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The Role of Cloud Computing in Improving the Performance of School Principals

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ABSTRACT

The primary objective of this research endeavour was to evaluate the influence of cloud computing on enhancing the efficacy of school principals within the context of the Ajloun Governorate. Additionally, the study sought to ascertain the extent of accessibility to requisite cloud computing resources and the actualization of administrative proficiency among school principals in the aforementioned region. To attain these research goals, a descriptive research design was employed, adopting a quantitative approach with a questionnaire serving as the principal tool for data collection. The research was conducted on a representative sample of 180 principals, encompassing both male and female individuals, within the Ajloun Governorate. The outcomes of this investigation indicate that both the accessibility to cloud computing requirements and the manifestation of administrative competence among school principals in the Ajloun Governorate were notably high. These findings imply a substantive and positive influence of cloud computing on the enhancement of school principals' performance.

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1. Introduction

The notable progressions within the information and communications technology sector have precipitated the emergence of varied methodologies and strategies underpinned by multimedia technology. These approaches harness technological innovations to augment the efficacy of educational processes (Alashhab et al., 2021). The progression of technology has exerted an influence on the educational system, prompting educators to explore modern methodologies and strategies in response to challenges encountered in the educational continuum. The evolutionary developments and ensuing transformations have mandated the assimilation of new responsibilities and duties for personnel across various educational institutions, notably for school administrators (Ali, Mazen, & Hassanein, 2018). In addressing these unfolding trends, it became imperative to endow school principals with the essential leadership skills and knowledge, enabling them to proficiently navigate and adapt to global developments and alterations within the educational landscape (Ali, 2019). Therefore, furnishing the principal with leadership skills endows educational institutions with the capacity to evolve, endure, expand, and effectively respond to contemporary environmental occurrences and shifts. This is facilitated by the principal's capacity to exert influential flexibility in addressing events and cultivating a cohesive organizational culture (Alonso-Monsalve, García-Carballeira, & Calderón, 2018).

Nonetheless, the role of school leadership holds pivotal significance in augmenting, refining, and streamlining educational administrative responsibilities to amplify their adaptability and capacity for advancement. Owing to notable advancements in administrative methodologies, technological advancements, and various influences necessitating rapid changes in educational institutions, an escalating imperative exists to re-evaluate administrative and educational paradigms to harmonize with the dynamic nature of education and optimize its outcomes (Arpaci, 2019). It is acknowledged that the onset of the third century represented more than a mere historical juncture, but rather ushered in substantial transformations, with arguably the most salient being the notable advancements in communication and information technology aimed at meeting evolving needs in a dynamic world. Within the pages of "Building the School of the Future" by Hedley Bear, a prospective scenario is delineated, providing a lucid perspective on the potential developments in both the current and forthcoming stages (Elhoseny et al., 2018). The adoption of a transformative pedagogical approach within the educational institution involves the incorporation of digitalization and e-learning methodologies. This strategic initiative aims to cultivate an innovative school community and empower students to leverage novel resources, including but not limited to cloud computing (Juma & Tjahyanto, 2019).

Cloud computing applications have attracted considerable attention and pervasive adoption. The swift progression of artificial intelligence technologies underscores the critical need to invest in and harness them within the educational domain. Such investment is imperative for proactively anticipating forthcoming opportunities and constitutes an urgent imperative demanding prompt preparedness (Njenga et al., 2019). Cloud computing, a state-of-the-art technology, entails transferring computer processing and storage to a cloud server via the Internet. This allows IT programs to be delivered as services, enabling users to access files and applications without local installations. This not only saves costs but also offers convenient access to a diverse array of applications (Comar, Hegazy, Henderson, & Hrozencik, 2014).

