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# **Development of Communication, Language, and Speech in Preschool-Aged Children Through the Application of Artificial Intelligence: An Educational Institutional Perspective**

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## OBJECTIVE AND APPROACH

### **Objective:**

To reveal the potential applications of artificial intelligence in speech therapist practice within preschool education institutions, with an emphasis on its benefits for the development of children's communication, language, and speech, as well as for strengthening collaborative, partnership-based activities between speech therapists and teachers.

### **Analysis of Practical Experience:**

- The presentation is grounded in professional practice and a review of the scientific literature.
- The application of AI tools in speech therapy sessions is examined.
- Children's engagement and progress are monitored and analyzed.





## SHORT INTRODUCTION

### **Relevance**

At "Smalsutis" Nursery-Kindergarten in Kaunas, we prioritize communication, language, and speech skills for our preschool-aged children. Language and speech disorders are becoming more common, so we need effective, engaging, and individualized educational methods.

### **The Potential of Artificial Intelligence**

The rapid development of digital technologies, particularly artificial intelligence (AI), is opening up new possibilities in the field of speech-language pathology practice. AI-based tools can facilitate the creation of interactive, engaging activities that adapt to the child's abilities.

### **Practical Significance**

Artificial intelligence enables: more effective organization of the educational process, systematic monitoring of a child's progress, and prompt adjustment of the strategies employed

### **Collaboration**

The use of AI encourages closer collaboration between speech therapists and teachers, ensuring continuity of activities both at the educational institution and at home.

### **Context of the Presentation**

This presentation shares practical experience from the "Smalsutis" nursery-kindergarten in Kaunas, highlighting the potential of AI in strengthening children's language development and improving the quality of education.



# THE POTENTIAL OF ARTIFICIAL INTELLIGENCE

## Use of AI in Speech Therapy for Preschool Children

- AI helps speech therapists organize individual and group activities more effectively
  - Enables personalized education: tasks adapted to each child's abilities
  - Provides feedback and progress monitoring

### Individual sessions:

- Supports creation of tailored activities based on specific language needs

### Group activities:

- Facilitates interactive, game-based tasks
- Encourages engagement, communication, and spoken expression

### Benefits of AI integration:

- Improves organization of the educational process
  - Allows systematic analysis of achievements
- Ensures continuity across different environments

### Scientific findings:

- Enhances management of speech and language disorders
  - Increases motivation
  - Supports early prevention

### Important:

- AI is a support tool, not a replacement for the speech therapist's professional expertise and decision-making





## THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE PRACTICAL WORK OF A SPEECH THERAPIST

### **Individual Sessions**

- individualized tasks tailored to the child's language abilities and the nature of the disorder
- consolidation of target sounds at the levels of syllables, words, sentences, and connected speech
- tasks aimed at developing phonemic awareness, articulation, and vocabulary
- gradual increase in task complexity based on the child's progress

### **Group Activities**

- application of differentiated language tasks for children with varying abilities
- integration of speech therapy tasks into the general educational curriculum
- play-based, interactive activities promoting communication and oral language expression
- development of social communication and language skills in a group setting

### **Organization of the Educational Process**

- planning of educational content based on the analysis of the child's achievements
- systematic monitoring and assessment of language abilities
- development and adaptation of educational materials to individual needs
- ensuring continuity of the educational process across different environments

### **Collaboration**

- alignment of speech and language development goals between the speech therapist and the teacher
- application of speech therapy strategies in everyday educational activities
- provision of individualized recommendations to teachers for adapting teaching methods
- consultation with parents and their involvement in the child's language development process
- ensuring continuity of education (speech therapy room – classroom – home)





# ENEFITS AND CHALLENGES OF APPLYING ARTIFICIAL INTELLIGENCE IN THE PRACTICAL WORK OF A SPEECH THERAPIST

## **Practical Benefits**

- More effective development of language and speaking skills
- Greater engagement and motivation to learn among children
- Expanded opportunities for individualization
- Strengthened collaboration among specialists
- More efficient use of speech therapists' time

## **Challenges**

- The capacity to accurately assess speech sounds is inherently constrained in the absence of a specialist.
- It is imperative to engage in a critical evaluation of AI-generated content.
- It is imperative to ensure the security of data and the adherence to ethical principles.
- The potential for excessive reliance on technological resources necessitates careful consideration and analysis.

