

EDUCATIONAL TECHNOLOGY EFFECTIVENESS: A CASE STUDY OF PRINCIPALS' STRATEGIES

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Abstract

This study intended to identify: (1) the extent to which high school principals use strategies in order to manage technology; (2) the level of effectiveness the principals administer their school; and (3) the relationship between these strategies and the effective administration. The researchers adopted Weng's and Tang's (2014) "Technology Leadership Strategies and School Administrative Effectiveness Scale" and administered it as a questionnaire through a survey method. Statistical population included 60 private high school principals and total population sampling was applied because of the limited number of the participants. Data analysis involved running a Pearson correlation coefficient to determine the relationship between dependent and independent variables. Analysis also benefited from simple linear regression to examine if management strategies predict administration effectiveness. The correlation coefficient test reveals that there is a moderately positive relationship between technology management strategies and school effectiveness ($r = 0.473$). Results of simple linear regression analysis also predict the dependent variable, effective school administration, as a function of independent variable, strategies of technology management ($r^2 = 0.210$). These findings could imply that effective school administration might be reached partially by identifying and implementing strategies to manage technology. These strategies and their implementations are in part affected by principals' knowledge of technology, their application skills in educational context, as well as their attitudes towards technology (whether or not technology could be a means of effectiveness). The study provides implications for policy makers, technology superintendents, principals and teacher's colleges. Policy makers should be aware of the technology effects on the functions of schools and facilitate the equipment of educational settings with the appropriate technologies. Technology superintendents are to provide leadership needed to make decisions in the era that its main characteristic is "change". School principals are expected to keep abreast of technology developments, assess their pros and cons, and incorporate the ones that meet their needs in their professional responsibilities. Teacher's colleges must revise their courses and/or to develop diploma programs to include technology administration in their program offerings.

Keywords: Management strategies, private high schools, technology effectiveness

1 INTRODUCTION

Education is considered as a main foundation of cultural, social, economic and political development of every country (Herrera, 2010). It usually consumes much of the state budget, which is also an investment in the country's future. It is an indicator in Human Development Report published yearly by the United Nations. Since a substantial part of the education is formal, schools are critical social systems and their administration process is of crucial importance (Shariatmadari, 2009).

Given the importance of education, there are increasing discussions and numerous investigations in relation to the performance of schools and their effectiveness. The lack of so called standard educational performance to lead school activities towards its desired goals, the dominance of teaching to the test and school policy aligned with such a dominance, and ignoring the specific talents of each individual student as a result of such policies, as well as many other factors, are some of the deficiencies of the current educational system, to name a few (Zinabadi & Ahmadyanfar, 2015). On the other hand, school principals, as agents in implementation of policies in schools, can play an important role in reducing shortcomings and the failure of the education system if they are trained well and sound policies were adopted. Therefore, in order for schools to end such problems principals need to adopt more effective strategies (Nzoka, & Orodho, 2014; Zinabadi & Mahmoodvand, 2015). In fact, effective and proper principals could be a difference between successful and unsuccessful organizations (Samson & Julius, 2015). The aim of effectiveness is to evaluate the measures taken to achieve the goals of an organization. In simple terms, the effectiveness measures to achieve the objectives; however, it seems it is a step beyond this. Effectiveness achieved in an educational course when first, educational needs clearly diagnosed, second, an appropriate program for addressing the needs is designed, third, program designed run properly and fourth, an appropriate assessment of the learning process and ultimately achieve goals done (Heidarinejad, Saberi, 2010). The measures of effectiveness is including customer satisfaction, facilitating the current affair of society, employees satisfaction level, access to services, customer confidence level (Shayan kho et al., 2013).

These indicators, the quality of education and the effectiveness of training systems are the major concerns of the educational systems, practitioners and decision-makers in the development of any country. School effectiveness in Iran has been a serious concern for over decades. The governments have hardly been able to pay even the expenditures of education. The above problems may in a state of relative stability have been easier to manage, but educational centers in an unpredictable and complex environment, quickly changing and for the survival and growth of themselves competing and to achieve the objectives shall be capable of rapid response to threats and opportunities available in this dynamic environment. Today, technology has spread all sectors of the organization and is one of the factors of organizational change. In this regard, it is necessary that educational centers and principals to have strategies in order to deal with this situation. In other words, in a century characterized by the dominance of new technologies, changes and a plurality of scientific acceleration, education systems not only should be able to keep abreast of the technological changes but also they are required to equip students with the knowledge to satisfy the needs of other global, national and local institutions and extensive interwoven relationships in the digital age (Ghaffari, 2004). Information and communication technologies have the potential to derive changes within an educational organization and transform the structure and quality of its outcomes (Chuang, 2013). In light of these changes, leadership also needs to revise what it does and how it does it. Therefore, the effectiveness of educational administrators is also a great source of concern and change. Such changes in turn derived from technological change and can affect the effectiveness of principals. To examine how technology administration and school principals strategies intersect, this study was designed to illuminate how school principals could facilitate changes with respect to technology administration strategies. In other words, researchers aimed to explore whether there is a relationship between technology management strategies and the effectiveness of private school principals' strategies in educational district 1 in Tehran.