The advent of the digital age has instigated a transformative revolution in education and various dimensions of human existence. Technological progress during this era has empowered learners to undertake a more proactive and self-directed role in their educational endeavours (Kumar & Bhardwaj, 2020). The Internet has facilitated the establishment of online communities characterized by innovative cognitive frameworks, allowing individuals of diverse age groups worldwide to engage in collaborative endeavours and derive mutual benefits from shared knowledge. It has bestowed upon children the capacity to take responsibility for their learning experiences through participation in activities involving discovery, expression, and experimentation (Alam, 2023). The constructivist theory establishes an interrelation between the acquisition of knowledge and the application of technology. Within the educational context, the learner employs technology to engage in exploration, investigation, and the generation of diverse solutions to challenges encountered in their life (Almaiah & Al-Khasawneh, 2020). Embracing a relational perspective facilitates the acknowledgment and understanding of interconnections among diverse phenomena. Consequently, cloud computing emerges as a direct consequence of the industrial revolution spanning all four phases. The fourth industrial revolution, characterized by digitalization, manifests through interconnected networks, the Internet of Things, and the swift exchange of information (Agrawal, 2021). The underpinnings of digital transformation, delineated by the World Bank, encompass communication and information technology infrastructure, an educational system attuned to the requisites of the digital era, and novel responsibilities vested in school principals. This study endeavours to augment the administrative proficiency of educational leaders, particularly school principals, by addressing diverse challenges and variables encountered in their roles. The researcher specifically concentrates on the utilization of cloud computing applications as a mechanism to enhance the skill set of school principals and elevate the overall performance of educational institutions.

2. Research Questions

The objective of this investigation is to scrutinize the inquiries posited in the preceding discourse, delineated as follows:

1. To what extent are the prerequisites for cloud computing available in schools within the Ajloun Governorate, as perceived by school principals?
2. How do school principals in the Ajloun Governorate perceive the actuality of administrative performance within their domain?
3. What function does cloud computing play in the administrative performance of school principals within the Ajloun Governorate?

3. Literature Review

Cloud computing is centred on the utilization of shared resources, with expenses contingent on their internet-based usage. This technological innovation evolved as a response to the challenges posed by costly technical resources and aims to optimize resource management for enterprises, especially following the establishment of internet infrastructure across various global regions (Samyan & St Flour, 2021). The emergence of laptop computers and smartphones has substantially facilitated communication, primarily

attributable to their capacity for Internet connectivity and the exchange of diverse information and files. Virtualization technology optimizes computing resources, augmenting their adaptability in response to workload and usage volume. The ownership-related expenditures, including maintenance and upgrades, are assumed by an external entity referred to as the service provider (Tajur, 2022). Educational institutions were incentivized to adopt this technology with the aim of reducing technical and informational costs, thereby influencing the efficacy of the human workforce in fulfilling their responsibilities within these establishments. The administrative performance of these institutions, as a determinant of efficiency and effectiveness, serves as a conduit for attaining their organizational objectives (AL-Omari, 2022). Elevating administrative performance has emerged as a central emphasis. The paramount objective of these institutions is to secure their success and distinctiveness by refining operational processes to attain heightened efficiency and effectiveness, concurrently mitigating both time and financial expenditures (Al-Muraikhi, 2023).

The genesis of cloud computing dates back to the 1960s, attributed to the pioneering efforts of computer scientist John McCarthy. McCarthy envisioned a prospective paradigm in which computing would be structured akin to a public utility, affording users the capacity to procure computing power in a manner analogous to procuring electricity from a centralized authority (Al-Adwan, 2023). The terminology was introduced by Ramnath Cellapa during a discourse in 1997, where he characterized it as an innovative computer paradigm. The commencement of cloud computing can be pinpointed to 1999 when Salesforce became a trailblazer in providing a platform for dispensing enterprise applications. Amazon entered the arena with Amazon Web Services in 2002, and later introduced EC2 as a commercial service in 2006. In 2007, IBM and Google initiated a research initiative in conjunction with other institutions, delving into the realm of cloud computing (AL-Safasfeh & Al-Ajlouni, 2019).

