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The Impacts of Lughati for Smart Education Initiative on Students' Acquisition of Arabic Language Skills at the Kindergarten Stage

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Abstract: Innovative programs are introduced to educational institutions to enhance teaching and student learning. One of these innovative programs is the Lughati for Smart Education Initiative meant to strengthen students' learning at the Kindergarten level in Sharjah, United Arab Emirates (UAE). The aim of this study is to determine the impact of the Lughati Smart Education initiative on the acquisition of Arabic language skills among kindergarteners and what are the strengths and areas that need improvement in the Lughati program from the point of view of the teachers who implemented the Smart Education program. A quantitative research approach was used to conduct the study, with a sample size of (100) children. Fifty of the students who underwent the Lughati Smart Education program were selected through purposeful sampling and they are considered as an experimental group and the other (50) who did not are considered as the control group. Also included in the study is a sample of one hundred teachers from the Emirate of Sharjah who have been involved in delivering Lughati Smart Education Program. The results of the study show that there are statistically significant differences in the variables related to reading skills, analysis, structure, concepts, and the achievement test in favour of the students who attended the Lughati program. However, there was no significant difference between the control and experimental groups in writing skills. As for teachers' feedback on the Smart Education Program (Lughati Initiative), it was found that most teachers indicated that the program helped develop the student's language proficiency, language skills through educational songs, reading skills, spelling, and handwriting. Based on the data, the study makes a number of recommendations, the most significant of which is to implement the initiative across all states and public schools in the country. In addition, it recommended that the program should be linked to the curricula devised by the Ministry of Education. School teachers should also attend training courses in smart education, and the program should be regularly updated.

Keywords: Smart education, Arabic language skills, kindergarteners, Sharjah Emirates.

1 Introduction and Background to the Study

The experiences that people have at an early age have a great impact on their future lives. Numerous studies in the fields of psychology, education, and health show that the fastest growth occurs during the early childhood period and that this is the period when humans are more susceptible to acquire knowledge and skills, especially language skills [1]. As such, it is evident that investing in children is ultimately an investment in the future of the whole society. This prompts us to believe that special attention should be paid to children at this age.

As a very active partner in the global endeavour to invest in the future of humanity, the United Arab Emirates (UAE) has spared no effort to educate its children, especially in a rapidly changing globalized world that is characterized by vast innovations in informatics and communication. Not surprisingly, one of the studies conducted in the UAE recommended the need for more research in the area of technology usage in Arabic language instruction across the country, and more support for the schools and teachers to use technology in teaching [2].

The literature indicates that one of the most significant pre-requisites for developing an education system suitable for children in the modern times is smart education [3]. Smart education, provided through digital platforms, offers students

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a variety of interactive electronic resources in the form of computer software and applications suitable for children of different age groups [4]. These resources increase students' motivation to learn, provide answers to their queries, and support their learning by highlighting their errors and then providing them with numerous opportunities to correct these mistakes [5]. Many of the electronic applications also gamify education, which delights, interests, and motivates children. Moreover, many computers software and applications facilitate cooperative learning, which enables children to acquire important teamwork skills and increases their interest in learning [6].

One significant development in the use of digital technology in education was the use of computer programs in language teaching, including Arabic. These programs have numerous advantages especially tailoring the level of the content to the students' language proficiency level and helping them to advance in mastering the content they are learning [7]. Many programs also assess the student's proficiency levels on the four language skills. Essentially, the programs highlight the students' errors, their reading, their writing speed, and automatically correcting comprehension questions [8].

Numerous educators and experts in the fields of education, psychology, health, and nutrition focused on early childhood development. Their studies show that early childhood is probably the most important developmental stage and has distinct characteristics. For example, at this stage, children are more susceptible to be influenced by their environment, develop their preferences, and learn various pieces of information, concepts, values, language and thinking skills, and behavior. This makes this stage crucial in shaping the personality and future of any child [9]. Education and culture produce social and moral benefits that much outweigh the productivity and material advantages. It begins with self-respect and pride and moves on to improving one's communication skills, elevating moral, cultural, and consumption values not only at the personal level but also at the level of the community and the country [10,11].

In addition, at this stage of their lives, children experience physical, psychological, intellectual, linguistic, emotional, and social changes. These are rapid changes that are tightly interlinked and complementary in such a way that they direct them towards maturity. Therefore, it is essential that child educators tailor the curricula and teaching approaches at the preschool stage to the specific developmental needs and characteristics of the children.

Scholars also argue that at this stage, a child's linguistic development is characterised by a shift towards accuracy, clarity and improved pronunciation [12,13]. Moreover, a child's speech focuses on tangible rather than abstract concepts because their perception of the world is conducted mainly through the five senses. Furthermore, language development at this stage is characterised by a rapid growth in the child's ability to understand and acquire new language as her ability to use new sentences accurately increases as a result of a surge in his semantic knowledge. Moreover, at this stage, a child can express his/her needs and experiences, and converse and argue with adults [14].

Language is essential for the development of cognitive, social, and emotional skills, especially at the preschool stage of development. Language is how children interact with others around them and, to do so, they need to listen to others, select specific semantic items, construct chunks of speech, and select appropriate tone and register as befits their linguistic capabilities. It is also important to note that language is not only a means of communication but also a method of influencing others and generating ideas; thinking cannot exist in the absence of language; in fact, there is no distinction between thinking and language [15].

