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USING ELECTRONIC LANGUAGE GAMES TO DEVELOP LINGUISTIC SKILLS IN CHILDREN WITH SPECIAL NEEDS

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ABSTRACT

This study aims to highlight the importance of electronic language games in teaching children with special needs, equipping them with linguistic skills that help them express their needs, reduce the impact of their disabilities on communication with others, and enable them to integrate into their communities alongside their typically developing peers.

KEYWORDS

Special Needs, E-Learning, Electronic Language Games, Linguistic Competencies

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Introduction.

Investment today, particularly in developing countries, is primarily focused on human capital to advance societies, break the cycle of underdevelopment and ignorance, and catch up with developed nations. Among this capital, gifted individuals are at the forefront due to their unique characteristics and abilities, which they possess from an early age. Therefore, attention to their development and education is crucial for advancing and developing society on all levels and in various aspects of life. However, the focus on gifted individuals should not be the sole goal of the authorities and relevant parties. There is also a category of individuals with average intelligence or those who possess a special type of intelligence (as classified by Howard Gardner) who excel in one area while struggling in another. Moreover, there is a group of children with special needs in whom investment can be made by providing learning environments that contribute to developing their abilities and enhancing their perceptions. The challenge lies in improving the quality of education offered to them through the investment in modern technologies and their integration alongside traditional schooling. Indeed, the education of children with special needs is in greater need of the application of modern technological tools, especially those provided by e-learning, where they can follow their lessons, review them, complete the exercises and assignments required, and address the problems presented to them without the necessity of their physical presence. Moreover, electronic programs can design entertaining and educational games tailored to their needs, which can mitigate their communication problems and cognitive abilities, enhance their psychological readiness, and motivate them to learn more. Therefore, this study aims to address an important question: How can modern technology support children with special needs in their learning? More specifically, how can we develop the linguistic competencies of children with special needs through electronic language games?

1. Education for Children with Special Needs:

A human is born with a set of innate abilities that are capable of growth and development. For example, a child between the ages of three and six months is "able to control head movements and play with their hands."[1] Before the age of four, a child is capable of acquiring specific motor skills, such as walking, jumping, and using school tools like crayons, as well as developing communication skills, including speaking in short sentences and expressing their needs. Each developmental stage has its own unique mental, sensory, physical,

and emotional characteristics, which require specialised care and education to ensure the child grows in a healthy environment. This allows their abilities to develop correctly, enabling them to integrate socially and lead an everyday life.

However, a child may suffer from developmental issues or delays in acquiring specific skills, such as motor skills, cognitive skills (thinking), or communication skills (speech, hearing impairment) from birth or shortly thereafter. They may also be born with a permanent disability, such as the loss of speech, vision, or others. This categorises them under what is known as "children with special needs" due to their continuous need for special care and the follow-up of specialists in their condition, as well as their placement in special education programs to pursue learning and develop their abilities.

Children with special needs are defined as "those who deviate from the normal or average level in one or more aspects of their personality to the degree that they require special services, different from those provided to their typically developing peers, in order to help them achieve the maximum possible growth and adjustment."[2] This means that they suffer from a disability that prevents them from living an everyday life as their typically developing peers do. The cases of disability in children with special needs are classified according to the type of disability, which is often summarised in the following categories:

First Case: Physical Needs

Some refer to this as a "physical disability,"[3] Both terms are correct and commonly used. Children may suffer from physical disabilities that arise for various reasons, such as congenital deformities, epilepsy, muscle atrophy, and others. The degree of disability may vary depending on the type of condition the child has.

Second Case: Developmental Special Needs

These are attributed to mental or physical impairments that often show signs before puberty, leading to significant difficulties, especially in areas such as language, mobility, learning, and other essential needs. For example, a child may suffer from autism or learning disabilities, which affect their abilities in listening, thinking, speaking, reading, writing, and more.[4]

Third Case: Behavioural/Emotional Special Needs

This is also referred to as emotional disorders or psychological disabilities, such as introversion, isolation, schizophrenia, anxiety, and others. Children who suffer from this type of disorder require a special learning environment and services that consider these disorders and work towards involving them with their peers in various learning activities.

Fourth Case: Sensory Special Needs

This condition occurs when a child is deprived of one of their senses, such as sight or hearing.

