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Leading with time and tech: ICT Integration in Omani school administration

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Abstract

This study investigates the relationship between secondary school principals' time management capabilities and their integration of Information and Communication Technology (ICT) tools in administrative practices. Utilizing a descriptive analytical research design, the study engaged (200) principals from public schools across four Omani regions (Muscat, North Al-Batinah, South Al-Batinah, and Ad-Dakhiliyah). A 50-item electronic questionnaire covering four dimensions: (Software, Databases, Email, and Internet) use was employed to gather data. The study aimed to examine differences in principals' responses based on gender, academic major, and years of experience regarding the use of IT in time management. Statistical analysis revealed no significant differences in perceptions across gender, academic major, or experience level, suggesting a uniformly positive perception of ICT role in enhancing administrative efficiency. Results indicated that accessible ICT resources-such as computers, internet access, and email-facilitated more effective planning, organization, and monitoring of administrative tasks. Moreover, the findings underscore that consistent policies and training programs offered by the Ministry of Education contribute to equal competency levels among principals, regardless of demographic factors. The study concludes that integrating ICT in school administration significantly improves time management and overall performance. Recommendations include expanding ICT training, updating hardware and software resources, and increasing institutional support to maximize administrative efficacy through digital tools.

Keywords: Information and communication technology ICT, Leadership development, Performance, School Administration, School principals, Time management.

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1. Introduction

A huge informational, technical, and practical revolution is happening right now throughout the globe. Two great leaps forward in technology, both generally and in the realm of information specifically, have occurred during this age. Data management and the timely and proper retrieval of information are made possible by information technology and communications programs, which are among the greatest current technological instruments. Changes in many spheres of life, as well as the facilitation of numerous administrative and technical tasks, have been brought about by advancements in information technology, which have had far-reaching effects on people's daily lives and on the lives of entire nations[1, 2]. Given the rapid advancements in science and technology that we are witnessing, the most pressing concern for the general public is the need to increase the integration of IT into all facets of schooling, from research to instruction, in order to break away from the shackles of antiquated practices and stay up with the international standard of excellence [3].

A number of studies on a worldwide, Arab, and regional scale have stressed the significance of implementing IT strategies in different types of organizations. According to these studies, it would be beneficial to make IT accessible to diverse administrative units and organizations in order to increase knowledge across departments and educate people on its usage [4-7]. Many organizations started incorporating ICT and providing training on its usage, particularly in educational institutions and for ICT-based initiatives [8]. By streamlining administrative tasks and facilitating their development, modernization, and improvement, information technology has emerged as a paradigm for the modern school. In the current day, it has emerged as a crucial tool for managing one's time effectively. An essential and fundamental resource that may make or break a management process is time [9, 10]. Managing one's time wisely allows one to get the most out of each activity. Success will come to those who are good at managing their time [11, 12]. One of the outcomes of the difficulties brought about by technology and various forms of electronic media is the need to regulate and supervise the rapid dissemination of new information; thus, it is preferable to attend to the personal and professional issues that arise throughout high school in relation to this development [13-17]. Data have proven that information and communication technology is the best weapon to eliminate the phenomenon of complexity. Information and communication technology has provided scientific means to contain the phenomenon of complexity, including simulation models, and means of analyzing systems and data. Information and communication technology has become an effective and helpful factor in solving many administrative problems [18-22].

A school principal's ability to effectively manage their time is now considered a key indicator of that principal's performance in the role [23-25]. The efficacy of time management for public school secondary school administrators has been the focus of several studies, papers, and books in recent years, reflecting a growing interest in the topic. To better utilize school administrators' time, the research suggests implementing electronic management in administrative tasks [26]. Thus, the study's author concluded that school administrators cannot fulfill their responsibilities in utilizing this current information technology to its full potential just by making use of its extensive programming tools and procedures. A practical research is necessary to assess the function of information technology in time management, although its abuse as a management tool for planning and organizing might result in managers wasting their own time.

1.1. Problem Statement

All organizations, including schools, are now required to use information technology and its applications as part of modern information management systems in order to maximize their potential, accomplish their objectives, and enhance the efficiency of teaching and learning. Traditional techniques of administrative work and managers' time management can be improved with the use of this technology. In the field of educational administration, and specifically in school administration, time management is a crucial subject. When it comes to Introduction to Technology, time management is all about having the skills and knowledge to get things done in an orderly and effective way. This means that you need to be able to plan, organize, and monitor your progress so that you can reach your goals.