2 LITERATURE REVIEW

Much has been done on school effectiveness and how administrators could facilitate it (Deeboonmee, & Ariratana, 2014; Etudor-Eyo, Emah, & Ante, 2016; Syed, 2015; Weng & Tang, 2014). There are studies that examine the factors which contribute to effectiveness of principles (Zaki et al, 2015). Behrangi and Tabatabai (2010) also examined the relationship of entrepreneurship with the effectiveness of managers in Kerman high schools. Keshtegar and Shokohi (2015) in a study explained the relationship between information systems of human resources and effectiveness of human resource management. Yeganegi (2010) investigated the role of management competency on the principal's effectiveness. Heidarinejad and Saberi (2010) examined the relationship between leadership styles and principal effectiveness of Lorestan Physical Education Department. There are also studies that explore the relationship between organizational skills of

time management and effectiveness of Hamadan secondary school principals in Academic Year 2011-2013 (Shayanjoo et al, 2013). Shariatmadari (2009) writes on the relationship between organizational health and effectiveness of principals in Tehran. Imani (2011) investigated the relationship between participative management and organizational climate and effectiveness of principles in secondary school of Bandar Abbas. Except for Weng's and Tang's research which explores similar concern with this study but in a different context, this study explores an avenue less taken. Hence, this study investigates the relationship between technology management strategies and the effectiveness of principles.

3 METHODOLOGY

3.1 Data collection

A Quantitative approach was adopted and a survey method was conducted to gather the data. The questionnaire was consisted of three sections: (1) demographic information; (2) school principal's leadership strategies; and (3) school administration effectiveness. The scale that we adopted was Weng's and Tang's (2014) "Technology Leadership Strategies and School Administrative Effectiveness Scale". It included eight constructs. Vision and management, model and guidance, supply and support, evaluation and research, and communication and inspiration were constructs of technology leadership strategies, and educational resource input, educational implementation progress, and educational objective outcome were effectiveness of school administration constructs. The questionnaire was designed in a Likert scale ranging from "strongly agree" to "mostly agree", "slightly agree", "slightly disagree", "mostly disagree", and "strongly disagree" (Weng & Tang, 2014, p. 98). The alpha coefficient obtained for all variables and the whole questionnaire was 0.70. This reflects the intrinsic correlation between variables. Thus, questionnaire has the necessary reliability. The Cronbach's alpha coefficient analysis also shows a reliability of 0.86 and 0.83 for technology leadership strategies and school administration effectiveness respectively while Weng and Tang report them 0.97 and 0.96.

3.2 Population and statistical sampling

The statistical population included all principals of private high schools in district one in Tehran with a total of 60 participants. Total population sampling was applied because of the limited number of the participants. The participants were all male principals as the schools in Iran are segregated and the data were gathered from boys' high schools in the academic year of 2016-2017. The questionnaire was distributed in two ways. Some of the participants were willing to receive it through email and some others in print. We emailed or delivered it to them based on their preference.

4 DATA ANALYSIS

4.1 Descriptive statistics

We used Statistical Package for the Social Sciences (SPSS) to analyze the data. Descriptive statistics benefited the research to depict the demographic data. The greatest participants include managers with bachelor's degree in education (36.7%) as well as those with master's degree (36.7%). Doctoral degree holders are only 6.7 percent of the participants. Principals also admit that technology management in schools is not necessarily carried out by them; they usually ask their assistants and head teachers to assist them in this field.

The demographic data also reveal that only 20 percent of the population have work experience less than 5 years and those with 5 to 10 years are about 15 percent. The highest work experience belongs to the principals with 10 to 15 years. There were also 15 percent of the participants who did not mention their work experience.

4.2 Inferential test

Correlation

Inferential analysis involved running a Pearson correlation coefficient to determine the relationship between dependent and independent variables. Analysis also benefited from simple linear regression to examine if management strategies predict administration effectiveness. Parametric tests such as correlation and regression are based on the assumption that the distribution of variables is normal. To verify the normal distribution of variables, Kolmogorov-Smirnov test was used. If the significance level of the tests is higher than 0.05, it can be concluded that the data distribution has no significant difference with normal distribution.

