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The impact of distance learning on school education during the corona pandemic - a field study on secondary schools in the Emirate of Fujairah-United Arab Emirates

Asma Alnaqbi¹, Khalid W. Wazani^{2, *}

- ¹ Head of the Community Awareness Unit- RCUAE; <u>asma.saif@rcuae.ae</u>
- ² Associate Professor of Public Policies, Mohammed Bin Rashid School of Government (MBRSG) – Dubai; <u>khwazani@gmail.com</u>
- *Correspondence: Dr. Khalid W. Wazani; email: khwazani@gmail.com

Abstract: The study aims to explore the impact of distance learning in its dimensions (education and electronic content, teacher qualification and training, and online technical support) on school education in its dimensions (education quality, student participation, and student communication) during the COVID-19 pandemic, in its dimensions (parental satisfaction and school readiness) in the United Arab Emirates. The study contributes to developing methods and techniques that the Emirates' school education institutions can use to enhance their educational initiatives, providing teachers with significant insights into integrated teaching, and anticipating future policy directions for the study. The study population comprised teachers and learners with sufficient experience related to the study's topic in the third cycle schools and the twelfth grade in the Fujairah Emirate, as well as the learners' parents. The study followed a quantitative approach with a random sample of 146 learners, 68 teachers, and 136 parents of learners. It concluded that distance learning in its dimensions has a statistically significant impact on school education, as well as an effect of the COVID-19 pandemic on the relationship between distance learning and school education. The study recommended several key points, including: (1) establishing an integrated educational system to achieve excellence in institutional education, including specific measurable standards, best practices, and determining the quality level of school performance; (2) a proposed mechanism for a rapid transition to distance learning during crises; and (3) a suggestion for integrating a learning portal at all times.

Keywords: distance Learning, E-Learning, electronic content, quality of school education, student participation.

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1. Introduction

Since late 2019, the COVID-19 pandemic has significantly impacted daily life, including social, economic, and especially educational aspects [1]. This unexpected event led to the suspension of schooling in some countries, while others adopted a "distance learning" system [2], where elearning was fully utilized at all educational stages. Under these circumstances, it became essential for countries to keep pace with technological developments, and the reliance of the educational system on educational technology became a necessary condition for the success of these systems [3].In this context, the United Arab Emirates took precautionary measures to protect its students from the impact of the pandemic by implementing a distance learning system for all learners in various educational institutions, including public and private entities, as well as intermediate and higher education institutes and universities. With few studies addressing the impact of distance learning during the COVID-19 pandemic, this study aims to explore the effect of this event on school education in the UAE, focusing on the third cycle schools, and providing insights and recommendations for school education in the face of future crises.

The study identifies three main hypotheses related to the lack of a statistical impact of distance learning on school education, its effect on student participation and communication, and the impact of the COVID-19 pandemic on managing the relationship between distance learning and school education. These hypotheses are based on a comprehensive analysis that includes various variables such as dimensions of e-learning, teacher qualification, technical support, student participation, and the quality of education.

The significance of the study emerges from highlighting the challenges and opportunities faced by school education in the context of the COVID-19 pandemic. The study provides theoretical and practical insights into the impact of distance learning and suggests strategies for school education in times of crisis. It also focuses on the need to adapt educational systems to technological advancements, emphasizing the importance of incorporating educational technology as a fundamental part of the educational system's infrastructure.

2. Literature Review

COVID-19 has changed the daily lifestyle, leading to a new norm that included the closure of educational institutions worldwide, including the United Arab Emirates. This led to more schools and higher education institutes facing the challenge of maintaining teaching and learning continuity during the threat of extended forced closures. Consequently, the government of the United Arab Emirates directed the implementation of a distance learning system across all educational in stitutions. Therefore, this chapter will review all aspects that have a direct impact on the country's educational system, through three illustrated topics as follows:

