but to help them confront problems that have never yet been successfully addressed" (Fullan, 2001, p. 3). Enthusiasm, patience, hope, compassion, energy, and forgiveness are all needed in the leaders of today and tomorrow. If leaders lead well then the organization will outgrow them. Therefore, the chief role of leadership is to mobilize the collective capacity to challenge difficult circumstances.

## THE STUDY

In view of the current state of the literature, this study explores how leadership affects the use of ICT in schools. Specifically, it determines the extent to which Iranian principals use ICT in their schools and identifies their perceived ICT competencies and their leadership style. These are empirical questions, and we provide some preliminary findings for supporting the efficacy of our expectation.

## METHOD

To determine the extent of ICT use among principals in their schools and identify their perceived ICT competencies and their leadership style, 30 secondary school principals from 19<sup>th</sup> educational area in Tehran, a large province in Iran, were invited to complete a set of questionnaire. The questionnaires are divided into two parts. Part A measures the perceived level of computer use by principals. Part B measures the principal's characteristics; perceived computer competence; and leadership style (transformational and transactional leadership).

Computer use was measured by 39 items using a five-point Likert scale. Each item was rated by respondents from 1 ("Never use") to 5 ("use daily"). The responses to all 39 items are analyzed using frequency and percentages to determine to what extent principals use the computer for instructional and administrative purposes. This scale was developed by Felton (2006). Also, several items were added to the survey instrument to accommodate the setting of this study. On the other hand, the computer competence scale was used to determine secondary school principals' beliefs about their computer knowledge and computer skills. This scale was developed by Flowers and Algozzine in 2000. A four-point likert-type scale ranging from "no competence" to "much competence" was provided. The responses are reduced to a mean score that demonstrates the level of each respondent's perceived computer competence, with higher scores indicating greater competence. Moreover, leadership style of principals was identified by Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (1997). The MLQ has been extensively used and is considered a well-validated measure of leadership style (Awamleh & Gardner, 1999). Its construct validity has been demonstrated using confirmatory factor analysis (Avolio, Bass, & Jung, 1999).

Although these instruments were valid, a panel of expert reestablished face and content validity of these instruments. Also, the survey was translated from English into Persian using the double back translation method to ensure the accuracy of the Persian version. In addition, Cronbach's alpha was used to measure internal consistency. The Cronbach's alpha coefficients for these scales were: level of computer use= .917, computer competence scale = .973 and leadership style= .813. In addition, demographic variables such as age, gender, experience, types of the school, education, and training were quantified by individual scores on six items. Then, approval was obtained from the Ministry of Education to carry out this study. The questionnaires described above were administered to thirty Iranian principals. These subjects were volunteers from the target population. Also, descriptive statistics was used to describe and summarize the properties of the mass of data collected from the respondents.

## Findings

Of the respondents, 47% were males while 53% were females. About 16% (n= 5) of the respondents were 41 or younger, 43% (n=13) were within the 42-47 age range, 30% (n=9) were within the 48-53 age range, 11% (n=3) were 60 or older. Participants' responses on their work experience showed that 40% of them had less than 19 years of experience, 40% were between 20 and 25 years, 17% had 26-31 years and 3% had more than 32 years. The majority of the respondents, 60% (n=18) worked in private schools, while 40% (n=12) worked in public schools. More than half of the respondents (70%) held bachelor degrees, 27% held Masters' degrees, and about 3% held a Doctorate degree. Nearly 90% respondents owned a home computer. Moreover, all of the respondents reported that they had had computer training.

## Use of computers by principals

Participants were asked to respond to 39, Likert-type statements dealing with their use of computer. According to this questionnaire, four domains of computer use such as Internet use, hardware and software use, instructional use, and administrative use were measured. A mean score on a 5-point scale represented computer use by principals, where 5 (use daily) represents the maximum score of the scale and 1 (never use) represents the minimum score. Higher scores indicate higher level of computer use and lower scores indicate lower level of computer use.

