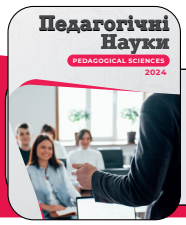

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Syllabic structure of the word: Examination and formation of knowledge in students with intellectual disabilities in primary schools

Abstract. The purpose of the study was to examine the formation of the sound-component structure of speech of students with intellectual disabilities in Ukrainian language lessons. The methodology of observation, testing, and questionnaires were used to achieve this goal. The object of the study was the students with minor learning disability The main focus of the study was on the development of individual approaches that consider the special needs of students, and interactive teaching methods aimed at stimulating speech activity, didactic games, and exercises were used to stimulate speech activity. The role of didactic games, visual aids, and exercises in the development of speech and grammar skills in children with intellectual disabilities is also examined. The results showed that systematic familiarisation with the sound structure of words and the development of phonemic perception positively affect the speech development of mentally disabled children. Students find substantial difficulties in developing speech skills, especially in using the component composition of words, based on the results. When working with complex words, the number of syllables and grades are often confused. Slowly but surely, due to the systematic use of didactic techniques, progress was made in the development of phonetic hearing and the analysis of speech structure. Students who have completed specially designed exercises should substantially improve their language skills. 75% of students participating in the study showed an improvement in their understanding of the sound-syllabic structure of words, which was confirmed by statistical data. There are certain factors that hinder the educational process, in particular, insufficient attention to the development of communication skills in the educational process. It is necessary to ensure the individual characteristics of each child to improve the speech development of children with intellectual disabilities. In the results obtained, the basis for further correctional programmes in the field of special education can be identified

Keywords: language evolution; inclusive education; correctional pedagogy; game methods; social integration

INTRODUCTION

Speech development is one of the key components of a child's overall development because speech is not only a means of communication but also an important tool for learning about the world around them. For children with intellectual disabilities, speech development is a particularly complex process that requires comprehensive attention and a special approach. These difficulties are particularly noticeable in elementary school classes, where attention is focused on basic language skills such as word sounds and syllable structure. Speech disorders in children with intellectual disabilities substantially complicate their ability to master a complex language system, including correct articulation, perception, and production of language units. This affects their social adaptation, learning, and perception of the world. An important aspect that deserves detailed examination in this context is the formation of the syllabic structure of words. This is because it is the basis for proper assimilation of grammatical and lexical norms of the language.

The problem of impaired self-regulation and organisation of mental actions in unfamiliar situations was investigated by L. Prokhorenko *et al*. (2021). After conducting an empirical review through testing, the authors determined

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that students often refuse to solve problems or simplify tasks, indicating weak abilities for self-regulation and an inability to purposefully organise their mental actions. The study analysed how different learning styles, students' level of emotional stability, or socioeconomic status can affect students' learning behaviour. This combines an understanding of the complexity of the problem and the possibility of a personalised approach to learning to help students better adapt. A study conducted by E. Kikas *et al*. (2008) highlighted the relationship between language skills in primary school students with learning problems and children who are developing normally. The problem is a lack of understanding of how specific learning disabilities affect language development. S. Malki & T. Einat (2019) examine the inclusion of students with intellectual disabilities in Israeli primary schools and the attitude of inclusive teachers to this process. It is proved that teachers with a positive attitude to the inclusion process are more effective in helping students with intellectual disabilities adapt to the general educational environment. However, negative attitudes and poor teacher training can substantially complicate this process, highlighting the importance of appropriate training and support to ensure inclusion. These authors did not consider aspects of the influence of the home environment on teachers' attitudes to receiving students with intellectual disabilities. For example, it did not analyse how the support or resistance of students' parents affects teachers' motivation to introduce inclusive practices in their classrooms.

