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Prospects for the Use of Artificial Intelligence Tools for People with Learning Disabilities with Special Reference to Some International Efforts

AOUAIDJIA Hamida

Badji Mokhtar –Annaba University
Email: hamida.aouaidjia@univ-annaba.dz
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Abstract

This study aims to identify the most important artificial intelligence applications used in diagnosing and treating speech disorders and dyslexia, emphasizing the linguistic and cultural specificities of each society. The study aims to answer the following question: How effective are the proposed programs in treating speech and reading disorders in different countries around the world, and in our Arab environment in particular?

A descriptive approach was adopted, and a comparative approach was used to compare various experiences and applications. The study concluded that digital therapies are rapidly adapting. It also recommended the development of training programs for teachers and the provision of modern tools that respond to all age groups and diverse societal cultures.

Keywords

Artificial intelligence, digital programs and applications, speech disorders, dyslexia, people with special needs, learning difficulties.

Introduction:

The world is currently witnessing a massive technological revolution driven by the Fourth Industrial Revolution. This revolution has manifested itself in many, if not all, areas of life. Education is one of these areas, and many countries have worked to enhance the quality of education by adopting artificial intelligence technologies for their citizens, whether for ordinary children and students, or even those with special needs.

Many countries have adopted the United Nations agenda in their vision for sustainable development and their ongoing plans to achieve education for all, along with its principles of justice, equality, and social inclusion. The eighth meeting of the Social Groups Forum, held on June 11, 2025, under the auspices of Finland and the Nordic countries, recommended the need to enhance the participation of persons with disabilities by designing artificial intelligence systems that take into account the needs of this group. The UNESCO conference on digital transformation in the public sector, held on June 5, 2025, also addressed ethical aspects and social inclusion.

Interpersonal communication is a fundamental human and social need in our time, occupying a significant portion of daily social interactions. Communication takes on many dimensions, not just the simple act of pronunciation and the articulation of words. Rather, it is a simultaneous and interconnected process involving numerous systems within the human body: the nervous system, the auditory

system, the respiratory system, the resonance system, the vocal system, and the articulatory system. Speech disorders may seem like a normal issue to some, but in reality, they take on multiple dimensions and social reactions, and the affected person may experience social rejection, frustration, aggression, and many other emotional reactions and perceptions.

The era of the technological revolution offers numerous digital applications and programs to train children and improve their collaborative interaction by reducing speech disorders. This study aims to answer the following question: How effective are the proposed programs in treating speech and reading disorders in various countries around the world, and in our Arab environment in particular? Is it possible to achieve social inclusion through sustainable development policies for individuals with these disorders?

Previous studies:

Tahrawi Yassin and Tashma Radhia's study, "Artificial Intelligence and Learning Difficulties," Journal of Measurement and Psychological Studies, Volume 1, Issue (4), February 2022. The study aimed to clarify the importance of the special needs category and how to use artificial intelligence for diagnosis and treatment, given the difficulties in developing algorithms that are valid for all cases and categories. The study contributed to clarifying how to use various artificial intelligence techniques and systems with speech disorders, dyslexia, dyscalculia, and dysgraphia. The study concluded that it is necessary to focus on teacher training and developing effective educational programs, while working to build digital therapeutic programs to serve people with learning difficulties in the Arab world.

J. R. Yap et al's study, Artificial Intelligence in Dyslexia Research and Education: A Scoping Review, Article in IEEE Access · January 2025
This study focused on students with dyslexia, through the research conducted, and its relationship to artificial intelligence. The descriptive approach was adopted, and literature in the field of dyslexia was collected and summarized through several electronic databases. Four main applications were identified and used. The study recommended improving artificial intelligence tools in various aspects of dyslexia, promoting interdisciplinary collaboration, expanding the use of local languages and dialects, and paying attention to ethical considerations and information quality issues.

Sara Mostafa Mohammed El-Hennawy's study, The Impact of Artificial Intelligence (AI) in the Assessment and Treatment of Communication Disorders (A Review of Literature), Egyptian Journal of Language Engineering, Vol. 11, No. 2, 2024.

The research paper examines how artificial intelligence and digital transformation in education can contribute to the diagnosis and treatment of children with communication disabilities. The study also addresses ethical, legal, and cultural aspects, and proposes a number of therapeutic tools and applications for specialists. It also examines the importance of logistic regression in analysis, treatment, and risk detection in cases of aphasia.