Dealing with a child who suffers from one or more of these conditions, helping them overcome certain obstacles, improve and develop their abilities, and integrate them into society requires the collective efforts of specialists, each according to their field of expertise, as well as those responsible for educational affairs, including curriculum designers, teachers, and educators. It is their responsibility to prepare special programmes for these children, as education is a fundamental right for every child without exception, a right enshrined in laws and constitutions, such as the Algerian constitution. A child with any disability, whether physical or mental, also enjoys full rights to education. As a result, educational systems and institutions have focused on integrating these children into society by supporting them, educating them, and providing opportunities for them to demonstrate their hidden potential. This requires adapting curricula, using specific teaching methods and approaches, and employing technology with all the tools and techniques it offers. "There are differences between teaching typically developing children and those with disabilities, and these differences require the availability of a set of teaching skills specific to individuals with disabilities. These can be utilised by educational technology specialists and teachers according to the teaching situation, the circumstances of the disabled child, their abilities, remaining senses, preparedness, and inclinations."[5]

It is essential to adapt curricula, programmes, content, and teaching methods to meet the needs of children with special needs, enabling their integration with their typically developing peers in society. Additionally, intensive scientific support should be provided to the educational staff to help them implement effective strategies for teaching this group.

It is well-established that a child's failure to acquire linguistic competence for any reason will negatively affect their learning and other life and academic skills. Linguistic competence allows them to understand and use language both orally and in writing. Therefore, it is important to gradually equip them with the fundamental components and levels of language, namely the phonological level, the morphophonological level, the syntactic level, the semantic level of words, and the pragmatic level. To achieve this, recent years have seen a marked trend towards the use of technology, including applications, digital platforms, and electronic

educational tools, in the education of children with special needs, helping them acquire language for communication and integration into their communities by creating digital learning environments tailored to their needs and those of other learners.

2. E-learning:

E-learning is now considered a parallel to academic education and has become a pressing necessity, especially following the spread of the COVID-19 pandemic, which brought life to a halt worldwide. As a result, schools and educational institutions were closed, making e-learning the optimal alternative to mitigate the severe educational losses caused by the pandemic, particularly the inability of learners to attend classes (though the emergence of this type of education was not exclusively tied to the COVID-19 period). E-learning is defined as "education based on the internet, where the educational institution designs a specific website with materials or programs, and the learner engages through a computer, receiving feedback along the way."[6] Alternatively, it is defined as "the content provided in adaptive learning environments with multiple objectives and varied organisation, allowing knowledge to be accessed through different learning styles and cognitive strategies of the learners."[7] Its features and advantages include interaction between the elements of the teaching-learning process, consideration of individual differences, and the construction of educational content that serves various learning styles while responding to the learners' psychological, physical, and cognitive readiness. Thus, this type of education offers several benefits, both in terms of educational communication and the development of curricula and course content. It also has a positive impact on the development of learners' perceptions, encouraging them to learn, develop themselves, and expand their knowledge. It motivates them to focus, engage in sensory observation, and enhance their internal perception through processes of differentiation, categorisation, organisation, and others.[8]

Given the advantages of this type of education (interaction, distance learning, feedback, and other benefits),[9] It is capable of addressing some of the educational and pedagogical challenges and requirements of children with special needs. As a result, there has been an increased focus on designing educational programmes for this group of learners. In the pursuit of developing these programmes, "the focus has shifted towards integrating e-learning systems and modern technological tools, as their effectiveness has been proven when used with typically developing children."[10]

As a result, several distance learning platforms, electronic programmes, applications, and educational games specifically designed for children with special needs have emerged in recent years, aiming to achieve better educational outcomes for them. "The psychological problems caused by certain auditory or physical disabilities can prevent learners from this group from continuing in traditional education and negatively impact the provision of appropriate educational opportunities for them. Furthermore, some individuals with physical disabilities face significant challenges in accessing schools, institutes, or universities, especially in developing countries that do not provide adequate services for them. Therefore, distance learning is the most suitable option, as it allows this group, along with others, to learn according to their specific circumstances."[11]

The design of content in this mode of education, as most studies suggest, plays a significant role "greater than that in traditional educational curricula,"[12] As it affects all elements of the teaching-learning process, including "teaching procedures, learning activities, time, place, and feedback."[13] The design of electronic content for children with special needs, from an educational perspective, is based on a set of principles, the most important of which are:[14]

- Adopting creative and innovative methods in design and production.
- Enhancing the learner's positivity and developing cognitive processes by incorporating collaborative learning tools and multimedia.
- Achieving flexibility that aligns with learning styles and the learner's educational preferences.
- Promoting collaborative learning by designing electronic content that encourages positive interaction among learners.
- Ensuring adaptability to suit the learner's educational inclinations.

