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Implementation of Artificial Intelligence and the Roles of Educational Leadership: Investigating the Expectations of Kindergartens' Principals

Bothina Mohammed Hussien Ali
Assoc. Prof., Department of Kindergarten Education, College of Education, Majmaah University, Majmaah 11952, Saudi Arabia, *Bm.ali@mu.edu.sa*

Technology is a new methodology based on the conscious use of information and communication technologies in the exercise of the basic functions of management in the organizations of the era of globalization. The aim is to investigate the expectations of kindergartens' principals concerning the effect of implementing AI on the roles of educational leadership. This is a cross-sectional study. Survey research through interviews is the most appropriate research strategy. Interviews are held over a period of four our meeting on Zoom App, interspersing with two intervals, as a 15-minute break. The data from the interviews indicate that four themes emerge: people as well as AI go side by side in several human tasks and jobs, personality traits and characteristics, building a sustainable ecosystem…making everyone a part of the team, and activating the role of artificial intelligence and setting the rules governing it. This study has identified several implications that AI will have on the leadership role. All school staff, administration and teachers have become sufficiently competent in using AI applications in their work and teaching tasks, along with face-to-face learning, since the outbreak and spread of the Corona epidemic before.

Keywords: artificial intelligence, educational leadership, kindergartens' principals, early childhood, kindergartens

INTRODUCTION

Artificial Intelligence and technology

The twenty-first century is witnessing a huge scientific revolution that carries with it many variables, the most important of which is the technological revolution, and the production of large quantities of information capable of increasing growth. Its leaders follow all the behaviors that contribute to its application in all areas of the institution, in a way that contributes to its development and improving its ability to compete and excel.

Hence, technology brought about radical changes in all areas of life, as it led to changing lifestyles in its various economic, social and educational forms (Gültekin, 2022). The world, so that it has turned into a small village, and the computer is

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considered the main means used in the transfer of the information revolution, and it also contributes to expanding the knowledge horizons of individuals due to the large number of knowledge resources that can be accessed through it, and the ease of obtaining information from it (Tut et al.,2021), and the global revolution in the field of Information contributes to creating a new future different from what is now, and modern technology plays a fundamental role in changing it. Where it affects the way of education (Mallik& Mallik, 2017).

Technology is a new methodology based on the conscious use of information and communication technologies in the exercise of the basic functions of management in the organizations of the era of globalization. Communications, in order to facilitate the daily administrative operations, whether within the institution or between it and educational institutions in general, and secondary schools in particular, which requires leaders who have the desire and ability to use technological technology in the development of the school (Göçen & Aslan,2022).

Educational Leadership

Leadership is the essence of the administrative process and its beating heart, as it is the focus of the administrative process, so that efficient leadership is one of the main characteristics by which it is possible to distinguish between successful and unsuccessful organizations (Daşcı & Gökmenoğlu, 2023; Rajbhandari, 2018). Leadership for the organization can be likened to the brain for a person. Because it directs and coordinates action and reaction processes according to the surrounding circumstances, it is influenced and influenced by the environment in which it operates, and effective leadership is considered one of the rare elements that both developing and developed societies lack (Akyol& Ulutaş, 2021).

Leadership is also the main engine for the entity of institutions and the main tool for change in them. The success of institutions in performing their mission and achieving their goals depends on the efficiency of their management(Göçen & Aslan,2022). Therefore, every organization, regardless of the number and variety of its activities, needs an effective management distinguished by the ability to pursue rapid changes and respond to the requirements of the future(Rajbhandari,2018). The leaders of these institutions can only adopt modern approaches, such as organizational learning, which serves as an entry point for producing ideas, innovative methods, and creating loyalty for the employees of the educational institution for the benefit of it (Silman,2015).

Leadership has also become measured by the extent of its belief in the participation of individuals in the leadership of the organization, a mature evaluation of business practices and their comparison with best practices in the same field(Silman,2015), the setting of measurable goals, a specific definition of the roles and responsibilities of individuals(Göçen & Aslan,2022), a well-defined application of the continuous improvement plan for the service provided, and the development of structured performance measures for each process to ensure benefit from improvement opportunities(Kıral & Suçiçeği, 2017; Silman,2015), and a set of tools, concepts, and modern management methods in the leadership of the institution, which are the

ingredients that support the achievement of goals and excellence in performance, and give it new ingredients that enable it to survive and outperform its competitor organizations, which differ from one institution to another (Rajbhandari,2018).

