

How to Cite:

Jameel, A. S., Ta'amneh, M. A. A., & Alrishan, A. M. (2022). The role of educational applications in enhancing special needs pupils' English language performance. *International Journal of Health Sciences*, 6(S6), 396–407.
<https://doi.org/10.53730/ijhs.v6nS6.9903>

The role of educational applications in enhancing special needs pupils' English language performance

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Abstract---Teaching special-needs pupils require a highly professional teacher with good teaching experience. Recently, especially during the COVID-19 pandemic-imposed distance- communication, educational institutions shifted the educational process to distance education via electronic communication platforms with the help of educational applications. Educational applications have experienced an extensive and rapid spread worldwide. This study aims to reveal the role of the most recommended educational application called "Children's Education" in enhancing special-needs primary school pupils' English language performance in writing English letters, reading English letters, learning English daily life vocabulary, subject pronouns, English numbers, dictation, and matching pictures with action words. The participants were nine from Baghdad, Iraq, twelve from Jordan, and eight from AlBuraimi City, Sultanate of Oman, of special-needs pupils from grade six inclusive classrooms in primary schools during the first semester of the academic year 2021–2022. A pretest and posttest were used to collect the data. Means and standard deviations were used as statistical means to analyze the data. The findings revealed that the "Children's Education" application positively affects the special-needs pupils enhancing their English language performances. Their conditions variables influenced the performance levels among the pupils.

Keywords---children's education application, special needs pupils, inclusive education, english language performance.

Introduction

Using technology education in the Arab world has increased rapidly during the COVID-19 pandemic quarantine. Education has shifted from face to face education to distance education. All the students from preschool to postgraduate face some obstacles to using technology in learning. In the Arab world, the educational institutions do not neglect the pupils with special needs to engage them with distance education. Several online educational programs and applications have been used to help special needs pupils to continue education. After the end of the quarantine and the return of students gradually to blended education and now to face to face education, the need for technological applications is still in demand. This study attempts to reveal the role of online educational applications in enhancing special needs pupils' English language performance in Iraq, Jordan, and Oman. The question raised now is, do electronic educational applications have the power to influence pupils with special needs academic performance? Does the face to face education consider an old instructional tool? The results of this study will answer these questions.

Statement of The Problem

In the Arab world, and during the home quarantine period, events accelerated using technology in education for all students, including students with special needs. Several innovations emerged, including “Technological Innovations”. The technological innovations in learning for people with special needs included the so-called “e-educational game strategies” based on platforms Electronic and electronic application stores. Studies by Zilz and Pang (2021), Anber and Jameel (2020), Ramdania (2020), Gandolfi (2018), Abdallah and Fayyumi (2016), Berns et al. (2016), Bouzid et al. (2015), and Durkin et al. (2015) have revealed the effectiveness of activating the uses of educational technology, including the platforms and applications of electronic educational games to develop the perceptions of the Arab child, especially those with special needs.

The platforms and applications of educational programs in the form of games have positive benefits, as learning takes place through experimentation and discovery while playing. The use of technology in teaching special needs has a significant effect on pupils' language achievement, and it facilitates the learning process in an exciting way (Chrzanowska, 2021; Good, 2021; Park et al., 2021; Jankowska, 2020; Cheng and Lai, 2020; Lersilp, 2018; Erdem, 2017; Ismaili and Ibrahim, 2017; Onivehu et al., 2017; Gonzalez, 2014; Maor et al., 2011; and Martinez, 2011). The findings of the mentioned studies encourage the researchers in this study to implement technology to teach Arab pupils with special needs the basics of the English language to overcome the obstacles that hinder them from learning the English language as a foreign language, which is considered a dilemma for them ordinary pupils.

Aims of the Study

This study aims to reveal the role of the educational application labelled "T3leem: Children's Education" in enhancing special-needs primary school pupils' English language performance in writing English Alphabet letters, reading English letters, learning English daily life vocabulary, subject pronouns, English numbers, dictation, and matching pictures with action words.