2.1. The Impact of the COVID-19 Pandemic on Educational Systems and Institutions

The emergence of the Coronavirus (COVID-19) was announced on December 31, 2019, and the World Health Organization declared the outbreak a pandemic on March 11, 2020. This led to radical changes in various aspects of life and forced countries to take preventive measures such as quarantine and social distancing [4]. As a result, many countries, including the United Arab Emirates, were compelled to close educational institutions and transition to distance learning using information technology [5]. Educational institutions around the world have adopted new pedagogical techniques and methods with the belief that online learning has the potential to overcome the shortcomings of classroom education. However, according to a UNESCO report, the education sector has not been immune to the adverse effects of COVID-19. This includes students with special needs, who faced several educational barriers including: a lack of trained teachers, educational resources and tools, curricula designed for their needs, loss of communication with peers, and access to the internet [6]. In the same context, Singh pointed out that in some densely populated countries, students, teachers, and parents faced obstacles when using online learning platforms, from limited ability to navigate digital content to a lack of financial readiness to adapt to the shift towards online education [7].

2.2. The Educational Environment of E-Learning Systems

2.2.1. An Overview of E-Learning

• Justifications for the Utilization of E-Learning During the COVID-19 Pandemic;

Based on Maginni and Winthrop, teachers and learners have benefited from new teaching methods and knowledge transfer through the use of information and communication technology for purposes of participation, communication, and learning in a virtual environment. Therefore, there are several justifications for the reliance on e-learning [8], which can be summarized as follows:

- 1. Flexibility of Time and Place: E-learning transcends the constraints of location and time [9].
- 2. Interactivity: E-learning supports interaction among learners and instructors [10].

- 3. Collaboration and Participation: A positive relationship between cooperative learning and student achievement [11].
- 4. Learner-Centered Approach: E-learning focuses on the needs of learners [12].
- 5. Multiple Assessment Methods: Diverse assessment tools in e-learning [13].
- Types of E-Learning;

Rosenberg categorizes e-learning into two main types: time-based education (which includes synchronous and asynchronous modalities) and method-based e-learning [14], encompassing several models, such as:

- 1. Learner-Centered Approach: This includes active participation, group interaction, critical and creative thinking skills, adapting to the learner's needs, and reducing reliance on the instructor [15].
- 2. Facilitated E-Learning: The role of the instructor is to provide resources and support, while participants learn collaboratively, set their own goals, and self-assess their learning.
- 3. Teacher-Centered E-Learning: This model resembles traditional classroom education, employing information and communication technologies for direct communication and screen sharing in a virtual classroom setting.
- 4. Blended/Hybrid Learning: This approach integrates classroom-based and online education, utilizing e-learning tools while maintaining the essence of traditional educational reality [15].
- Dimensions (Pillars) of E-Learning;

Perez identifies the critical components of e-learning as encompassing: theories and research, policy planning, integrated learning management for learners, teachers, administrators, subordinate software, electronic curriculum content, educational activities, feedback systems, and maintenance and technical support systems [17]. Therefore, e-learning is founded upon dimensions that address: the institutional aspect, administrative, technical, educational, ethical, interface design, resource support, and evaluation [18].

• Comprehensive Quality Standards in E-Learning;

Al-Madiras (2004), Majid et al. (2008), and Mahmoud et al. (2009) emphasize the importance of adopting a total quality system in education to enhance educational institutions and transform the administrative organizational culture [52-54]. This comprehensive quality, which meets the aspirations of learners for the future, enables them to handle advanced technology, and includes systematic review of education and multiple assessments of schools, teachers, and students [19]. Furthermore, there are several controls that govern quality in the electronic educational environment, which include the following [20]:

- 1. Integrated System Design: Development of e-learning programs based on recognized principles, considering the specifics of online education and maintaining quality standards.
- 2. Academic Quality Standards: Alignment between learning outcomes and objectives, teaching strategies, curriculum content, and evaluation standards in online educational programs.
- 3. E-Learning Program Management: Continuous development of all components of teaching and learning through evaluation, review, and feedback.
- 4. Learner Development and Assessment: Supporting self-learning, providing necessary information, and ensuring adherence to quality standards.
- 5. Quality Assurance Mechanisms: Balance and coherence between internal and external quality assurance mechanisms to meet the requirements and expectations of educational stakeholders.
- 6. Shared Trust and Accountability: Sharing responsibility and supporting development and innovation in schools.