Commentary on Previous Studies

Previous studies have focused on clarifying the relationship and importance of artificial intelligence in education and upbringing, especially for children with disabilities. Some used samples of children, while others focused on a theoretical study of the subject.

This study complements previous studies in terms of presenting ideas and focusing on an important aspect of the education sector, namely the methods of digital transformation and the use of artificial intelligence. However, it focuses more on the effectiveness of applications and algorithms and the extent of their use in dyslexia and communication and speech disorders in general, through a comprehensive evaluation at the international level. It also focuses on some Arab countries through their progress in generalizing the use of digital education for people with special needs.

Significance of the Study:

The importance of this study lies in emphasizing the importance of proposing training programs and their relevance to children with speech and reading disorders. Studies have yet to fully establish the need to develop general policies in this regard. Many studies focus on only one aspect, examining a small sample of a specific segment of society. However, this issue requires careful consideration and a moment of reflection on all aspects of the problem.

Objectives of the Study:

The study aims to identify the most important digital applications used in treating speech and reading disorders in the era of artificial intelligence. It is important to consider the language and cultural specificity of each entity and organization by developing programs and applications specifically for them. This can only be achieved by allocating financial resources and training a large number of highly qualified specialists to undertake this task.

Study Methodology:

The descriptive analytical approach was used in many aspects of the study, while the comparative approach was used in other aspects. This was done to compare the various experiences and applications used, especially given the diversity of societies and cultures and the specificity of treatment.

1. Using Artificial Intelligence with People with Learning Disabilities:

1.1 Importance:

Many studies indicate that traditional "onesize-fits-all" educational approaches cannot be generalized given the diverse range of learners in our contemporary world. To overcome this, educational content has been adapted or flexible learning environments have been designed, especially with the increasing presence of people with learning difficulties in many countries. Therefore, it is necessary to examine these studies that rely on comprehensive design, especially in developing countries. (Al-Azawei, A., Serenelli, F., & Lundqvist, K. 2019)

The importance of using artificial intelligence for people with learning disabilities lies in:

- Accurately and quickly identifying cases of all types of learning disabilities.
- Adapting electronic programs to the learning needs and weaknesses of the target group.
- The ability to develop educational programs that meet the needs of learning and understanding.
- Improving the quality of life for people with learning disabilities, facilitating their integration into society.
- Creating an enjoyable learning environment while reducing frustration and inequality.

1.2 Using Artificial Intelligence with Learning Disabilities:

Today, we live in an era of digital transformations that have brought radical changes to the inputs and outputs of the education system. Artificial intelligence has changed the roles of stakeholders in the

education system, both through their interaction with traditional and virtual interaction patterns. Many interactive educational platforms offer a wide range of services to students, which will lead them in the future to solve many problems related to concentration and motivation, and to taking into account the privacy of those with special needs. It is also expected that the problems of large numbers in classrooms will be solved by providing realistic solutions based on feedback, thus improving academic achievement in universities and educational schools.(Alqahtani, M.,2021

Many programs are used with many cases that suffer from deficiencies in a specific aspect of the child's sensory abilities.

- **Electronic program for screening people with learning disabilities:** The program screens individuals and identifies the types of difficulties they face, assisting field specialists by providing a range of services that meet the purpose.
- **Using artificial intelligence with dyslexia:** Dytective is one of the most popular applications for diagnosing and treating individuals with learning difficulties. This application was developed by researcher Luz Rello, using cognitive aspects of computer science and linguistics, at the IE Business School. This tool won a UNESCO award. This program can provide a rapid diagnosis for dyslexia patients in 15 minutes using Spanish. The application is also equipped with 40,000 exercises that range from fun to serious, and it was specifically designed to address the needs of the child by focusing on strengths and developing cognitive skills.
- **Using artificial intelligence with dysgraphia:** This group is characterized by slow writing and many difficulties compared to normal individuals. These difficulties are usually discovered at a later age, which necessitates the use of artificial intelligence programs and applications to address the problems of these groups:
- Programs for spelling checkers
- Programs for speech production (synthesis speech)
- Programs that predict words and provide word banks (word banks and prediction words)
- Programs that review grammar and style (grammar and style checkers)
- **Using Artificial Intelligence with Dyscalculia:** There are numerous programs dedicated to dyscalculia, many of which are available online, that examine the difficulties individuals experience in math. Among these programs is "CAB-DC."

