

**COMPUTER USAGES TO DEVELOPING SOME OF THE LANGUAGE SKILLS TO
STUDENTS WITH INTELLECTUAL DISABILITIES**

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ABSTRACT

Mentally impaired people have different talents and features hence, their learning ability and social maturity varies. Programmed learning Computer-Assisted instructions were developed in the 1960s to aid children in developing their language and academic skills. In recent years, specialists have been particularly interested in the function of information and communication technologies (ICTs) in helping students with intellectual disabilities to improve their daily life skills. The goal of this systematic study is to examine the potential of new technologies in relation to education, adaptive skill development and academic and social inclusion of students with intellectual disabilities. The study conducted literature searches in *GOOGLE SCHOLAR* to identify literature that addresses the effects of computer usage in developing language skills. This research supports the world and Arab perspectives that we need to develop programs and services that help exceptional instances, who are mentally handicapped to enhance

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their abilities and participate in their communities, allowing them to become self-sufficient citizens. Adaptive technology may also enable children with severe impairments to become active learners in the classroom alongside their classmates, allowing them to participate in a wider range of educational activities to meet a variety of needs. This article explains how computer technology may assist students with special needs in learning in regular classes.

Keywords: ICTs; Intellectual disability; Visual learning; physical disability; impairments

1. INTRODUCTION

In recent years, there has been an increase in the number of studies and literature reviews on the general difficulties in daily life skills, both in the context of the school and wider environment but also in the possibility of vocational training and inclusion faced by persons with a mental disability. The purpose of this literature review was to answer questions that have developed in recent years in relation to research on the use of ICTs in the field of mental impairment. Since the 1980s, it has been stated that the application of modern technology in special education allows for the "integration" of children into society (Dillon, 2004). Furthermore, learning using ICTs play a significant role in both traditional and non-traditional learning contexts, as it ensures equitable access to educational and social growth (Istemic Starcic & Bagon, 2014). All of the above prompted our team to look at the kind of protocols that were designed and executed, as well as their success in crucial areas such as adaptive skills and social inclusion. It was believed that it was important to describe how mental disability is defined, especially after the name change in 2002, and then it looked at the possibilities presented by ICTs to better the lives of these individuals through the protocols. The systematic review includes studies since last seventeen years, researchers have looked into daily life skills, literacy, learning geometric concepts and shapes, focused attention, gross and fine motor skills, and visual-motor coordination, as well as ICT protocols like video prompting, video modelling, computer-based instruction, computer-based video instruction, and iPad use. According to the findings of the review, implementing ICT protocols can enhance everyday life, accomplish social inclusion, and enable the occupational integration of individuals with general learning disabilities (Alexopoulou 2021). For clinicians, each new discovery of pathogen genes in the brain's molecular pathway is crucial because it has

a direct impact on families. In neuropathies like intellectual impairment or developmental delays, early diagnosis leads to prompt intervention, which improves educational intervention planning in the future. The scientists believe that these novel de novo point mutations in ID will lead to new insights into the molecular etiology and transcriptome map of ID, allowing for more accurate genetic diagnosis in the Iranian population. Furthermore, determining the source of a unique mutation may open the door to splitting ID patients into familial and sporadic forms, which might lead to cohort studies that could aid targeted therapy. In the afflicted population, this principle is the most important step toward individualized medication (Parsamanesh 2018).

The low-level intelligence quotient (<70) is a common neurological issue that causes intellectual impairment or cognitive disruption. Approximately 1% to 3% of the overall population suffers from intellectual impairment. In X-linked, autosomal dominant, recessive and mitochondrial inheritance patterns, the interaction of environmental circumstances and diverse genetic agents can induce intellectual impairment. When engaged in bases of the whole genome, spontaneous mutations in the germ line can have critical phenotypic consequences. The etiology of intellectual impairment is important for accurate diagnosis and can help the couple plan for the future. The advancement of genome sequencing technology has the potential to increase mutation detection in a single experiment. These methods have been demonstrated to be a novel approach to understand the molecular mechanism in a hereditary illness. This finding might have far-reaching implications for early detection and therapy development.