The integration of artificial intelligence within speech-language pathology services does not constitute a replacement for professional speech therapists; rather, it serves to augment the quality of child-centered care.



# SPEECH THERAPIST–TEACHER COLLABORATION IN AI-BASED PRACTICE

The integration of artificial intelligence within the educational sector has been demonstrated to enhance collaboration between speech therapists and teachers. This enhancement is achieved by facilitating the alignment of educational goals and activities, thereby contributing to a more cohesive and effective educational environment. This approach fosters continuity in language education, facilitates the tracking of progress, and enables the implementation of consistent strategies across diverse settings. Such collaboration is imperative for the effective intervention of communication, speech, and language disorders, as well as for the early prevention of language development issues in children.

## **Coordination of Activities**

The coordination of activities is a multifaceted process that entails the facilitation of joint activities, ensuring the continuity of language tasks within the group, and aligning educational goals between the speech therapist and the teacher.

## **Information Sharing**

The accelerated exchange of information is conducive to expedited task allocation and recommendation dissemination, ensuring enhanced visibility of the child's progress and maintaining uniformity in information dissemination across all relevant specialists.

## **Individualized education**

Individualized education tasks are adapted for both speech therapists and teachers, with the same goal being achieved in different settings. Differentiated activities are more easily implemented within a group.

## **Continuity of Education**

Activities that promote the development of children's language skills are a component of educational activities beyond speech-language pathology sessions. These activities are designed to ensure that children's language skills are consistently developed in a variety of daily activities. Furthermore, these activities serve to strengthen the connection between the educational institution and the child's home environment.

## **Professional Collaboration**

The teamwork model is strengthened, and the use of reflective and data-driven decision-making is encouraged. Consequently, the quality of the educational process is improved.



## PRACTICAL INSIGHTS

### **The implementation of AI in speech-language pathology practice has yielded the following practical insights:**

- Individualized instruction entails adapting tasks to the child's abilities, the nature of the disorder, and their progress.
- Increased motivation in children is achieved through interactive, game-based activities that encourage active engagement.
- Language and speech skills are strengthened through articulation, phonemic awareness, vocabulary, sentence structure, and coherent speech development.
- More effective monitoring of progress is facilitated by creating opportunities to analyze the child's achievements more systematically and plan activities.
- Collaboration is strengthened through improved interaction between the speech therapist, teacher, and parents.



**In summary**, the efficacy of AI tools in creating motivating and individualized activities is well-documented. However, it is imperative to note that their application necessitates critical evaluation and professional supervision to ensure optimal outcomes.



## CONCLUSIONS

The efficacy of artificial intelligence in speech-language pathology practice is demonstrated by its application as a tool to assist in the individualization of instruction, the enhancement of children's motivation, and the reinforcement of collaboration among professionals. The integration of AI within educational settings has the potential to enhance organizational efficiency, facilitate effective monitoring of progress, and ensure the continuity of activities across diverse environments. However, the integration of artificial intelligence (AI) does not imply the substitution of the speech therapist. The role of the specialist remains pivotal, encompassing their expertise, clinical assessment, and direct therapeutic relationship with the child. In accordance with the guidelines established by European speech-language-hearing associations, the implementation of artificial intelligence (AI) should be contingent upon empirical evidence, necessitating the adherence to ethical principles, the safeguarding of data security, and the prioritization of the best interests of the child. Empirical evidence has demonstrated that the deliberate and judicious application of artificial intelligence can markedly enhance the efficacy of speech-language pathology services in early childhood education.

The integration of artificial intelligence within the field of speech-language pathology does not constitute a replacement for the expertise of professional speech therapists; rather, it serves to augment the comprehensive support provided to children.

**Artificial intelligence can speak, but it is the speech therapist who teaches the child to speak.**



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