Cognifit's "CAB-DC" program is based on several tests aimed at diagnosing areas of weakness for individuals with dyscalculia. It is intended for children over 7 years of age and adults. Through a neuropsychological assessment, a report is prepared quickly and accurately after a test lasting 30-40 minutes. Using algorithms, psychometric results are obtained that meet the therapist's expectations.

Despite efforts to make AI more compatible with human activities, some researchers on digital transformation and its relationship to education and upbringing believe there is still a long way to go. Conversations between humans and AI still require a degree of accuracy and credibility. The desired goals can be achieved through simulations of educational conditions and the adoption of multimedia computing in assessment and feedback. (Memarian,B. Doleck,T.,2024).

1.3 The Knowledge Economy, Computers, and the Internet: The

knowledge economy is linked to the use of computers, as computers have become essential for personal use. Knowledge acquisition currently involves familiarizing students with the use of computers and their various software and applications.

It is essential to pay attention to teaching strategies to enable students to acquire direct concepts, as well as to problem-solving and methods of dialogue and discussion. Assessment is an important stage in the educational process, as information and communication technologies are employed in various strategies based on performance, observation, and communication (PBA), using a variety of assessment tools, such as checklists, presentation scales, and learning logs.

Electronic programs are often proposed that address e-learning from both a technical and administrative perspective. This makes it possible to improve and develop educational performance, strengthen communication opportunities with students and their parents, and facilitate various pedagogical processes related to exams and assignment preparation. Since the late 20th century, the World Bank has proposed the "Wordlinks" program as part of its efforts to bridge the digital divide by equipping schools with technological skills and capabilities. Many of the proposed instructional packages also offer interactive, feedback-driven learning experiences, based on a realistic study of various educational activities.

1.4 Selective Attention and Its Improvement Through Artificial Intelligence

An individual focuses their attention on stimuli that distract them from their surroundings, while ignoring other stimuli. This is accomplished through the senses of hearing and sight. Selective attention is usually divided into:

- Auditory Selective Attention
- Visual Selective Attention

1.4.1 Factors Influencing Selective Attention

External Factors:

- Intensity: Individuals tend to prefer more intense stimuli.
- Novelty: Familiar stimuli are usually less appealing than novel stimuli.
- Nature of the Stimulus: An individual differentiates between the type of stimulus and its auditory or visual source, which affects their ability to exercise selective attention.
- Stimulus Movement: Static stimuli may not engage the individual as much as moving stimuli.

Internal Factors:

- Fatigue and Rest: An individual is more attentive if they are physically and neurologically comfortable. - Intrinsic motivation: If an individual is more motivated to focus on a particular topic, they will achieve better results than if they were in a normal situation.
- Interests and inclinations: Individuals' interest in and inclination toward a particular topic will effectively contribute to increasing the degree of selective attention to it.

1.4.2 Using Technology to Improve Selective Attention:

The use of mindfulness-based programs helps reduce attention deficit disorder, in addition to programs that aim to improve working memory by developing selective attention.

Selective attention was used in one study to emphasize attention to important parts of an image while generating each word. This was done using a convolutional neural network to extract visual features from the image, in addition to a recurrent neural network that generates words sequentially. The study demonstrated that adding selective attention to a machine allows it to focus on certain important parts, making it mimic the functioning of the human brain. **(Xu, K., et al, 2015).**

2. E-learning Across the World

2.1 E-learning in the Eyes of International Organizations

UNESCO (2022) defines artificial intelligence applications as: computer programs designed for a specific purpose, downloaded onto multiple devices such as mobile devices, smartphones, and tablets, and connected to the internet.

The United Nations Educational, Scientific and Cultural Organization (UNESCO (2020)) emphasized that artificial intelligence contributes to sustainable development by establishing a culture of e-learning, improving teaching, saving teachers' time and effort, and addressing each student according to their abilities and interests. (unesco 25 June 2019)

It also helps in recognizing and analyzing voices and integrating people with special needs with their peers through the use of augmented and virtual reality technologies, various chatbots, and data analysis. (Guo,A., Ece Kamar,E., Vaughan,J.,Wallach,H., Morris,M.,2019)

The International Conference on Artificial Intelligence and Education, organized by UNESCO in cooperation with China in 2019, called for the use of artificial intelligence for learning purposes, and launched what became known as the "Beijing Consensus on AI and Education", in order to integrate artificial intelligence with the 2030 Education Agenda. (en.moe.gov. August 29, 2019)

Regarding people with special needs, the conference identified several concerns:

- Focusing on the comprehensive and equitable use of artificial intelligence in education for all segments of society, regardless of their social or cultural status or physical or mental disability.(iite.unesco.org, 2019)

- Promote and recognize the efforts of the UNESCO Institute for Information Technologies in Education (IITE) in developing a web portal for the visually impaired, which provides them with access to educational materials and training courses for the purposes of social and academic inclusion.