**Table 1. Distribution of mean scores on the computer use scale**

Scale	Percent (%)					Mean	S.D.
	Never use	Use a few times a month	Use a few times a week	Use 2 or 3 times a week	Use daily		
Internet use	0.0	16.7	20.0	43.3	20	3.67	0.99
Hardware and software use	0.0	6.7	23.3	56.7	13.3	3.77	0.77
Instructional use	0.0	13.3	40	40	6.7	3.4	0.81
Administrative use	0.0	20	56.7	23.3	0.0	3.03	0.67
<b>Overall Computer Use</b>	0.0	13.3	36.7	43.3	6.7	3.43	0.817

As shown in Table 1, principals’ overall computer use was moderate with an overall mean score of 3.43 and a standard deviation of 0.81. The level of computer use by principals were evident within the Internet use (M= 3.57), hardware and software use (M= 3.77), instructional use (M= 3.4), and administrative use (M= 3.03) domains. Also, the results showed that 43.3 percent of principals use computers 2 or 3 times a week while only 6.7 percent of them apply computer daily for doing their tasks.

Based on these findings, the number of principals who used Internet daily at school was more than those who used it at home. Besides, most of the principals indicated that they used the Internet daily for sending and receiving e-mail. They also used search engines to conduct Internet searches, whereas using a web browser to explore educational and professional resources was either in the category of “never use” or “a few times a month”. Moreover, the main use of computer was in the application of hardware and software. Also, the majority of principals (60%) reported that they used word processing daily for their professional work while only 3% stated that they used computer to construct spreadsheets, databases and presentations (such as PowerPoint). By increasing the availability of computers at school and home, it is not surprising that basic computer operation skills and word processing are skills that most principals are competent in. These skills are not seen as critical for principals as other staff can assist them and therefore the principals can spend more time on other aspects of ICT. However, the relatively low proficiency of principals in creating and using spreadsheets and databases are essential for those in leadership positions where use and interpretation of data is increasingly becoming a critical skill. Hence, considerable ongoing, professional development opportunities need to be provided for principals to fulfill their role as technology leader. Training needs to be ongoing so principals can continue to learn how to use hardware and software applications within the context of their administrative and instructional responsibilities.

Regarding the instructional use domain, about 40 % of the respondents used computer “2 or 3 times a week” or “a few times a week”. Majority of respondents stated that they used computers for recording discipline referrals, monitoring student achievement for specific objectives, monitoring students’ grades, creating a master schedule, and developing or writing curriculum.

According to Table 1, 23.3% of principals used computers “2 or 3 times a week” for administrative tasks. This amount is less than the amount of computer use in other domains. Moreover, most of the principals applied technology to communicate with their staff, members of the wider school, initiate and sustain collaborative activities with colleagues within and outside their school, whereas about 36% of principals stated that they did not use a program to analyze information for solving problems. Also, nearly 50% reported that they have never used technology to participate new kinds of professional development such as collaborative work groups and online study groups.

**Perceived ICT competencies of principals**

The survey provided an opportunity for each principal to rate themselves on a range of ICT competencies. Table 2 demonstrates the eight domains of the perceived ICT competencies of principals. The scales ranged from a low of 1 (no competence) to a high of 4 (much competence).

**Table 2. Distribution of mean scores on the computer competence scale**

Scale	Percent (%)				Mean	S.D.
	No competence	Little competence	Moderate competence	Much competence		
<b>Basic computer operation skills</b>	0.0	3.3	30.0	66.7	3.63	0.56
<b>Set up, maintenance, and troubleshooting of equipment</b>	0.0	30.0	46.7	23.3	2.93	0.74
<b>Word processing</b>	0.0	10.0	30.0	60.0	3.5	0.68
<b>Spreadsheets</b>	3.3	40.0	46.7	10.0	2.63	0.72
<b>Database</b>	3.3	40.0	50.0	6.7	2.6	0.68
<b>Networking</b>	3.3	26.7	50.0	20.0	2.87	0.78
<b>Telecommunication</b>	0.0	26.7	43.3	30.0	3.10	0.77
<b>Media communication</b>	0.0	16.7	56.7	26.7	3.10	0.66
<b>Overall computer competence</b>	0.0	14.3	50.0	35.7	3.21	0.69

As can be seen from Table 2, the majority of the respondents (50%) possessed moderate competence in handling most of the computer functions needed by principals. Also about 35.7% of principals had much competence and approximately 14.3% of them had little competence in computer use. The mean of principals' computer competence was 3.21, indicating that these principals perceived themselves to be moderately competent in computer technologies. The standard deviation of principals perceived computer competence was 0.69 which means that their responses clustered around the mean. In addition, more than half of the respondents indicated that they had much competence in handling basic computer operation skills (66.7%) and word processing (60%) while only 6.7% of principals reported that they had much competence in entering data, searching, producing a report and queries in a database. To improve the computer competency among school principals; policy makers should plan computer programs to train principals. They should emphasize on training for principals to effectively use technology in their work. Therefore, principals must be given support to help them understand the use of computers for complex tasks of their jobs.