A low language proficiency level limits learning not only at preschool but throughout the child's education. This means that the impact of acquiring Arabic language skills extends far beyond simply learning the language itself to the acquisition of knowledge easily and comprehensively as it is the tool by which a child attains knowledge and expresses himself [16]. Several studies indicate that the ideal age for language acquisition is from birth and up till five years of age after which age language development, especially oral skills, accelerates [17]. As explained in a study, this is crucial as language development facilitates emotional and social balance and cognitive maturity [18].

However, although preschoolers experience rapid growth in their language skills at this stage of their development, the majority display limited vocabulary, expressive abilities, and simple syntax [19]. Indeed, there are apparent individual differences in language development among children attributed to the education level of the family and the language that the child is exposed to in his milieu [20]. Nevertheless, nursery schools play a similar role to the family in enriching and shaping the children's personalities, especially when teachers adopt a pedagogy that is suitable to their age and stage of language development [21]. Teachers and parents may require brief training on violence reduction in order to accomplish this effectively, as it may be sparked by harmful school-age behaviors [22]. That notwithstanding, one of the studies conducted in the UAE recommended the need for more research in the area of technology usage in Arabic language instruction across the country, and more support for the schools and teachers to use technology in teaching [2]. As such, this study explored the impact of an innovative education program on students' learning skills at the kindergarten stage. Besides, it examined the teachers' point of view toward smart education initiatives. The study offers insights into students' language development through smart education initiatives and possible ways that teachers may act toward such initiatives.

2 Context and Significance of the Study

This study was conducted in the context of a smart education initiative introduced in the Emirate of Sharjah to promote Arabic language education for students. The initiative relies on learning through the latest programs and creating an appropriate school environment for creativity. Under the initiative, tablets were distributed freely to students and teachers at all schools in the Emirate. The tablets included new educational programs and innovative applications in Arabic.

As the study explored the effectiveness of the Lughati program for Arabic language teaching to kindergarten students in the Emirate of Sharjah, it is hoped that the study would offer insights into strategies to enhance the education and Arabic language skills of kindergarteners. It will enable stakeholders to make informed decisions pertaining to the continuation of the initiative and any required modifications to the smart learning platform.

3 Theoretical Framework and Literature Review

Several scholars developed theories to explain language acquisition. It was proposed that language is acquired in the same way as any other behaviour. For example, proponents of behaviourism, such as B.F. Skinner, and the cognitive social learning theory, especially Albert Bandura, claim that all children are born equipped with the mechanisms required for language acquisition. They also argued that through the observation of adult language production a child can then formulate various syntactic rules that enable him to produce language chunks that he has not heard before [23,24,25].

The American linguist, Noam Chomsky theories that children develop speech unaware that the function of speech is to communicate with others around them. Therefore, they develop some kind of inner dialogue that progressively becomes associated with outer dialogue. This explains why language is an indispensable facilitator of learning and development. Initially, language develops in response to our need to communicate, then, and as the child grows, it evolves into an inner dialogue that enables the child to organize his thoughts [26].

The cognitive theory proposes that cognitive development occurs in predictable stages that vary in quality and quantity in synchronization with the child's age. According to the leading cognitive psychologist, Jean Piaget a child's first words, which are uttered during the pre-operational stage of development are egocentric. This ego-centric speech then evolves into socialized speech because of the child's interaction with peers, and its social and natural environment [27].

It then appears to be a general consensus among psychologists on the importance of language acquisition at the early stages of a child's development. This development can be facilitated by enriching the child's social environment, engaging him in stimulating social and natural educational experiences, and providing him with opportunities for dialogue, discussion, and language expression. Therefore, tools of educational technology can provide the most appropriate teaching approaches to help a child learn, understand, and acquire a language [28].

As earlier mentioned, numerous studies focused on preschool stage teachers and teaching methods. For example, an educator reviewed a language program based on storytelling and its effect on the language development of preschoolers in Amman, Jordan. The study shows that there was a statistically significant difference between the control and experimental groups in language skills in favor of experimental group, indicating that the program has an active role in the development of language skills [29].

In a study that aimed to evaluate the impact of story reading on improving the reading skills of preschoolers, a sample of (106) preschoolers were selected from one school and were randomly distributed into two groups (experimental and control groups). The experimental group exposed to story reading program while the control group exposed to traditional method. The results indicated that there were statistically significant differences at ($\alpha=0.05$) between experimental group and control group in reading skills in favour of experimental group. This mean that the story reading had a statistically significant impact on the reading skills of preschoolers of the experimental group. The results indicated that there were not any statistical differences at ($\alpha =0.05$) in reading skills of preschooler's children due to the interaction between sex and groups variables [30].

Another comprehensive study focused on preschoolers and explored the theories that explain language acquisition, the distinguishing factors of language acquisition at the preschool stage of development, the language skills that can be enhanced at this stage, and the factors that impede language acquisition from the point of view of the teacher and principal. The study also made some valuable recommendations on how to best to eliminate the factors that impede language acquisition. The study found that the three main factors were the syllabus, then the teacher, while interaction was deemed to have the least impact. It was also found that There were no statistically significant differences between the point of the view of the sample (teachers and principals) according to their qualifications, employment, and years of experience [31].