(iite.unesco.org/news/unesco-iite-at-themobile-learning-week-2019)

- Providing workshops that explain how to use artificial intelligence to benefit people with special needs, and various field applications and cases.

(Guo,A., Ece Kamar,E., Vaughan,J.,Wallach,H., Morris,M.,2019) Understanding organizational factors can help teachers consistently use assistive technology, thus supporting students with dyslexia. One study found that students achieved pedagogical objectives despite discontinuing the use of audiobooks, which poses a significant challenge for the future of higher education.(Bäck,G., Lindeblad,E., Elmqvist,C., Svensson,I.,2024)

2.2 Foundations of the Educational Vision:

We will explore the foundations that define the educational vision that benefits from automation while protecting the needs of learners and teachers. Miguel A. et al,2023)

2.2.1 Foundation One: Key Personnel: (Parents, Teachers, and Students)

Many people today may prefer to use electronic maps instead of paper maps. This may pose security risks related to the privacy of individuals' personal data, which artificial intelligence uses to improve itself. An important recommendation is to maintain the human role in providing various feedback to improve AI performance. Humans should remain present in various educational applications to make decisions, and AI should not be left as a complete substitute for human decision-making.

Several studies have concluded that educational strategies in the United States, for example, suffer from a lack of recruitment of individuals with doctoral degrees to faculty positions due to stagnant wages. Consequently, training programs for people with learning disabilities also suffer from a lack of comprehensive coverage, particularly in areas such as fluency, voice, augmentative and alternative communication, and dysphagia. Consequently, there has been a heavy reliance on adjunct faculty members. Studies have recommended the inclusion of clinical experts with doctoral degrees and less research experience within qualified teaching teams. (ASHA, 2023)

2.2.2 The Second Foundation: Comprehensive Justice

Many segments of society have suffered from inequality and a lack of access to many rights and welfare, whether due to racial discrimination in communities or bullying of marginalized groups. Children and students with learning disabilities have suffered particularly from this discrimination. Caution must also be exercised against "algorithmic coding," which often takes on the character of "algorithmic bias" by creating premature classifications of children, creating unfair assessments.(UNESCO,2019)

2.2.3 Principle Three: Ensuring Safety, Ethics, and Effectiveness

The adoption of AI goes beyond traditional data collection about students and teachers. It must extend to close monitoring of their learning and the study of teachers' performance as they use the technology.

2.2.4 Principle Four: Enhancing Transparency

Education professionals are interested in understanding how AI models work. This enables them to analyze situations, better identify problems and limitations, and thus better assess the accuracy of AI in the educational process and the achievement of educational goals.

2.3 Types of AI Applications Used in Education

2.3.1 Robotics: This technology can move, touch, and perform visual predictions. It aids teaching and office tasks, in addition to its ability to correct tests.

2.3.2 Computer Science: It relies on the work of supercomputers, which perform symbolic processing and rely on hardware components to produce software.

2.3.3 Cognitive Science Applications: It helps users learn by providing information that allows them to adjust their

path, in addition to expert systems.

2.3.4 Natural Language Processing

Applications: It works to understand human languages and engage in conversation with humans.

2.4 A quick study of some Arab countries:

The widespread use of artificial intelligence in universities and schools has raised issues related to ethics, culture, and Arab identity. The use of big data, through direct contact with individuals, may raise issues related to personal freedom and data privacy. Algorithmic bias may also raise questions about local Arab identity, based on colloquialisms and dialects that vary across geographic regions, as well as cultural and historical heritage. Therefore, this must be considered more seriously by creating databases that include all Arabic speakers.(AlShaboul,I., Abdi Ali,A,., Kariem,A., Zarovna,I., Glushchenko,T., Khasawneh,M.,2025).