1.2. Questions of the Study

RQ1. Does the gender of school principals have any bearing on how they feel about using technology to better manage their time?

RQ2. Do school administrators' reactions to technology's potential to improve time management vary significantly by level of experience?

RQ3. Does the educational level of school principals have any bearing on how they respond to the usage of technology in time management?

1.3. Significance of the Study

The study's relevance stems from the fact that information technology is crucial for keeping up with the latest trends in technological innovation and its application across all sectors, particularly educational institutions. Research on the effectiveness of instructional technology is a hot topic, and this study has piqued the curiosity of academics who may be interested in comparing future studies along these lines. This study's findings can help shape training programs for school principals that focus on improving their time management skills through the strategic use of information technology, thereby mitigating the disruptive process. School administrators and those in charge of education should use the study's results to reevaluate their use of technology in the classroom and identify ways to better manage their time.

1.4. Objectives of the Study

The purpose of this investigation is achieving these objectives:

- Determining if a statistically significant difference exists in school administrators' comments about technology use in time management after controlling for gender, years of experience, and educational level.
- Developing recommendations to enhance the utilization of information technology in time management for school leaders.

2. Literature Review

The use of information and communication technology has become linked to various fields, as most institutions, depending on the nature of their activity and size, are all built on the circulation and exchange of information. Hence, this section will address the presentation of the concept of information and communication technology, its importance, forms of use, and its effects on the institution [27, 28]. The demand for methods and instruments to regulate and oversee the flow of information has grown in response to the two exponential rises in the rate of information transmission in the modern world. With the advent of information technology came a tremendous growth in technology, which has allowed people to gain control over and profit from the information world [29-31]. As a product of the technological and scientific revolution, it has played a major role in defining modern life. When evaluating a nation's scientific advancement, information technology has emerged as the yardstick of choice. Additionally, it is multi-faceted and serves as a reminder to all fields of study that ICT has become the backbone of information services by storing, processing, and accurately retrieving quantitative data for users [32-35].

To put it simply, information technology is the set of tools that allow computers to communicate with one another and share and receive data in a variety of forms (e.g., text, tables, photos, audio). By extension, [28] state that (ICT) encompasses "the accumulated experience and knowledge and accessible information, instruments, and physical, administrative, and managerial methods by which people gain information, whether verbal, written, textual, or digital, and whether this information is widely managed or stored, in order to obtain and exchange it. In addition to computers and all of their physical components, software, storage devices, and communication networks, information technology also encompasses the methods and tools used by information systems to carry out a wide range of computer-based tasks [9, 22]. These explanations suggest that the core emphasis of IT is the management of human-related information flows through the use of hardware and software. Anyone with a basic understanding of (ICT) and how to use it may manage this data.

All administrative operations, such as planning, organizing, directing, and regulating, require information, which is why managers in all institutions and organizations rely on it. Institutions like this rely on information technology-the backbone of any modern data infrastructure-to manage and handle massive amounts of data quickly, accurately, and efficiently [24]. Organizational and administrative effects result from the use of computerized systems for information in organizations. One organizational effect is the shift from a central to a decentralization structure, which is further enhanced by the use of communication networks [6]. It also helped modern businesses streamline their activities and administrative layers.

The idea of time management encompasses all aspects of human existence, including both the present and the past, and is thus not exclusive to any one individual or location. It encompasses both business and personal time management [1, 12]. The term "time management" is associated with both contexts because it refers to the ongoing process of organizing and assessing one's actions within a certain time frame with the purpose of making the most efficient use of that time in order to accomplish one's objectives. The art of time management is making the most efficient and sensible use of one's time. Methods such as preparation, organization, motivation, guidance, monitoring, and dialogue form their basis [16, 21]. Looking forward, investigating potential vistas, and projecting potential paths, orientations and routes to objectives are the core of this qualitative and quantitative approach. Time management is considered one of the contemporary administrative concepts that most researchers in management science agree on its great importance, due to the fact that it is linked to all stages of planning, organizing, directing, and decision-making and control as well. Therefore, the institution’s achievement of its goals is directly linked to the extent of its interest in the time required for that [12].

