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Educational Video Games in the Initial Assessment and Treatment of Children with Special Educational Needs: A Survey of Speech-Language Pathologists

Fatemeh Zolfaghari [1], **Mahboobeh Sanei** [1]
[1] Masters of Educational Research, Allameh Tabatabaei University, Tehran, Iran

Corresponding author:
Fatemeh Zolfaghari,
Masters of Educational Research, Allameh Tabatabaei University, Tehran, Iran
Email: f.zolfaghari@atu.ac.ir
https://orcid.org/0009-0003-6105-3958

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Abstract

Background and Objective: Digital interventions are increasingly utilized in therapeutic settings. This study aims to investigate the current landscape and efficacy of educational video games as tools for the initial assessment and therapeutic management of children with special educational needs (SEN).
Materials and Methods: A descriptive-analytical cross-sectional survey was conducted. Data were collected via a researcher-developed instrument comprising 26 items covering demographic variables (age, gender, years of experience) and clinical practices regarding the integration of computer-based gaming in Speech-Language Therapy (SLT). The study population consisted of 150 speech-language pathologists (SLPs) in Tehran, Iran. Data were analyzed using SPSS software (version 22).
Results: The findings indicate that, currently, available educational video games lack standardization and specific clinical design features required to support SLPs effectively in the initial assessment of speech and language deficits in children with SEN. Furthermore, there is a significant gap between the potential of digital game-based therapy and its practical implementation in clinical environments.
Conclusion: While educational video games hold promise for pediatric rehabilitation, current software designs do not adequately meet the clinical requirements for standardized assessment. There is an urgent need for the development of evidence-based, clinician-supported, and standardized gaming platforms to improve therapeutic outcomes in special education.
Keywords: Video Games; Child, Exceptional; Speech-Language Pathology; Educational Technology; Diagnostic Techniques and Procedures.

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Introduction

Educational video games serve various purposes within Speech-Language Therapy (SLT) practice, including the improvement of attention, memory, reading, and language skills, as well as the development of strategic approaches to task management, competitive sportsmanship, motor skill speed, coordination, critical thinking, rapid decision-making, and the evaluation of one's own decision-making outcomes, and social adaptability. These tools are utilized to assess children's knowledge and abilities by diversifying therapeutic approaches and providing opportunities for relaxation and respite during educational activities.

Strategically, the use of "break" or rest time during educational activities is frequently employed by SLTs in their practice to provide rewards, promote relaxation, and bridge time gaps between sessions [1]. Educational computer games possess various definitions and classifications. Gee (2003) replaced the term "video and computer games" with "video games," defining them as games played on gaming platforms (such as Sony PlayStation 2, Nintendo GameCube, or Microsoft Xbox) and games played on personal computers [2]. Tang et al. (2009) defined "educational games" as computer games intended for game-based learning [3]. They explained both the similarities and distinctions between these and other types of games; while computer games and educational games share numerous technical characteristics, they differ significantly in their intended use and content design. Commercial games are primarily designed for entertainment purposes, whereas the objective of educational games is the transfer of knowledge or the development of specific skills [3].

Although educational and entertainment elements often overlap in both domains, the primary goal of conventional computer games is entertainment, with content centered on narrative and fantasy themes. Conversely, educational games integrate specific tasks aimed at learning and skill acquisition. Therefore, the distinction between computer games and educational games is better explained through three design frameworks: play, rules, and culture. "Play" in commercial games involves interactions analogous to those in the real world, whereas educational games utilize specialized interactions and dialogues. The "rules" of computer games typically follow the game's internal design and mechanics; however, in educational games, the rules are structured around specific learning outcomes.

Regarding "culture," computer games present beliefs, norms, and world settings tailored for artistic expression and imagination, while educational games present beliefs, norms, and settings that reflect the real world and are grounded in relevant knowledge [3]. Herz (1997) introduced a classification of video games based on the player's perspective, categorizing them into seven genres: action, adventure, puzzle, role-playing, simulation, sports, and strategy [4]. Furthermore, by considering the intrinsic characteristics of educational computer games, this classification can be expanded by incorporating game features linked to target learning outcomes, as described by Wilson et al. (2008), such as cognitive, psychomotor, and affective skills [5]. Finally, national educational standards regarding student knowledge and skill levels provide additional classification criteria based on standardized educational subject areas.