1.1. The study's challenges

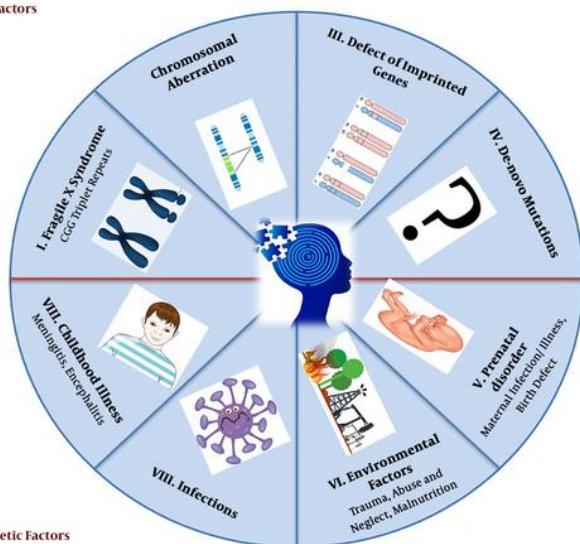
Its goal is to determine the efficiency of computer learning programs in assisting mildly mentally challenged (I.Q: 75–70) individuals in improving language abilities such as listening, conversation, reading and writing, as well as the challenges they confront and suggestions for overcoming those challenges.

1.2. Etiology

The perspective of illness etiology can give useful and important clinical information for the diagnostic, prognostic, concept and therapeutic conversion. This notion aids couples in planning and understanding the

likelihood of a future pregnancy recurrence. Several reasons for intellectual impairment and global developmental delay which are briefly discussed in this paper. Genetic and non-genetic factors are the two primary etiologic causes for ID as shown in [Figure 1](#) (Rauch A 2006, Wakefield J 2002).

A. Genetic factors



B. Non-genetic Factors

Figure. 1 represents diagnostic flow chart for evaluation of intellectual disability patients first: Family history; second: Physical examination; third: Laboratory diagnostic tests, including: Cytogenetic study, assessment of fragile X syndrome, array studies (SNP, CGH) and whole exome sequencing (Parsamanesh 2018).

Table 1. Disability statistics according to types of disability (Noor 2016).

Types of disability	Number
Hearing impairment	62,153
Vision impairment	50,827
Speech impairment	3,988
Physical disabilities	174,795
Learning disabilities	188,911
Mental	24,263

Multiple disabilities	27,025
Total	531,962

2. LITERATURE REVIEW

2.1. Terms used to describe mental study

It study is based on three measures: mental performance is below average (25.1), less than 75-70 and two or more adaptive behavior skills are lacking, which occurs between the ages of childhood and 18. The language skills include listening, conversing, reading, and writing. It entails verbal communication, the acquisition of concept-related terms, reading readiness, and the ability to express oneself vocally and in writing.

2.2. Related studies

The effect of linguistic preparation on language and cognitive learning in mentally impaired individuals who are educated & capable was studied. The hypothesis was supported by the data (KhiryAgag 1999). For this reason, four mentally challenged children were found to have learnt figures of words using a computer program, whereas one kid had failed (Lee Yeungoo 2001). Therefore, the research on the usefulness of computer programs in acquiring some linguistic abilities led her to this conclusion (ImanFarag 2003).

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The researchers investigated the relationship between IQ and verbal language development as well as figural language (children's drawings) including gender disparities. Hence, it discovered a link between the degrees in the two languages that shows significant differences in mean verbal language scores vs. figural language scores. The outcomes of the study were in favor of the verbal language, as well as gender disparities in favor of females and differences between children with low I.Q. and those with high I.Q. in favor of the high IQ groups (Hanan El ziat 2003). Although there were some speaking and pronunciation issues among the mentally challenged students, as there was no evidence of fluency found (Abd Allah El Wably 2003). Therefore, they looked at the written outputs of power strategy and discovered that it boosted word rate from ten to forty words among students with writing disabilities (C.T. whedomBakken 2004). Hence, it was discovered that when learning challenged youngsters interacted with computers, their reading skills improved (Thomes Tius et.al. 2004).