- 7. Support for Innovation: Providing opportunities for innovation and development in schools, and opening channels of communication and response to needs.
- 8. Mutual Understanding and Dialogue: Supporting the development of a common language and understanding among educational stakeholders.
- 9. Capacity Building and Data Use: Investing in capacity building to generate, interpret, and use data for school improvement and learner progress.
- 2.2.2. Fundamental Concepts in Designing Online Educational Content for Curricula

Online education programs can surpass traditional classroom teaching if they are designed with methods and technologies that align with the learning subject, learner engagement, and provide feedback between teacher and student [21]. Additionally, coordination in the educational process is crucial for effectively achieving goals [22]. Focus should be placed on modern approaches in designing and developing electronic curricula based on the following aspects [23]:

- 1. Setting Standards: establishing quality standards for the electronic curriculum and directing educational outcomes.
- 2. Focus on Thinking Skills: developing thinking and problem-solving skills in the academic curriculum.
- Impact of Learning Beyond Classrooms: connecting curriculum content with practical and applied skills for learners.
- General Framework for Online-Based Electronic Curricula;

The design of electronic education extends beyond simply disseminating digital content, encompassing the provision of an effective and engaging educational experience through technology [24]. In addition to the importance of having an effective learning environment for learners, whether in the classroom or online, there is an emphasis on the effective or [25,26] use of technological tools. Studies concur on the construction of the electronic curriculum within a general framework and stages of analysis, design, development, implementation, and evaluation, with specific tasks varying at each stage. It is crucial that electronic curricula meet several requirements, which can be summarized as follows [27,28]:

• Firstly: Equipping Learners with 21st Century Educational Skills;

21st-century learning skills encompass three areas: learning, knowledge, and life skills, summarized as follows:

- 1. Learning Skills: These include critical thinking, creativity, collaboration, communication, and research [30].
- Knowledge Skills: Focus on information awareness, media literacy, and technological knowledge.
- 3. Life Skills: Encompass flexibility, initiative, social skills, productivity, leadership, organization, and management [31].
- Secondly: Integrating Technology into Curricula;

The use of technological tools in designing and evaluating electronic curricula enables learners to complete educational activities, analyze information, generate new ideas, and solve problems. Furthermore, the role of the teacher includes planning the use of technology in a way that achieves educational objectives and equips learners with necessary skills, utilizing models like TPACK for integrating technology into education [32]. Content knowledge focuses on the teacher's responsibility for academic content, while pedagogical knowledge encompasses teaching methods and learner learning strategies, and technological knowledge concerns the teacher's ability to integrate technology into the curriculum.

• Thirdly: Teacher Proficiency in Communication and Thinking Skills;

Preparing teachers to develop 21 st-century skills, such as leadership and adaptability, requires strategies to enhance critical skills like collaboration, critical thinking, and creativity. Collaboration

and communication involve teamwork and entrepreneurship, while creativity [33,34] includes space for thought and challenging individual skills. Meanwhile, critical thinking encourages self-development and problem-solving [35].

2.3. Literature and Previous Studies Related to the Study Variables

• **Firstly**: Studies Related to the Dimensions of Distance Learning;

Various studies address the dimensions and challenges of distance learning during the COVID-19 pandemic across different countries. A study in Egypt points to obstacles such as the lack of direct interaction, neglect of social activities, and high internet costs [36]. Conversely, a study in North America highlighted increased stress levels and concentration problems among students due to the transition to this type of learning [37]. In Turkey, challenges recorded include time constraints and weak interaction between students and teachers [38]. A study in India compared traditional classroom education with distance learning, indicating the superiority of the former in aspects of knowledge transfer and effectiveness [39]. In the Kingdom of Saudi Arabia, a study drew attention to the improvement of teachers' technical skills and communication challenges arising from distance learning [40]. Another study in Jordan discussed the impact of this learning mode on teachers and students, offering suggestions for enhancing the educational process [41].