In the same vein, a research explored the views of a sample of 113 nursery school teachers on reading aloud to preschoolers. The study found that the teachers' evaluation of reading aloud to preschoolers was of medium impact if

conducted by the teachers themselves, while their evaluation of this practice was low if conducted by the parents. In addition, the study revealed that the practice of reading aloud to preschoolers was obstructed mainly by the lack of time and suitable areas in the kindergarten. However, there was no statistically significant differences attributed to the different levels of qualifications of the teachers. With regard to the levels of experiences of the teachers, the results indicated that the experienced teachers were found to place greater value on the impact of the parents reading aloud to their children [32].

Assessing the effectiveness of a proposed training program to improve 4–5-year-old's' listening, pre-reading and oral expression skills, a sample of (60) preschoolers were selected from one kindergarten school at Damascus - Syria and were randomly distributed into two groups (experimental and control groups). The experimental group exposed to training program related to language skills (listening, pre-reading, and oral expression skills), while the control group exposed to traditional method. The results indicated that there were statistically significant differences at ($\alpha=0.05$) between experimental group and control group in language skills in favour of experimental group. This mean that the training program applied to experimental group had a statistically significant impact on the language skills (listening, pre-reading, and oral expression) of 4–5-year-olds kindergarten children compared with those belonged to control group [33].

Similarly, a study aiming to improve the listening and speaking skills of foundation 2 students through a music program was conducted. The results of the study showed a considerable improvement in the children's language due to the impact of music program that applied on children who formed the experimental group skills [34]. The study concluded that language skills can be enhanced when the child is immersed in a rich stimulating environment and engaged in activities that reinforce the learning of these skills. Further, a study assessed the impact of a music activity-based program on the development of the language skills of preschoolers. It revealed that musical activities, such as singing, had the most significant impact on improving the children's listening and speaking skills and the acquisition of reading and writing skills (Naser, 2009) [35].

Another study conducted in Jordan evaluated the impact of a special program that employed storytelling, language games, drama, and educational technology to improve the language skills of a sample of sixty preschool and grade 1 children. It was found that the program enhanced the language skills of the children in the experimental group hence proving its effectiveness [36].

A study that aimed to assess the impact of an activity and game-based program on the development of receptive language skills among a sample of twenty 3-5-year-old children suffering from language learning disabilities showed that the children in the experimental group displayed significant improvement in such skills as comprehension and sentence structure [37].

A study conducted by Khalaf (2011) explored the impact of using mind maps of the development of language and creative thinking skills of preschoolers. It was revealed that children in the experimental group performed better than their peers in the control group on the language post-tests, both the post-program and continuous Torrance Creative Thinking test, and the continuous language assessment [38].

Another study conducted by Alsulami (2016) to investigate whether the iPad enhances the teaching and learning styles in Arabic language classes for first grade in Albushra primary school, and also its effect on students' skills and achievements. The pre-and-post-tests group design was used in this study: The experimental group taught by using an iPad in Arabic language classes and the control group taught by using traditional teaching methods to assess students' achievement in reading, writing, and cognitive skills. In addition to that, the researcher conducted interviews with Arabic teachers and parents whose children were taught by using iPad. The results of this study indicated that the iPad is an effective teaching and learning tool in Arabic language, especially in improvement of students' cognitive and reading skills. However, it may weaken the handwriting skills of students if they learned writing Arabic by using their fingers on iPads instead of using stylus most of the time, especially when they are at young age and need to learn how to hold a pencil to write properly. As well, providing the iPad for each student might lead to less communication and cooperation between students in classrooms [39].

Jawhar's (2008) study also aimed to identify the impact of the establishment of an early learning corner for reading and writing in a kindergarten classroom in Kuwait on the development of early learning skills for reading and writing among the children concerned. The study was launched from the perspective of the emergence of early reading and writing learning, which indicates that children can learn these skills much earlier than they were in formal school education. The post-test control group design was used in this study in which the experimental group exposed to early corner for reading and writing while the control group at the same time not exposed. The study showed that children in the experimental group significantly outperformed their peers in the control groups on storytelling, picture description, word definition, comprehension, the number of lexical items acquired, reading of picture books, and recognition of a number of letters and words [40].

Another study that focused on the use of computers in private primary schools in Kuwait concluded that although computers are essential for language learning, the lack of teacher training programs, administrative encouragement, and strict rules for teacher attendance of educational technology training courses significantly impacted the teachers' use of digital resources in their classroom [41].

Badri (2001) conducted a study on developing early reading skills among preschoolers in UAE. The study concluded that the proposed training program resulted in a considerable improvement in the early reading skills of children in the experimental group [42].

In study that aimed to assess the perception of the effectiveness of the design and use of new software for Arabic language learning at Omani Basic Education schools, the researchers used a focus group interview consisted of (12) Arabic female teachers from Muscat Basic Education, and (9) of them participated in semi-structured interviews. The results indicated that teachers perceived the designed software as an effective tool to promote students' learning and to deal with their learning difficulties [43]. One of the interesting studies was conducted to measure the American university students' perceptions of the use of mobile apps in learning Arabic, focuses only on non-native speakers of Arabic who took Arabic classes at their universities. The sample of the study were 40 male and female American college students from different majors of study at different universities in the USA. The results of the study indicated that participants were satisfied with the method of using Mobile assisted language learning in learning Arabic, and they enjoyed using it in their learning activities and helping them to interact with their classmates and improve their speaking skills [44].