The usefulness of a computer software in reducing hyperactivity in youngsters was discovered (Ahood Safer 2004). However, (ZeinabZeedan 2005) discovered the usefulness of a computer software in increasing listening and reading abilities among mentally handicapped persons. Moreover, non-verbal communication in mentally handicapped children was studied, and a training method based on spoken language was employed to rehabilitate weak and ambiguous utterances (Abd Allah El Wably 2005). As a result, the effectiveness of a training programme in improving receptive verbal communication abilities, expressive skills, verbal content-related skills and lingual age development among persons in mentally retarded schools from 4th, 5th, and 6th grades was identified (Ala'aMahran 2006).

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F. Connors et.al. 2006 used a phonologic reading skills training program in which children learnt how to pronounce words, due to which their phonological awareness also improved and those with prior language abilities performed better. The findings of the study demonstrated that cerebral palsy children with mental disability had poorer language awareness than normal children particularly, when their capacity to speak was compromised (Peeters et.al. 2007). Yet founding an association between reading and understanding of written texts in slightly mentally challenged persons and their I.Q. Control and experimental groups were created from the sample. The study's purpose was to see how effective a training program was using four different strategies: summering principle concept, responding comprehension questions, clarity, and expectations. For the four reading types, there was also an integrated treatment. According to the findings (Van Boss et al), there were significant modifications in favor of the experimental group (2007).

The impact of a mental-health training programme was studied and it included skills such as: using a mouse, using a keyboard, entering data onto a computer, and utilizing a computer in their daily lives, their talents were assessed before, throughout, and after six months of instruction. According to the data, their acquired skills remained constant (Cecilia et.al. 2007). Therefore, the influence of employing a mobile software application with mentally challenged people who are unable to operate a traditional phone was being studied. According to the statistics, respondents who completed eight calls required less assistance and made fewer mistakes (Sock et.al. 2008).

2.3 Comments on previous studies

The researcher attempted to apply the following results after analyzing the literature, hypotheses of the study, goals of the study, sample subjects, technique, and tools were that the topics and objectives included

expressive and receptive language abilities, as well as figural language (children's drawings) and how it influences their verbal language. Speech issues and their impact on handicapped people's personalities; verbal and nonverbal communication, phonetics, reading and comprehension, and the impact of mobile phones and telephones on writing abilities. It included persons with various levels of mental impairment (mild to severe), as well as individuals with language difficulties, learning disabilities, hearing impairments, and movement issues. Therefore, further exams were conducted for figural and verbal expression, listening and reading, phonetic awareness, reading and comprehension, and verbal intelligence. Moreover, they observed the differences between groups benefited experimental groups, that girls did better, and that IQ had an effect on language skill development.

2.4 Study findings:

As previously stated, the researcher attempted to address the following questions: What are the cognitive, academic, and language skills of slightly mentally impaired individuals?

In the early year's cognitive academics described the differences between impaired and typical children are minimal but they become important as they get older, yet finding that mental growth progresses at a slower pace. Looking at IQ (as mentioned above) we can see that the handicapped person's mental age spans from 7 to 11 years old with a scholastic accomplishment of no more than 4th or 5th grade. Because he is weak at abstract thinking and manipulating symbols, his language development is delayed. His mental functions (attention, perception, reasoning, and memorization) are all below average. As a result, center processing via stimulus categorization, reasoning and evolution is difficult. The majority of concepts are tangible.

Mentally handicapped students can study in school based on their IQ and talents. Any educational or instructional program must include academic characteristics for the close interaction between teachers and students, selection of activities and training by involving people, learning, and using problem-solving skills.

2.5 Features of linguistic abilities

Stuttering is common among mentally handicapped persons; their phrases are weak and simplistic and they do not correspond to their mental or chronological age. As a result, it is referred to as juvenile language; there are numerous errors and weak grammatical norms. Language development progresses at the same rate as cognitive growth. Computers play an important role in helping mentally challenged youngsters to study more effectively. In contrast to what was going on in the middle of the twentieth century, special needs programs and educational materials were adjusted. In the 1960s, programmed teaching became popular, allowing individuals to learn quickly provided the programs were well-prepared. The computer was then used as a direct way of learning in special education classrooms. It demonstrated that it is an appealing way to communicate with people while they are learning and provide feedback in order to track progress and correct errors. Studies revealed that people were enthusiastic about learning through computer programs that effectively treat speech abnormalities, language development and trainings are aided. Following are some

examples of computer applications in the educational process:

It is employed in the field of administration for filing records, making instructional schedules, and producing schooling reports are just a few examples. It is employed in the field of research is to solve issues, carry out mathematical operations, and interface with data-driven centers. It was a subject for study is for students, researchers, and laypeople, as well as members of the community and organizations. It acts as a learning facilitator: It is suited for self-learning by anyone regardless of their talents. It may be used to learn new things is by creating programs in a variety of disciplines.