### Leadership style of principals

Leadership style of principals was measured by the Multifactor Leadership Questionnaire. The instrument used in this study provided two scores: transformational leadership and transactional leadership. The transformational leadership score is the average score of 20 items making up transformational leadership. The transactional score is the average score of the 12 items encompassing transactional leadership. Leadership style was measured by a mean score on a five-point Likert scale, where 0 (not at all) represents the minimum score of the scale and 4 (frequently, if not always) represents the maximum score.

**Table 3. Distribution of mean scores on the leadership style scale**

Scale	Percent (%)					Mean	S.D.
	Not at all	Once in a while	Sometimes	Fairly often	Frequently if not always		
<b>Transformational leadership</b>	0.0	6.7	20.0	56.7	16.7	2.83	0.79
Idealized influence (attributed)	0.0	16.7	20.0	50.0	13.3	2.60	0.93
Idealized influence (behavior)	6.7	16.7	26.7	43.3	6.7	2.27	1.04
Inspirational motivation	6.7	16.7	26.7	43.3	6.7	2.27	1.04
Intellectual stimulation	3.3	13.3	33.3	36.7	13.3	2.43	1.0
Individualized considerations	0.0	6.7	40.0	46.7	6.7	2.53	0.73
<b>Transactional leadership</b>	0.0	10.0	66.7	23.3	0.0	2.13	0.57

Contingent reward	0.0	13.3	23.3	40.0	23.3	2.73	0.98
Management by-exception-active	0.0	13.3	36.7	40.0	10.0	2.47	0.86
Management by-exception-passive	0.0	16.7	43.3	20.0	20.0	2.43	1.0
Overall leadership style	0.0	16.7	50.0	30.0	3.3	2.20	0.76

Table 3 reports the percentage, mean scores and standard deviations of responses for each set of items measuring transformational and transactional leadership. As a composite variable, transformational leadership received a mean rating of 2.83 (on a five-point scale). In addition, all of the five dimensions of transformational leadership received very similar mean ratings (2.27-2.60). Also, the standard deviations associated with all five transformational leadership dimensions were relatively large, ranging from 0.73-1.04. This indicates at least moderate variation in the perceptions of respondents. In all, the areas where most improvement is needed are individualized consideration (behavior) and inspirational motivation. Individualized consideration (behavior) and inspirational motivation had the lowest total mean score of 2.27. Transactional leadership however received a mean score of 2.13. Among the three dimensions measuring transactional leadership, contingent rewards received a larger mean score (2.73). The overall mean score of principals' responses on the leadership style scale was 2.20 with a standard deviation of 0.76.

## DISCUSSION AND CONCLUSION

This paper raises some issues about the role of principals in technology integration, determines the extent to which Iranian principals use ICT in their schools and identifies their perceived ICT competencies and their leadership style. Findings indicate that principals are using computers two or three times a week for a variety of instructional and administrative tasks. In fact, if Iranian principals want to be successful for their new role as technology leaders, they must understand the role of ICT in their work life and acquire appropriate skills to use this knowledge. In other words, they must be proficient in utilizing the computer to assist in administrative and instructional functions. For example, they should understand word processing, how to construct and report from a data base, how to use a spreadsheet to solve financial problems, how to create reports and link them with a mail-merge package, how to create and maintain files on a disk, how to use hardware available in their district, and how to use specific applications programs in use in their school. Hence, principals should use of technology and realize the role that technology can play in teaching and learning process. Successful adoption of computer is important for school principals who must use computers and model their use for their staff (Tiede, 1992). If this modeling is successful, the staff may then model the use of computers for students. In this way, principals who do not have positive expectations for computer use or do not instill or support a culture of technology use; integration is inhibited (Anderson & Dexter, 2000). Therefore, principals should have knowledge, skill and positive attitudes towards implementing ICT in schools and also they must know new administrative techniques to manage their schools effectively.