The aforementioned studies focused on the development of the four language skills of kindergarten students. Many explored teachers' views on best practice and most suitable and effective tools to support the development of their students' language skills. The current study drew on previous research to devise its research tools such as an achievement test and a teacher questionnaire. However, this is the first study to focus on preschool education in the Emirate of Sharjah and the effectiveness of Lughati, a smart learning platform for the teaching of Arabic language skills.

4 Aims of study

This study aims to assess the impact of a smart learning platform (Lughati) on the acquisition of Arabic language skills among a sample of kindergarten students in the Emirate of Sharjah, UAE. It also aims to reveal the views of the teachers who used the platform. In particular, the study aims to answer the following questions:

- (1) Are there statistically significant differences at the level ($\alpha = 0.05$) between the Mean performance of the group that was exposed to the Lughati program and the Mean performance of those who were not based on their scores on the acquisition of concepts and skills of the Arabic language test?
- (2) What are the strengths and areas that need improvement in the Lughati program from the point of view of the teachers who implemented the Smart Education program?
- (3) What modifications do the teachers deem necessary to make the Smart Education program more effective and comprehensive in achieving the goals of Lughati initiative?

5 Methodology

Method

The study adopted a quasi-experimental research approach to assess the performance of children in both the control and experimental groups, while it adopts a descriptive analytical approach to analyze the views of the teachers. The experimental group undertook the Lughati Smart Education Program, and the control group did not. Members of both groups were given a post-test in Arabic language skills and concepts. The second methodology implemented in this study is the descriptive analytical approach, which was used to measure the point view of those teachers who used the Lughati Smart Education Program in their teaching toward this Program, and also what can be done to improve the quality of the program.

Study Sample

The sample of this study consisted of (100) kindergarteners. Fifty of them who underwent the Lughati Smart Education program were selected using purposeful sampling method from nursery schools in Sharjah and they were considered as an experimental group. Another fifty children from Sharjah Private Nursery Schools who did not receive training through Lughati were elected randomly from the control group. In addition to that a sample of the study also comprises of one hundred nursery school teachers selected purposefully from the same kindergarten schools we selected the children from it who used Lughati Smart Education program in their teaching as we indicated before.

Research Tools and Data collection

The study used an Arabic Language Achievement Test (ALAT) to measure the students' acquisition of Arabic language skills. The test was designed by a group of expert Arabic language teachers from the University of Sharjah. It includes a total of sixteen items equally divided into four sections. All items are related to the teaching content covered in the program and focus on reading, writing, analysis and structure and language concepts. The validity of the test was confirmed by a panel of (8) experts from Arabic language and Literature from Department, Education Department at the University of Sharjah, and Lughati program supervisors. A few modifications were carried out on the test based on feedback from the panel.

The reliability coefficient of the test was measured using Cronbach alpha(N=100) and the results indicated that the internal consistency of the test found to be 0.81. The internal consistency coefficient for each of the four sections of the test (reading, writing, analysis, and structure) were 0.97, 0.69, 0.50, and 0.56 respectively. This indicates that the validity and reliability indices of the tests were at the acceptable levels which justify using this test for achieving the study purposes.

In addition, a questionnaire that measures the point of view of nursery school teachers in the Emirate of Sharjah who implemented the Lughati initiative was designed by a group of experts in educational psychology, educational and psychological assessments, and the topic under study. The questionnaire comprised a total of thirty items, divided into three sections including 10 items each covering the importance of Lughati Smart learning initiative to develop the Arabic language skills, Lughati and its role in improving Arabic language skills, the challenges of implementing the Lughati initiative. Adopting the Likert Scale, respondents were asked to rate their degree of agreement to certain statements as follows: 5 = very strongly agree, 4 = strongly agree, 3 = moderately agree, 2 = slightly agree, and 1= do not agree. The weight of each response was reserved when the statement was negative. The questionnaire also included open-ended questions.

The validity of the questionnaire was ascertained by a panel of experts in the field. The internal reliability of the three sections of the questionnaire was measured using Cronbach alpha and were found to be 0.881, 0.935, and 0.860.

To achieve the purpose of the study, data were collected in two ways:

- (1) An Arabic Language Test was applied by a group of trained research assistant. The expected maximum duration of the test is 40 minutes to avoid the children feeling bored and losing interest in the test.
- (2) The questionnaire was answered by all subject teachers at the same time. The Participants were informed that the information they provided was confidential and to be used only for purposes of scientific research.

Statistical Analysis and Ethical consideration

To answer the first research question, Means, standard deviations, and t test were used to assess the difference in achievement performance between the control and experimental groups. In addition, to answer the second and the third questions of this study, frequencies, and percentage of the responses of the teachers to the questionnaire were calculated.