For instructional leadership, there are specific technology requirements regarding licensure preparation for school leadership, which require the status of artificial intelligence courses, and current technology-professional administrators report about instructional leader preparation for promoting artificial intelligence(Hejres, 2022).

The role of the school leaders is changing fast pace with the constant changes happening in education sector development. The instructional leader being the main component in guiding the teaching-learning process is necessary for preparing students with relevant knowledge and skills technology(Hejres, 2022).

Principals as instructional leaders need more training opportunities to obtain a positive impact on their leadership styles need to the school system. Professional development program provides the practice of the artificial intelligence concept to build successful technology system and can make a change to support teacher's role in teaching and learning process (Rajbhandari, 2017;Hejres, 2022). According to the National Education Technology Plan states that "the problem of technology, integration is not necessarily lacking funds, but lack of adequate training and understanding of how computers used to enrich the teaching and learning process." (Hejres, 2022).

School leaders can provide opportunities for teachers to use technology tools to track student achievements and attainment of learning goals. The school leader arranges school level meetings or plan training programs for demonstration of these tools for teacher using the teacher-to-teacher model for example(Hejres, 2022). Give insights about how technology tools used to report student progress to parents and guardians (Priyanka, 2016).

Bourton et al. (2018) describe the relationship between leadership and artificial intelligence as the potential to help leaders with clarity and specificity to make the decision. Robots tend to be non-functional without leaders. Therefore, instructional leaders need professional coaches to overcome challenges, threats that could facilitate and innovation, which is a need in schools(Hejres, 2022). Artificial intelligence promotes new models of digital education and artificial intelligence workforce development for principal, teachers and students to have the skills needed in the 21st-century economy(Hejres, 2022).

Problem statement

Modern technology, where AI lies in the heart of it, has created several challenges for school leaders, as it is their responsibility to help their schools capture the full benefits of the technology. They themselves have to adapt to the technological development , identify new problems that may arise as a result of using Tech. They also have to be open minded enough to find optimal solutions to those problems and be able to transfer these challenges to new opportunities in order to be prepared for the future. According to the existing literature(e.g. Holmes et al.,2019; Peifer & Jeske , 2022), leadership role

will change due to the implantation of AI, however, it is also essential to investigate the expectations of school leaders concerning the implantation of AI , This will help us gain valuable insights on the field, as this will clarify how AI will impact the leadership role in the future schools. To my knowledge, these types of studies are rare in our country.

Aims

The aim is to investigate the expectations of kindergartens' principals concerning the effect of implementing AI on the roles of educational leadership. This may help us gain more insights on how AI affects the leadership role in the future.

METHOD

Research Approach

A qualitative approach is employed in this study. It is a general research methodology in the social sciences, focusing on describing phenomena and seeking a deeper understanding of them, through the inductive and interpretive approach of information collected in the natural context of the phenomenon, and it is clear in this that it differs from quantitative research that usually focuses on experimentation and on revealing the cause or effect or differences, or aims to describe limited to numerical data. The question raised in qualitative research is an open-ended question that is concerned with process and meaning more than with cause and effect (Bogdan& Biklen, 1998; Marshal& Rossman, 1999; Patton, 2002).

Research design

This is a cross-sectional study. Since the aim of this study is to investigate the expectations of kindergartens' principals concerning the effect of implementing AI on the roles of educational leadership, survey research through interviews is the most appropriate research strategy. Interviews are held over a period of four our meeting on Zoom App, interspersing with two intervals, as a 15-minute break.

Data Collection Method

Interview structure and procedure

In order to collect data, qualitative semi-structured interviews were employed. Semi-structured interviews are a data collection method that pairs predetermined survey questions with interviewer-initiated open-ended (Ayres, 2008), ad hoc follow-up probes (Harrell& Bradley, 2009). These probes give the respondent the opportunity to provide more detailed information based on their initial answer (Ahlin, 2019). The interviews were conducted individually.

The interviewer started the interview with a general, unrestricted question. Then asked as many questions as possible, as she was supposed to leave the most talking space for the interviewee. According to (Laforest, 2009),it is also useful to question the validity of some of the information collected. Following recommendation by (Cohen, 2006), she respected the person's speed. The interviewer did not judge what the interviewees said.