As for the reality of digital Arabic, it exists in terms of writing, morphology, syntax, semantics, and lexicon. However, there are some difficulties related to usage, text analysis, and improving the quality of machine translation. Researchers have been able to use a recurrent neural network to recognize spoken Arabic numerals, focusing on the characteristics of spoken speech sounds: sound energy, tone, frequency, discrete waveform transformation, and sound approximation to human hearing. The Arabic language still faces several shortcomings, primarily related to its limited reach on the internet compared to other languages, and the lack of a clear vision, including Arab countries, to spread the culture of artificial intelligence in Arab educational and scientific settings. (Doohee,A.,2024).

Dyslexia affects approximately 11% of primary school students in Arab countries, with this percentage rising in the Gulf states.The effects of dyslexia often extend beyond the classroom, where the affected person feels discouraged from continuing to study.(IDA.,2021)

Numerous studies have shown that remote application of artificial intelligence is feasible, especially in countries with extensive infrastructure.
However, the presence of multiple dialects may somewhat hinder the process, in addition to obtaining prior consent from the child's parents regarding the use of personal data related to the child.

Digital systems are currently being designed to accommodate non-Arabic speaking users, using voice recognition and pronunciation correction through various interactions. In the future, augmented reality and virtual reality technologies will be proposed to simulate various educational scenarios. (Madwi.,(2025)

2.4.1 Qatar: Qatar has partnered with UNESCO to build a foundation for artificial intelligence and digital education. Some field studies have shown an improvement in reading comprehension among Arabic-speaking children.

2.4.2 Saudi Arabia: Saudi Arabia has invested heavily in digital education infrastructure and in integrating students with special needs into higher education, especially during the COVID-19 pandemic. Several studies have indicated an improvement in academic achievement for this group after the use of artificial intelligence technologies. However, this remains limited when expressed in Saudi dialects. It is also important to raise awareness among field specialists about the need to adapt the Saudi context to the digital tools used.

2.4.3 Algeria: There are numerous services related to speech disorders. However, some

shortcomings remain due to the gap between local culture, different dialects, and AI-related digital data. This requires systematic funding and rigorous programs based on short reading tests, eye-fixation pattern analysis, and simple phonetic features across different regions and dialects.

2.4.4 Egypt: Egypt is one of the Arab countries with a vast amount of digital data in linguistics and health sciences. Teletherapy services have also been proposed, although AI resources in Arabic are still limited, within the framework of stuttering treatment studies and small clinical trials.

The Egyptian government has sought to establish policies capable of integrating various AI technologies into its educational programs. Several AI faculties have been established at universities, and departments dedicated to AI programs have been created at computer science faculties. **(Ideis,.2024)**

3. Diagnosis and Treatment in the Field of Language and Communication Disorders

Speech and language disorders are among the most complex problems, particularly as they are linked to neural networks in the brain. Genetic factors also play a significant role, with genetic variations occurring in families with language difficulties, with up to 30% of their children experiencing the same symptoms. Environmental factors also play a significant role, particularly in terms of parents' education and level of interaction with their children. However, there are many secondary factors, such as physical illnesses and hearing impairment or loss. (Banu,L,. Saad,T., Hossain,K., Azizul Hossain,A.,2023)

3.1 Some Applications Used

Among the applications used to diagnose pathological conditions in the field of language and communication disorders are:

- Personal Assessment and Diagnosis

Artificial intelligence algorithms are used to assess language impairments by distinguishing between vocabulary deficits and grammatical errors.

Expert systems for online automated intervention also help in a systematic review of online language therapy systems, where speech is automatically recognized, and then individual performance is analyzed and evaluated. Attwell,G., Bennin,K., Tekinerdogan,B.(2022).

- **Predictive models for early intervention planning**

Large sets of personal data related to lesion location and extent are analyzed, enabling effective intervention strategies to be predicted.

- **Machine Learning Intervention**

The patient's condition is monitored remotely through chatbots that adapt content based on the patient's progress, providing real-time feedback and recommendations.

A study classified language disorders in preschoolers using a sample of 483 preschoolaged children, 54% of whom had language disorders.(Justice,L, Ahn , W., Logan,J.,2019) **Natural Language Processing**

This is achieved by using neurolinguistic programming techniques, where words are predicted by suggesting related words, thus constructing sentences more efficiently. Machine learning, large-scale language processing, and speech-to-text conversion are also used, helping specialists speed up diagnosis.(Themistocleous,2024).

- **Social Inaction**

Artificial intelligence applications contribute to providing the social interaction required for groups that suffer from severe linguistic problems, by providing alert signals in a timely manner in order to play specific roles in social media during the conversations.