• Secondly: Studies Related to the Dimensions of School Education;

A collection of diverse studies has highlighted different aspects of the dimensions of school and university education in the context of the COVID-19 pandemic. One study focused on teachers' preparedness to use information and communication technologies (ICT) in teaching and assessment prior to the pandemic, noting the ability of younger teachers with permanent contracts to integrate these technologies into their educational practices [42]. Another study examined the impact of the pandemic on university students [43], emphasizing the role of university support as a mediator in the pandemic's impact on academic performance and student concerns. Additionally, another research explored the impact of the pandemic on the academic and research activities of faculty members at Libyan universities, indicating positive trends towards internationally adopted academic development strategies during the pandemic [44]. A study also investigated the barriers to achieving quality in distance learning, pointing to self-imposed, educational, technical, and financial challenges faced by professors and students in Arab universities [45]. Finally, a study explored the capacity of schools in Georgia to adopt online education, affirming the successful rapid transition to this educational mode but noting that the electronic curricula did not meet the expected quality standards [46].

• Thirdly: Studies Related to the Dimensions of the COVID-19 Pandemic;

In the context of studies on the impact of the COVID-19 pandemic on education, it has been found that the pandemic significantly affected school readiness and educational preparedness. A study conducted in the United States showed that most teachers felt that student performance deteriorated during the pandemic [47]. In Hong Kong, a study revealed a lack of readiness for primary school among children, with limited impact from social support and the time parents spent with children [48]. Another study in Germany focused on parental satisfaction with school services during the pandemic, indicating a positive impact of remote learning and teachers' technical proficiency [49]. Additionally, a study in Giza Governorate, Egypt, highlighted the obstacles faced by teachers, students, and parents in implementing distance learning, including challenges in qualification and technical infrastructure [50]. In Dubai, a study addressed the specific challenges faced by people of determination in distance learning, pointing to difficulties in communication and the unsuitability of technical tools [51].

3. Methodology

The study is divided into two sections: the first addresses the methodology and approach of the study, while the second focuses on the demographic data of the sample and the aspects of the surveys.

3.1.Study Methodology and Procedures

This study presents a specific research methodology that includes an analysis of the impact of distance learning on school education during the COVID-19 pandemic. The methodology of the study involves using a quantitative approach to collect data through surveys directed at a randomly selected sample, consisting of 146 learners, 68 teachers, and 136 parents in the third cycle schools in the Emirate of Fujairah, United Arab Emirates. The study focuses on research questions aimed at assessing the impact of distance learning elements such as the quality of education and student engagement, and the effect of the pandemic on the relationship between distance learning and school education. The study includes specific hypotheses related to the statistical impact of distance learning on various variables such as education quality and student participation. The independent, dependent, and controlled variables are measured through a survey distributed to the sample. The study population and sample were determined based on research ethics criteria, with care taken to represent the study community members randomly and accurately.

3.2. Statistical Methods for the Demographic Profiles of Respondents and Aspects of the Surveys

This study addresses the analysis of the demographic data of the respondents and aspects of the surveys using advanced statistical methods with the SPSS software. The independent variables include gender, age, years of experience, and academic qualifications. The study utilized a Likert scale to determine the length of response cells from 1 to 5, with sub-divisions clarifying the extent of agreement or disagreement. For analyzing personal characteristics, frequencies and percentages were calculated for responses to the main survey themes. To ensure the validity of internal consistency, Pearson correlation scores for each statement were compared with the total score of the theme and the entire instrument. Cronbach's alpha coefficient was used to measure the reliability of the instrument, and the arithmetic means to understand the variation in responses. The weighted mean was also employed to measure the values of responses, and the standard deviation to analyze the extent of deviation of responses from the mean. Finally, "T" and "F" tests were used to analyze the significance of differences in respondents' opinions.

4. Results and discussion

4.1. Analysis of the Field Study Results on the Adaptation of Third Cycle Students to Distance Learning During the COVID-19 Pandemic

The field study's analysis of third cycle students' adaptation to distance learning during the COVID-19 pandemic revolves around three main dimensions: e-learning, digital content, and school participation, in addition to communication.

• E-learning;

The study indicates a variety of e-learning activities and their effectiveness in understanding the curriculum, despite being recorded as an additional burden. The arithmetic mean of student satisfaction was high (4.37), indicating strong agreement. However, the study pointed to difficulties faced by students in using this mode of education, with an average of (4.15). Electronic tests and exercises were rated with a lower average (4.0).

