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Article

Using information and communication technology as a time management tool among school principals in the secondary stage

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Abstract: The purpose of this study was to explore the relationship between using effective information and communication technology tools and time management skills in school administrations. The study aimed specifically to identify the presence of differences in the responses of school principals towards using technology in time management after isolating the variables of gender, years of experience, and educational level. This study utilized the analytical-descriptive method to achieve its objectives. The study instrument included a questionnaire with 45 items. The study sample consisted of 190 principals from different public schools in four emirates in the UAE (Dubai, Abu Dhabi, Sharjah, and Al-Ain). The principals were selected randomly by sending them an electronic questionnaire. The findings of the study revealed similarities in the responses of the school principals to the questionnaire on the role of information and communication technology in helping them achieve better time management.

Keywords: educational management; time management; information and communication technology; school principals; administration

1. Introduction

The world is living now in a major practical, informational, and technological revolution. This era has witnessed two tremendous advances in general and information and communication technology in particular. Information and communication technology and communications programs are among the best modern technical tools that enable data management and assist in storing and retrieving information appropriately and on time (Alkhawaldeh and Khasawneh, 2023). Information and communication technology has played a major role in the lives of societies and populations, whether individuals, groups, institutions, or at country levels, brought important changes in various areas of life, and helped people complete many administrative and technical works more effectively (Turnbull et al., 2020). In light of this scientific and technological progress in which we live, what is important for people is the advancement of the use of information and communication technology in the aspects of academic life, both scientific and educational, as well as to get rid of the pattern of traditional methods and techniques and trying to keep pace with progress and sophistication that abound in the countries of the world (Litz and Scott, 2017).

Several studies have recommended the importance of using information and communication technology in various institutions. These studies recommended working on making information and communication technology available to various institutions and administrative units to raise awareness in different departments and provide people with information about its use (David and Abukari, 2020; Omotayo

and Chigbundu, 2017; Singh, 2017). Different institutions began to integrate ICT (Information and Computer Technology) and hold training courses on how to use this technology, especially in schools and projects based on ICT. Information and communication technology has become a modern model that helps in developing, modernizing, and improving traditional methods, saving time used in completing administrative work in the school. It has become one of the most significant tools and modern means of time management. Time is an important and basic resource in the management process and one of the factors in its success or failure (Yost et al., 2019). Time management means using time effectively to achieve optimal outcomes from different tasks. Organizations and individuals who manage time well will be better rewarded (Day et al., 2020). It is better to address the personal and professional challenges in high school to this development and change another set of challenges imposed on it by technology and multiple electronic media, as one of the results of these challenges can be oversight and control over new information, like modern computers, modern technology, and speedy circulation of information (Connolly et al., 2019).

The subject of time management is one of the important topics in the field of work of the school principal, as time management has become one of the criteria that is taken into consideration to determine the principal's success and effectiveness in the school (Burkhauser, 2017). Interest in this subject has increased, and much research has appeared, such as studies, articles, and books, that aim to identify the degree of effectiveness of time management for secondary school principals in public schools. The literature recommends activating electronic management in administrative work to invest school principals' time (Beare et al., 2018). Therefore, the researcher found that the use of large programming tools and techniques of information and communication technology alone is not sufficient for this modern technology in the field of information for school principals to perform their roles in achieving its benefits and positive effects. However, its misuse as a means of planning and organizing in management may create a potential waste of time that leads to wastage of time for these managers, and the role of information and communication technology in time management cannot be determined except by conducting a practical study.

1.1. Problem statement

Information and communication technology and its applications constitute the latest developments in our current era in information management systems, which have been imposed on all institutions, including educational institutions, to use them to benefit from their capabilities, achieve their goals effectively, and improve the performance of the educational process. This technology contributes to developing the traditional methods used in completing administrative work and achieving effectiveness in time management for managers. Time management is a very important topic in educational administration in general and school administration in particular. Time management requires skills and the ability to complete work in an organized and effective manner to achieve the desired goals using the best means and tools in introduction to technology, which require planning, organizing, and

monitoring to play their role in achieving better time management.

1.2. Objectives of the study

The study attempted to achieve the following objectives:

- Identifying whether there is a statistically significant difference in the responses of school principals towards using technology in time management after isolating the variables of gender, years of experience, and educational level.
- Formulating some proposals to activate the role of information and communication technology in time management for principals.