Hypothesis of the Study

To achieve the aims of the study the following hypotheses have been formed:

- There is a significant difference at ($\alpha = 0.05$) in the mean scores of the pupils' English language achievement of the experimental group that can be attributed to the teaching method.
- There are significance differences in the experimental group students' English language achievement that can be attributed to the country.

Significance of the Study

The outcomes of the study will be helpful for the EFL teachers who teach pupils with special needs to encourage to integrate technology in teaching. Also, it will be a good indicator for the curriculum designers and educational policy makers to take in consideration the educational applications which designed in the form of games and animations.

Limits of the Study

The study is limited to:

- Participants: The participants were primary pupils with special needs.
- Special needs: The cases of pupils are pupils with low vision, Hearing impairment (Hard of Hearing), Locomotor disability (Muscular Dystrophy), and Learning Disabilities (Dyslexia and Dysgraphia).
- Location: The pupils were from schools that have inclusive classroom for special needs pupils in Iraq, Jordan, and Oman.
- Duration: The study was conducted during the first semester of the academic year 2021-2022.
- Instructional program: A ready-made online program was used.

Literature Review

Tackling educational issues concerning special needs education is different from the non-Special need. The UNESCO (2020) Called to pay attention to the obstacles encountered by the students of special needs in distance education and the use of technology in remote education. Chrzanowska (2021) shows the fear of special needs students' isolation due to distance education. This fear has a negative effect which may increase their learning problems. Janos-kresloandSlaby (2016 cited in Chrzanewskska, 2021) revealed the factor that influences special needs children. In Poland, for example, a family with a particular need child's

income face difficulty and the family condition is worse than the family that does not have a disabled child.

Gonzalez (2014) found that the use of different formats of E-Books has a significant effect on special needs students. Comprehension for those students who have reading disabilities. Hudson et al. (2007) State that about 80% of the special needs students have reading disabilities. Using technology devices helped improve special needs students' communication, and the challenging behaviours decreased (Park et al., 2021). The researchers in this study noticed that the students with special needs who can benefit from using technology devices and intelligent applications could be those who have social Phobia, unusual interest in objects, excessive worry, shock, the reaction of sight, hearing, and/or touch, and avoidance behaviours. These students can benefit Largely from electronic educational programs, especially game-oriented-based educational programs.

The researchers noticed that "Digital literacy" is a helpful tool that encourages particular needs students to practice behaviour they may not do without the encouragement of a digital educational program. The colour, the sound, easy use, interesting feedback, and clarity are all factors that motivate particular need students to involve in the educational process. Using educational applications in ready-made learning programs in inclusive classrooms, where the special needs students learn with the non-special need students, has been revealed to have a significant positive effect on developing special needs students' foreign language performance Hock (2015), and Al-Busaidi and Tuzlukova (2018). Oman and Jordan are considered at the initial stage of implementing practical, inclusive learning classes enhanced by technology (Al-Busaidi and Tuzlukova, 2018).

The involvement of technology in helping particular need students learn the English language has a positive result, as shown in Al-Busaidi and Tuzlukova's (2018) study that assistive technology had positively enhanced visually impaired students to read and be independent. The obstacles that special needs pupils in using technology in education are shown in Chrzanowska's (2021) study; she found that special needs people face difficulty with online learning and accessibility to Smart-Phone applications. In the Arab world, the most comer cases among pupils with special needs are stuttering, reading disability, and dyslexia. Using technology, electronic devices, educational applications, etc are tools that increase input information. According to Krashen's input hypothesis (1985), when a learner exposes to high input, the outcomes will be high; additional educational tools and comprehensive input do this, the assistive technology can be a good tool for comprehensive input (Lin and Nzai, 2014). EFL teachers can present students with special needs with rich input via assistive technology and smartphones (Hasselbring, 2000).