A study that included 20 children using a robot (SAR) reached within 8 weeks, as the study concluded an improvement in linguistic skills in children who interacted with actual robot compared to the default. (Spitale,M.,Silleresi,S.,Mataric,M. 2023)

A study on logical intervention and linguistic education of a sample of children and its interaction with NAO robot within 30 weeks also led to qualitative results through meetings and notes. (Egido-García,V.,Estévez,D.,Corrales-Paredes,A., Terrón-López,M., Velasco-Quintana,P. 2020)

- Data Data Data Progression

Data is collected and analyzed, and work to determine future trends to develop the child's language through upcoming sessions.

3.2 Some applied models of artificial intelligence in the treatment of speech and language diseases

3.2.1 Artificial Intelligence Applications to treat and support individuals with speech and speech disorders for four credit hours (ME)

This workshop diagnoses various cases of speech disorders, including dysageria, Aprlyxia, and stuttering, where the disorder is diagnosed and rehabilitation tools are identified.

3.2.2 Diagnosis, treatment and monitoring of autism spectrum disorders

There are many tools that have become accurately diagnosing autism, giving various therapeutic alternatives, and in a brief time, whether they are attached to the methods of research or medications used in treatment, and by using machine learning techniques and deep learning, and natural language techniques, it is possible to analyze huge data, and thus early diagnosis of the disease, including proposing appropriate treatments for each disease.

3.2.3 AI Yoodle's speech and speech disorders

This application works to chat with people with speech disorder, so that the patient is able to express his feelings through expressive symbols of what he wants to say.

3.2.4 The Yudel app to reduce speech and speech disorders

This application works to convert spoken texts into expressive symbols, and Samsung has proposed this application on its mobile phones, at first, in two languages, English and Italian. It helps people who suffer from language defects, such as Afazia,(news.samsung.com/ The April 24, 2017)

The application contains more than 140 ready entertainment activities, events and -made phrases classified on 6 groups related to celebrations.
daily life, eating and drinking, feelings, help, (Akshay,G,.2017)

injured person sends expressive symbols, to be read by the average person after its translation, and upon the response they are received through symbols by the injured.
(Mogg,T.2017)
The application may be used for a distance conversation or even face -to -face conversations. Dr. Francesca Polini has confirmed the ability of the injured to keep facial expressions despite losing language, (Reigh,B. 2017)

Where the application aims to facilitate the daily communication of the injured without using the written and spoken language.(Lesage, N.(2017)

3.2.5 Enhanced and alternative communication devices: AAC: Advanced Audio Conding
It is used for the category of individuals with critical linguistic disabilities, as it helps using symbols, images and words to create spoken camels and messages. It is usually used in critical cases that accompany severe poverty in the spoken words or their absence, as these devices and other technologies have been proposed such as:
Speech Generation Devios - Photo -
based communication boards Text

converting programs to words.
The use of these devices faces some difficulties associated with people who also suffer from motor disabilities, as some practical solutions were suggested from those on touch screens, keys or tracking by eye or breathing, and from practical experiences these devices succeeded in helping groups who suffer from speech disorder, delayed language, and autism.
The artificial intelligence systems are based on the uninterrupted speech voiceitt as well as combining large linguistic models for natural and personal modern production, for example, we find the new Speak Ease 2025 system. It can be speaking with the same user's voice, by providing approval camels for the social or emotional situation, and that the introduction of data is left to the user's abilities was bad through writing, sound or symbols. (Xu,Y. et al,2025)
There are also similar systems such as the Speakfaster system that improves the introduction of the text for individuals with

motor disabilities, as the system helped reduce the number of clicks by 57 %, and the speed of the entry via eye tracking has improved 60 %. (Cai,S.et al, 2023) **3.2.6**

Other applications:

- Huni Al Speech Training for Kids

This application is devoted to the children's category for the correct pronunciation training, by registering the child to spoken words, and through an evaluation of these sounds, the application in teaching the child the pronouncement of words initiates the words in a correct way, which is usually directed to the category of children who suffer from delay in speech, stuttering and dyslexia.(Orlandi, S.et al , 2021)

- **Pecture Exchange Communication System** This system focuses on the category of non verbal individuals through mobile phone applications through images or converting the text into words.
- **Eye -GAZE Eye Track Technology** This technique is used for individuals who suffer from severe motor disabilities, by tracking eye, and working to translate its focus on specific images, letters and codes on the screen, thus creating sentences or accessing stereotypes expressing the emotional state of the individual. (Beukelman, 2013) Read Speacker and Speech Maker

Through these programs, words are proposed during writing, which contributes to enriching the written expression of individuals.