A great deal of the modification that has occurred in administrative systems, and especially school administration, has been brought about by technological advancements in computers. This is because principals now have access to tools that can assist them in overcoming many of the challenges that come with running a school [8]. This is an essential part of my time management strategy because of the emphasis on technical and administrative details. Computers, the Internet, and email are the most common forms of information technology, and they may help the school administrator understand how these tools might improve time management. Liu and Hallinger [20] Explored a model related to the instructional leadership of principals and teacher learning through mediated effects. Based on the model's findings, principals' time management skills and self-efficacy are antecedents of instructional leadership, while teachers' self-efficacy mediates the relationship between instructional leadership and teachers' professional progress. Researchers in Qingdao, China, surveyed 3,414 classroom instructors and 186 middle school principals to compile their findings. To examine the data from several sources, we employed structural equation modeling, bootstrapping, and confirmatory factor analysis. The study's findings support a partial mediation model that links principal instructional leadership to teacher professional learning via both direct and indirect means. The instructional leadership of the principle was unaffected by factors such as their self-efficacy and time management.

School administrators' time management strategies were investigated by Naparan and Tulod [35] to determine their impact on the efficiency with which they ran their institutions. The researchers conducted interviews with principals of several elementary schools in the Western Philippines. Based on the study's findings, school officials came up with time

management strategies, such as creating calendars, assigning work, avoiding distractions, identifying priorities, and writing plans. These time management strategies are aimed at improving the administrative supervision provided by school administrators. School administrators may be able to get more done in less time if they implement these time management strategies. Ridwan [27] Looked at the connection and effects of leadership on the performance of teachers, both individually and collectively. The data needed to verify the study's results scientifically is gathered using research instruments, quantitative research methodology, and regression analysis techniques. Teacher performance is not solely influenced by the leader's school management system, according to the study's results. Teachers' work will improve (evaluation and assessment) if the principal is able to successfully carry out the management job. This includes organizing, regulating, monitoring, and managing.

The ability of principals to effectively oversee the improvement of student achievement was studied by Komalasari, et al. [18]. The research approach used in this study is qualitative and descriptive. Interviews and written records were both utilized to compile the data for this study. They used the reduction of data, showing or demonstration of data, conclusions, and data confirmation were the three forms of data analysis utilized in this study. The results showed that the principal was very effective as a manager in improving the level of education in the Lais District. This document contributes to better education by enhancing the principal's ability to oversee.

Principals' use of time was the subject of research by Grissom, et al. [14]. Using a time management inventory, 300 principals participated in the study. In order to predict how people would spend their time, the study used a descriptive analysis of the record scores together with data from a survey measuring work stress and evaluations of supposed job performance from school teachers and assistant administrators. Principals who are adept at controlling their time spend less time building personal ties and more time in classrooms monitoring instruction. This trade-off may explain why the data showed conflicting correlations between principals' time management skills and their subjective assessments of their own success.

3. Methodology

3.1. Research Design

The goals of this study were accomplished through the use of the analytical-descriptive approach. Researchers using the analytical descriptive method observe and measure pre-existing events, phenomena, and practices in their natural state, without interfering with or changing them in any way; this allows the researcher to better comprehend and make sense of the data.

3.2. Participants

A total of 200 public school principals from four Omani cities (Muscat, North Al-Batinah, South Al-Batinah, and Ad-Dakhiliyah) made up the study's sample. An electronic questionnaire was sent to the principals in a random manner. Before the study was conducted, their agreement and endorsement were sought. Table 1 and Figure 1 summarizes the sample's demographics as they pertain to the research variables.

Table 1.
Data on the sample according to the variables.

Variable	Number	Percentage
Gender		
Male	120	60%
Female	80	40%
Academic Major		
Scientific	130	65%
Humanities	70	35%
Years of Experience		
1 to 5 years	44	22%
5 to 10 years	70	35%
More than 10 years	86	43%
Total	**200**	**100%**