This study was conducted in compliance with ethical standards in academia. An ethical consideration form was completed and approved by the research office of the university. Consent forms were distributed to all the teachers who participated in this study and those willing to participate in the study completed the forms. Through the consent form, teachers were given information about the study's purpose, their voluntary roles, and how they can withdraw from the research without any repercussions. Teachers were also assured of their privacy and the confidentiality of their information. The information about the teachers who indicated their willingness to participate in the study was unknown until their results were released. Teachers' privacy and confidentiality were respected as no name was mentioned in any part of the study. In addition to that the permission was taken from the parent or guardians to apply the test to their children.

6 Findings and Discussion

The results of the study are presented in this section, using the research questions as a framework.

Research Question1: Are there statistically significant differences at the level ($\alpha = 0.05$) between the Mean performance of the group that was exposed to the Lughati program and the Mean performance of those who were not based on their scores on the acquisition of concepts and skills of the Arabic language test?

To answer this question, mean scores and standard deviations on each dimension that constitute the Arabic Language Test were calculated, and the t –test for two independent samples were calculated between the Means of two groups on each dimension and the total score.

Table 1: Means, standard deviations, and t –test for the differences between Means of students' performance on the Arabic Language Test.

Dimension	Group	M	SD	N	Df	t	P
Reading	Experimental	17.18	3.57	51	77.99	3.29	0.002
	Control	13.86	6.19	50			
Writing	Experimental	11.92	4.81	51	98.26	- 1.75	0.083
	Control	13.66	5.15	50			
Analysis and Structure	Experimental	17.67	4.19	51	99	4.069	0.000
	Control	13.72	5.48	50			
Concepts	Experimental	23.88	0.97	51	60.154	2.601	0.012
	Control	22.78	2.83	50			
Total	Experimental	70.40	10.48	51	84.97	2.374	0.020
	Control	64.02	15.85	50			

The data show that there are differences in the Mean scores of the two groups in each of the four dimensions and the total scores of the of the test. To be sure if these differences are statistically significant differences at ($\alpha = 0.05$),t-test for two independent groups were calculated using SPSS. The results indicated that there were statistically significant differences at ($\alpha = 0.05$) between the two groups on Reading, Analysis and Structure, and Concepts with t values of 3.29, 4.069, and 2.601 respectively and these differences in favour of the experimental group.

These results indicate the effectiveness of the training program, which supports the proposal to use digital educational tools in the teaching of Arabic language to kindergarten students. This is in line with previous studies that recommend the use of educational technology to improve preschoolers’ language skills (see for example Abu-Tu’ma & Yousif, 2015; Alkendi, 2002; Almahboub, 2002, Hassan, 1995; Iraqi, 2012) [30,45,41,33, 34].

However, the results showed no statistically significant difference between the two groups in writing skills ($t=-1.75$. $P =0.083$). This result is in line with the idea that using iPad, it may weaken the handwriting skills of students if they learned writing Arabic by using their fingers on iPads instead of using stylus most of the time, especially when they are at a young age and need to learn how to hold pencil to write properly (Khalaf, 2011) [38].

With regard of the total score, the results indicated that there was statistically significant difference between the two groups ($t=2.374$, $P=0.020$) in favour of the experimental group (Mean = 70.40) as compared to the control group (Mean = 64.02). According to these results, we can conclude that the use of educational technology can provide the most appropriate teaching approaches to help a child learn, understand, and acquire a language (Asoulin, 2016) [28]. The results of this study are also in line with the results of the study conducted by Hassan (1995) which indicated that the training program applied to the experimental group had a statistically significant impact on the language skills (listening, pre-reading and oral expression) of 4–5 year old’s kindergarten children comparing with those belonged to control group. As such, teachers need to be more proactive in using educational technology to support children’s education and school leaders also need to provide the essential infrastructure and resources to promote technology-enhanced learning. Where and when necessary, teachers should also get the required training to develop the skills to appropriately use educational technology to help children to learn effectively [33].

Research Question2. What modifications do the teachers deem necessary to make the Smart Education program more effective and comprehensive in achieving the goals of the Lughati initiative?

To answer this question, means, standard deviations and ranking of teachers’ viewpoints (Means) on the use of Lughati were calculated as shown in table 2.

Table 2: Means, Standard Deviation, and ranking of the point view of the Teachers towards the use of Lughati

Dimension	No.	Item	M	S. deviation	Rank
	1	Regular use of Lughati because of its importance	4.33	1.33	6