In special education, the computer had evolved into the following instructional technologies: It assists in dealing with an ever-increasing number of individuals. The classrooms were overcrowded as a result of the growth in population. Teachers also employ several technologies in the classroom, such as television, radio, and computers. It aids in the management of individual variances among people.

In the cognitive phase, they aid in the faster acquisition of concepts, facts, rules, and theories by clarifying abstract language via direct experiences. In psychomotor skills, they teach individuals how to write, swim, and use tools and apparatus; and in affection skills, they educate people attitudes, interests and values via real-life experiences.

Educational technology aid in the realization of cognitive, psychomotor and emotional learning goals. They assist in the cognitive phase by clarifying abstract language through actual experiences associated to help obtain concepts, facts, laws and theories in less time. In psychomotor skills, they teach individuals how to write, swim, and use tools and apparatus; In affection skills, they educate people on how to develop attitudes, interests and values via real-life experiences. Some challenging topics can be taught with the aid of educational technology because they employ audio-visual tools and tangible figures like slides, films and microscopes to impart some educational experiences. Mountains, historical events plant and animal growth; bacteria and viruses are only a few instances of experiences that people can't relate to right away. People's drive to study is increased by educational technology, which causes them to concentrate and participate. They will not be bored and will engage during listening, conversations and lab activities since they will employ several senses (vision and audition) and manipulation. Educational tools assist students in changing incorrect beliefs and attitudes. They

picked bad habits at home, in the club and on the street, such as lying and tossing the trash in the street. By watching films, we can help people correct their bad habits. Learning is aided by educational technology because, by utilizing educational software, we can assist individuals in learning independently rather than relying solely on teachers; instead, they will serve as facilitators. People's language skills improve as a result of educational technology. They employ a computer, audiotapes and videos to supply words for children and adults to learn their mother tongue and other languages. Learning is conserved thanks to educational tools. Films and digital software for instruction help students remember more and retrieve material more quickly. People are taught scientific thinking skills using educational tools. Observation and experimentation, data collecting, and hypothesis verification are only a few examples. Educational technologies aid in teaching employees how to tackle some of their issues

Films and slides are controlled by efficient professionals using computer software. Teachers save time and effort by using educational tools because computer-based training tools and practices allow people to learn on their own, instructors' responsibility will be limited to counseling, coaching, evaluation and follow-up.

- How do computers help mentally challenged children learn some language abilities (hearing, talking, reading, and writing)?

Listening is crucial since it is the foundation of all communication, including conversing, speaking, reading and writing. We may also increase listening skills by using a CD that incorporates events from the mentally disabled's everyday lives, allowing them to converse, comprehend and acquire language terms. Therefore, it is vital to strengthen mentally challenged conversing and speaking skills by reciting written materials that aid verbal expressiveness. Moreover, several Programs were created by experts to assess the readability levels of texts among mentally impaired people based on sentence and word length and complexity. However, Listening, reading, and expressing talents are all linked to writing skills in mentally challenged persons, as are psychomotor skills like discriminating and drawing words. This may be accomplished by using handwriting books to instruct individuals.

- What are the obstacles to utilizing computers in the classroom to teach mentally impaired children?

Here are some issues that may be caused by the mentally challenged person themselves, by teachers or by

programs. A scarcity of computer science and technology experts. If teaching is insufficient, train the instructor to operate a computer and become familiar with it in programming sessions. Educational programs are insufficient to meet a variety of educational demands. There are several issues with integrating computers in schools, including maintenance, operating, and follow-up. Preparing instructional programs using computers is expensive. Whenever feasible, middle school students should be the ones to use computers in groups in the classroom. Because a computer's television screen is small, letters and numbers appear to be too small, forcing the student to sit in front of it like a typewriter does in front of a typing machine. Sound instructional programs are rare, and Arabic versions of them are similar to (Arab star.) (algorism,) and (Arab star) (arithmetic teacher program). Organizing teacher training programs to improve their efficacy and encourage them to utilize computers in the classroom. Creating computer programs for intellectually impaired people or translating Arabic into other languages. Develop graphical instructions to work that display on the screen in front of individuals to help mentally impaired youngsters handle computer apparatus who have motor coordination issues. People's lack of access to computers can be addressed by facilitating their sales or assisting them through charitable and social groups. School training programs might take place during the day or in the evening.