The term "cloud computing" is currently ubiquitous yet somewhat nebulous. It encapsulates a conceptualization involving services, applications, software, hardware, and resources accessible via the Internet, managed by a third-party service provider within their data centres. Individuals expressing discontent with any or all facets of this arrangement are colloquially labelled as dissenters within the payment-per-use framework (Ismael & Mubariz, 2020). This system, commonly embraced by enterprises, entails remuneration for the utilization of cloud computing services. The remuneration is contingent upon the usage of processing capabilities, storage capacity, memory size, the quantity of authorized users, and other relevant factors. Essentially, instead of utilizing local computing resources for network communication and program and file storage, these resources are centralized in data centres commonly referred to as the cloud (ALharahsheh & Al-Dhiabat, 2019). The computer, in this context, serves as a conduit for accessing and communicating with the designated cloud infrastructure. This is applicable across all computing devices within an organization. Instead of installing the programs directly onto the devices of employees, these applications are instantiated on the cloud and function in a conventional manner (Baldassarre et al., 2018).

As per the National Institute of Standards and Technology definition, cloud computing is delineated as a framework facilitating seamless and enduring network access. Within

this framework, a compilation of computing resources, encompassing networks, servers, storage units, applications, and services, can be promptly provisioned and activated with minimal administrative intervention or engagement from service providers (Qasem et al., 2019). The cloud model comprises five fundamental attributes, three service delivery models, and four implementation models. It is denoted as a technological framework that leverages computational capabilities, computer storage resources, and processing capabilities through the Internet. This suite of services is provided as a service by Internet service providers (Komalasari, Arafat, & Mulyadi, 2020). Cloud computing technology necessitates the existence of the subsequent components:

i. User or beneficiary: The user or recipient of this technology will employ their computer or mobile device, requiring an Internet connection, to access and avail themselves of its services (Özdemir, Sahin, & Öztürk, 2020).
ii. Applications: The recipient has the capacity to employ diverse application programs hosted on the cloud, encompassing functionalities such as word processing, presentation, spreadsheet, and information transfer and sharing services (Alashhab et al., 2021).
iii. Platforms: Apple and Google serve as purveyors of this service, furnishing extensive servers characterized by substantial storage capacities and expeditious data processing capabilities (Ali et al., 2018).
iv. Infrastructure: The cloud infrastructure is integral to the provision of the service, encompassing personal computers, the Internet, and data storage facilities (Ali, 2019).
v. Services: Applications provide an array of services accessible to users upon establishing connectivity between their device and the Internet. These services encompass text editing, email, calendar functions, chat, and additional functionalities (Alonso-Monsalve et al., 2018).

Cloud computing is characterized by a distinct set of attributes, with self-service being one of them. This denotes the capacity for users to autonomously access and employ cloud-based applications in accordance with their individual needs. Users possess the ability to generate, modify, and store data within the cloud infrastructure utilizing a web browser (Arpaci, 2019). Flexibility pertains to the capacity to transition effortlessly between diverse service providers without encountering substantial adverse repercussions. It also involves the seamless integration of various services, such as procuring storage from one provider and employing software from another, contingent upon the efficacy and dependability of each service provider (Elhoseny et al., 2018). Furthermore, flexibility encompasses the ability to expand and adapt to forthcoming changes by leveraging current versions of software and hardware within the cloud. Cloud computing affords users the capability to access its services through a web browser, irrespective of the operating system, access device, or physical proximity to the cloud. Cost reduction is realized by eliminating the necessity to procure server space, software, storage devices, and hardware maintenance; these responsibilities are instead carried out remotely by the service provider through an internet connection utilizing personal computers, desktops, or mobile phones. Usability is a pivotal facet of cloud computing services, facilitated by contemporary modes of communication via digital devices over the Internet. This facilitates convenient file storage and retrieval from any location, as well as seamless sharing and collaboration with other users (Juma & Tjahyanto, 2019).

Various enterprises provide users with cloud computing services, with Microsoft, Amazon, and Google emerging as particularly noteworthy providers. In this discourse, our attention will be directed towards the preeminent services extended by Google, acknowledged for their widespread adoption, extensive usage, and noteworthy attribute of being proffered without charge. Some of the distinguished services encompass email, Google Drive, Google Docs, Google Sites, OneDrive, Google Presentations, Google Forms, Google Calendar, and Google Meet (Njenga et al., 2019). Students in media-related disciplines have the opportunity to utilize a diverse array of services, encompassing access to a variety of academic resources, research applications, and educational tools, contributing to the enrichment of their scholarly and professional pursuits. This is achieved without the necessity for device exclusivity, whether it be a mobile or computer, and is not constrained by physical location or specific temporal limitations.