The widespread availability of computers, televisions, interactive whiteboards, tablets, and internet connectivity enables professionals to leverage various computer and online games to meet the specific educational needs of children, depending on the therapeutic approach employed. Unfortunately, there is a scarcity of adequately developed projects and programs utilizing educational computer games for special educational needs, particularly those

tailored for children with developmental disorders.

Review of Literature

Numerous researchers have reported positive outcomes regarding the integration of digital games in education, including the enhancement of cognitive processes, social and emotional learning, and the development of essential interpersonal skills required for successful peer interaction. In addition, significant improvements have been observed in skills critical for independent learning, such as goal setting, turn-taking, sharing, decision-making, problem-solving, sequencing, deductive reasoning, and memory [6, 7, 8].

A large-scale European study (European Schoolnet, 2009), which surveyed 528 teachers across nine languages, revealed that 70% of educators incorporate games into the instructional process. Furthermore, over 80% of respondents reported that digital games should be utilized within school settings, though they expressed a need for more comprehensive information regarding their application. This study also indicated that teachers frequently utilize various games in the classroom (e.g., puzzles, digital console games, simulation games, and adventure games) which are often centered on specific subject matter or skill sets. Notably, the study highlighted that most games used by teachers and SLPs are commercial in nature, suggesting that their application for instructional purposes is more widespread than previously assumed. Also, the most common motivations cited by teachers for using digital games include capturing student attention, increasing motivation, promoting learning outside of school hours, and providing entertainment. Additionally, teachers employ digital games for assessment, repetition, regulating learning speed, rewarding students, and ensuring active engagement in the educational process [1, 9].

Koh et al. (2011) conducted an in-depth investigation into teachers' perceptions and attitudes toward the use of games in schools, concluding that games play a vital role in teaching and learning. They categorized the factors influencing this integration into two distinct groups: (1) Push factors including educational policies, curricula, and environmental support; and (2) Pull factors including personal interest and the intrinsic appeal of the games. Their findings further indicated that the specific subject matter, the level of instruction, and years of professional experience significantly influence the frequency and manner in which computer games are implemented in the classroom [10].

The term "special educational needs" (SEN) typically refers to children who experience significant learning difficulties compared to their age-matched peers. These challenges frequently manifest in reading and writing, comprehension and self-expression, behavioral and social functioning, attention and memory, as well as sensory and psychological domains. Within the field of special education, the application of educational computer games can be categorized based on the type of disorder and the frequency with which speech-language pathologists (SLPs) utilize specifically developed games for assessment and intervention. Furthermore, these applications can be classified by their functional role in SLP practice: skill and knowledge assessment, therapeutic intervention, and recreational engagement [1, 11].

Fernández-López et al. (2013) evaluated the impact of a specialized learning platform on children with SEN, concluding that significant improvements were observed in language, mathematics, environmental awareness, independence, and social functioning. They suggested that children acquire additional skills previously unobserved, likely due to their ability to engage with customized content and intuitive user interfaces. Similarly, Saridakis (2010)

reported that children with special educational needs can utilize digital games to achieve higher levels of learning motivation.

Griffiths (2002) posits that computer games are highly beneficial, as they offer advantages not typically found in other learning strategies, such as the capacity to explore multiple solutions to a complex problem and the ability to follow consequences within a controlled environment. However, he also cautions against the risks of excessive use and the potential for games to replace other effective pedagogical techniques. Regarding the generalization of learning outcomes in computer-based instruction, Griffiths suggests that the most significant opportunities arise from games specifically designed to address particular clinical or educational challenges.