S. Stebljuk *et al*. (2021) investigated the process of formation of communication skills in younger schoolchildren with intellectual disabilities in the context of inclusive education. The main challenge is to be able to effectively integrate these students into the educational environment. The main results of the study showed that effective communication of students with intellectual disabilities in the educational environment can be fully ensured, provided that their special educational needs are considered. This highlights the importance of creating appropriate conditions and support for the integration of these students. J.A. McKenzie & C.I. Macleod (2012) applied the concept of Michel Foucault's medical perspective and the psychological experience of Nicola Rose to develop important ideas in the education of children with intellectual disabilities. Two forms of expert knowledge that play a key role were analysed. The analysis showed that medical and psychological approaches often lead to the classification and normalisation of these students, which may limit their opportunities in the learning process. The authors emphasise the importance of critically reviewing these approaches to develop more comprehensive educational policies that meet the needs of South African children. The authors do not analyse how different cultural values affect attitudes towards inclusion and learning about inclusion, or even the learning outcomes expected of students. This limits understanding of how different cultural environments affect the success of inclusive education and the integration of students with intellectual disabilities into the regular education system. Considering these aspects will help to develop more individual and effective educational programmes that meet the needs and characteristics of different groups of students.

A paper of A. Hanreddy & D. Östlund (2020) examines alternative curricula for students with intellectual disabilities and their impact on inclusive education. The authors emphasise that intellectual disability is a socially deterministic category and can vary from culture to culture. However, despite these changes, students with intellectual disabilities often face isolation and low expectations in the school environment. J. Pownall *et al*. (2020) examined the relationship between social isolation and health literacy among young people with intellectual and physical disabilities, especially in terms of sex education. A study by D. Ioanna (2020) presents the concept of an independent life for people with intellectual disabilities in Greece to parents, teachers, and people with intellectual disabilities. The paper examined how school psychologists interpret intelligence tests to identify specific learning difficulties. The problem is that parents and teachers do not understand how important independent life is for people with intellectual disabilities. The author noted that intelligence tests are used to detect learning difficulties, but their use can be ambiguous. Researchers J.N. Kranzler *et al*. (2020) focus on the various approaches used by practical psychologists and the impact of these approaches on school practice. The authors noted that the lack of agreed assessment criteria may lead to inconsistencies in practice and aspects of the impact of practical recommendations for teachers and parents on accompanying students with intellectual disabilities in the learning and socialisation process were not considered.

The purpose of this study was to analyse the specific features of the formation of syllabic word structures in mentally disabled children of primary school age and develop effective methods for improving these abilities. Based on the set goal of the study, the following subjects were identified, such as: research of scientific approaches to the formation of word components in mentally disabled children, analysis of typical mistakes made by primary school students when reproducing syllabic structures of words, development of a series of iterative exercises aimed at improving formations.

LITERATURE REVIEW

Special education programmes were reviewed by G.H. Alnahdi *et al*. (2024) for students with intellectual disabilities, emphasising the need for individual approaches and inclusive practices. The authors established that families and teachers were dissatisfied with the current curriculum. This study highlighted the need to improve the curriculum to better meet the individual needs of these students. W. Xin *et al*. (2024) analysed the views of Chinese primary school teachers on teaching students with intellectual disabilities. Researchers have identified three categories of beliefs, which allow for a better understanding of the professional perspective of teachers. N. Panopoulos &

M. Drossinou-Korea (2020) used Bronfenbrenner's theory to analyse the improvement of reading comprehension in students with intellectual disabilities through individual programmes. N. Schoop-Kasteler & C.M. Muller (2020) focused on assessing student relationships in special classes and analysing social interactions and friendships. The study offered new directions for further scientific research. H.I. Cannella-Malone *et al*. (2021) conducted a systematic review of the literature on the development of learning skills in students with serious intellectual disabilities. This study determined that most interventions were effective, especially those that combined modelling, cues, and visual support. A study by O. Aktan (2020) was dedicated to examining the educational needs of teachers in the context of inclusive learning. The author identified a substantial gap in the professional training of teachers – a lack of knowledge to develop individual plans and provide effective support to students and their families.

A. Kart & M. Kart (2021) conducted a comprehensive literature review on the implications of inclusion for students without disabilities. The study showed the positive impact of an inclusive environment on social adaptation, promoting tolerance, and reducing prejudice. L. Tometten *et al*. (2021) focused on the relationship between teachers' awareness of special educational needs and students' social participation. The researchers established that students with emotional and behavioural disorders have lower levels of social integration and academic performance compared to other students. J.R. Root *et al*. (2022) investigated the effectiveness of modified schematic instructions for students with autism and intellectual disabilities. Researcher I.A. Pramantik (2021) has optimised traditional games such as Gobak Sodor games to develop the character of children with mild intellectual disabilities. The study has shown that combining adaptive physical education techniques with traditional games can substantially improve children's cognitive, social, and practical skills. Instead, researchers like Y. Bystrova *et al*. (2021), focused on social and pedagogical support for children with visual impairments in general education institutions. M.M. Kim & E.L. Kutscher (2021) used longitudinal data to investigate factors that influence the development of academic achievement and confidence in students with disabilities. In turn, J.A. Kurth *et al*. (2021) examined teacher training for inclusive education for students with serious disabilities. They used the Delphi examination to identify key skills and techniques that teachers need to master to effectively support such students. S. Krämer *et al*. (2021) conducted a meta-analysis of cognitive and psychosocial outcomes in students with learning difficulties. The study showed that inclusion has a noticeable effect on cognitive outcomes, but has almost no effect on psychosocial performance.