Portable electronic devices, such as iPad applications, can be a good source that enriches literacy skills for students with special needs (Lin and Nzai 2014). Lin and Nazai (2014) found that the iPad application games such as "Injini child development game suite", "ArtikPix", "In my dreams", and "write for School" have developed special needs students' English language literacy skills. Ipad "pica" application which covers educational activities for special needs students, has been used to investigate its effect on special needs students. The implementation

of "Picasa" positively affects students with special needs language skills performance (Fernández - López et al., 2013). The use of games is not limited to the educational context, Stankova et al. (2021) found that 87% of speech and language therapists use games in treating children and adults, and the games have a significant effect on the unique needs students' language performance.

Assistive technology plays a big and significant role in supporting and enhancing special needs students' learning process. Recently, in the Arab countries, we have witnessed the use of Mobile Assisted language learning (MALL), tablets, iPad, and Smart-Phones were used in special education; it is easy to access to "Google Play Store" and download the application that serves the students of special needs (Ismaili and Ibrahim, 2017). Alzayer and Banda (2017) fostered the significance of Table-based devices in enhancing students with special needs (Autism) communication skills. Cheng and Lai (2020) found that the studies conducted on Technology-Supported applications addressed to special needs students increased rapidly every year. Also, most studies are focused on primary level students with special needs. The notion of training the particular needs students to use electronic materials and programs to learn is not just a matter of using helping tools to educate the special needs students, but it is a matter of providing the special need students with the right to good quality and equal education with the other students (Al-Busaidi and Tuzlukova, 2018).

Children, in general, are attracted by mobile Smartphone games' applications, which occupied most of their lifetime. Thus, investing in electronic games as instructional tools has been investigated well. Most studies' results reveal the significance of the games in developing students' language abilities. Bouzid et al. (2015) found that the electronic games designed for students with hearing disabled and hard hearing have helped them develop English vocabulary acquisition. Recently, Zafar et al. (2021) found that the "Avatar Approach" has a significant role in providing an electronic platform for teaching English language vocabulary, sentences, and phrases to special needs deaf students. It is worth involving media and technology to support special needs students learning process to facilitate the learning English language (Ramdania et al., 2020, Gandolfi et al., 2018, Bouzid et al., 2015, Durkin et al, 2015). Educational and instructional electronic games can support special needs students' language progress Ramdania, et al (2020) used Fisher-Yates and Fuzzy Sugeno games to measure special needs students' level of understanding of English materials progress. The game has increased students' understanding and comprehension of English materials.

Previous Studies

Campigotto et al. (2013) investigated the effect of the IOS application (My Voice) application in special education classrooms to improve students with special needs' motivation to learn the English language. The participants were from a special education classroom in Toronto- Canada, from grade 7 to grade 12. An "MY Voice" application via IOS devices was used to collect the data. The results revealed that technology added fun to the educational process, and application has increased the students' level of attention and motivation to learn the English language. Also, there is a strong effect of integration technology in special

education classes. Using "My Voice", which connects students' voices with a picture, positively affects students with special needs' self-confidence and positive attitudes to word language success. Elaish et al. (2018) investigated the effect of mobile games on the unique needs of students in the Arab Countries Vocabulary and motivation for the English language. The participants were 4664 students from different Arab countries from the international school in Putrajaya-Malaysia. A Vocabulary test, Motivation questionnaire, and VocabGame (from Google play store) were used to collect the data for the study. The results revealed that the digital game had improved students' vocabulary and language confidence.

Participants

The participants were 26 from three Arab countries. Table 1 shows the distribution of the participants.

Table 1
Distribution of the participants

Country	School	Number
Iraq	Bayader Elementary school	9
Jordan	Abu Bakr AlSiddig Elementary School for Boys	12
Oman	Khadra Al Breimi Elementary School	8
Total		26

Table 1 shows that eight pupils from Bayader Elementary School in Iraq enrolled in an inclusive classroom in grade six. Also, 12 pupils from Abu Bakr Al Siddiq Elementary School in Jordan enrolled in inclusive classroom grade six. Moreover, six pupils from Khadra Al Breimi Elementary school in Oman enrolled in an inclusive classroom in grade six. The total number is 26 pupils who study the English language in inclusive classrooms.