Several models have been proposed in the field of (electronic content design), including the ADDIE model, which is based on five stages: Analysis, Design, Development, Implementation, and Evaluation; and the SAMR model, which consists of two levels: the first is improvement, which includes the substitution and augmentation phases, and the second is transformation, which involves the modification and redefinition phases.[15] These models, along with others, are "closely related to Universal Design for Learning (UDL), based on the idea of providing accommodations and benefiting from technology in the education of individuals with disabilities to achieve educational integration with their typically developing peers."[16] As studies emphasise,

Universal Design for Learning is interdisciplinary, incorporating fields such as neuropsychology, human development, and education, among others.

Moreover, learning through play is one of the most important strategies used in e-learning. In the following section, we will focus on electronic language games to highlight their role and significance in teaching children with special needs.

3. Electronic Language Games:

Free play in children is considered an instinctive behaviour and a means of expression, freedom, and exploration. Any limitations do not constrain it, nor are they imposed by family members or peers. During play, the child naturally and joyfully experiences their childhood. However, educational games differ from free play in that they are directed, controlled, and governed by rules, with a clear beginning, end, and specific goals. Educational games are considered a rich environment and an effective strategy for teaching children, providing both enjoyment and benefits, whether they are typically developing children or those with special needs. They serve as a means to foster creativity and innovation, instil proper behaviours, allow emotional expression, and more. The areas of educational games are diverse, covering all fields of knowledge related to the learner. Some games aim to enhance the child's knowledge of visual images and words, as well as develop their abilities in differentiation, analysis, and synthesis, or to acquire the skills necessary for mental, artistic, neurological, and muscular growth.[17]

3.1. The Concept of Language Games:

Among the types of educational and pedagogical games that are widespread, those related to language, i.e., language games, are considered a "type of play in which symbols, sounds, and words are used for expression. It relies on playing with words, how to produce organised sounds, and forming sentences. Children use language forms and grammatical rules in these games."[18]

Language games play a prominent role in developing the four language competencies: listening, speaking, reading, and writing. Based on this, their use in the process of teaching and learning the Arabic language, as acknowledged by scholars, "is not merely a series of activities and movements; it holds high educational and pedagogical value. Most language games require learners to use language in a natural context, rather than focusing on learning the correct forms of linguistic patterns."[19] Furthermore, they "represent a fun way of practising language under the guidance and direction of the teacher in active and natural or fabricated situations, aiming to enrich the learners' personalities and develop various aspects of their skills: cognitive, practical, and emotional."[20]

In other words, language games foster innovative and engaging learning, enabling learners to express themselves and interact with the target language in real-life contexts. They stimulate imagination, support learning through mistakes, and offer direct error correction, making them an effective tool in the educational process and in improving learners' linguistic performance, especially for children with disabilities. The following table illustrates language games, the language skills they enhance, and how to improve them:[21]

Table 1. Examples of Language Games and the Skills They Enhance

Language Skill	Examples of Games that Enhance the Skill	How to Achieve Targeted Improvement
Vocabulary	Puzzle games and crosswords	Expand vocabulary by exposure to new words
Listening and Auditory Comprehension	Role-playing and simulation games	Develop the ability to understand verbal commands and instructions
Grammar	RPG character interaction games	Practice using tenses and morphology correctly
Speaking and Pronunciation	Communication challenge games	Improve confidence and fluency in language through verbal interaction

3.2. Electronic Language Games:

Technology has played a significant role in producing a new generation of interactive and physical games, including educational electronic games, such as mental games, sports games, and language games.[22] The latter focuses on enabling learners to develop language skills, such as reading, writing, and letter recognition, among others. Electronic language games differ from traditional ones in terms of the media and

technologies used. Their goal is to "create an attractive educational environment that combines both achievement and enjoyment,"[23] Thus, "encourage language use… and provide numerous opportunities for listening and speaking in lively and enjoyable contexts."[24] The objectives of electronic language games are:[25]

- Achieving personal, academic, and social alignment.
- Increasing students' motivation and providing them with more opportunities to achieve success.
- Developing cognitive skills such as association, inference, discovery, thinking, and creativity.
- Activating students' imaginative skills, which are essential for creative thinking.
- Addressing students' weaknesses in various skills.