3. METHOD

The descriptive-analytic technique is used in this study. In light of prior research, the researcher attempts to investigate the role of utilizing a computer in the development of language abilities among mentally challenged children. This systematic review was conducted in accordance with the PRISMA-P. In light of available literature, the researcher aimed to explore the following questions using a descriptive-analytic approach:

- What are the cognitive, intellectual, and linguistic abilities of those who are mildly challenged?
- What is the role of computers to improve the learning process of the mentally disabled?
- What function does the computer play in the development of some of the people having language abilities (listening, conversing, reading, and writing)?
- What challenges do individuals and instructors confront when it comes to employing computer applications in that field?
- How will we overcome these challenges?

As a result, the researcher conducted studies to determine its efficacy in teaching language skills (listening, talking, reading, and writing), because their IQ is so low, as are their cognitive capacities, teaching language skills to moderately mentally impaired people is quite tough thus, we must employ a variety of ways. Based on tailored learning, the computer is stunning. Many studies have shown that utilizing a computer can help mentally impaired people improve their academic and linguistic abilities (Stromer. Et al. et al.), Shimizu, (Yamototo 2001, and Iman Farag (2003). The research attempted to answer the fundamental question that “how helpful is utilizing computers to help youngsters with modest mental disabilities improve language skills such as conversation, reading and writing”?

3.1 Extracted questions from the results

The following are some of the questions that have arisen as a result of this inquiry:

- What are the features of slightly mentally retarded in terms of cognitive, scholastic, and language skills?
- What function does the computer play in the educational process of mentally challenged children?
- What role does the computer play in helping mentally challenged youngsters gain certain language abilities such as listening, conversation, reading, and writing?
- What challenges do individuals and instructors face when developing computer programs for people with mental disabilities?
- What are the options for overcoming such challenges?

3.2 Data extraction

Reviewing the titles and descriptions of each item was the first step in the selection process. Second, after deleting insufficient abstracts, the publications were studied in their entirety.

3.3 Eligibility criteria

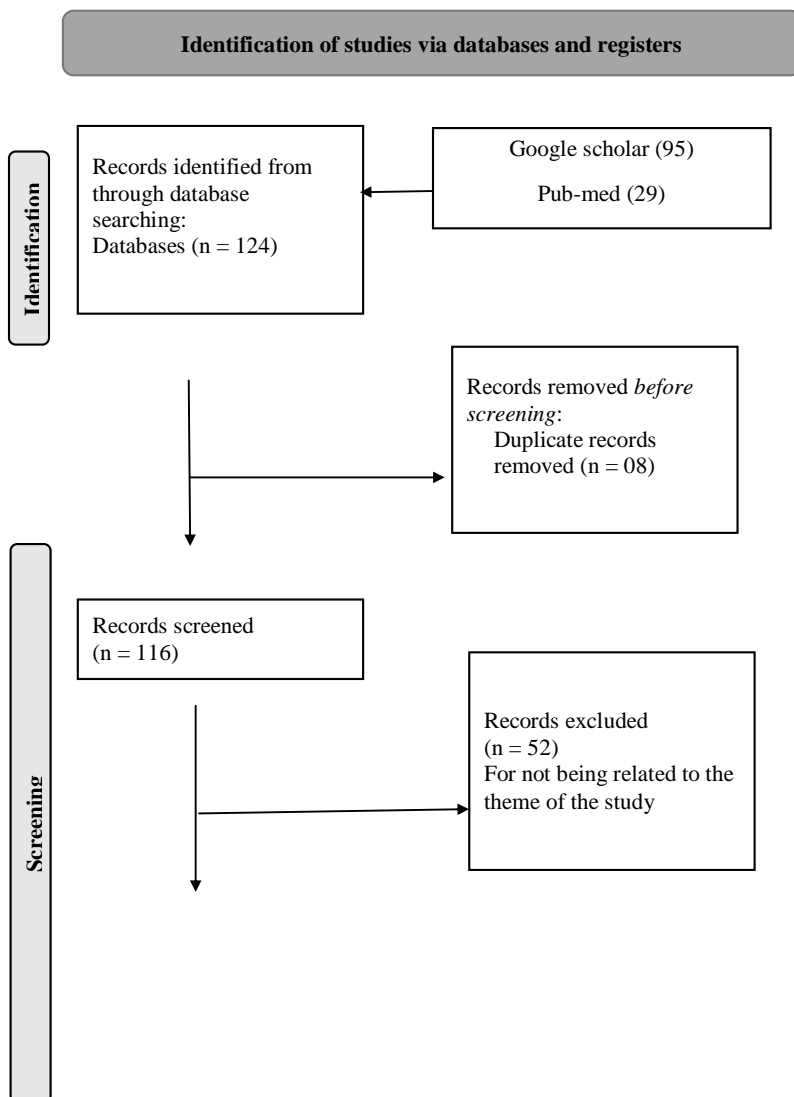
Only human studies in English analyzing the link between computer usage in developing language skills among mentally disabled students were included. Author correspondence, theses, dissertations and animal studies were not accepted.