• Digital Content;

The digital content was positively evaluated in terms of ease of navigation and increasing students' self-skills (4.44). However, there was a lower evaluation for content that did not include sufficient explanatory means (4.00 - 4.05). An overall arithmetic mean for this dimension was recorded at (4.24).

• School Participation;

The study showed the importance of the teacher's availability for participating in answering student inquiries, but it recorded a decrease in interaction and participation among students and their peers. The arithmetic means for this aspect reached (4.17), indicating the importance of student participation.

Communication;

Communication with teachers and creating an environment that encourages this communication was positively evaluated (4.44). However, lower ratings were recorded for inappropriate interference by teachers and technical support during exams. The overall arithmetic mean for this dimension was (4.22). The study highlights the importance of distance learning during the pandemic, arranging the dimensions in order of importance as follows: e-learning, digital content, communication, and finally, student participation. Overall, an average arithmetic mean of satisfaction was recorded at (4.22), indicating a high level of adaptation and satisfaction with distance learning during the COVID-19 pandemic.

4.2. Analysis of Field Study Results to Measure Teacher Satisfaction with Qualification and Training, Technical Support, School Education Quality, and School Preparedness During the COVID-19 Pandemic

The field study's analysis to measure teacher satisfaction relates to four main dimensions: teacher qualification and training, online technical support, the quality of school education, and school preparedness during the COVID-19 pandemic.

• Teacher Qualification and Training;

Teachers reported a reasonable level of satisfaction with their qualification and training, especially in relation to their proficiency in using video conferencing software. Nevertheless, they reported challenges in using remote learning technology, with a standard deviation of 6.15, indicating a lack of unanimous agreement over these obstacles. The level of satisfaction about their training on online learner assessment techniques was quite low, suggesting a need for improvement in this particular domain. The arithmetic mean for this dimension was 4.18, emphasizing the significance of teacher qualification and training.

• Quality of school instruction;

The quality of school instruction was assessed by teachers, who indicated a favorable impact on achieving educational goals and a rise in students' academic levels via remote learning. The average rating for this impact was 4.44 on a scale. Nevertheless, there was a little decline in satisfaction pertaining to the accessibility of educational frameworks and the standards of quality in elearning. The average for this dimension was 4.26.

School Readiness;

Teachers expressed their satisfaction with using commercial software for conducting online lessons, but they pointed to challenges in providing guidance to parents and schools' ownership of specialized software for video conferencing. The arithmetic mean for this dimension was (4.05), reflecting a moderate level of satisfaction.

General Conclusion;

The arithmetic mean for this dimension was (4.05), reflecting a moderate level of satisfaction. Teachers expressed their satisfaction with a value of (4.18) for teacher qualification and training, and the quality of school education, while satisfaction with school readiness and online technical support was relatively lower. The results indicate the importance of continuous teacher qualification, reliable technical support, and the necessity of improving infrastructure and resources to ensure the quality of distance education.

4.3. Analysis of Field Study Results to Measure Parental Satisfaction with Distance Learning During the COVID-19 Pandemic

The analysis results showed parental satisfaction with distance learning during the COVID-19 pandemic in the Emirate of Fujairah. The results indicate the highest levels of satisfaction, with an arithmetic mean of 4.44 for statements reflecting the ability to balance work and monitoring children's education remotely, and the efficiency of schools in educating parents. On the other hand, the data indicates the need for parents to spend additional time following up on their children, with the lowest level of satisfaction at an arithmetic mean of 4.01 and a variation in opinions (standard deviation of 6.84). Additionally, the results show strong support from the school with an arithmetic mean of 4.23 in areas of guidance, counseling, and technical support. Despite some variations in opinions with a dispersion value of 5.93, T= 8.41, these results are an indicator of overall parental satisfaction with distance learning. The arithmetic means for the different items ranged between 4.01 and 4.44, with a high T-value reflecting positive evaluations of distance learning. The results emphasize the importance of active parental involvement in the education and monitoring of their children under exceptional circumstances.