1.3. Questions of the study

1) Are there any statistical differences in the responses of the school principals to the use of technology in time management according to gender?
2) Are there any statistical differences in the responses of the school principals to the use of technology in time management according to years of experience?
3) Are there any statistical differences in the responses of the school principals to the use of technology in time management according to the educational level of the principal?

1.4. Significance of the study

The study is significant because of the importance of information and communication technology, which helps in following the trends of technological advancement and its use in all institutions, especially in schools. This study may increase the interest of researchers in comparing other similar studies, as they are closely related to the use of information and communication technology in the education system, which may contribute to enhancing the performance of the educational process. The results of the current study may provide effective contributions to the field of administrative training to design training programs for school principals to raise their ability to use information and communication technology effectively in managing their time in a way that addresses the disruptive process. The findings of the study may benefit both school principals and the educational administration in re-evaluating information and communication technology programs in the school administration to better facilitate time management for school principals.

1.5. Study limitations

Objective limit: This study was limited to revealing the role of information and communication technology in time management among the principals of public schools in the UAE.

Spatial limit: This study included the four emirates in the UAE (Dubai, Abu Dhabi, Sharjah, and Al-Ain).

Time limit: This study was conducted in the second semester of the school year 2022–2023.

2. Literature review

Our contemporary world has witnessed two huge increases in the flow of information, which has made humans need means and tools to control and manage the flow of this information. Information and communication technology has emerged with a massive technological explosion to control the information world and benefit from it (Bush, 2020). It is one of the achievements of the scientific and technological revolution that has had a significant direct impact on shaping the life of this age. Information and communication technology has become the benchmark for measuring the scientific progress of any country (Tijani et al., 2020). It is also characterized by multiplicity, and it reminds every one of the knowledge areas that information and communication technology has become the cornerstone and the basic foundation for information services, through its storage, processing, and retrieval of quantitative information for the beneficiaries as accurately as possible (Lunenburg and Ornstein, 2021).

Information and communication technology is defined as the technology that unites computing systems with connectivity through fast means of communication to transfer data and various information (texts, papers, tables, images, audio). Information and communication technology is also defined as the body of knowledge, experiences, accumulated and available information, tools, and physical, organizational, and administrative means that people use to obtain information: verbal, written, textual, and digital, whether extensively processed or stored for obtaining information and exchanging it (Rosenbloom et al., 2022; Nang'unda, 2019). Information and communication technology also means the tools and techniques that information systems use to implement computer activities of various types and applications and includes all of the computer hardware and physical components of computers, programs, storage technology, and communications technology (Chandio, 2021; Ma et al., 2020). According to these definitions, information and communication technology focuses basically on the use of devices and software to manage the flow of information related to human activities. Managing this information requires any person to have prior knowledge of the basics of ICT and its usage.

Managers in all institutions and organizations need information to carry out all administrative processes, including planning, organizing, directing, and controlling. As the volume and quantity of information increase, these institutions need tools and equipment, the most important of which is information and communication technology, which helps them organize and process this information in a way that achieves accuracy, speed, and efficiency (Powell et al., 2020). The use of computerized information systems in organizations has organizational and administrative effects, as it has an impact on the organizational structure of the organization through the shift from centralization to decentralization and the use of communication networks that enhance this concept (Burgos-Vera et al., 2021). It also contributed to streamlining the functions and administrative levels in contemporary organizations.

Time management as a concept is very comprehensive of time and place for human beings, in which it is not limited to one person alone nor limited to one place or time without another. It includes time management for private time in addition to working time (Demirdağ, 2021). The word management is linked to time in both cases, through the continuous process of planning, analysis, and evaluation of all the

activities that a person undertakes during a specific time that aims to achieve the utilization of the available time to reach the desired goals. Time management is defined as the process of rational use of time and the process of investing time effectively. It is a process based on planning, organization, coordination, motivation, direction, follow-up, and communication (Lunenburg and Ornstein, 2021). It is a qualitative and quantitative process as a basis for looking to the future, exploring its horizons, and forecasting its path, directions, and the various roads to its goals.