Study objectives

In the Iranian context, there is a notable absence of well-structured and empirically developed programs based on computer gaming for the assessment and treatment of developmental disorders, specifically concerning speech and language deficits. Consequently, the integration of technology remains dependent on the individual speech-language pathologist's (SLP) choice, professional experience, training, and the availability of resources for selecting and implementing such games. While most educational institutions, including kindergartens and schools, provide SLPs with access to computers and the internet, and many of them utilize laptops, desktop computers, and tablets provided by these institutions, the clinical application of these tools remains inconsistent.

The primary objective of the present study is to investigate the utilization of educational computer games in the initial assessment and intervention of children with special educational needs. To address this objective, the current research seeks to answer the following questions:

1- Do speech-language pathologists utilize computer-based gaming in the initial assessment and intervention of children with special educational needs?

2- Which types of games are perceived as most effective, and which specific disorders are most commonly targeted through computer-based interventions?

3- To what extent are educational computer games utilized, and what are the SLPs' perspectives on the learning outcomes associated with these games?

4- What specific categories of educational computer games do SLPs employ, and what information resources do they rely on to select these gaming platforms?

Materials and Methods

Study Design

This study employed a descriptive-analytical cross-sectional survey design. A cross-sectional approach was selected as it is a widely recognized quantitative research methodology suitable for examining the prevalence of specific practices and describing the current landscape of a phenomenon at a single point in time. The descriptive-analytical nature of the study allowed for both the characterization of current clinical habits and the exploration of relationships between demographic variables and professional practices.

Participants and Sampling

The study population comprised 150 Speech-Language Pathologists (SLPs) practicing in Tehran, Iran. Due to the relatively small and specific nature of the professional population in this region, a total enumeration approach was adopted rather than a probability-based sampling method, ensuring that the entire

available professional community was included to enhance the representativeness of the findings.

Instrumentation

Data were collected using a researcher-developed questionnaire, specifically designed to address the nuances of digital tool integration in clinical settings. The development of this instrument was grounded in an extensive review of existing literature regarding computer-based gaming and was further refined through the authors' clinical expertise and practical experience in the field. The instrument comprised 26 items, which were categorized into two primary domains:

1- Demographic and Professional Profiles: Including age, gender, and years of clinical experience.

2- Clinical Practice and Integration: Focused on the frequency, types, and specific applications of computer-based gaming within Speech-Language Therapy (SLT) interventions and assessments.

Data Collection and Statistical Analysis

Data collection was conducted through a hybrid (online/in-person) structured digital survey. The quantitative data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. Descriptive statistics, including frequencies and percentages, were utilized to summarize demographic data and clinical trends, while Chi-square test was employed to investigate the analytical components of the study.

Results

The study data were analyzed in relation to the research questions and are now presented in order. First, the participants' demographic information is presented in Table 1.

Table 1 - The participants' demographic information

Gender	Frequency	Percent
Male	8	۵٪
Female	142	95%
Age		
20-30 years	15	10%
31-40 years	45	30%
41-50 years	68	45%
51-60 years	15	10%
Above 61 years	7	5%
Years of Employment		
1-5 years	26	17%
6-10 years	27	18%
11-15 years	37	25%
16-20 years	45	30%
Above 21 years	15	10%

The first research question addressed the utilization of educational computer games: Do speech-language pathologists utilize computer-based gaming in the initial assessment and intervention of children with special educational needs? Responses to this question were categorized into five groups:

1- Use of educational computer games for the initial assessment of children with special educational needs.

2- Use of educational computer games for the treatment of speech and language disorders in children with special educational needs.

3- Use of educational computer games for breaks and relaxation between different therapeutic tasks.

4- Non-utilization of educational computer games in clinical practice.

5- Other (i.e., uses not falling into the above categories).

Regarding the diverse applications of gaming, respondents identified an additional use case within the "Other" category: utilizing games to initiate a session to increase a child's motivation and engagement in the educational process.