Instruments

To achieve the aim of the study and verify the hypothesis, a pre-test, a post-test, "T3leem" application was used to collect the data. The instruments were given to jury members to judge the content and face validity. The jury members' recommendations and suggestions have been taken into consideration. Also, the achievement test reliability has been calculated. The test reliability was calculated by exposing it to a pilot sample consisting of 4 pupils out of out-of-the participants of the study. The reliability was calculated using the Alpha-Cronbach Formula; the reliability coefficient is (0.86), considered acceptable since it is above (0.50). The "T3leem" application programme was given to a jury member from specialists in curriculum design, educational technology, and Special needs Specialists specialized in "assistive Technology". The program was adopted by Abelhameed (2022) from the Play Google Store. All the jury members prove the suitability of the application for the target sample. The reliability coefficient was calculated using the Alpha-Cronbach Formula; it is (0.93) acceptable.

A Brief Description of the "T3leem" Application

The application is an interactive educational application that aims to teach children in general and children with special needs to read, write, pronounce English letters and write them correctly, teach numbers, synonyms and names of things. The application consists of two languages (Arabic and English). It consists of 14 icons: Writing English letters; Reading English Letters; Some English words; Letter test; Drag and Drops; The word and its opposite; Religion; English dictation; Choose the correct answer; Animals; Math; and numbers in the English language. The icon for writing English letters contains dotted letters. A learner needs to use his/ her finger to pass over the letter and then press the feedback icon to check the task. The Reading English letters icon consists of English letters; to learn the sound of a letter, a learner needs to press on it. The pupils who have hearing difficulty can see the shape of the letter and the transcription.

The some English words icon contains 12 icons: Animals, Aquatic; Birds; Colors; Fruits; Shapes; Veggies; Parts of the Body; Jobs; Clothes; Subjects pronouns; and Diverse. Letter test icon contains pronunciation of a sound by displaying three letters to test learners' ability to distinguish among them, such as the sound /æ/ is pronounced by displaying three letters with it [a, e, and i]. Choose the correct answer icon containing pictures, and under each picture, four names with an icon beside the name which pronounce the name that a learner chose. For example, a learner displays a picture of a boy holding a book. Under the picture, four icons represent the boy's action [read, write, draw, colour]. A learner can read and even press an icon to listen to the action.

Procedures

To verify the hypotheses and achieve the aims of the study, the following procedures were conducted:

- First: Select the schools with inclusive classrooms in Iraq, Jordan, and the Sultanate of Oman.
- Second: the selection of participants in an intentional manner. Participation of all students with special needs in the sixth grade of primary school.
- Third: Distribution of tablets to students that contain the educational program.
- Fourth: Asking for help from teachers with special needs in training students to use the program, each according to his type of need and ability to use the application.
- Fifth: Diagnosing students' cases and taking into account each student's type of particular needs.
- Sixth: A pre-test for students to reveal their English language level. A written and oral test was conducted according to the case of the student with special needs.
- Seventh: Starting to implement the experiment in cooperation with teachers of special needs classes. By dividing the fields of education contained in the program among students in proportion to the student's ability. For example, students who have a low level of hearing focus on writing and speaking skills

more than listening. The experiment aims to reveal the effect of using the program in developing students' ability in the English language.

- Eighth: Conducting a daily assessment of students for four weeks, at an hour each day (Sunday, Monday, Tuesday, Wednesday, and Thursday).
- Ninth: conducted the post-test (oral and written).
- Tenth: collecting data and analyzing the results.

Results

Result of the first hypothesis

To verify the hypothesis, 'There is a significant difference at ($\alpha= 0.05$) in the mean scores of the pupils' English language achievement that can be attributed to the teaching method', mean scores, standard deviations, and t-values of the two groups were used to calculate the results of the pre-test and post-test, as shown in Table 2.