Scholarly investigations have demonstrated that the integration of cloud computing in education yields numerous advantages. This encompasses the capability for users to retrieve their files and applications through the cloud, obviating the necessity for the installation of applications on their personal devices (Kumar & Bhardwaj, 2020). As a result, this mitigates security risks, diminishes the probability of file loss or damage, and conserves time associated with installation, operation, and upgrades. It leverages the capabilities of expansive servers to execute intricate tasks that might necessitate high-performance equipment (Alam, 2023). Merely possessing a computer equipped with high-speed internet connectivity and accessing a website providing requisite software enables users to circumvent the substantial expenditure associated with software acquisition. The prevailing architecture of cloud computing entails data centres endowed with the capacity to deliver services comprehensively to consumers globally. The organization exhibits the capability to swiftly scale its computational services within a brief timeframe subsequent to the decision to expand (Almaiah & Al-Khasawneh, 2020).

The role of the school principal has evolved from that of an educational director overseeing academic affairs within the school to that of a leader responsible for instituting requisite reforms within the educational institution. The principal's primary focus is on formulating and nurturing a shared vision for the school, concurrently improving modes of communication and collaboration with the staff (Agrawal, 2021). This requires the empowerment of the school principal in the execution of his professional duties. A responsible educational administrator collaborates with the school staff utilizing evidence-based, expert, and compassionate principles, as opposed to relying on authoritarian leadership approaches (Samyan & St Flour, 2021). The efficacy of the school principal in accomplishing his mission is contingent upon the adoption of an effective administrative and leadership style, continual professional development, a profound awareness of the significance of his responsibilities, and a proclivity towards innovation, growth, and creativity in his professional endeavours. The school principal is obligated to acquire a comprehensive comprehension of the educational system, encompassing curricula and curricular concerns. Moreover, they must exhibit awareness of the challenges facing the school and engage in active collaboration with staff and the local community to address these challenges (Tajur, 2022). The school principal is required to harbour a clear and explicitly articulated vision. This vision, endowed with empowering qualities, serves to fortify the principal's resilience and self-assurance, concurrently compelling others to actively

participate in their work. The principal, through the enhancement of the skills and competencies of the staff members, and the cultivation of a culture grounded in mutual respect, possesses the capacity to effect positive transformation within the school. In order for this favourable transformation to transpire, the principal must actively advocate for the professional development of the workers and educators, fostering a conducive psychological milieu that champions the principles of collaboration and teamwork (AL-Omari, 2022).

The foregoing information suggests that cloud computing has aroused substantial interest among stakeholders in the information industry. This is attributable to its capacity to provide infrastructure, services, and applications through a network, offering compelling advantages for educational institutions (Al-Muraikhi, 2023). A pivotal attribute of cloud computing lies in its capability to streamline the generation and utilization of diverse media forms, including documents, tables, images, presentations, and interactive video displays, by administrative entities. The imperative adoption of cloud computing in educational institutions stems from its capacity to store audio files without necessitating substantial storage capacity (Al-Adwan, 2023). Multiple investigations have corroborated that the incorporation of cloud computing resources in educational settings fosters learning and stimulates innovation, operating at both individual and collective levels. Furthermore, it serves to address educational challenges (AL-Safasfeh & Al-Ajlouni, 2019). Although there might exist a few drawbacks linked to cloud computing, they are largely negligible when juxtaposed against the substantial opportunities presented by the cloud environment. Additionally, the cloud adheres to rigorous security standards, resilient to minor errors that may occur, underscoring the inherent security robustness of the cloud environment (Ismael & Mubariz, 2020).

4. Previous Studies

AL-Safasfeh and Al-Ajlouni (2019) This study investigated the influence of an educational program centred around cloud computing on the comprehension of scientific concepts among eighth-grade students in the domain of science. The study encompassed two groups: an experimental group (n=30) subjected to instruction via cloud computing, and a control group (n=30) receiving traditional instruction. To achieve the study's objectives, the researchers developed an educational program focused on cloud computing along with an assessment test to measure the assimilation of scientific concepts. The findings revealed statistically significant differences in the mean scores of students from the two groups on the scientific concepts test, with the experimental group demonstrating superior performance.