In line with this idea, Thomas (2001) stated that administrators should understand (a) the elements and characteristics of long-range planning for the use of current and emerging technology; (b) demonstrate an ability to analyze and react to technology issues, concepts and proposals; (c) possess a "big-picture" vision of technology in education and schools; (d) use technology to communicate efficiently with staff, parents and the community; (e) use technology directly to collect and analyze data and other information that can improve decision-making and other management functions; (f) understand how current and available technologies can be integrated effectively into all aspects of the teaching and learning process; (g) understand the legal and ethical issues related to technology licensing and usage; and (h) use technology appropriately in leading and communicating about school programs and activities. Hence, meaningful opportunities must be provided for Iranian principals to develop their skills and dispositions necessary for leadership in the current educational milieu. In this way, they will understand that technology use can enhance their professional practice and increase their own productivity.

As indicated above, improved technology leadership will only occur if the principal becomes proficient in the use of technology and then provide leadership in the use technology for administrative, instructional, and learning functions. In fact, the principal needs to have up-to-date knowledge on areas of education. The best way to do this is by committing themselves to the process of learning every day throughout their lives (Coughlin, 1994). It means that leaders should never stop learning and honing their skills. In addition they must be familiar with current research and best practice. They must maintain a personal plan for self-improvement and continuous learning (Bennis, 1999). Therefore, such leaders can inspire others and create shared vision;

demonstrate effective uses of technology in the areas of learning and teaching; incorporate technology as they support, manage, and operate the school; and actively involve themselves in the assessment and evaluation of technology in the school.

The pace of change confronting organizations today has resulted in calls for more adaptive, flexible leadership. Adaptive leaders work more effectively in rapidly changing environments by helping to make sense of the challenges confronted by both leaders and followers and then appropriately responding to those challenges (Bass et al., 2003). In other words, such leaders are influential in approving or disapproving new ideas. They play an important role in the diffusion and adoption of innovations. Adaptive leaders work with their followers to generate creative solutions to complex problems, while also developing them to handle a broader range of leadership responsibilities (Bennis, 2001). Bass (1985) labeled the type of adaptive leadership described above transformational leadership. This study shows that a representative sample of Iranian secondary school principals provided fairly often some elements of transformational leadership. Principals should be eager to model the transformational components of charisma (idealized influence), inspirational motivation, intellectual stimulation and individualized consideration in their schools. As charismatic leaders, these principals must talk about values and beliefs, emphasize the sense of mission and promote the good of the group (Bass & Avolio, 2000). As a part of inspirational motivation, principals must create a vision and enlist others to share this vision by making them feel a part of something bigger than themselves (Kouzes & Posner, 1989). Principals should provide intellectual stimulation by challenging teachers to reconsider and rethink assumptions about their work (Leithwood, 1994). According to Bass and Avolio (2000), transformational leaders were not born; rather, transformational leadership could be taught. Hence, principals must develop and display transformational leadership behaviors through training to improve creative and innovativeness in their schools.

Although we have found several encouraging results, it is important to recognize that the current findings also have limitations. First, the sample size should be increased because using data from a larger number of respondents will permit more powerful findings. Second, participants of this study completed a self-reported instrument. Given the self-reporting nature of this instrument, it was quite possible that principals overrated their proficiency or underrated their proficiency. These ratings may not reflect the true proficiency levels of the principals. In spite of these limitations, this study will be useful for policy makers, providers of professional development programs for principals and for system level decision makers to support mechanism and strategies to assist principals to develop their knowledge, skills and their leadership style. Thus, principals will understand the critical role that they play in facilitating the implementation of ICT in schools to improve teaching, learning and administrative processes. Therefore, we need leaders, not bosses, who help us develop a clearer vision and shed light in the moments of dark confusion (Wheatley & Margaret, 1992).