Computer technology has affected most of the activities that we undertake in various areas of life and has brought about a significant change that has been reflected in administrative systems, including school administration, as this technology can provide an important role for school principals in helping to overcome many of the obstacles that arise (Bush, 2020; Khasawneh, 2022). The focus here is on the administrative and technical aspects in a way that makes it a vital tool in my time management process. The role of information and communication technology in time management can be clarified to the school principal through its most prominent applications, which are computers, the Internet, and electronic mail.

Previous studies

A mediated-effects model of principal instructional leadership and teacher learning was studied by Liu and Hallinger (2018). The model revealed that teacher self-efficacy operates as a mediator between the benefits of principal instructional leadership on teachers' professional growth and principal time management abilities and self-efficacy as antecedents of instructional leadership. Data from the study were obtained from 3414 teachers and 186 administrators from 186 middle schools in Qingdao, China. Confirmatory factor analysis, structural equation modeling, and bootstrapping were used to investigate the multi-source data. The study provided evidence for a partial mediation model in which principal instructional leadership had some direct and indirect effects on teacher professional learning. The principal's self-efficacy and time management had a little effect on the instructional leadership of the principle.

Naparan and Tulod (2021) explored the time management techniques used by school administrators and how they contributed to their ability to run their institutions effectively. Administrators of a few Western Philippine primary schools were questioned by the researchers. School administrators developed time management methods based on the study's findings, which included allocating tasks, setting priorities, minimizing distractions, drafting plans, and making calendars. The administrative oversight of the school administrators was the main emphasis of these time management techniques. These time management techniques might facilitate uncomplicated school operations and enable administrators to complete their jobs more quickly.

Ridwan (2021) examined the link and impact of leadership on teacher performance, both as an individual and as an organizational quality. Regression analysis techniques, research tools, and quantitative research methodologies form the foundation for data gathering to scientifically validate the study findings. The study's findings imply that a variety of elements, including the leader's-instituted school

management system, affect teacher performance, which is not independent. But if the principal can truly fulfil the management role effectively—that is, in terms of organizing, regulating, supervising, and controlling—teacher performance will improve (evaluation and assessment).

Komalasari et al. (2020) assessed principals' managerial proficiency in raising educational standards. This study employs a qualitative descriptive methodology. In this study, two methods of gathering data were used interviews and documentation. In this study, three types of data analysis were used, data reduction, data display or presentation, and conclusions and data verification. The findings demonstrated the principal's strong managerial ability in raising the standard of instruction in the Lais District. By upgrading the principal's management skills, this document helps to raise educational standards.

Grissom et al. (2015) examined time management among school principals. The study employed 300 principals, who completed a time management inventory. The study employed a descriptive analysis of the inventory scores to forecast time-use information gathered from observations, a survey-based work stress gauge, and assessments of perceived job performance from assistant principals and school instructors. More time is spent in classrooms and overseeing instruction by principals who are better at managing their time, but less time is spent cultivating personal relationships. The results found mixed relationships between principal time management abilities and subjective evaluations of principal performance, possibly as a result of this tradeoff.

3. Methodology

3.1. Research design

This study adopted the analytical-descriptive method to achieve its objectives. The analytical descriptive method is defined as a method in research that deals with the study of existing and established events, phenomena, and practices that are available for study and measurement as they are, without the researcher's intervention in their proceedings, so that the researcher can interact with them, filter them, and understand them.

3.2. Sampling

The study sample consisted of 190 principals from a population of 800 principals from different public schools from four emirates in the UAE (Dubai, Abu Dhabi, Sharjah, and Al-Ain). The principals were selected randomly by sending them an electronic questionnaire. Their consent and approval were obtained before conducting the study. The following table presents the demographic information of the sample according to the study variables as shown in **Table 1**.

Table 1. Distribution of study sample members according to the variables of the study.

Variable	Number	Percentage
Gender		
Male	106	55.79
Female	84	44.21
Specialization		
Scientific majors	100	52.63
Humanities	90	47.37
Years of experience		
Less than 5 years	33	17.37
From 5 to 10 years	65	34.21
More than 10 years	92	48.42
Total	100	100

3.3. Instrument of the study

The researcher prepared an instrument to measure the role of information and communication technology in time management among school principals in public schools in the UAE and ways to activate it. The questionnaire was selected as an instrument because it helps in obtaining the information and data that are required to be filled out by the respondent. After its final drafting, the number of paragraphs in the questionnaire was 45 divided into four areas. The first area, software, consists of 21 paragraphs. The second area, databases, consists of 21 paragraphs. The third area, email, consists of nine paragraphs. The fourth area, the Internet, consists of 28 paragraphs.