Ismael and Mubariz (2020) The research scrutinized the correlation and strength of the relationship between the prerequisites for implementing cloud computing technology and the quality of educational services. The primary objective was to evaluate the levels of educational service quality and cloud computing technology adoption within private universities. To achieve this, a survey questionnaire was employed to collect primary data from a sample of 374 personnel comprising faculty members, supporting staff, and administrative personnel. The study revealed several key findings, notably: a positive correlation exists between cloud computing technology and the quality of educational services in the examined private universities, and there is also a positive correlation. A statistically significant relationship was identified between each of the five attributes of

cloud computing technology and the support provided by senior management in the realm of computing technology. The cloud facilitates organizational support in areas such as change strategies, infrastructure, confidentiality, and security. Furthermore, there is a statistically significant correlation between the prerequisites for implementing cloud computing and all facets of educational service quality.

Ababtain and Al-Dariwish (2021) a study at Shaqra University investigated the utilization of Cloud computing in education. It explored applications, significance, and challenges through a questionnaire administered to 100 female students from the College of Science and Arts. Results showed strong student acceptance and recognition of the significance of Cloud computing in education, alongside identified barriers to its implementation at Shaqra University.

ALharahsheh and Al-Dhiabat (2019) investigated the influence of information technology on augmenting the administrative efficacy of school principals within the schools affiliated with the Ramtha District Education Directorate. Additionally, it explored the modulating effects of variables such as gender, educational qualifications, educational stage, and administrative experience on this impact. The sample encompassed 70 headmasters and headmistresses, and a comprehensive tool comprising 53 paragraphs across four sections (instructor, student, school environment, and local community) was developed to assess pertinent factors. Employing a descriptive methodology, the study revealed a noteworthy positive impact of information technology on enhancing the administrative performance of school administrators in the Ramtha District schools. The ranked order of impact across domains was as follows: student, teacher, community, and school environment. The community displayed exceptional academic performance, while the educational environment demonstrated a moderate level of academic achievement. Furthermore, the findings indicated the absence of statistically significant disparities attributed to gender, scientific expertise, educational level, and managerial background across all domains.

AL-Omari (2022) acknowledged the impact of cloud computing on advancing proficiency in Google educational applications and fostering critical thinking skills among students enrolled in the Internet Applications in Education course at Mutah University. The study involved a sample of 22 students assigned to the experimental group, instructed through cloud computing, while a control group of 22 students received conventional instruction. Employing a semi-experimental methodology, data collection utilized note cards and a critical thinking scale. The results revealed statistically significant differences in student performance on the observation card, favouring the experimental group. However, no significant statistical differences were observed between the two groups in terms of their scores on the critical thinking measure. Consequently, the study recommends the integration of cloud computing into university education to enhance proficiency in utilizing Internet applications.

5. Methodology

The current study adopted a descriptive research approach and utilized quantitative methods to furnish a thorough, accurate, and systematically organized representation of the characteristics and data associated with the studied population. Saunders, Lewis, and Thornhill (2016) posit that the fundamental aim of descriptive quantitative research is to meticulously outline and expound upon the various attributes of the subject or situation under investigation. Following this, the collected data undergoes scrutiny and subsequent presentation.

5.1 Population and Sample

The study focused on school principals within the Ajloun governorate as its population. Due to the considerable size of the entire population, the researcher employed the established technique of sampling to choose a subset for investigation. This entailed the selection of 230 schools and their respective principals. Out of the distributed 230 questionnaires, 190 were returned. After excluding responses from 10 participants with insufficient information, a total of 180 surveys remained available for analysis.

5.2 Instrument of Study

The current research employed questionnaires as a data collection method to elicit responses and evaluate participants' perspectives on various survey topics. Utilizing the Likert scale, featuring five possible values ranging from "1" to "5", responses were assessed and categorized into three segments. The initial round of the survey captured personally identifiable information such as gender, educational attainment, and years of experience. The second part comprised 21 questions examining the accessibility of cloud computing requirements, while the third part involved 13 questions addressing the actuality of administrative performance. It's noteworthy that the framework for these sections is based on Wassel (2020) study, which serves as the foundational reference.