4. RESULTS

The first search generated a total of 124 articles. After filtering by reading titles, abstracts, and duplicates, 105 studies were excluded and 25 articles were selected for a reading of the full text. Of these, 19 articles met the eligibility criteria, as is illustrated in Figure. 2.

4.1 Study characteristics

The selected studies were carried out mostly with usage of computers for developing language skills among mentally disabled students, in different nations throughout the globe.



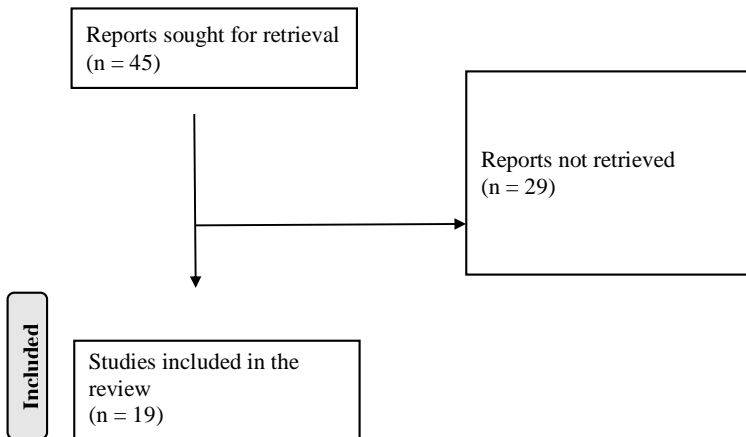


Figure. 2: The PRISMA flow diagram

5. CONCLUSION

This research supports the world and Arab perspectives that we need to develop programs and services that help exceptional instances who are mentally handicapped to enhance their abilities and participate in their communities, allowing them to become self-sufficient citizens. Arabic studies that employ current high technology, particularly computers to develop academic and linguistic abilities are uncommon. Furthermore, developing mentally disabled people's verbal language abilities allows them to interact with others and enhance their academic skills.

Recognizing the cognitive, scholastic, and language capabilities of children with modest mental disabilities. To emphasize the role of computers in helping mentally impaired youngsters study more effectively. To demonstrate the necessity of utilizing computers to help mentally challenged youngsters gain certain language abilities (listening, conversation, reading, and writing). To identify barriers to usage of computers in the field of mental disability in general and in the case of slightly mentally challenged children in particular. Learning

how to deal with such challenges. Understanding the advantages of utilizing a computer with mentally impaired people based on prior studies and study findings.