The distribution of use cases is detailed in Table 2. The results indicated that 43.3% of participants utilize educational computer games for the treatment of speech and language disorders in children with special educational needs (intervention). Furthermore, 24.6% of participants utilize these games for the initial assessment of children with special educational needs (diagnostic and assessment purposes). Additionally, 18% of respondents reported using educational computer games for breaks and relaxation between therapeutic tasks. Finally, 12% of participants reported no utilization of educational computer games. These findings suggest that, currently, computer games are not specifically designed or standardized to assist clinicians in the initial speech and language assessment of children with special educational needs.

Table 2 – Utilization of educational computer games in Speech-Language Therapy

Purpose of using educational computer games	Frequency	Percent
Initial assessment of children with special educational needs	27	18%
Intervention in children with special educational needs	65	43.3%
Breaks and relaxation between different therapeutic tasks	37	24.6%
Non-utilization of educational computer games	18	12%
Other types of uses	3	2%

The second research question addressed the following: "Which types of games are most effective, and which disorders are most commonly targeted through the use of educational computer games?"

Based on the data regarding the frequency of use and the specific types of educational computer games utilized by Speech-Language Pathologists (SLPs), the findings were categorized into several distinct groups. Tables 3 and 4 illustrate the types of games used, categorized by their level of accessibility and the frequency of use by practitioners.

Table 3 – Types of Games

Types of Games	Frequency	Percent
Freely accessible web-based games	68	45.3%
Clinically-vetted games provided by institutions	44	29.3%
Computer games acquired via single payment	18	12%
Subscription-based games in digital platforms	5	3.3%
Games requiring specialized training and purchase	15	10%

The results indicate that free, internet-based games are the most frequently utilized tools among SLPs. Conversely, there is a notable absence of structured gaming platforms specifically designed to be compatible with the unique requirements of children with special educational needs. This gap suggests a critical need for increased guidance and support from governmental organizations, regulatory bodies, and clinical specialists to facilitate the provision of specialized computer resources and to support practitioners in speech-language clinics.

The following subsection details the use of games categorized by the frequency of use. Table 4 specifically illustrates the primary applications of these games, distinguishing between their use in therapeutic intervention (aimed at enhancing knowledge and skill acquisition) and their use during session intervals (for relaxation and breaks).

Table 4 – Utilization of educational computer games categorized by the number of gamers

Number of gamers	Frequency	Percent
Several gamers	10	6.6%
Two gamers	35	23.3%
Single gamer	105	70%

As illustrated in Table 4, SLPs demonstrate a clear preference for single-player games (70%). Viewed from the applied perspective, this preference may be attributed to the specific requirements of the educational and therapeutic process, as single-player formats allow for more controlled, individualized interaction between the clinician and the student.

The subsequent section of the survey addressed the specific disorders for which educational computer games are most frequently utilized. To ensure clinical application and efficacy, it is essential that SLPs integrate these games for enhanced achievements based on evidence-based resources and predictable learning outcomes. The results presented in Table 5 indicate that educational computer games can be really effective in addressing various learning disabilities. In addition, it can conceived that they may serve as a supportive tool in managing symptoms of hyperactivity in target groups of learners with disability. Relevant findings are reported in Table 5 as follows:

Table 5 - Utilization of educational computer games categorized by specific disorder

Disorders	Frequency	Percent
Educational problems	51	34%
Hyperactivity	37	24.6%
Autism	16	10.6%
Sensory Processing Disorder (SPD)	18	12%
Mental retardation	23	15.3%
Stuttering	11	7.3%
Language Impairment	42	28%
Speech Disorders	23	15.3%
Dyslexia	34	22.6%
Behavioral and Emotional Disorders	23	15.3%

The third research question investigated the frequency of educational computer game utilization and the perceived learning outcomes: To what extent are educational computer games utilized, and what are the perceived learning outcomes reported by SLPs? This question specifically assessed the frequency of computer-based gaming integration within speech-language therapy. The findings revealed that the majority of SLPs utilize educational games on a weekly basis (once per week), while other frequencies of use were distributed equally among the respondents (see Figure 1).