5.3 Validity of Instrument

A cohort of ten educational technology professionals, concurrently serving as faculty members at Jordanian universities, were engaged to evaluate the research instrument for its reliability. These experts were entrusted with assessing the instrument's linguistic structure, scientific accuracy, and clarity. The unanimous consensus among the experts was that the instrument was generally acceptable, with only a few minor linguistic modifications deemed necessary.

5.4 Reliability of Instrument

One method employed to assess the reliability of a measurement involves scrutinizing the consistency of results by employing comparable samples and instruments while maintaining control over all other variables. The examination of response consistency was conducted through the utilization of Cronbach's alpha coefficient. The reliability of a survey is indicative of its dependability, as articulated by Saunders et al. (2016). Reliability is deemed attained when the survey attains or surpasses a minimum threshold of 60%.

Table 1

Cronbach Alpha Test.

Variables	Value
cloud computing requirements	0.833
Administrative performance	0.825

The outcomes presented in Table 1 demonstrate a robust degree of consistency in the study, as evidenced by their alignment falling within the range of 0.833 and 0.825. Additionally, it is imperative to acknowledge that each section of the survey yielded a Cronbach's alpha coefficient exceeding 0.60, signifying a significant level of reliability. Consequently, no inconsistencies were identified among the diverse components of the research instrument.

5.5 Data Analysis

The study concerns were comprehensively addressed through statistical analyses conducted using the SPSS program. The methodologies employed in this inquiry involved averaging and straightforward linear regression calculations. This section furnishes an elaborate elucidation of the outcomes derived from employing varied research methods to evaluate and characterize these results. Items garnering an average score of 2.33 or lower are designated as having a low grade, those falling between 2.34 and 3.67 are categorized as moderate, and items with a mean score equal to or exceeding 3.68 are indicative of a high level.

6. Findings and Discussion

The respondents' demographic characteristics were analysed through descriptive analysis, which involved the categorization of "gender, years of experience, and educational qualification." The male respondents constituted the majority, representing 52.8%, while females accounted for 47.2% of the total respondents. Concerning the respondents' level of experience, 44.4% had 6 to 10 years of experience, 22.8% had 1 to 5 years of experience, 19.5% had 11 to 15 years of experience, and 13.3% had more than 15 years of experience. Based on the data presented in Table 3, it can be observed that 63.9% of the respondents hold a bachelor's degree, 22.2% possess a master's degree, 11.1% have a high diploma degree, and 2.8% have obtained a Ph.D. degree.

Table 2

Profile of Respondents.

The variable	Categories	N	%
Gender	Female	85	47.2
	Male	95	52.8
Years of experience	1-5 years	41	22.8
	6-10 years	80	44.4
	11-15 years	35	19.5
	More than 15	24	13.3
Educational qualification	Bachelor's	115	63.9
	High Diploma	20	11.1
	Master's	40	22.2
	Ph.D	5	2.8

The researcher employed mean values and standard deviations to evaluate the degree of availability of cloud computing requirements in schools within the Ajloun Governorate, as perceived by school administrators, in order to address the initial research question.

Table 3

Means and Standard Deviation.