The importance of the Lughati initiative to the development of Arabic language skills	2	I believe Lughati is more effective than traditional teaching methods	4.070	0.89	9
	3	Lughati is easy to use	4.49	0.61	1
	4	Lughati is suitable for use with kindergarten and primary school students	4.06	0.95	10
	5	The classroom environment promotes the use of Lughati for its importance	4.22	0.86	8
	6	Lughati enables teachers to achieve their pedagogical objectives	4.33	0.85	6
	7	Lughati promotes independent learning and creativity	4.41	0.71	3
	8	The program shapes students' characters and reinforces their self-confidence	4.41	0.69	3
	9	The program instils interest in continuous learning in students	4.41	0.67	3
	10	Lughati saves students' and teachers' time and effort	4.33	0.72	6
	Total			4.31	0.59
The role Lughati plays in developing students' Arabic language skills	11	Lughati improves students' language range	4.52	0.62	1
	12	Lughati helps develop students' reading skills	4.40	0.61	3
	13	Lughati helps develop students' writing skills	4.11	0.85	8
	14	Lughati helps develop students' speaking skills	4.17	0.77	7
	15	Lughati helps develop students' listening skills	4.39	0.72	4
	16	Lughati helps develop students' comprehension skills	4.25	0.82	6
	17	Lughati helps develop students' Arabic language skills through the use of computer games	4.30	0.91	5
	18	Lughati helps develop students' Arabic language skills through the use of songs	4.41	0.78	2
	19	The program helps students deal with spelling problems	3.89	1.003	9
	20	The program helps students improve their handwriting	3.58	1.24	10
Total			4.2	0.67	
Challenges to the implementation of Lughati	21	Lughati adds extra burden on teachers	3.71	1.45	4
	22	Lack of teachers training courses on the use of Lughati	2.92	1.28	1
	23	Students cannot use the program effectively	3.94	1.28	7
	24	Lughati reduces students' opportunities to interact with their peers positively in class	3.95	1.27	8
	25	Lughati does not cover all the required areas for Arabic language acquisition	3.73	1.35	5
	26	Lughati has a negative impact on the implementation of the syllabus provided by the Ministry of Education	2.92	1.28	10
	27	Lughati involves too much time and effort to achieve the expected teaching objectives	3.91	1.39	8
	28	The use of Lughati is not mandatory	3.50	1.35	3
	29	Technical problems that impede the use of the program	3.21	1.54	2
	30	Students may get distracted	4.13	1.30	9
Total			3.74	0.90	

As shown in table 2, the results indicated that teachers believe that Lughati had a considerable impact on developing students' Arabic language skills. According to the teachers, the main reason for this was that Lughati was thought to be an easy program to use. This was followed by the idea that Lughati fostered independent learning, that it reinforced students' self-confidence, and that it motivates students, all of which ranked the same. On the other hand, the teachers ranked the following reasons as the least significant: Lughati is more effective than traditional teaching methods ($R = 9$), and that the program is suitable for students at the early learning stages. However, the weighting of these two items was higher than 4/5, which indicates that teachers still believed that these were important reasons to justify the use of the Smart Learning Program.

The teachers also thought the Lughati program can play a significant role in developing their students' Arabic language skills positively. The Mean scores on items included in this section ranged from 3.58 to 4.52 with a total Mean of 4.27. The majority of teachers agreed that Lughati enriched students' language ($M = 4.52$). This was followed by item 18 (Lughati helps develop students' Arabic language skills through the use of songs) with an average score of 4.41, then

item 12 (Lughati helps develop students’ reading skills) with an average score of 4.40. The items that ranked the lowest in this section were items 13 (M = 4.11), 9 (M = 3.89), and 20 (M=3.48). These results are consistent with results of the conducted by Al-busaidi (2016) which indicated that teachers perceived the designed software as an effective tool to promote students’ learning and to deal with their learning [43].

In a sense, this study fosters the previous study on the importance of smart education and the need for teachers to lean more towards the use of smart technology to enhance students’ learning. As mentioned earlier, promoting the use of technology is not the duty of teachers alone. School leaders should also promote its usage and funding to facilitate the purchase of necessary educational technology to foster students’ learning. Besides, government policy must also promote such an endeavor. For instance, the UAE ‘s vision 2021 recognizes the use of technology in classroom is recognized as a necessity for promoting a first-class education system (<https://www.vision2021.ae/en/national-agenda-2021/list/first-rate-circle>) [46].

Considering the section that explored teachers’ perception of the challenges that hindered the use of Lughati in the classrooms, it is worth noting that the lower the average score on any item, the higher the level of challenge. This means that, items that scored the lowest average scores were deemed to be the most significant challenges by the teachers.

The Mean scores on this section ranged from 2.92 to 4.29 where the most significant challenge was the lack of training program on the use of Lughati (M = 2.92). The second most important difficulty was related to the breakdown of computer devices (M = 3.21) followed by the fact that the use of Lughati was not made compulsory (M= 3.50). Meanwhile, teachers indicated that the least pressing challenges were that Lughati had a negative impact on their ability to implement the syllabus provided by the MoE (M= 4.29), that Lughati distracts students (M = 4.31), and finally that the program reduces the students’ ability to interact positively with their peers (M = 3.96). These results are in line with the idea which indicated providing the iPad for each student might lead to less communication and cooperation between students in classrooms [39]. The findings also indicate that using technology does not necessarily impact students’ learning positively and teachers need to apply educational technology strategically to foster students’ engagement and learning.

(4) Research Question 3. What modifications do the teachers deem necessary to make the Smart Education program more effective and comprehensive in achieving the goals of Lughati initiative?

To address the third research question, a number of open-ended questions were added to the questionnaire. The first open-ended question asked teachers whether they have ‘noticed any improvement in students’ Arabic language skills because of using Lughati’. The following is an analysis of their responses as shown by table 3.