The interviewer focused on predetermined topics, avoided suggesting answers and asking questions that changed the course of the conversation. She also avoided asking closed questions (restricted to specific options) that did not give the interviewees the freedom to speak, which would slow down the speed of the interview. She was sure to discuss all pertinent topics included in the interview plan. She asked clear and direct questions that started with words like: How? where? when? from? What? Why? How much? how much?

Since semi-structured interviews do not include closed-ended questions, they can be difficult to complete. When the interviewer felt that all the topics were discussed and that the allotted time for the interview expired, she asked the interviewee if she had anything to add to what was said. The interviewer thanked the interviewee for their participation, explained how the rest of the study project would proceed and indicated that the results would be sent to them once the study is completed. Once the interview was over, the interviewer summarized what the interviewee said and wrote down her impressions and any other important observations. This would facilitate the debriefing and analysis of the interview.

In order to put the respondent's words into text following, Bryman's (2008) example for how to increase the quality of interviews, the interviewer recoded all the interviews.

Participants

Nonprobability sampling technique, though purposive sampling was employed in this study. Those who were chosen had comprehensive insight and knowledge on the field of AI and leadership, from the records of Educational administration, Majmaah, KSA. 12 kindergartens' principals were chosen. Inclusion criteria were that: a) they had comprehensive insight and knowledge on the field of AI and leadership, b) they were kindergartens' principals, c) they had at least five years' experience as a kindergartens' principal, and d) they had certificate and training courses in AI.

Qualitative research experts argue that there is no straightforward answer to the question of 'how many' and that sample size is contingent on a number of factors relating to epistemological, methodological and practical issues (Vasileiou et al., 2018). Sandelowski (1995) recommends that qualitative sample sizes are large enough to allow the unfolding of a 'new and richly textured understanding' of the phenomenon under study, but small enough so that the 'deep, case-oriented analysis' (p. 183) of qualitative data is not precluded.

Data Analysis

Data were categorized into themes. That is, thematic analysis was employed. In this method, the researcher closely examines the data to identify common themes – topics, ideas and patterns of meaning that come up repeatedly. The data analyzed were audio-recordings of the full interviews and written notes taken during the interviews. Audio-recordings were listened through and summarized. The researcher followed the following steps in thematic analysis (Caulfield, 2022): 1) she got a thorough overview of all the data collected before she started analyzing individual items. This

involved transcribing audio, reading through the text and taking initial notes, and generally looking through the data to get familiar with it, 2) she coded the data. That is, highlighting sections of the text – usually phrases or sentences – and coming up with shorthand labels or "codes" to describe their content,3) she looked over the codes created, identify patterns among them, and started coming up with themes,4) she made sure that themes were useful and accurate representations of the data. She returned to the data set and compared the themes against it to see if something was missing, and whether these themes really presented in the data, 5) she named and defined each of the themes, and 6) finally she wrote up analysis of the data.

Trustworthiness

Trustworthiness is one way researchers can persuade themselves and readers that their research findings are worthy of attention (Lincoln & Guba, 1985). Lincoln and Guba (1985) refined the concept of trustworthiness by introducing the criteria of credibility, transferability, dependability, and confirmability to parallel the conventional quantitative assessment criteria of validity and reliability. Trustworthiness was achieved through a detailed description of all proceedings related to the study, which should also aid in transferability (Curtin & Fossey, 2007). In order to achieve the internal validity of this study, I kept a notebook of my thought process, so that it could be referred to later on to examine whether my own biases may have interfered with the study in any way. Validation of data can also be achieved through the usage of peer reviews of the data collected. Two other researchers were asked to review the coded data to ensure that it had been clustered accurately prior to the development of any textural descriptions. This type of member checking helped to ensure the accuracy of the findings.

FINDINGS

Q.1.How the adoption of AI applications in your schools help them to run differently?

The question is formulated in such a way so that respondents are free to say their experiences freely, that is , advantage or disadvantage.

Almost all of the respondents expressed that they use AI in their schools today since the Corona epidemic and the dependence of the school world as a whole on the digital world in education.

Respondents 1-12" *I believe that all school staff, administration and teachers have become sufficiently competent in using AI applications in their work and teaching tasks, along with face-to-face learning, since the outbreak and spread of the Corona epidemic before"*

One respondent stated that " "*a digitalisation will change the entire society, and we should be ready for this change* "

Another respondent stated that "*In fact, the government spares no effort in training us on the one hand, and providing all the capabilities of using AI applications in education on the other hand.*"

However, all respondents still agreed that people as well as AI go side by side in several human tasks and jobs. Respondent came to the conclusion that "*Today and in the future as well, we will use AI, but we will still need people, that is, a combination the best of human beings and the best of AI.*"

To sum up, as expressed by the respondents , we will use AI, but we will still need people, that is, a combination the best of human beings and the best of AI.