N	Items	Means	St.Devs	Results
1	Adopting cloud computing contributes to maintaining databases in the event of any natural disasters or accidents, whether technical or fires.	4.08	0.73	A
2	Adopting cloud computing provides high flexibility in expanding storage capabilities	4.05	0.78	A
3	Adopting cloud computing reduces the technical pressure on the organization's existing devices	3.95	0.76	A
4	Adopting cloud computing contributes to keeping pace with the technology of hardware and software	4.12	0.79	A
5	Cloud computing provides software as per business requirements	4.69	0.73	A
6	The flexibility of operating systems and cloud applications allows dealing with all traditional operating systems.	4.00	0.79	A
7	Cloud computing allows you to leverage the programming expertise of a cloud service provider	4.15	0.83	A
8	The cloud computing service provider seeks to develop the software used based on specialized competencies.	3.80	0.78	A
9	The cloud computing service provider guarantees always-on connectivity services.	3.70	0.74	A
10	Cloud computing ensures effective communication and reduces pressure on management	3.94	0.76	A
11	Cloud computing involves timely access of information and reports	3.78	0.78	A
12	Cloud computing supports teamwork and teams	3.90	0.82	A
13	Cloud computing makes it possible to use and expand applications with ease	3.96	0.80	A
14	Cloud computing helps access applications at any time, place, and from any device	3.99	0.84	A
15	Cloud computing allows flexibility to change according to the goals and business requirements	3.98	0.73	A
16	Cloud computing ensures high flexibility in dealing with Internet browsers	3.88	0.77	A
17	Cloud computing reduces the cost of training the human element	4.02	0.75	A
18	Cloud computing reduces the cost of acquiring hardware, servers, and software	4.05	0.88	A
19	Cloud computing reduces the burden of hardware maintenance and software development	4.08	0.82	A
20	Cloud computing ensures that some information is encrypted and what is available and what is not available from the data is determined	4.02	0.80	A
21	Cloud computing provides flexibility in data updating procedures such as deletion, addition, and modification	4.01	0.73	A
	Total	**4.01**	**0.61**	**A**

As per the data presented in Table 3, the magnitude of cloud computing requirements exhibited a mean value of (4.01) with a standard deviation of (0.61). This implies that school principals hold elevated expectations regarding the fulfilment of cloud computing requirements in schools within the Ajloun Governorate. This observation aligns with the findings of AL-Safasfeh and Al-Ajlouni (2019), Ismael and Mubariz (2020), Ababtain and Al-Dariwish (2021), and AL-Omari (2022). Among the cloud computing requirements, the item with the highest mean value is item 5, which states, "Cloud computing provides software as per business requirements" (4.69). Conversely, within the means, item 9, "The cloud computing service provider guarantees always-on connectivity services," has the lowest value (3.70).

This outcome is attributed to a fundamental characteristic of cloud computing, namely its capacity to furnish storage capacity as needed. Respondents underscored the ease of expanding storage capacity seamlessly, in contrast to the intricate and multi-step procedures involved in the implementation of traditional computing. Additionally, the increasing inclination towards adopting cloud computing ensures the protection of the provider's existing databases against both technical and natural threats. Unlike traditional

computing, which required the organization to incur regular maintenance costs and adhere to routine protocols for safeguarding against natural disasters, technological malfunctions, theft, and piracy, this aspect instils a sense of contentment. The responsibility for security and maintenance of backups lies with the service provider, Microsoft, thereby alleviating operational pressures. Moreover, the primary goal of implementing cloud computing is for managerial entities to divest from investing in information technology infrastructure. This is attributed to the service provider furnishing a sophisticated infrastructure encompassing advanced servers and scalable storage capacity. Furthermore, the provider undertakes the responsibilities of infrastructure maintenance, monitoring, and security, while facilitating convenient access from any location and at any time.

This outcome can be attributed to the heightened efficiency of communication among personnel, both within the same administrative level and across various levels. The expeditious and effective transmission of information is particularly facilitated by the swift connectivity of the Internet, allowing the utilization of electronic messages, emails, publications, and messages. Cloud computing facilitates remote work by providing constant access to databases, software, and work-related applications for employees. This ensures the effectiveness of administrative processes, uninterrupted workflow, and timely task completion. Moreover, it empowers employees to handle browsers with flexibility, accessing the Internet without significant technical or logistical barriers. Consequently, the participants in the sample unanimously agreed that cloud computing offers remarkable adaptability in managing software usage. This encompasses the capacity to promptly correct errors made by employees through effortless deletion and modification, as well as seamlessly integrating updates or new data in a convenient, efficient, and flexible manner.

The researcher utilized mean values and standard deviations to assess the reality of administrative performance among school principals in Ajloun Governorate from their perspective, addressing the second research question.

Table 3

Means and Standard Deviation.