Following this brief discussion on language games, both traditional and electronic, and highlighting their role and importance in teaching language skills, a crucial question arises: Are there electronic language games specifically designed for children with special needs? Furthermore, do electronic language games play a role in teaching children with special needs and developing their communication skills, both written and oral?

4. Electronic Language Games and Their Importance in Teaching Children with Special Needs:

Games for children with special needs are classified into sensory games, which help develop their five senses, such as games involving water, sand, soft materials, and various sounds. There are also motor games that help develop fine and gross motor skills, such as those that involve the use of hands and fingers, as well as balance and movement exercises. Social games encourage social interaction and communication such as group games and cooperative games. Language games specifically help improve language and communication skills, such as those that utilise images and words, storytelling, and reading games, among others. This is what we will discuss in further detail.

Technology, which has developed rapidly in recent years, has impacted various aspects of life, providing modern tools that have become an integral part of the resources used in institutions, commercial companies, medical clinics, and other sectors. By reviewing studies that highlight the role of technology in helping children with special needs, particularly through electronic language games, it becomes clear the significant role these games play in teaching children who suffer from language disorders, learning difficulties, or any disabilities mentioned earlier. They help these children overcome many of the challenges they face when learning to read and write, improving their listening and auditory comprehension skills by presenting diverse dialogues from various characters, such as parents, friends, and siblings. Moreover, these games enrich their vocabulary, mainly since they are characterised by flexibility, interactivity, and consideration of individual differences.

To enable these children to use language and improve their communication skills effectively, many electronic language games have been designed, either in the form of educational applications or through online educational platforms. These include word games, puzzles, role-playing and simulation games, reading games, and others, all of which provide real opportunities to enhance and develop language skills in simple, engaging, and enjoyable ways. As education experts affirm, these games provide "a safe environment where learners can practise language and make mistakes without the fear of social judgement, which strengthens language learning."[26] This approach helps reduce the impact of some psychological disorders that hinder the learning process, such as excessive shyness, stuttering, aphasia, dyslexia, and others that the child may experience.

Many specialised studies have emphasised the importance of focusing on children with intellectual disabilities and training them in non-academic skills, particularly those related to daily life, which enable them to adapt to themselves and their communities. One such study presented at the Fourth Conference of the Arab Society for Educational Technology and Teaching the Arab Child, held in 2008, recommended "activating the use of educational technology, including electronic educational games, to develop the perceptions of Arab children, especially those with special needs, in light of informatics, by producing educational and enriching software that aligns with the child's identity."[27]

Furthermore, a study by researcher Maria Abdullah Al-Wahebi, titled *"The Importance of Play-Based Therapy in Intellectual Disability,"* concluded that play therapy enables the child to:[28]

- Better pronunciation and richer vocabulary.
- Improved emotional and social adaptation.
- Higher language comprehension and a higher linguistic level.
- Better problem-solving strategies.
- Increased curiosity and the ability to adopt a different perspective.
- Higher intellectual competence, more innovation, and greater imagination.

4.1. Examples of Electronic Language Games:

The Internet offers a vast collection of educational and interactive language games, particularly through platforms or Android applications. However, most of these games are typically aimed at children with typical development. Nevertheless, electronic language games designed for typical children can be adapted to suit those with special needs. Some of these games include learning letter and sound games, word-building games, picture vocabulary games, interactive story games, augmentative and alternative communication games, and more.