The questionnaire was presented in its final form to a group of arbitrators at UAE universities, where they expressed their opinions and observations on the questionnaire. In light of these opinions, some items were excluded and others were modified, so that the number of items in the questionnaire became 45 items. to confirm the instrument's dependability. Using the Cronbach alpha technique, the researcher determined the questionnaire's reliability coefficient. The results indicate the value of the alpha coefficient for each field and the questionnaire as a whole, as presented in the following **Table 2**.

Table 2. Cronbach's alpha coefficients for the questionnaire.

Area	Number of items	Cronbach's alpha coefficients
Software	13	0.908
Databases	13	0.889
e-mail	9	0.907
The Internet	10	0.883
Total	45	0.963

Table 2 demonstrates that the quantitative reliability coefficient is 0.963, and this indicates that the questionnaire has a high degree of reliability. This means that if this

tool were re-applied to the person studying the study more than once, the results would have been almost completely identical, and their results would have been called stable.

3.4. Data analysis

The study used the following statistical treatments to analyze the results of the field study. Percentages, mean scores, and standard deviations were used to measure the respondents' answers. The *t*-test was used to show the significance of the difference between the means of the sample according to the variables (gender and specialization). The one-way-ANOVA analysis was used to show the significance of the difference between the averages of responses of sample members according to the variable of years of service.

4. Results and discussion

4.1. Results of the first question

To answer the first question, the mean scores, standard deviations, and the *t*-test were used to extract the differences between the respondents' answers to the areas of the questionnaire. **Table 3** presents the results.

Table 3. Results of the *t*-test reveal the significance of the differences in the school principals' estimates of the role of information and communication technology in time management due to the gender variable.

Area	Gender	Number	Mean score	Standard deviation	*t* value	Sig.
Software	Male	106	56.255	5.584	0.275	0.783
	Female	84	56.476	5.407		
Databases	Male	106	53.698	6.616	0.386	0.700
	Female	84	54.060	6.132		
e-mail	Male	106	39.047	4.326	1.608	0.110
	Female	84	39.976	3.429		
The Internet	Male	106	40.660	5.215	2.283	0.024
	Female	84	42.381	5.089		
Total	Male	106	189.660	19.023	1.218	0.225
	Female	84	192.893	17.032		

Table 3 demonstrates that the calculated "*t*" value is less than the tabulated "*t*" value in all domains and the quantitative score of the scale, except for the domains of the Internet. This indicates that there are no statistically significant differences in the averages of the ratings of school principals. The technical complexity of managing time is isolated according to the variable of gender (male, female). The researcher attributes this result to the centralization of administration, where the Department of Education is considered the reference for school principals. Both female and male principals received training courses and workshops for all managers and directors, without exception. School principals' performance of administrative and technical tasks is within the framework of administrative regulations and circulars, and this is what makes them in agreement with these matters. This leads to a convergence in the

point of view of principals regarding the role of information and communication technology in time management. These results agree with other studies covering the topic (Naparan and Tulod, 2021; Ridwan, 2021), which have emphasized the importance of technical skills among school principals.

4.2. Results of the second question

To answer the second question, the mean scores, standard deviations, and the *t*-test were used to extract the differences between the respondents' answers to the second variable of the questionnaire (specialization). **Table 4** presents the results.

Table 4. Results of the *t*-test reveal the significance of the differences in the school principals' estimates of the role of information and communication technology in time management due to the specialization variable.