Emerging theme : *People as well as AI go side by side in several human tasks and jobs*

Q.2. Do you think that the principal's personality traits and characteristics have a role in his/her adoption of AI app.?

Personality traits and characteristics emerged as important factors in influencing these principal' adoption of AI app. Some of the respondents expressed that*" I believe that the most important characteristic of a school principal as a leader is to be a lover of learning because he is a model for all school workers*".

Another on added" *open to change is among the most important characteristics"*

As asserted by one principal" *school principal should be a working smarter, not harder. He/she should be aware that AI technology helped to reduce the work burdens and workloads of all school staff, administration and teachers, with the speed of the data analysis*"

Some respondents asserted that "*We now live in a world characterized by a competitive advantage, and therefore the AI Apps. Make the principal of the school, and therefore every subordinate in the school, sit at the top of knowledge by seeing everything new in the world of teaching and technology, and this in turn gives them precedence and makes them at the top of the pyramid of competitiveness*."

Emerging theme: Personality traits and characteristics

Q.3. What do principals/leaders lack in today's leadership?

From feedbacks, it is clear that building and promoting team-work with the implementation of AI is emerging. Respondents' views on their responsibilities in the leadership role are presented.

As some of the respondents phrased it*" It seems that leadership in most of schools that do not adopt AI can be of servant leadership, that is, the leaders role is to help others to develop and find new possibilities. The leader is responsible for the vision, the strategy and the decision-making".*

Another one commented that "this *sort of hierarchical leadership with one leader telling others what to do would not work in today's work environment. Everything goes much faster today. The focus needs to be on understanding tasks in teams rather than individually".*

She added " *We should be like a family, everyone has a role to play, everyone should be a part of a team , we call this ecosystem*".

Another one commented" *Yes, what we lack now is to facilitate high performing teams*".

Some of the responded stressed that "*Some people may criticize the applications of artificial intelligence and its use in business, such as the social aspect that allows individuals to deal with each other face to face, and that this use will affect the closeness of personal relationships, and we also cannot assume that machine intelligence replaces human intelligence, but I think that using both sides may solve the problem.*"

Emerging theme: Building a sustainable ecosystem…making everyone a part of the team

Q.4. What are the limits of using artificial intelligence applications in the field of work?

AI seems to be of valuable benefits , however, we cannot completely dispense with the human element that controls the machine. This emerged from respondents responses. As some of them stressed it" "*in some fields , machines are smarter than we are in, however, it cannot see the whole picture in the same way as us*".

Another one added" yes, " *though important in our life today and tomorrow as well, AI cannot think for us , cannot use data as a basis for decision making . We cannot exclude humans from that process*."

Some commented " *We need an ethical dimension to control the machines as the machine cannot ever think humanly and emotionally. These dimensions , that is, the emotions and personal attachments , which are not the work of the machine, affect organisational behavior* ".

One respondent added" *In some applications, AI scan CV's and decide who to hire, without any personal interaction or soft values. Ok, it is permitted , at least in our country to have computers make decisions for us…this is something one has to come up with oneself. However, I think we should think of methods of combining the two together. That is, set rules that govern the use of AI in such a decision making process"*

Another one added" *Though employees to may accept information given from a neutral computer as a source for the decisions*"

Emerging theme : Activating the role of artificial intelligence and setting the rules governing it.

DISCUSSION

The information gained from this study has answered the guiding questions by providing new insights into :How the adoption of AI applications in your schools help them to run differently? , Do you think that the principal's personality traits and characteristics have a role in his/her adoption of AI app.? ,What do principals/leaders

lack in today's leadership?, and What are the limits of using artificial intelligence applications in the field of work?

The data from the interviews indicate that four themes emerge: people as well as AI go side by side in several human tasks and jobs, personality traits and characteristics, building a sustainable ecosystem…making everyone a part of the team, and activating the role of artificial intelligence and setting the rules governing it.

The participants of this study all believe that they use AI in their schools today since the Corona epidemic and the dependence of the school world as a whole on the digital world in education. “Today and in the future as well, we will use AI, but we will still need people, that is, a combination the best of human beings and the best of AI.”