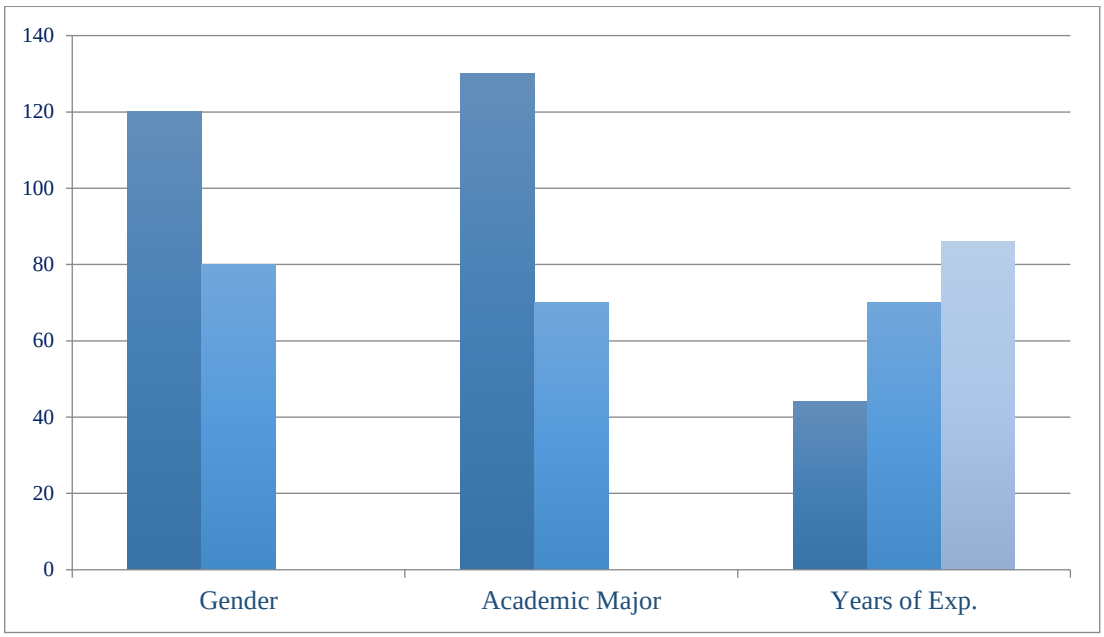

Figure 1.
Sample Study Distribution According to the Variables.

3.3. Instrumentation

The study developed a tool to assess the impact of information technology on time management among public school administrators in Omani and strategies for its enhancement. The questionnaire was chosen as a tool because it facilitates the acquisition of necessary information and data from the responder. Upon completion of its final design, the questionnaire had 50 items categorized into four sections. The initial section, software, comprises 18 items. The second section, databases, comprises 17 items. The third section, email, comprises 13 items. The fourth section, the Internet, comprises 12 items.

The finalized questionnaire was submitted to a cohort of arbitrators in Omani universities, who provided their feedback and insights on it. Consequent to these viewpoints, certain elements were omitted and others revised, resulting in a total of 50 items in the survey to verify the instrument's reliability. The researcher assessed the questionnaire's reliability coefficient utilizing the Cronbach alpha method. The findings demonstrate the alpha coefficient's value for each domain and the overall questionnaire, as seen in the subsequent table.

Table 2.
The reliability coefficients for the questionnaire.

Dimension	Number of Items	Cronbach's Alpha Coefficients
Software	15	0.91
Databases	15	0.90
Email	10	0.92
Internet	10	0.90
Total	**50**	**0.90**

Table 2 reveals that the quantitative consistency coefficient is 0.90, signifying a good level of dependability for the questionnaire. This indicates that if this instrument were administered to the individual doing the study several times, the outcomes would have been almost comparable, thereby categorizing their results as reliable.

3.4. Data Analysis

The research employed the subsequent arithmetical methods to evaluate the outcomes of the field investigation. Percentages, mean scores, and standard deviations were employed to assess the respondents' responses. The T-test was employed to demonstrate the significance of the difference between the means of the sample based on the variables of gender and specialty. The one-way ANOVA analysis was employed to demonstrate the significance of the differences in average replies among sample members based on years of service.

4. Results and Discussion

4.1. The First Question

To address the initial inquiry, the mean scores, standard deviations, and t-test were employed to discern the disparities in the respondents' replies throughout the questionnaire's domains. Table 3 displays the findings.

Table 3.
Results of the t-test due to the gender variable.

Dimension	Gender	Number	Mean	SD	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		
Email	Male	106	39.047	4.326	1.608	0.110
	Female	84	39.976	3.429		
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 indicates that the computed "t" value is inferior to the tabulated "t" value across all dimensions and the score of the scale, with the exception of the Internet domains. This signifies the absence of apparent significant disparities in the mean evaluations of school principals. The technical intricacy of time management is differentiated by the variable of gender (male, female). The study ascribes this outcome to the concentration of management, wherein the Department of Education is seen as the benchmark for school principals. All principals, regardless of gender, participated in training courses and seminars designed for all managers and directors. The fulfillment of administrative and technical activities by school principals adheres to administrative regulations and circulars, ensuring compliance with these directives. This results in a consensus among principals concerning the function of information technology in time management.