Table 3: Frequencies and percentage of teachers’ opinions regarding improvements in their students' language skills as result of using Lughati

No.	Responses	Frequency	%
1	Yes (no comments)	14	20
2	A noticeable improvement in students’ language range as a result of engaging in varied activities and positive interaction was detected.	18	25
3	I noticed that students learned to read and write through listening, cooperation, and competition.	12	17
4	Their language improved and our objectives were achieved.	1	1.4
5	It was noticed that students could learn and recognize letters, words and numbers as a result of listening to the audio recordings and seeing words that illustrate the letters they are learning.	9	13
6	An improvement in perceptive skills and recognition and writing of the alphabet.	3	4.29
7	An improvement in students’ interaction, speech, memorization, eloquence, and self-confidence was observed.	2	2.85
8	Independent learning by learning the alphabet through listening.	1	1.4
9	A considerable improvement, while students seemed to like and enjoy the activities.	1	1.4
10	An improvement of language skills due to listening to stories, reciting songs, and learning reading and writing.	3	4.29
11	An improvement in story reading, letter recognition, and word recognition using phonics.	2	2.85
12	The program helped improve students’ language, mathematical and scientific skills.	2	2.85
13	The program helped students learn unfamiliar letters and improve their reading.	2	2.85
Total		70	

The teachers’ responses show that they believe that Lughati helped improve their students’ Arabic language skills, increased their vocabulary and range of grammatical structures due to the variety in the activities it provided, and the interest shown by the kids in its content as reported by 25% of the teachers. A further 20% of the teachers simply agreed

that the program improved the students' language skills (item 1). Moreover, 17% of the teachers believed that their students learned to read and write through listening, cooperation, and competition. Some teachers also asserted that the program helped students learn and recognize letters of the Arabic alphabet, numbers, and words (13%). This indicates that Lughati had achieved the expected outcomes, especially when we take into consideration that a number of teachers did not respond to this question.

The second open-ended question that related to question 3 asked teachers to describe their practical experience using Lughati. Table 4 illustrate the frequency and percentage of the teacher's responses.

Table 4: Frequency and percentage of teachers' description of their experiences using Lughati

No.	Responses	Frequency	%
1	It is excellent as it helped students to memorise stories and songs and learn the alphabet.	2	2.90
2	Shows students' talents in art and arrangements.	1	1.45
3	Interesting and attractive to the children.	3	4.35
4	Helps enrich students' language, improved their listening and speaking skills, and boosted their self-confidence.	4	5.80
5	A great experience and up-to-date technologically.	1	1.45
6	Reinforces competitiveness and interaction during learning the alphabet in an active way.	2	2.90
7	This is a very successful and effective experience as it helped improve students' Arabic language and mathematical skills.	2	2.90
8	It helped improve students' reading skills as students read stories in the learning corner daily and it helped them acquire reading and writing skills.	4	5.80
9	It helped students spell, recognize, write, and pronounce letters accurately through storytelling.	5	7.25
10	It helped students listen to songs to learn storytelling, the alphabets, numbers, colours, and geometrical shapes.	5	7.25
11	This program is very useful and effective and helped achieve the pedagogical objectives.	5	7.25
12	Students enjoyed using the computer devices and the program helped improve some of their language skills such as reading and the alphabets through reading stories in the learning corner.	3	4.35
13	This was a very successful experience as it combined learning, play and entertainment and created an active environment.	4	5.80
14	It helped students develop independent learning skills, their self-confidence, and independence.	2	2.90
15	The program really appealed to the students and had very good outcomes. It was a great experience and provided students with a lot of information, which saved teachers so much time.	3	4.35
16	It helped improve, reinforce, and develop students' language skills and especially their knowledge of the alphabet, through reading and listening to stories in the learning corner.	4	5.80
17	This is a very good experience as it provided teachers with varied tools and techniques to implement the Arabic language syllabus effectively and helped in other areas of the curriculum as well.	1	1.45
18	It helped students learn the alphabet and gave examples of it.	2	2.90
19	This is a very appropriate and motivating program, especially for learning the alphabet as it provides varied activities through play learning.	2	2.90
20	This is a wonderful experience as it helped students learn to write the letters accurately through games, writing and drawing.	3	4.35
21	Very appropriate of this age group	3	4.35
22	It facilitated teachers' work and became the main reading resource in the learning corner.	1	1.45
23	This is a great opportunity as it provides computer devices to those children who do not have them.	1	1.45
24	Enjoyable and engaging, helped improve dialogue and interaction among the children, and developed their reading and writing skills.	4	5.80
25	It is difficult to implement with a large number of children.	1	1.45
26	It is a successful experience, although I found it difficult to charge all the devices. This program needs to be improved to be more suitable for this age group and compatible with the new curriculum.	1	1.45
Total		69	

The teachers' responses to this question indicate that the program effectively contributed to the students' learning of storytelling, and spelling and pronouncing the letters of the alphabet. In addition, it increased students' motivation and facilitated achieving the learning objectives of the curriculum. Furthermore, it developed students' listening and speaking skills, and self-confidence. It is evident that it is an enjoyable method of teaching that enhanced students' interaction and attracted their interest. Moreover, it was a great asset to the teachers.

It is clear that the program motivated both the students and the teachers. However, being at its early stages, it requires more time and attention from the teachers.

The third open-ended question that related to question 3 asked teachers to give their recommendations to improve Lughati (see table 5 below).