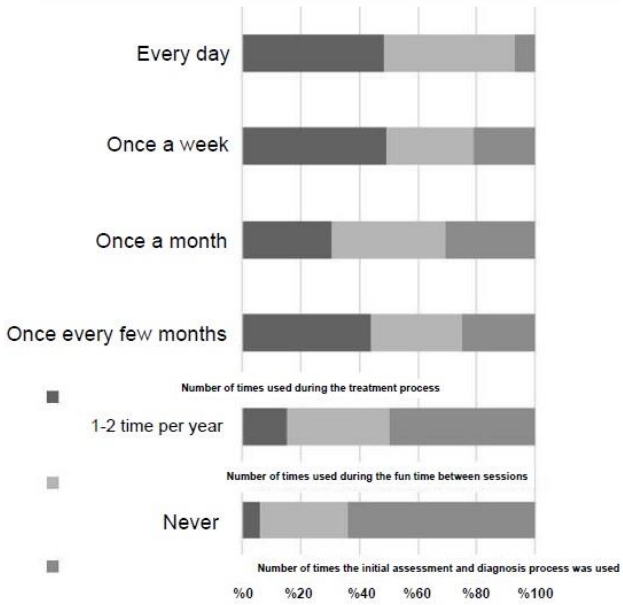


Figure 1: Frequency of educational computer game utilization among SLPs

Furthermore, the perceived learning outcomes of these games were evaluated. Most practitioners reported that the use of educational games serves to reinforce supplementary knowledge and skills rather than being used to acquire foundational or primary skills.

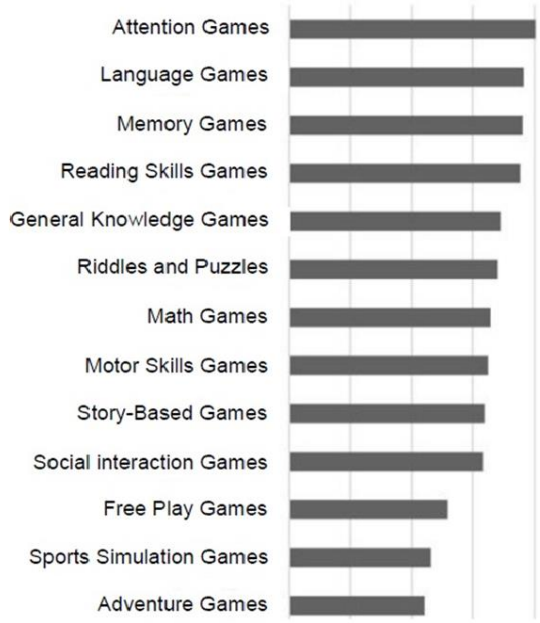
The fourth research question addressed the specific types of games used and the information sources relied upon: Which types of educational computer games do SLPs utilize, and what are their primary information sources for selecting these games? Figure 2 illustrates the distribution of educational computer games based on their genre/type. The categories identified include: precision, language, memory, literacy, general knowledge, puzzle, mathematical, motor skills, narrative-driven, social-interactive, and sandbox (open-ended) games. Additionally, sports simulation and adventure games were included in the classification.

Table 6: Perceived learning outcomes of educational computer games

Perceived Learning Outcome	Frequency	Percent
Acquisition of basic knowledge and skills	34	22.6%
Acquisition of supplementary knowledge and skills	61	40.6%
Assessment of knowledge and skills	25	16.6%
Entertainment and downtime	30	20%

As shown in Figure 2, precision, language, and memory-based games are the most frequently utilized categories. These findings align with the specific clinical disorders targeted by SLPs, as previously detailed in Table 5. Conversely, sports simulation and adventure games were the least frequently utilized. This lower frequency may be attributed to their emphasis on high-arousal/excitement elements at the potential expense of structured pedagogical progression. It is suggested that SLPs may reserve these genres primarily for recreational breaks during sessions with children with special educational needs.

Figure 2: Utilization of educational computer games categorized by game type



The subsequent section details the types of systems (hardware) utilized by SLPs to facilitate the use of computer-based games.