4.2. The Second Question

In response to the second question, mean scores, standard deviations, and the t-test were employed to discern the variations in respondents' replies about the second variable of the questionnaire (specialization). Table 4 displays the findings.

Table 4.
Results of the t-test due to the academic major variable.

Dimension	Gender	Number	Mean	SD	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		
Email	Male	106	39.390	3.824	0.248	0.805
	Female	84	39.533	4.149		
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 illustrates that the computed "t" value is inferior to the tabulated "t" value across all dimensions and the score of the scale, signifying the absence of apparent differences pertaining to the academic major variable. The researcher ascribes this outcome to the notion that all school principals acquire proficiency in identical courses within the realm of information technology. All managers should apply administrative and technical information in accordance with policies, such as administrative circulars. Both sorts of school principals are accountable to a singular supervising authority that establishes overarching strategies for them. The Omani Ministry of Education disseminates identical directives and laws for the utilization of accessible technologies in schools that may assist the principal in fulfilling the requisite responsibilities. The workflow of the entire school is streamlined and unobstructed due to the explicit procedures and guidelines provided by the accessible technology to all staff members. Consequently, the results indicate that the gender variable does not influence the various outcomes associated with the utilization of information technology tools in management.

4.3. The Third Question

The researcher employed one-way ANOVA to analyze the variations in participants' replies based on their years of experience. Table 5 displays the findings.

Table 5.
The results of the ANOVA analysis due to the variable years of service.

Dimension	Source of variance	SS	df	MS	F	Sig.
Software	Between groups	42.94	2	21.47	0.709	0.493
	Within groups	5660.428	187	30.270		
	Total	5703.374	189			
Databases	Between groups	164.555	2	82.278	2.036	0.133
	Within groups	7558.608	187	40.420		
	Total	7723.163	189			
Email	Between groups	17.393	2	8.696	0.549	0.579
	Within groups	2963.770	187	15.849		
	Total	2981.163	189			
Internet	Between groups	62.365	2	31.183	1.147	0.320
	Within groups	5081.950	187	27.176		
	Total	5144.316	189			
Total	Between groups	679.689	2	339.845	1.027	0.360
	Within groups	61883.790	187	330.929		
	Total	62563.479	189			

The above table indicates that the computed " F " value is inferior to the calculated " F " value at the significance level of 0.05 across all domains and the quantitative score of the survey. No apparent clear differences were identified except for the variable of years of service.

Leaders of both genders acknowledge the significance of information technology and its efficacy in time management, with all training courses and seminars offered to all school leaders without prejudice based on tenure. All school principals within the Department of Education must implement administrative performance utilizing contemporary approaches. Furthermore, all school principals comply with the regulations and stipulations of school administration based on their tenure.

The Ministry of Education in Oman serves as the only authority for all public school principals, ensuring equitable treatment and support for them. Consequently, the experience variable produced analogous outcomes among subjects.

5. Conclusion

The study sought to determine if a statistically significant difference exists in school administrators' responses to technology use in time management after controlling for gender, years of experience, and educational level.

The study's results indicated parallels in the replies of school principals on the use of information technology in enhancing their time management efficacy. The Ministry of Education in Oman offers equitable services to principals, allowing individuals of all genders and various specializations to access resources like as computers, internet connectivity, and email accounts. The results indicated that the accessible ICT tools assist school administrators in executing their administrative responsibilities effectively.

The more school principals use the available tools the more their skills in managing their time become effective. The findings revealed the importance of ICT tools in promoting efficiency and accuracy among the principals in carrying out their duties. In addition, the teachers will be inspired by the principals' utilization of these tools and implement them in their daily plans for classrooms.

6. Recommendations

The study advises the Ministry of Education leadership to extensively integrate information technology in schools by offering training sessions for principals and facilitating participation in several seminars and workshops on information technology, including time management, based on an assessment of training needs.

The study advocates for the utilization of information technology in executing administrative functions within school administration, including planning, organizing, supervising, and enhancing managers' proficiency in its effective application across all administrative tasks. It is advisable to prioritize the update of computer hardware, including critical software for educational administration services, to fully leverage information available on computers and the Internet. The Ministry of Education can grant an adequate funding to fulfill the technological needs of schools and to continuously update data within the institution.

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