## REFERENCES

- Anderson, R. E., & Dexter, S.L. (2000). *School Technology Leadership: Incidence and Impact (Teaching, Learning, and Computing: 1998 National Survey Report#6)*. Irvine, CA: Center for Research on Information Technology and Organisations, University of California, Irvine.
- Attaran, M., Vanlaar, I. (2001). Managing the use of school technology: and eight step guide for administrators. *Journal of Management Development*, 20 (5), 393-401.
- Avolio, B. J., Bass, B. M., & Jung, D. (1999). Re-examining the components of transformational and transactional leadership using the multifactor-leadership questionnaire. *Journal of Occupational and Organizational Psychology*, 72, 441-462.
- Awamleh, R., Gardner, W.L. (1999). Perceptions of leader charisma and effectiveness: the effects of vision content, delivery, and organizational performance. *Leadership Quarterly*, 10, 345-73.
- Bass, B.M., Avolio, B.J., Jung, D.I., & Berson, Y. (2003). Predicting Unit Performance by Assessing Transformational and Transactional Leadership. *Journal of Applied Psychology*, 88 (2), 207-218.
- Bass, B. M. and Avolio, B. j. (1994). *Improving Organization Effectiveness: through transformational leadership*. Thousand Oaks: Sage.
- Bass, B.M. & Avolio, B. J. (2000). *MLQ Multifactor Leadership Questionnaire (2<sup>rd</sup> ed.)*. Redwood, CA: Mind Garden, Inc
- Bass, B. M., & Avolio, B. J. (1997). *Full-range leadership development: Manual for the multifactor leadership questionnaire*. Palo Alto, CA: Consulting Psychologists Press.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York: I press
- Bennis, W. (2001). Leading in unnerving times. *MIT Sloan Management Review*, 42, 97-102.
- Bennis, W. (1990). Why leaders can't lead: *The unconscious conspiracy continues*. Francisco: Jossey-Bass.
- Brooks-Young (2002). *Making technology standards work for you: A guide for school administrators*. Eugene, OR: ISTE.

- Byrom, E., Bingham, M. (2001). *Factors influencing the effective use of technology for teaching and learning: Lessons learned from the SEIR\*TEC intensive site schools*. (2nd ed.). Greensboro, N.C.: University of North Carolina at Greensboro.
- Burns, J. M., (1978). *Leadership*. New York: Harper and Row.
- Cronbach, L.J. & Meehl, P.E. (1955). Construct validity in psychological tests. *Journal of Psychological Bulletin*, 52,281-302.
- Coughlin, W. (1994). The balance of a lifetime. *Association Management*, 46(1), 67-72.
- Dinham, S. (2005). Principal leadership for outstanding educational Outcomes. *Journal of Educational Administration*, 43 (4), 338-356.
- Felton, F.S. (2006). The use of computers by elementary school principals. (Doctoral Dissertation, Virginia Polytechnic Institute and State University, 2006).
- Fiske, E., Hammond, B. (1997). Identifying quality in American colleges and universities. *Planning for Higher Education*, 26 (1), 8-15.
- Flanagan, L. and Jacobsen, M. (2003). Technology Leadership for the twenty first century principal. *Journal of Educational Administration*, 41(2), 124-142.
- Fleit, L. (2000). *Panel on the Future of the Profession*. Educause Review, January/February.
- Flowers, c. p., Algozzine, R.F. (2000). Development and Validation of Scores on the Basic Technology Competencies for Educators Inventory. *Journal of Educational and Psychological Measurement*, 60 (3), 411-418
- Frambach, R.T. and Schillewaert, N. (2002). Organizational innovation adoption: a multi-level framework of determinants and opportunities for future research. *Journal of Business Research*.55: 163-76.
- Fullan, M. (2003). *The moral imperative of school leadership*. Thousand Oaks, CA: Corwin.
- Fullan M. (2001). *Leading in a Culture of Change*. San Francisco: Jossey-Bass.
- Gibson, I. W. (2002). PT3 and T3L—Teaching tomorrow’s technology leaders: Preparing school leaders to use technology. *Proceedings of SITE 2002: Society for Information Technology & Teacher Education International Conference*. Nashville, TN
- Hope, W.C., Kelly, B., & Guyden, J. (2000). *Technology Standards for School Administrators: Implications for Administrator Preparation Programs*. Paper presented at the Information Technology and Teacher Education Educational Conference, Sand Diego.
- Howell, J.M. and Avolio, B.J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: key predictors of consolidated-business-unit performance. *Journal of Applied Psychology*, 78 (6), 891-902.
- Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999) *Learning with technology: a constructivist perspective*, Upper Saddle River, NJ: Prentice Hall.
- Johnston, M., Cooley, N. (2001). *Supporting new models of teaching and learning through technology*. Arlington, VA: Educational Research Service.
- Jung, D. & Avolio, (2000). Transformational and transactional leadership and their effects on creativity in groups. *Creativity Research Journal*, 13(2), 185-195.
- Kouzes, J.M., & Posner, B.Z. (1989). *The leadership challenge: How to get extraordinary things done in organizations*. San Francisco: Jossey-Bass.
- Jung, D.I., Chow, C., & Wu, A., (2003). The role of transformational leadership in Enhancing organizational innovation: Hypotheses and some preliminary findings. *The Leadership Quarterly*. 14:525–544.
- Lee, J. (2005). Effects of leadership and leader-member exchange on commitment. *Journal of Leadership & Organization Development*, 26(8), 655-672.
- Leithwood, K. (1994). Leadership for School Restructuring. *Journal of Educational Administration Quarterly*, 30 (4), 498-518.
- Lowe, K.B., Kroeck, K.G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta- analytic review of the MLQ literature. *Leadership Quarterly*, 7, 385–425.
- Macneil, A., Delafield, D. (1998). *Principal Leadership for Successful School Technology Implementation*. Paper presented in the Society for Information Technology & Teacher Education International Conference, March 10-14, Washington.
- Mills, Steven C., Tincher, Robert C. (2002). *Be the Technology: Redefining Technology Integration in Classrooms*. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2002* (pp. 2334-2338). Chesapeake, VA: AACE.
- Michael, S. (1998). Best practices in information technology (IT) management: insights from K-12 schools’ technology audits. *International Journal of Educational Management*.12 (6), 277-88.
- Northouse, P. (1997). *Leadership: Theory and Practice*. Thousand Oaks, CA: Sage Publications.
- Otto, T.L., and Albion, P.R. (2004). Principals’ Beliefs about Teaching with ICT. International Conference of the Society for Information Technology and Teacher Education. (March, Atlanta, Georgia).