Table 7: Types of technological systems utilized by SLPs

Types of Systems	Frequency	Percent
Computer	68	45.3%
Laptop	37	24.6%
Smartphone	10	6.6%
Tablet	23	15.3%
Television	4	2.6%
Interactive Whiteboards	8	5.3%

Furthermore, the investigation examined the information sources practitioners rely upon for identifying and selecting appropriate educational computer games. The majority of SLPs reported acquiring useful clinical information and game recommendations through professional websites and online resources. Additionally, participants utilized

peer-to-peer exchange (colleagues), professional development courses, and academic forums such as conferences and seminars. The specific breakdown of these sources is presented below.

Table 8: Information sources utilized for selecting educational computer games

Information Sources	Frequency	Percent
Colleagues	36	24%
Professional courses offered by employers	10	6.6%
Personal development professional courses	18	12%
Conference and Seminar	21	14%
Patients and Parents	16	10.6%
Professional websites and online sources	49	32.6%

Discussion

This study aimed to investigate the current landscape and efficacy of educational video games as tools for the initial assessment and therapeutic management of children with special educational needs (SEN). Our findings reveal that available educational video games lack the standardization and specific clinical design features required to effectively support Speech-Language Pathologists (SLPs) in the initial assessment of speech and language deficits in children with SEN. Furthermore, a significant gap exists between the theoretical potential of digital game-based therapy and its practical implementation within clinical environments.

Overall, SLPs maintain a positive attitude toward the integration of educational computer games into their practice with children with SEN. Currently, these tools are primarily utilized during the therapeutic process to provide recreational breaks between sessions, and ultimately, for assessment and evaluation purposes. Notably, one-quarter of the participating SLPs do not utilize educational computer games at all, highlighting a critical need for the development of professional platforms and specialized resources tailored to the requirements of children with special educational needs. The frequency and pattern of use remain highly unstructured; most SLPs utilize games once a week or once a month, while daily or frequent use remains rare.

The most commonly utilized tools are free internet-based games, suggesting that the majority of clinicians select these resources based on subjective professional judgment. A secondary group of games consists of those recommended by government institutions and organizations involved in the inclusion of children with SEN. Only a small percentage of SLPs utilize subscription-based resources, which are often specifically engineered for educational purposes and the management of children with special educational needs.

Regarding clinical application, SLPs find educational computer games appropriate for addressing the following conditions: learning disabilities, language disorders following ADHD, dyslexia, speech disorders, and intellectual disabilities. This preference likely stems from the fact that many existing games incorporate language and reading-based tasks; conversely, designing tasks to target cognitive functions, such as memory and attention, is arguably more straightforward. Surprisingly, Autism Spectrum Disorder (ASD) was not represented among the targeted conditions, despite extensive research highlighting the benefits of computer games for children with autism. Furthermore, games are rarely utilized for children with stuttering or specific speech fluency disorders. The primary expectation of SLPs when using these tools is the acquisition of additional knowledge and skills by the child. Regarding information sourcing, clinicians primarily rely on professional websites to identify relevant gaming resources.

Conclusion

While educational video games hold significant promise for pediatric

rehabilitation and the enhancement of engagement in special education, current software designs do not adequately meet the rigorous clinical requirements for standardized assessment and intervention. This study underscores a critical gap between the potential of digital gaming and its practical implementation in clinical speech-language pathology. There is an urgent need for the development of evidence-based, clinician-supported, and standardized gaming platforms specifically designed to improve therapeutic outcomes for children with special educational needs.

Furthermore, this research identifies a major opportunity to develop professional educational databases that provide SLPs with curated, high-quality, and clinically applicable gaming resources. It is essential to recognize that technology, particularly digital games, should not be viewed as a replacement for professional clinical expertise; rather, it should be integrated as a sophisticated supplementary tool. When implemented correctly, computer games can augment traditional therapeutic techniques, providing a more versatile and engaging framework for the assessment and treatment of children with diverse developmental and communication challenges.

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