Table 5: frequency and percentage of Teachers' recommendations

No.	Responses	Frequency	%
1	Regularly updating and improving the program	7	7.77
2	Adding more varied and effective activities for learning the alphabet	6	6.67
3	Provide Internet connection	3	3.33
4	Providing connections to display the content to all students	2	2.22
5	Increase the number of chants	1	1.11
6	Providing enough computer devices for all the children and maintaining them regularly	7	7.77
7	Connecting the devices to T.V. screens	5	5.55
8	Individual differences should be taken into consideration and activities should be varied and cater for students with different abilities	7	7.77
9	Adding a special program for cycle 1 such as stretching and short movements	9	9.99
10	Improving the program and developing two different versions for cycles 1 and 2	1	1.11
11	Finding a way to control the children's devices when they are using them	3	3.33
12	Uploading the program on the Alabaster application so it can be regularly updated, and the program should be more varied	2	2.22
13	Assigning specific teachers to introduce and explain the use of the program	4	4.44
14	Providing lockers to store the iPads and supplying schools, especially in the Eastern Region, with devices as they are not available there	2	2.22
15	Regularly updating the program and linking it to the official curriculum	1	1.11
16	Adding activities from the official curriculum and adding them to student grades. For example, activities on the alphabets, words, and other activities.	1	1.11
17	Supplementing the program with activities that facilitate the learning of mathematics such as learning the numbers and shapes	3	3.33
18	Assigning a compulsory time or lesson for reading and not only in the learning corner	5	5.55
19	At least one of the Arabic lessons should be spent using the program	1	1.11
20	Offering teacher training courses	2	2.22
21	Providing schools with iPad chargers	1	1.11
22	Adding phonics, story writing through pictures, visual recognition of words, and the three Arabic vowels	7	7.77
23	Adding a word copying program and varied activities for each stage of nursery education	4	4.44
24	Modifying the terms and labels to suit the culture of the UAE	2	2.22
25	Enlarge text fonts	1	1.11
26	Add activities to help students learn numbers, addition, and subtraction as well as suitable exams for this age group	1	1.11
27	Adding a game or space for writing words and adding letters, and focusing more on letter placement	1	1.11
28	Add a game where students can record themselves telling a story or describing a picture	1	1.11
Total		90	

As shown in table 5 It is clear from these responses that many teachers recommended modifications related to the cycle 1 program. They especially preferred to see more activities that focused on long and short sounds, story writing through pictures, phonics, and learning letter combinations with the three Arabic vowels. Furthermore, they strongly recommended that the program should be regularly updated, activities should be designed to cater for individual differences and students with different abilities, and that the computer devices should be regularly maintained and made available to all students. A number of teachers also suggested adding more varied and effective activities for learning the alphabet, a lesson dedicated to reading, and a word copy program. We believe that all these recommendations should be

carefully considered as they point to important areas that would facilitate improvement in the use of the program by both teachers and students.

The fourth open-ended question asked teachers whether they needed intensive training on the use of Lughati effectively. The results indicated that 20% of the teachers agreed that there was a need for intensive training on the use of Lughati, and their responses focused on the following five areas:

- (1) Adding the program to the daily schedule and linking it to the official curriculum set by the Ministry of Education
- (2) Developing programs for the evaluation of the teachers and students
- (3) Holding teacher training courses to help teachers use the program more effectively
- (4) Providing the smart learning program to novice teachers
- (5) Holding training sessions to provide teachers with more information about the program and its uses.

As the findings indicate, holding training sessions to assist teachers to develop and enhance their digital skills will go a long way to ensure the effectiveness of smart education programs. While school leaders should provide the necessary support, the teachers should attend all the necessary training to strengthen their professional development.

The study explored the impacts of a smart education initiative on children's Arabic language skills development in the Emirate of Sharjah, UAE. Through teachers' questionnaires and language development tests for the participating children, the findings suggest that the program successfully assists students in developing Arabic language skills. Based on the results, the following recommendations can be considered by stakeholders in children's education in Sharjah and beyond:

1. Support Lughati, and similar programs that focus on facilitating the learning of Arabic at the preschool and primary stages of education.
2. Endeavor to implement Lughati in all public and private schools in the UAE.
3. Link Lughati to the MoE curriculum and assign it as one of the support programs of Arabic language education at the nursery and primary stages.
4. Regularly update the program and add more activities that focus on long and short sounds, story writing through pictures, phonics, and the learning of letter combinations with the three Arabic vowels.
5. Regular maintenance of the devices and providing them to all students.
6. Supplement the program with activities that facilitate the learning of mathematics such as learning the numbers and shapes.
7. Hold teacher training courses to help teachers use the program more effectively.
8. Link Lughati to monitors in all classrooms.
9. Add a voice or video recording application to support some language learning activities.
10. Train Arabic language teachers on the use of modern technology and best practice.

7 Limitations and areas of future studies

The sample of the study was restricted to certain preschools within the Emirate of Sharjah and therefore we cannot generalize the result to all preschools in Sharjah or the UAE as a whole. Therefore, we recommend a comprehensive study using representative sample for the population. The results also depend on the reliability and validity indices of the test and questionnaire used in this study. The higher the validity and reliability of the tools used the results will be valid in reflecting the reality, therefore we recommend modifying these tools to increase their reliability and validity in future studies.

Further studies needed in this area using smart education programs especially in early childhood stage. As such, we recommend the application of the Lughati Smart Education to other emirates and at the same time conducting study measuring children performance before and after applying the initiative.

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Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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