- Popper, M. & Zakkai, E. (1994). Transactional, Charismatic and Transformational Leadership: Conditions Conducive to their Predominance. *Journal of Leadership & Organization Development*, 15(6), 3-7.
- Raizen, S.A., Sellwood, P., Todd, R.D. and Vickers, M., 1995. *Technology Education in the Classroom*, Jossey-Bass, San Francisco, CA.
- Ross, J., McGraw, T., & Burdette, K.,(2001). Toward an effective use of technology in education: A summary of research. Charleston, WV: Institute for the Advancement of Emerging Technologies in Education at AEL.
- Rowden, R.W. (2000). The relationship between charismatic leadership behaviours and organisational commitment. *Leadership & Organization Development Journal*, 21, 30-5.
- Schepers, J. & Wetzels, M. (2005). Leadership styles in technology acceptance. *Journal of Managing Service Quality*, 15 (6), 496-508
- Sheingold, K., Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Center for Technology in Education, Bank Street College of Education.
- Schiller, J. (2003). Working with ICT Perceptions of Australian principals. *Journal of Educational Administration*, 41(2), 171-185.
- Schillewaert, N., Ahearne, M.J., Frambach, R.T. and Moenaert, R.K.,(2005). The adoption of information technology in the sales force. *Industrial Marketing Management*.34:323-36.
- Smith, G. (1999). Leading and Managing Learning Technologies. Paper presented at the Connected Learning and Learning Technologies in Schools Conference, Brisbane.
- Stegall, P. (1998). *The Principal-Key to Technology Implementation*. Paper presented at the 95th Annual Meeting of the National Catholic Education Association , Los Angeles , CA.
- Thomas, W.R. (2001). Education technology: Are school administrators ready for it Southern Regional Education Board, Atlanta, GA. Retrieved June 30, 2005, from <http://www.sreb.org/>
- Tiede, L. J. (1992). A study of selected elementary school principals' use of computers for administrative purposes. (Doctoral dissertation, Northern Illinois University, 1992). *Dissertation Abstracts International*, 53(06A), 1760. (UMI No. AAG9230727).
- Wheatley, Margaret J. (1992). *Leadership and the New Science*, Berrett-Koehler, San Francisco.
- Wilmore, D., Betz, M. (2000) Information Technology and Schools: the principal's role. *Educational Technology and Society*. Available at: [http://ifets.ieee.org/periodical/vol\\_4\\_2000/v\\_4\\_2000.html](http://ifets.ieee.org/periodical/vol_4_2000/v_4_2000.html) 105
- Yee, D. (2000). Images of school principals' information and communications technology leadership. *Journal of Information Technology for teacher Education*, 9 (3), 287-302.