Findings from interviews, in line with the literature on the topic, suggest people as an essential component of schools and organisations . They claim people to play a valuable part in organisations despite the implementation of AI. These results are consistent with significant trends in the literature, suggesting the essence for leaders to take on a role as the innovator in their schools as a compliment to AI (Björkman & Johansson,2018).

Björkman & Johansson (2018) show a future leadership role in change, with an increased emphasis on modern leadership theories, including shared and transformational leadership. This study results suggest that the implementation of Artificial Intelligence (AI) in the workplace will enhance the need for leaders to be adaptable and open to change. In addition, it suggests that it will be necessary for leaders to motivate employees, share the company vision and values, and facilitate creativity and teamwork when Artificial Intelligence performs tasks of more technical nature. Additionally, this study suggests a traditional leadership approach as suitable for leading Artificial Intelligence, with set roles and responsibilities, as the study shows that it will be essential for the leader to monitor, guide and set the rules for Artificial Intelligence and provide it with an ethical dimension. The results of this study show that leaders are informed about the impact Artificial Intelligence will have on the leadership role and that they are prepared for the future.

Findings indicate that we still are in need to human interaction and availability to run schools. However technology and AI might still be used as a way of facilitating communication for leaders. This goes in the same line with the results obtained by Björkman & Johansson (2018). As indicated by Tapscott (2015) ,technological reliance in workplaces creates a need for collaboration, teamwork and social skills.

Hence, findings suggest that we will use AI, but we will still need people, that is, a combination the best of human beings and the best of AI. Findings further suggest an increased responsibility for the leader to facilitate team-work among teaching staff to perform their tasks . However, AI replaces technically and logically oriented tasks. Findings suggest that people are still necessary to provide a bigger picture, EI and an ethical perspective to their schools. This result is consistent with the existing literature, which highlight the need for human interaction in organisations (Dewhurst & Willmott, 2014) to tackle complex tasks and to understand situations where intuition or feelings are involved (Björkman & Johansson,2018; Parry, Cohen & Bhattacharya, 2016).

Findings indicate that school principals are still in the position of controlling AI . This happens by seeing the bigger picture, setting the rules for what to do, and bringing an ethical and emotional dimension to the workplace. It is the leaders who monitor AI (Parry, Cohen & Bhattacharya, 2016) through asking the questions (Brynjolfsson & McAfee, 2017), setting up rules and guide AI (Björkman & Johansson,2018;Plastino & Purdy, 2018).

CONCLUSION

This study has identified several implications that AI will have on the leadership role. All school staff, administration and teachers have become sufficiently competent in using AI applications in their work and teaching tasks, along with face-to-face learning, since the outbreak and spread of the Corona epidemic before. A digitalisation will change the entire society, and we should be ready for this change. Though employees to may accept information given from a neutral computer as a source for the decisions. Hierarchical leadership with one leader telling others what to do would not work in today's work environment. Everything goes much faster today. The focus needs to be on understanding tasks in teams rather than individually.

It is of great importance to keep the human interaction in the workplace, even when AI makes decisions on its own. Leaders/principals use AI for better running their schools/organisations, however, they have to be present to monitor all the processes and the AI. "Artificial intelligence applications are poised to increasingly encroach on more skilled occupations," (Tyson, 2020 p. 89) and education will not be spared. "Whether we welcome it or not, AI is increasingly being used widely across education and learning contexts" (Holmes, Bialik, and Fadel,2019, p. 180).

AI usage in schools is growing exponentially (Holmes et al., 2019), and the many considerations only serve to highlight the need for further research in this area so that future school administrators can possess a clearer idea of whether AI is right for their schools (Tyson,2020).

LIMITATIONS

This study employed purposive sampling , as it is the most natural fit for the aims of the study. however, this study is not without limitations. The most evident limitation would be the lack of geographic diversity. By focusing only on the educational leaders from one specific area, Arar city, KSA , the depth of knowledge necessary to provide a clear picture of the effects AI integration is having on schools worldwide may not have been achieved. Choice to interview only school principals who have already utilized AI in their schools. Hence, using a more representative cross-section of school principals may reveal data that more accurately reflects the current status of AI in schools.

DATA AVAILABILITY

The data used to support the findings of this study are available from the corresponding author upon request.

DECLARATION OF CONFLICTING INTERESTS

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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