Area	Gender	Number	Mean score	Standard deviation	*t* value	Sig.
Software	Male	106	56.060	5.568	0.773	0.440
	Female	84	56.678	5.421		
Databases	Male	106	53.430	6.188	0.972	0.332
	Female	84	54.060	6.132		
e-mail	Male	106	39.390	3.824	0.248	0.805
	Female	84	39.533	4.149		
The Internet	Male	106	41.000	5.121	1.174	0.242
	Female	84	41.889	5.312		
Total	Male	106	189.880	18.201	0.966	0.335
	Female	84	192.433	18.193		

Table 4 shows that the calculated "*t*" value is less than the tabulated "*t*" value in all fields and the quantitative score of the scale, and this indicates that there are no statistically significant differences isolated to the specialization variable. The researcher attributes this result to the idea that all school principals master the same courses in the field of information and communication technology. A practice such as all managers implementing administrative and technical information within the framework of policies such as administrative circulars. Both categories of school principals report to a single supervisory body that sets broad plans for them. The Ministry of Education in the UAE issues the same instructions and regulations regarding the use of available technologies in the school that might help the principal perform the requested duties. The workflow of the whole school becomes smooth and without hindrance because of the clear steps and instructions the available technologies provide to all staff of the school. Therefore, it is clear from the results that the gender variable does not affect the different outcomes of using information and communication technology tools in management.

4.3. Results of the third question

To answer this question, the researcher used the one-way ANOVA analysis to find the differences between the participants' responses according to the number of years of experience. **Table 5** presents the results.

It is noticed from the previous table that the calculated "*f*" value is less than the tabulated "*f*" value at the level of significance (0.05) in all areas and the quantitative degree of the scale. There are no statistically significant differences isolated from the variable number of years of service. Principals of both genders recognize the importance of information and communication technology and its effective role in managing their time, and all training courses and workshops are provided to all principals of the schools without discrimination based on service. All school principals in the Department of Education are required to practice administrative performance using modern methods. Moreover, all school principals adhere to the rules and requirements of school administration according to their years of service. The single reference for all school principals in public schools is represented by the Ministry of Education, which provides equal treatment and support to school principals. Therefore, the experience variable yielded similar results among participants.

Table 5. The results of the one-way ANOVA analysis for the significance of the differences in the school principals' ratings of the role of information and communication technology in time management due to the variable years of service.

Area	Source of variance	Sum of squares	Freedom value	Mean square	*f* value	Sig.
	Between groups	42.946	2	21.473		
Software	Within groups	5660.428	187	30.270	0.709	0.493
	Total	5703.374	189	-		
	Between groups	164.555	2	82.278		
Databases	Within groups	7558.608	187	40.420	2.036	0.133
	Total	7723.163	189	-		
	Between groups	17.393	2	8.696		
e-mail	Within groups	2963.770	187	15.849	0.549	0.579
	Total	2981.163	189	-		
	Between groups	62.365	2	31.183		
The Internet	Within groups	5081.950	187	27.176	1.147	0.320
	Total	5144.316	189	-		
	Between groups	679.689	2	339.845		
Total	Within groups	61,883.790	187	330.929	1.027	0.360
	Total	62,563.479	189	-		

5. Conclusion

The study aimed to identify whether there is a statistically significant difference in the responses of school principals towards using technology in time management after isolating the variables of gender, years of experience, and educational level. The results of the study showed similarities in the responses of the school principals to the questionnaire on the role of information and communication technology in helping them achieve better time management. The services the Ministry of Education provides to these principals showed equal treatment, as principals from both genders and different specializations can access these services, whether computers, access to the internet, or e-mails. The findings showed that the available ICT tools provide

support to school principals to perform their administrative duties efficiently. Time management is an important process at the school level, and it must receive the attention of school principals in general, and teachers in particular, because the process of education is one of the most important and largest processes of human production. Since the teaching-learning process includes a number that all interact to achieve one goal, which is the success of that process, it was important to work on coordinating a specific, organized, and planned timetable according to all the various efforts under management that works according to its schedule.

6. Recommendations

The study recommends the Ministry of Education leadership implement information and communication technology in schools broadly providing training courses for school principals and participating in private seminars and workshops on information and communication technology, such as time management, is based on a study to identify training needs. The study also recommends employing information and communication technology in performing administrative functions in the field of school administration, such as planning, organizing, controlling, supervising, and controlling, as well as increasing the ability of managers to use it correctly in all school administration work. It is recommended to pay attention to updating computer hardware, such as essential software for school administration services to take advantage of the information on computers and the Internet. The Ministry of Education can allocate a sufficient budget to meet the requirements of using technology in schools and to update data in the school regularly.

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