As reported in table 1, the Kolmogorov-Smirnov test showed that the technology leadership strategies and

school leadership effectiveness variables as well as all their items were normally distributed at the sample level ($p > 0.05$).

Table 1: Results of Kolmogorov-Smirnov Tests

Variables	Kolmogorov-Smirnov		Variables	Kolmogorov-Smirnov	
	Stat.	Sig.		Stat.	Sig.
Vision and management	0.970	0.303	Educational resource input	0.977	0.295
Model and guidance	0.985	0.286	Educational implelemntation progress	1.205	0.110
Supply and support	1.353	0.051	Educational objective outcomes	1.043	0.226
Evaluation and research	1.136	0.151	School administration effectiveness	0.825	0.504
Communication and inspiration	1.333	0.057	Technology leadership strategies	0.866	0.441

One of the goals of the research was to identify the relationship between technology leadership strategies and the effective school administration. A Pearson correlation was computed to determine the relationship between technology leadership strategies and effectiveness of school management. As indicated in table 2, there is a positive, medium correlation between them, which is statistically significant ($r = 0.437$, $p > 0.01$).

Table 2: Correlation between technology leadership strategies and school management effectiveness

Variables	Technology leadership strategies	School management effectiveness
Technology leadership strategies	1	$r = 0.437$ $p = 0.000$
School management effectiveness	$r = 0.515$ $p = 0.000$	1

The above table shows that there is an average, positive correlation between technology leadership strategies and school management effectiveness ($r = 0.473$ and $p > 0.01$). Thus, the effectiveness of school management could be improved with the development and implementation of technology leadership strategies. Pearson correlation matrix between the strategies of technology leadership and school management effectiveness items is presented in table 3 below.

As the table 3 illustrates, items management and perspective, and model and guidance have only average, positive relationship with educational purposes outputs ($r = 0.418$ and $r = 0.351$ respectively). There is not any significant relationship between 'support' and any of the school management effectiveness items at $p > 0.05$.

Among the school management effectiveness items, evaluation and research, and communication and inspiration have only an average, positive relationship with educational purposes inputs ($r = 0.509$ and $r = 0.626$ respectively at $p > 0.01$).

Except for support, there is also an average, positive relationship between the technology leadership strategies items with whole school management effectiveness at the level of 0.01 ($p > 0.01$). 'Communication and inspiration' has the lowest correlation with school management effectiveness ($r = 0.347$).

Table 3: Pearson correlation matrix between items of technology leadership strategies and those of school management effectiveness

Variables	Perspective and Management	Model and guidance	Support	Evaluation and Research	Communication and persuasion	Inputs	Program development	Outputs	Effectiveness
Perspective and Management	1								
Model and guidance	**0.336	1							
Support	0.880	**0.433	1						
Evaluation and Research	0.113	**0.525	**0.593	1					
Communication and inspiration	0.253	**0.534	**0.334	**0.635	1				
Educational resource inputs	0.239	**0.351	0.184	**0.509	**0.626	1			
Educational program improvement	0.181	0.117	0.050	0.168	0.131	*0.288	1		
Educational purposes inputs	**0.418	*0.327	0.127	0.002	0.238	0.022	0.054	1	
School management effectiveness	**0.454	**0.436	0.038	**0.437	**0.515	**0.549	**0.556	**0.714	1

* Significant at 0.05 level

** Significant at 0.01 level

Linear regression

Another goal of the present research study was to figure out whether the independent variable (technology administration strategies) could predict independent variable (school administration effectiveness). To test this, we applied linear regression. Linear regression needs the relationship between the independent and dependent variables to be linear. The linearity assumption can best be tested with scatter plots. As figure 1 shows, the relationship between independent and dependent variables are linear.