Authors C.C. Klimaitis & C.A. Mullen (2021) focused on investigating the involvement of students with disabilities in STEM education. The researchers analysed teachers' plans for inclusion in primary, middle, and high schools, examined teaching methods in Virginia, and identified seven key approaches to effective integration. D. Domin *et al*. (2020) devoted a study to the prospects of readiness of students with intellectual disabilities for federally funded higher education programmes in the United States. They identified a relationship between successful employment and three key strategies: engagement, improving access to career services, and building partnerships. M. Medina-García *et al*. (2021) also considered the important role of inclusion. Their study showed that information and communication technology skills affect teacher motivation, although the level of use of these technologies in primary schools was low. Other researchers, including R.R. Schalock & R. Luckasson (2021) concentrated on terminology and classification aspects. They reviewed in detail the differences between intellectual disability and developmental disorders and proposed refined terminology – intellectual disability and developmental disability. B. Akdemir (2024) examined the opinion of special education teachers on inappropriate sexual behaviour among young people with intellectual disabilities. The findings show that the most common behaviours of this kind are masturbation and undressing and that teachers are poorly prepared to intervene in such situations due to a lack of appropriate training.

The attitudes of primary school teachers towards inclusive education were examined by K.T. Lindner *et al*. (2023), they determined that teachers preferentially focus on students with complex disabilities and demonstrate a neutral or ambivalent attitude towards inclusion. This indicates that there are certain psychological barriers to the perception of inclusive learning. Another study conducted by S. Schwab *et al*. (2022) concluded that children often do not have friends in class. Particularly interesting was the fact of a substantial discrepancy in the assessments of friendship between students and teachers, which indicates deeper socio-psychological problems of integration. A paper of S.Y. Skinner *et al*. (2024) showed that students with serious disabilities do not receive adequate support to fully participate in learning and that student involvement is largely limited by the social environment and culture of the classroom.

MATERIALS AND METHODS

This study was conducted from the beginning of May to August 2024. It concentrated on teaching and shaping the knowledge of primary school students with intellectual disabilities and focused on the syllabic structure of words. The study was conducted in the 11th comprehensive resource centre of the Darnytskyi district of Kyiv. For this purpose, a sample of 30 students from the second to fourth grades with mild intellectual disabilities was created. The sample included 15 boys and 15 girls, which provided a balanced gender representation. The criteria for inclusion in the sample were as follows: participants were between the ages of 7 and 10, had a diagnosis of mild intellectual disability confirmed by medical records, and had the consent of their parents or legal guardians to their child's participation. The study involved teachers with at least 5 years of experience working with children with intellectual

disabilities. Each of them has special knowledge and skills that allow them to effectively teach children with different needs. Teachers have appropriate educational training and have been trained in the field of correctional education. During the study, teachers actively participated in the development and implementation of teaching methods that considered the individual characteristics of students. They used a variety of interactive and didactic materials to encourage learning, including games and creative tasks. All participants of the study demonstrated high professionalism and responsiveness to the needs of students, which contributed to creating a positive educational atmosphere. A sample was randomly generated among the centre's students to ensure the representativeness of the data and the possibility of gender analysis. This study was conducted in three stages, as shown in Table 1.