Conclusion:

The current study discussed the effectiveness of the use of artificial intelligence in treating speech disorders and dyslexia, whether for the children's category before schooling, or during the early stages of the study, and the study emphasized the importance of using various artificial intelligence applications for good diagnosis and better treatment, with distinction of cases according to the privacy of the injured. The most important results emerged as: - The previous presentation has proven the speed of adapting to the proposed treatments, no matter how different the cultural and social environment is for children, which is similar to many studies, whether Arab or international. - Several studies have proven that the result of bad habituation is an important reason to replace some letters, as well as special training programs based on artificial intelligence, and are returned in an upward way to fix this defect.

- The study also demonstrated a desire to conduct upcoming research on the necessity of separating the sexes, in order to collect more observations and data that may lead to more improvement in the quality of the digital means used.
- When discussing dyslexia problems, in many cases it may be attributed to a failure in the working memory and sound awareness who play an important role in the severity of the audio deficiency, as artificial intelligence systems simulate these relationships to provide a correct diagnosis that approaches the truth, with the need to pay attention to the human factor when making any decisions in this regard.

Recommendations:

- Preparing comprehensive training programs for teachers to use the latest artificial intelligence applications in providing lessons for the category of speech and reading difficulties.
- Composing applications with local dialects and community cultures in terms of sentences to install the sentences, and apply words to what is known in the vicinity of the injured. - Adopting treatment programs that respond to the requirements of the age group for children, whether they are or not.
- Providing the necessary means for early detection of children with speech and reading disorders, which are placed in each school, or at the level of each geographical region

distributed throughout the city, while providing specialists in special education. - Documenting successful experiences based on artificial intelligence, while submitting suggestions to improve performance and innovate diagnostic and treatment methods that respond to the requirements of the experiment .

References

- Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2019). Universal Design for Learning (UDL): A content analysis of peer-reviewed journal papers from 2012 to 2015. *Journal of the Scholarship of Teaching and Learning, 16*(3), 39–56. https://doi.org/10.14434/josotl.v16i3.19295
- Akshay,Gangwar.(2017)https://beebom.com/samsung-wemogee-app-forpeople-with-language-disorders/ Published: April 26, 2017
- Mogg,T.(2017) , https://www.digitaltrends.com/phones/samsung-wemogee/ April 26, 2017
- Alqahtani, M. (2021). The use of artificial intelligence in enhancing Arabic language learning: Opportunities and challenges. *Arab World English Journal (AWEJ), 12*(4), 355–372.DOI: https://dx.doi.org/10.24093/awej/call8.18
- Al-Shaboul,I., Abdi Ali,A., Kariem,A., Zarovna,I., Glushchenko,T., Khasawneh,M.(2025). Bridging the gap: The role of artificial intelligence in enhancing Arabic lan-guage learning, translation, and speech recognition. *Research Journal in Advanced Humanities*, 6(2),1-13. https://doi.org/10.58256/17f30w24
- American Speech-Language-Hearing Association (ASHA). (2023 Final Report of the Ad Hoc Commiftee to Plan Next Steps to Redesign EntryLevel Educafion for Speech-Language Pathologists from https://www.asha.org/public
- Attwell,G., Bennin,K., Tekinerdogan,B.(2022). A Systematic Review of Online Speech Therapy Systems for Intervention in Childhood Speech Communication Disorders,*Sensors*, *22*(24), 9713; https://doi.org/10.3390/s22249713
- Bäck,G., Lindeblad,E., Elmqvist,C., Svensson,I.(2024). Dyslexic students' experiences in using assistive technology to support written language skills: a five-year follow-up. *Disability and Rehabilitation: Assistive Technology*,19(4), 1217-1227.https://doi.org/10.1080/17483107.2022.2161647
- Banu,L,. Saad,T., Hossain,K., Azizul Hossain,A.(2023).Speech Language Disorder in Children: An Overview. *Journal of Comilla Medical College Teachers' Association*,27(2), 75-82 . DOI:https://doi.org/10.3329/jcomcta.v27i2.71568
- Beukelman, D., & Light,J., (2013). *Augmentative and Alternative Communication: Supporting Children and Adults with Complex Communication Needs.* Paul H. Brookes Publishing Co
- Doohee,A. (2024). The Contribution of Artificial Intelligence to Learning the Arabic Language. *European Journal of Language and Culture Studies*,3(3),17-23. DOI: 10.24018/ejlang.2024.3.3.120