4.4 Analysis of the Hypothesis Results

• First Hypothesis;

The results of the first hypothesis analysis showed that the independent variables of distance learning in its dimensions (e-learning and digital content, teacher qualification and training, and online technical support) explained 62% of the variance in the dependent variable of school education in Fujairah schools. This was confirmed with high Beta coefficients and T-values (0.118, 0.219, 0.317, 0.171) and (2.743, 4.075, 5.695, 4.179) respectively. The results also showed the validity of the model with an F value of 88.621, and an F value of 33.819, indicating a significant statistical effect of distance learning on school education in its various dimensions.

Second Hypothesis;

The analysis of the second hypothesis results revealed that distance learning in its dimensions (e-learning and digital content, teacher qualification and training, technical support) had an impact on school education in Fujairah schools. The F value reached 37.254, with a variance of up to 41%. High Beta coefficients (0.150, 0.358, 0.344, 0.137) and T-values (2.201, 5.039, 2.712) indicated a statistically significant impact of distance learning on school education. F values of 9.62 and 23.902 confirmed this impact, with variances of 15% and 30% respectively, underscoring the importance of distance learning in influencing the quality of school education.

Third Hypothesis;

The analysis of the third hypothesis revealed that the COVID-19 pandemic and its dimensions (parental satisfaction, school readiness) have a significant effect on managing the relationship between distance learning and school education in third cycle schools in Fujairah. The correlation value R was 0.775, reflecting the impact of changes in the pandemic on managing this relationship. The determination coefficient R^2 was 0.602, indicating that 61% of the variance in the pandemic and its dimensions affects the management of the relationship. An F value of 26.524 indicated a complete effect of the pandemic on this management, with a significant level at $\alpha \leq 0.05$. Meanwhile, it was evident that parental satisfaction significantly statistically influenced the management of the relationship, with an impact ratio of 33% and an impact coefficient β of 0.156.

4.5. Field Study Results

The field study examining the impact of the COVID-19 pandemic on education revealed learners' and teachers' perceptions of various aspects related to distance learning and school-based education. The results indicated that distance education and electronic content received high ratings from learners, whereas school participation and communication were ranked lower. Surveys related to teacher satisfaction, training and development, technical support, and the quality of school education recorded high levels of satisfaction. Through hypothesis testing, the study found that the independent variables of distance learning, in its various dimensions, had significant values, indicating their notable impact on school education in Fujairah schools. The results also pointed to a statistically significant effect at a confidence level of $\alpha = 0.05$ of the COVID-19 pandemic and its

dimensions on school education. Sub-hypothesis testing revealed a statistically significant impact of the independent variables on each dependent variable of school education, emphasizing the positive effect of using distance learning in its combined dimensions on student participation, education quality, and student communication.

Finally, it was evident that the dimensions of the coronavirus pandemic, such as parental satisfaction and school readiness, had a noticeable impact on managing the relationship between distance learning and school education, with an emphasis on the independent effects of parental satisfaction and school readiness in managing this relationship.

4.6. Theoretical Study Results

The theoretical study results illuminated COVID-19-related education challenges and opportunities. The lack of preparation and training for teachers and students became obvious when institutions struggled with distant learning. Schools relied on e-learning systems with many collaborative tools. However, this shift affected comprehension and information sharing differently between pupils. The study stressed the educational system's versatility and ability to change. It stressed the need of parent participation, technological efficiency, and a good learning environment.

The study stressed the need of motivating and engaging students in online education, as well as improving digital resources and learning and communication techniques. Teachers have struggled with remote communication and resistive students, underlining the need for better communication and teaching methods. The study stressed the need of enhancing instructor and student technological competency and creating online learning instructional frameworks. It also stressed the need of using teaching methods that build connection and direct communication while considering each student's individual traits. The study emphasized students' technical obstacles, worries about data security and safety during online exams, and parents' increased obligations in supporting home learning.

5. Limitations

The study, which examines impact of distance learning in Fujairah's schools during the pandemic, is limited by its geographical exclusivity to the Emirate, hence reducing the generalizability of its findings. Furthermore, it is limited by the temporal boundaries of the academic year 2022/2023, which may result in the exclusion of long-term effects. The research's limited scope on specific features of remote learning and school education achievement may fail to consider other pertinent factors. Additionally, the demographic scope, centered on a specific population from the Emirates Foundation for School Education and a selected sample of parents and students, may not fully represent the broader affected population.

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