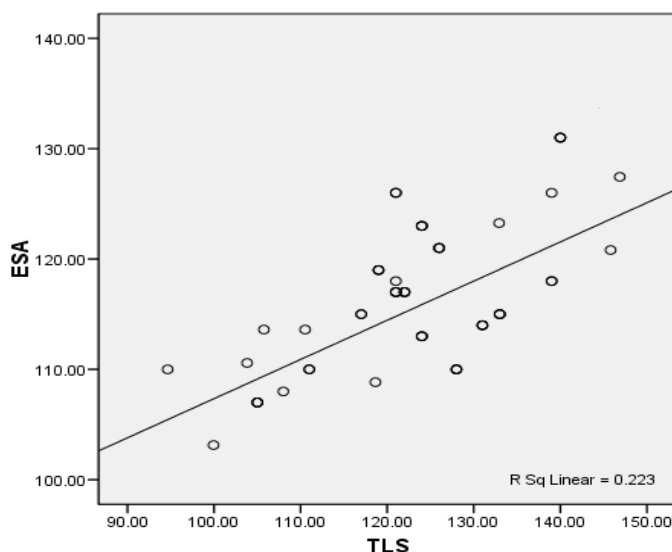


Fig. 1: Simple scatter-plot

As table 4 shows, 21% of variances in school administration effectiveness can be predicted by technology leadership strategies.

Table 4: Linear Regression

Model	Correlation	R^2	Standard R^2	F	Sig.
1	0.473	0.223	0.210	16.693	0.000

5 CONCLUSION

Among the dimensions of school management effectiveness, management and perspective has only average, positive and significant relationship with "educational purposes outputs" ($r= 0.418$ and $p > 0.01$). The reason for this could be due to the fact that the perspective are measures that in the final output of an organization show themselves; therefore, the criteria in this section have shown themselves more and more tangible.

Among the dimensions of school management effectiveness, "model and guidance" only has average, positive and significant relationship with "educational purposes inputs" ($r= 0.351$ and $p > 0.01$) and "educational purposes outputs" ($r= 0.327$ and $p > 0.05$). First, the model describes the relationship between input and output and not much focus on administrative procedures. That is why perhaps the model and guidance is effective educational purposes inputs and educational purposes outputs.

There is not any significant relationship between "support" and none of the dimensions of school management effectiveness ($p > 0.05$). This can be due to the fact that the importance of information technologies for all components of a school is well established; so, persuasion by the support cannot significantly increase motivation.

Among the dimensions of school management effectiveness, "evaluation and research" only has average, positive and significant relationship with "educational purposes inputs" ($r= 0.509$ and $p > 0.01$). This means that in the schools, managers understand that if they could inside the school input obtain more distortions and errors through continuous evaluation, there are fewer problems later which require limited assessment.

Among the dimensions of school management effectiveness, "communication and persuasion" only has average, positive and significant relationship with "educational purposes inputs" ($r= 0.626$ and $p > 0.01$). This means that if the implementation of a work have been appropriate, next steps have been right and in the same direction automatically; thus in the stage of educational purposes inputs need many managers to encourage persuasion and awareness.

There is average, positive and significant relationship between the dimensions of technology leadership strategies except support with whole effectiveness of school management in the level of 0.01 ($p > 0.01$). "Communication and persuasion" have the lowest correlation with "school management effectiveness" ($r= 0.347$). This means that, school management effectiveness increases with the improvement of technology leadership strategies. Because firstly it is considered a new issue and the role of manager communication style with driving components of this infrastructure can better justified in understanding the reasons and why it is used in the system. Also, because this concept is in its infancy, the evaluation and scrutiny of the results can lead to lack of trust in the system.

The study faced with limitations which made the results difficult to generalize to the school principals in the city of Tehran. Some principals asked their technology coordinators to fill out the questionnaire. Even though the coordinators in come cases might be aware of the school administration strategies and leadership procedures, they could have different perspectives towards how school is governed and technologies policies were implemented.

Another shortcoming was that the data came from the male principals and the study as best could only represent almost half of the principals strategies in the community of privates schools in district 1 in Tehran. Even with this half participation, some data were missing which affected the analysis and findings.

Since the information obtained was in the form of a questionnaire, the accuracy of information depends on the accuracy of the answers of respondents. It is in part due to the limitations of survey in data collection. Thus, respondents may be self-censored.

6 SUGGESTIONS

Findings revealed that there is significant relationship between the item 'perspective and management' and 'educational purposes output'; thus, it is suggested that the high school principals pay more attention to

drawing prospects for their high school in terms of technology adoption and implement such strategies that could facilitate technology effectiveness in the school settings.

As per the results which found that there is a significant relationship between "model and guidance "and" output and inputs of educational purposes "; thus, it is suggested to the high school principals in district 1 of Tehran that models offered for implementation of information technology have greater accuracy and comprehensiveness.

The study found that there is a significant relationship between "Evaluation and Research "and" educational purposes inputs "; thus, it is suggested to the high school principals that consider the evaluation criteria for the system in primary stage. It is also suggested that the high school principals attempt through manager communication and other system components to explain the level of expectation and the way of doing it.

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