- Egido-García,V.,Estévez,D.,CorralesParedes,A., Terrón-López,M., Velasco-Quintana,P.(2020). Integration of a Social Robot in a Pedagogical and Logopedic Intervention with Children: A Case Study, *Sensors* , *20*(22), 6483; https://doi.org/10.3390/s20226483 Special Issue Human-Robot Interaction and Sensors for Social Robotics)
- Cai,S.et al.(2023), Using Large Language Models to Accelerate Communication for Users with Severe Motor Impairments, *arXiv:2312.01532* (cs),DOI: 10.1038/s41467-024-53873-3
- Guo,A., Ece Kamar,E., Vaughan,J.,Wallach,H., Morris,M.(2019). Toward F,airness in AI for People with Disabilities: A Research Roadmap . Workshop on AI Fairness for People with Disabilities . *arXiv:1907.02227v2*
- Ideis,T.,(2024). The Reality of Artificial Intelligence (Al) and Its Applications in Arab Countries (Challenges and recommendations),*Journal of arts, Literature, Humanities and Social Sciences*,112, 364-381, DOI: https://doi.org/10.33193/JALHSS.112.2024.1241
- International Dyslexia Association (IDA). (2021). Dyslexia basics. Retrieved from https://dyslexiaida.org/dyslexiabasics
- http://en.moe.gov.cn/news/press_releases/201909/t20190902_396913.html August 29, 2019
- Justice,L, Ahn , W., Logan,J.(2019). Identifiant Children With Clinical Language Disorder: An Application of Machine-Learning Classification,Journal of Learning Disabilities ,52(5),351-365. DOI: 10.1177/0022219419845070
- https://iite.unesco.org/news/unescoiite-at-the-mobile-learning-week-2019/
- https://iite.unesco.org/theme/ict-forinclusive-education/page/3/ 2019
- Lesage, N.(2017),https://www.numerama.com/tech/252543-avec-wemogee-samsungtransforme-les-emojis-en-texte-pourpallier-les-troubles-dulangage.html, 26 avril 2017
- Madwi ,F ,H.(2025). Integrating Artificial Intelligence in Arabic Language Education: Challenges and Opportunities. *Journal of Arabic Literature*,3(1) ,45-55. https://doi.org/10.58223/dzilmajaz.v3i1.371
- Memarian,B. Doleck,T.(2024).A Your voice is your voice: Supporting review of assessment for learning with Self-expression through Speech artificial intelligence.*Computers in* Generation and LLMs in Augmented *human Behavior : Artificial Humans*, and Alternative Communication, 2(1), https://www.sciencedirect.com/ *arXiv:2503.17479* (cs),1-21.
- . Miguel A. Cardona, Roberto J. Rodríguez, Kristina Ishmael, Artificial Intelligence and the Future of Teaching and Learning, Office of Educational Technology May 2023
- https://news.samsung.com/global/samsung-wemogee-a-new-communication-tool-for-people-withlanguage-disorders? on April 24, 2017
- Orlandi, S., Brooks, R., & Oberauer, K. (2021). *Eye tracking in communication disorders: A review of its use and potential in speech and language pathology.* DOI: 10.1016/j.jcomdis.2021.106131

- Reigh,B.(2017),https://www.androida uthority.com/wemogee-emoji-basedapp-people-aphasia-766959/,April 25, 2017
- Spitale,M.,Silleresi,S.,Mataric,M., Using Socially Assistive Robots in Speech-Language Therapy for Children with Language Impairments.(2023). *International Journal of Social Robotics* , 15(9).
- Themistocleous,C.(2024). Open Brain AI. Automatic Language Assessment, *arXiv:*2306.06693 (cs),
- UNESCO. (2019). Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development. Paris: United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000376700
- https://www.unesco.org/en/articles/firs t-ever-consensus-artificialintelligence-and-education-publishedunesco 25 June 2019
- Xu, K., et al. (2015). *Show, Attend and Tell: Neural image caption generation with visual attention.* https://arxiv.org/abs/1502.03044
- Xu,Y.,Chakraborti,M., Zhang,T., Eng,K., Mohan,A., Prpa,M.(2025).