Table 2
The Mean Scores, Standard Deviations and T-Test Values of the pretest and the posttest

Groups	Number	Mean scores	S.D	D.f	Calculated T-value	Tabulated T-value	Sig
Pretest	29	7.54	0.90	28	8.26	2.000	0.05
Posttest	29	15.07	1.37				

Table 2 shows that the mean score of the pupils in the pretest is 7.54 with a standard deviation of 0.90, and the mean score in the posttest is 15.07 with a standard deviation of 1.37. The calculated T-value is 8.26, higher than the Tabulated T-value, which is 2.000, which means there is a significant difference between the pupils' achievement in the pretest and the posttest in favour of the posttest. This indicates that the hypothesis is rejected.

Result of the second hypothesis

To verify the hypothesis, "There are significance differences in the pupils with special needs English language achievement that can be attributed to the country". Mean scores, standard deviations were used, Table 3 shows the results.

Table 3
The Mean Scores, Standard Deviations of the pupils scores in the achievement test due to countries

Country	N.	Means	Standard Deviations	D.f	Calculated T-value	Tabulated T-value	Sig. 0.05
Iraq	9	4.48	0.501	8	2.672	2,000	Statistically significant
Jordan	12	3.67	0.670	11	2.529	2,000	Statistically significant

Oman	8	3.73	0.921	7	2.826	2.000	Statistically significant
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Table 3 shows that the Iraqi pupils' calculated T-value is 2.672, the Jordanian pupils' calculated T-value is 2.529 and the Omani pupils' calculated T-value is 2.826. As all the calculated T-values are higher than the Tabulated T-value, there are no significant differences in pupils' achievement in the English language that can be attributed to the country. This means that the hypothesis is rejected and replaced with the null hypothesis, which states, " There are no significant differences in the pupils with special needs English language achievement attributed to the country".

Discussion of the Results

The study results revealed that the use of the application has a significant effect on pupils' English language performance. The pupils' post-test scores were higher than their scores in the pretest concerning the performance in reading, writing, dictation, recognizing phonetics, recognizing the names and pronunciation of things (animals, colours, shapes, fruits, clothes ... etc.). The participants' special needs cases are low vision, hearing impairment (Hard of Hearing), Locomotor disability (Muscular Dystrophy), and Learning Disabilities (Dyslexia and Dysgraphia). The pupils with low vision benefited from the different kinds of sound icons that helped them learn the vocabulary, subjects' names, numbers, and colours. The pupils with hearing impairment benefited from the pictures, animation, drawing, figures, and shapes to learn the English language and memorize vocabulary and essential daily life habits. The pupils with Muscular Dystrophy and Learning Disabilities benefited from the application to learn the English language; they could learn via interaction with the application by voice, by solving puzzles and by watching exercises. The results of the study are consistent with the results of Jameel (2022), Anber and Jameel (2020), Campigotto et al. (2013), Lin and Nazai (2014), Bouzid et al. (2015), Alzrayer and Banda (2017), Elaish et al. (2018), Zafar et al. (2021) found a significant positive effect of using a game application in helping students with special needs to develop their language competence.

Conclusion

The teacher who teaches pupils with special needs to be a researcher, a scholar, and creative to find a solution to every case that s/he deals with it. Integrating technology is considered a beneficial tool that leads to achievements. In this study, the educational application has increased pupils with special needs English language performance. The used application in this study has been downloaded by thousands of users worldwide, especially from Arab countries.

Data Availability

The dataset used and/or analysed during the current study would be available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Funding Statement

The authors declare that the work was done without any financial support from any person or organization.

Acknowledgements

The authors would like to thank English language editor and Mr. Abelhameed, Hamed, Abelhameed for designing the "T3leem" application and his permission for using his own application for free as a tool of this study.

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