DISCUSSION

According to Brodin (2010), the most important Mastering the generalization of acquired skills so that training and intervention programs have a meaningful and long-term influence on their quality of life, with the goal of social and occupational inclusion, is a challenge for persons with intellectual impairments. All of the preceding study procedures indicated that computer simulation, video modeling, and video instruction are excellent approaches to educate persons with intellectual impairments on a variety of independent living skills. CBVI training, in particular, has been shown to assist people to learn and generalize daily living skills (Mechling, Gast, & Langone, 2002; Mechling & Cronin, 2006; Ayres & Cihak, 2010; Mechling & O'Brien, 2010). The process is different from video modeling, in which students watch the model do the steps and then repeat them. In a computer-based simulation environment, video training includes interactive features and learners receive immediate feedback. The interactive whiteboard was also beneficial since it allowed for visual-motor coordination and attention training (Sahin & Cimen, 2011). It is a very user-friendly tool since it adapts to various technical gadgets and allows for the expansion of its present functionality. Some people were also effectively trained in the development of ICT-related abilities (Dekelver & De Boeck, 2010) and geometric concept perception (Mastrogiannis & Anastopoulos, 2012). Another effective way for educating and teaching persons with intellectual impairments on the generalization of daily life skills was through multimedia computer simulation (computer-based instruction - CBI) (Mechling, Gast, & Barthold, 2003; Davies, Stock, & Wehmeyer, 2003; Ayres et al., 2006; Hansen & Morgan, 2008). Furthermore, the iPad has shown to be an effective tool for teaching persons with intellectual impairments basic life skills (Cakmak & Cakmak, 2015). Video-assisted training on mobile devices such as the iPad has been proved to be effective and time-saving (Kellems et al., 2018). The iPad depicts objects more correctly than static images that do not adequately capture the objects' real shape and size. However, a person with an intellectual handicap will find it challenging to hold an iPad and a supermarket cart at the same time, for example, while grocery shopping. In a more controlled context, such as a classroom, video prompting through iPad is likely to be beneficial.

Video prompting (Mechling & Gustafson, 2009; Cannella Malone et al., 2011; Kellems et al., 2016; Bouck, Satsangi, & Bartlett, 2017) was found to be more effective in the education and training of people with intellectual disabilities than static images, audio devices, and video modelling (Mechling & Gustafson, 2009; Cannella Malone et al., 2011; Kellems (Mechling & Swindle, 2013; Kanfush & Jaffe, 2019). Finally, the significance of ICTs in aiding intellectually impaired persons in all areas of adaptive skills is undeniable, as the review concludes. Information and communication technologies (ICTs) aid in the removal of barriers, allowing pupils to gain independence and autonomy. ICT training and assistance assist students with disabilities in removing barriers to their education (Wehmeyer, Smith, Palmer, Davies, & Stock, 2004), achieving curricular objectives (Brodin, 2010), strengthening their skills, and increasing their self-esteem. As a result, we argue that further ICT integration in learning settings, curriculum design, and vocational training development is required. We also believe that more study into therapies using other portable technology devices, such as tablets and smartphones, may be done since they are easily accessible and convenient, and could enhance the lives of intellectually challenged individuals. At the same time, because the intellectually handicapped persons educated in all research protocols make up a very small sample size, the good findings of all research protocols must be backed up by larger-scale research.

FUTURE PROSPECTIVES

By providing an overview of recent studies in the subject, the purpose of this study was to acquire information regarding the use of computers in strengthening language skills for children with intellectual impairments. For kids with intellectual impairments, learning academic and practical skills is a huge task. The system would give recommendations to special education instructors that would aid them in establishing a language-based teaching method that would fulfil the particular educational requirements of individuals with intellectual impairments. To do this, it is necessary to properly describe the domains of learning language and intellectual disorders, thus the first step is to build an ontology for educational domains and characteristics of students with intellectual disabilities. For better selecting appropriate activities for kids with intellectual impairments, the new ontology will be developed in collaboration with special education instructors. Special education instructors can use the expert system to incorporate activities for education into the teaching process that will

meet the student's particular requirements with the objective of developing the intellectual and adaptive abilities they require to operate at their best. So far, the research has contributed to the project by defining terms such as activity-based learning, educational games, serious games, and connecting them to the term intellectual disabilities, as well as highlighting new findings in the use of digital games in the upbringing and education of students with intellectual disabilities. These discoveries aided in a better understanding of the subject of language learning for kids with intellectual impairments, and they will play an important part in the project's next phases, which involve the construction of a domain ontology as a starting point for the future expert system (Kristian Stancin 2020).

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

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FUNDING
CONSENT FOR PUBLICATIONS
ETHICAL DECLARATION

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