However, most of these games are not available in Arabic. Therefore, we made efforts to search for games that feature the following characteristics:

- A user interface suitable for children with visual impairments or attention difficulties.
- Customisation options, such as the ability to change font size, colours, and game speed.
- Support for alternative input methods, allowing the use of special keyboards, eye-tracking devices, or other assistive tools.
- Clear, multisensory instructions: Providing visual, auditory, or even tactile instructions during interaction.
- Simple interface: A clear and straightforward design that reduces distractions and enhances focus.

Below, we present an example of an electronic language game designed in English aimed at both typically developing children and children with disabilities.

Educational Website (Education.com):

This educational website is designed for children, offering a vast collection of electronic educational games, including brain games, math games, art and colouring games, as well as language games. These include letter and sound games, grammar games, and spelling games. These games are intended to provide both typically developing children and children with special needs (such as those with autism) with the structure and support needed to engage in interactive conversations. For example, the site mentions that "phonics games help children build reading skills... through lessons covering vowel sounds, consonant sounds, rhyming, blending, and segmentation. Online phonics games make learning to read a fun experience! You can also browse our spelling games to practice word building."[29]

The website further emphasises the importance of this type of electronic language game: "These games make it easy for children to identify and blend different sounds, as well as recognise the corresponding spelling patterns. Look for games that focus on specific sounds, such as short vowel sounds or the silent E, or try phonics games that blend sounds or include a variety of final sounds."[30]