N	Items	Means	St.devs	Results
1	The workload is compatible with my personal abilities and academic qualifications	3.76	0.68	A
2	I feel like time flies by because of the fun at work after adopting cloud computing	3.73	0.73	A
3	Using electronic means helps me complete the greatest amount of work	4.10	0.60	A
4	The software used contributed to reducing errors and achieving a high level of performance	4.05	0.63	A
5	The technology used helps me constantly improve my performance	4.00	0.65	A
6	The technology used makes me more able to do my job well	3.83	0.74	A
7	Using technology helps me create and develop my work	3.85	0.78	A
8	The technology used saves effort in completing tasks	3.87	0.76	A
9	The technology used simplifies my work	3.70	0.74	A
10	The required work is completed on time	3.93	0.71	A
11	Make sure to achieve the general goals of the school	3.78	0.75	A
12	I have the ability to take responsibility	3.90	0.79	A
13	Make sure to arrive and deliver work information in a timely manner	3.88	0.77	A
	Total	**3.88**	**0.55**	**A**

As per Table 4, human competencies exhibited a mean value of (3.88) with a standard deviation of (0.55). This suggests that there are elevated expectations among principals regarding

the reality of administrative performance in secondary schools within Ajloun Governorate. This observation aligns with the findings of previous research of ALharahsheh and Al-Dhiabat (2019). The highest mean value within the human competencies category is associated with item 3, stating, "Using electronic means helps me complete the greatest amount of work" (4.10). Conversely, within the same category, the lowest mean value is attributed to item 9, which asserts, "The technology used simplifies my work" (3.70).

This result can be ascribed to the availability of diverse resources facilitating it, including fast Internet connectivity and a variety of electronic applications for transmitting and exchanging information (e.g., email, video conferencing, direct file sharing). Respondents' answers also indicated their readiness to embrace cloud computing tools and applications to enhance job performance, contributing to the institution's overall objectives. The efficiency in task completion and improved service quality can be attributed to collaborative efforts, fast Internet connectivity, user-friendly Microsoft applications, and reduced reliance on paper transactions. The adoption of technology, particularly cloud computing, has led to a reduction in human errors, enhancing service quality. The outcome is also linked to the potential for remote work beyond the school's geographical boundaries, outside official working hours, facilitating timely completion irrespective of project magnitude. Employees can access applications remotely from their homes or other locations to complete unfinished tasks, without implying an increase in responsibilities beyond working hours. On the contrary, adopting cloud computing has made their routine tasks more streamlined and requires minimal effort.

To address the third question, which sought to ascertain the influence of cloud computing on the administrative performance of school principals in Ajloun Governorate, the study utilized simple regression analysis. The outcomes of this inquiry are detailed in Table 4.

Table 4

Regression Analysis Results.

Variable	R	R^2	B	F	P
Cloud computing	0.700	0.491	0.920	109.815	0.000

The data presented in Table 4 reveals an R value of 0.700, signifying that cloud computing elucidates 70% of the variance in the administrative performance of school principals. The F value stands at 109.815, with a significance level of 0.000, underscoring a statistically significant impact of cloud computing on the administrative performance of school principals. Furthermore, the table underscores a robust positive correlation (correlation coefficient = 0.92) between cloud computing and the administrative performance of school principals. This implies that an expansion in cloud computing correlates with a commensurate increase in the level of administrative performance demonstrated by school principals.

7. Conclusion

The primary aim of this study was to examine the impact of cloud computing on enhancing the performance of school principals. The study's outcomes underscore the significant influence of cloud computing in augmenting the administrative efficiency of administrators in Ajloun Governorate. The research affirms that a notable feature of cloud computing is its capacity to extend the scope of work beyond the physical confines of the

school. This flexibility includes the advantage of not being confined to official working hours, facilitating the timely completion of projects regardless of their scale. In essence, personnel can access applications from their residences or any location to finalize tasks left incomplete during regular working hours. In certain instances, a computer with Internet connectivity is necessary, but this doesn't imply an escalation of responsibilities beyond the standard working hours. On the contrary, it is posited that the integration of cloud computing has heightened their comfort level. This is attributed to the streamlining of routine tasks through user-friendly applications, reducing the effort required and ensuring minimal exertion.

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