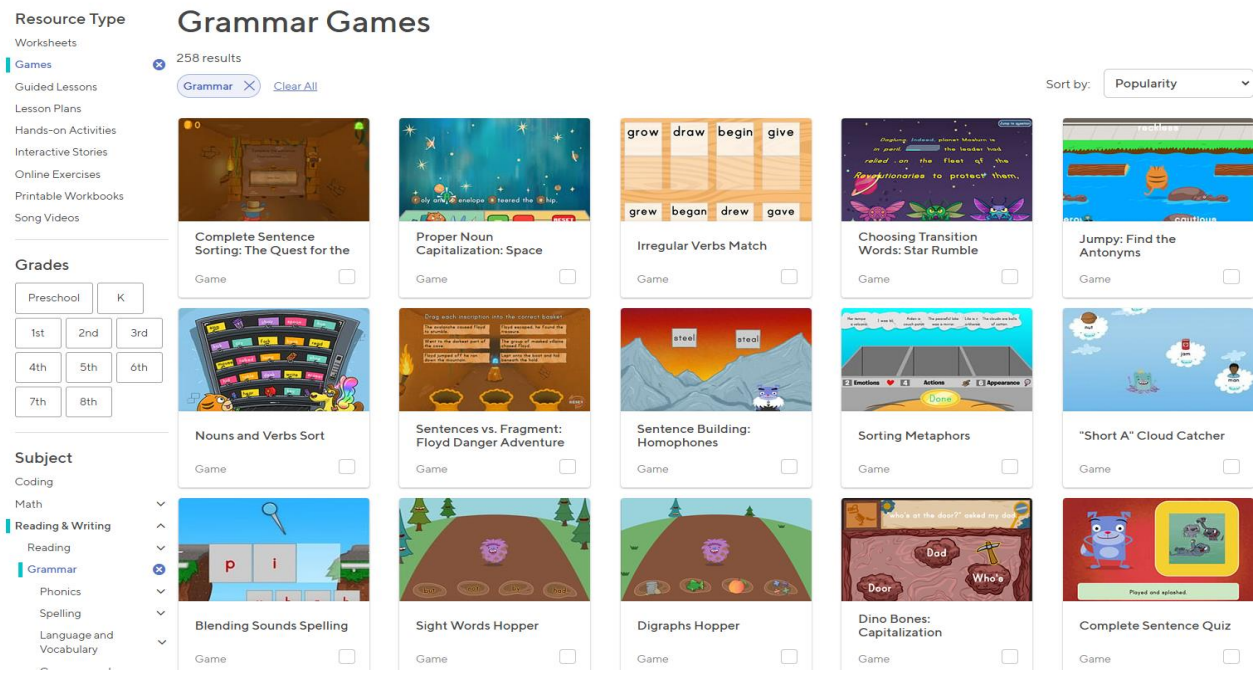

Fig. 1. *Language Games (Grammar) Interface*

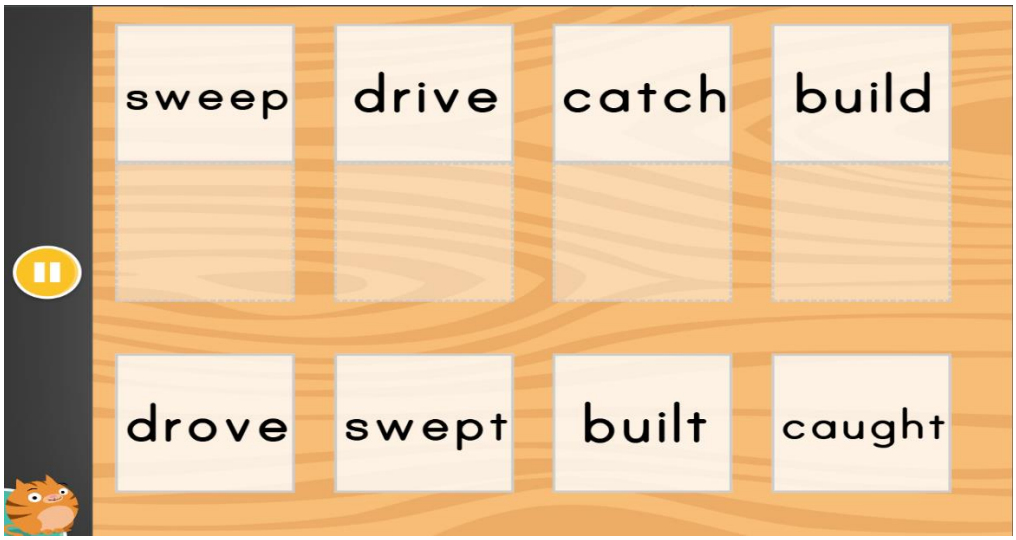

Fig. 2. *Electronic Language Game*

The image in Figure 02 represents an electronic language game, which consists of a set of cards containing basic vocabulary. Each vocabulary word is accompanied by a blank space for the child to fill in by choosing the appropriate card from the opposite row. This process is repeated three times, with a new set of words displayed each time, accompanied by encouraging sounds in the case of success or motivational sounds in the event of failure.

There are other examples of language games on the same website where children are shown sentences accompanied by icons that remind them to stand, look, speak, and listen. After completing the sentence, they are reminded to listen to it in its entirety.

In summary, these examples of electronic language games are practical tools for helping children with special needs develop their language competencies, provided they are adapted to suit each specific condition. The games cover phonological, morphological, syntactic, and semantic levels in a way that aligns with the psychological, physiological, and cognitive abilities of the children. They offer simple and easy examples to stimulate learning without the children feeling the monotony or difficulty of lessons, allowing them to express themselves freely without any negative feelings, such as shyness. The ultimate goal is to make learning enjoyable and as accessible as possible.

Conclusions.

Through this discussion, we have aimed to direct the attention of curriculum developers, educational programme designers, and those concerned with educational matters towards the importance and effectiveness of electronic language games for children with special needs. The significance of play as an instinctive and spontaneous activity that children engage in with enjoyment, as well as the significant role electronic language games play in developing the cognitive abilities of this group, such as thinking and synthesis, has been highlighted. These games also enhance their language skills through the immersive linguistic environment they provide, as well as the diversity and effectiveness they offer.

Finally, it must be acknowledged that there is a significant lack of electronic language games designed for children with special needs, particularly those designed in Arabic. We found that most educational websites offering language games were initially built for typically developing children. Therefore, designing electronic language games specifically for children with special needs still requires development and innovation. Such games have not yet been designed to ensure complete independence in play for these children; they still need guidance from adults to use these games effectively, with varying degrees of assistance depending on the nature of their disability. This underscores the need for deep and serious consideration in addressing the needs of this group. It is not enough to simply provide them with a classroom, a teacher, and educational content. In our view, a comprehensive plan should be developed to create tailored educational programmes and electronic language games for them. This would require the collaborative efforts of researchers and experts from various fields, including medical, speech therapy, psychological, pedagogical, educational, electronic, and computer

engineering, among others, to lay the foundations for a complete educational programme that takes into account all the cognitive, physical, psychological, and pedagogical variables.

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