Table 1. Stages of the study

Stage	Description	Duration	Methods and tools
1. Assessment of the initial level of knowledge	Diagnostic testing, which included tasks to determine the syllabic structure of a word. Testing was conducted in an interactive form using games, which encouraged students to actively participate	2 weeks	Test tasks, game forms of assessment, observation of participants
2. Formation of knowledge	Training sessions aimed at improving students' knowledge of the syllabic structure of a word. Classes were organised with an emphasis on students' gender preferences, which provided high motivation to learn	8 weeks	Vocabulary games, art therapy, didactic materials, active forms of work (group tasks, discussions)
3. Analysis of results	Processing of data obtained as a result of testing at the beginning and end of the educational process. Assessment of changes in students' knowledge and an analysis of the impact of gender on learning outcomes	1 week	Statistical analysis (Student's t-criterion, Fischer's criterion), comparison of average knowledge values between boys and girls

Source: compiled by the author

All stages of the study were conducted in accordance with ethical standards of Declaration of Helsinki (2013). Written informed consent was obtained from the participants' parents or legal guardians prior to the study. All student data was processed anonymously to ensure confidentiality and protect personal data. Statistical analysis methods were used to process the obtained data. In particular, the Student's t-criterion was used to compare students' average knowledge scores before and after training and analyse gender differences. The Fischer criterion was used to analyse the variance of the test results. This allowed identifying statistically substantial differences between boys and girls.

RESULTS

In the initial stage of the study, diagnostic testing was conducted, which included a series of tasks to determine the level of knowledge of students about the syllabic structure of words. One of the key aspects of this stage was the identification of gender differences in task performance. Overall results showed that girls showed 3-4% better results in all task categories compared to boys, which was an interesting point for further analysis. Girls had the most noticeable advantages in tasks related to recognising the number of syllables in words, while boys showed slightly worse but still substantial results in other tasks, in particular, in dividing words into syllables. The results of syllable recognition tasks showed that girls, on average, understood and performed better on these tasks. Their success can be explained by several factors. Firstly, the speech skills of girls tend to develop faster than those of boys, especially at a younger age. Studies in the field of children's speech development show that girls master speech at a younger age and are more verbally active than boys. This phenomenon is associated with biological, cognitive, and social factors that affect the development of language skills in various states. Girls most often start speaking earlier than boys and are more likely to use more complex language constructions. They develop vocabulary better in early childhood because cognitive functions associated with speech activity develop faster. Neuroscientists have shown that girls develop more actively the parts of the brain responsible for speech, which gives them an advantage in the early stages of speech development. This factor may explain the higher level of skills in performing syllable recognition tasks. Notably, the girls showed a greater ability to concentrate during tasks, which is especially important for tests for recognising the constituent elements of a word. This task requires not only an understanding of the sound elements but also a certain level of attentiveness and the ability to analyse in detail. Girls' higher scores in this task category may indicate their better ability to process and analyse phonetic information. The boys, although they showed slightly worse results, still showed a fairly high level of task completion. Their weak point was lower accuracy in determining the number of syllables, which may be due to less attention to detail or lower levels of speech development compared to girls at this stage. However, it is important that this difference was insubstantial and did not affect the overall picture of the boys' results. The task contributed to the development of critical thinking and the expansion of students' vocabulary, as they had the opportunity to work with language material

at a deeper level. On average, girls showed slightly higher results on all indicators compared to boys, which may be due to the girls' natural propensity for speech skills at a younger age. Detailed results are presented in Table 2.

Table 2. Initial student test results, %

Tasks	Overall result (%)	Boys (%)	Girls (%)
Recognising the number of syllables	63.3%	60%	66.6%
Forming words with addition/subtraction of syllables	56.6%	46.6%	73.3%
Dividing words into syllables	60%	60%	40%

Source: compiled by the author

The results of the conducted studies indicate differences in the speech abilities of primary school boys and girls, as well as the overall level of development of children's speech abilities. An analysis of the three tasks received by students shows a clear trend. The first task that the students set was to determine the number of syllables in a word. From the overall results of the students, it can be concluded that the majority of children coped very well with this task and achieved an average of 65%. This shows that they have developed a basic ability to recognise syllable numbers and can successfully apply these skills in practice. However, differences in the results of boys and girls on this task indicate specific gender characteristics. The percentage was 60% for boys and 66,6% for girls. This confirms a general trend often seen in similar studies, which suggests that girls at a younger age perform better on tasks related to language and voice manipulation. Notably, girls are better able to perform syllable recognition tasks due to their innate propensity for speech activity. At a younger age, girls usually communicate more with adults, actively socialise, and participate more often in speech games, which can contribute to a better development of vocal skills. Since they recognise sounds better, they can more accurately determine the number of syllables in a word. This factor can also be explained by biological features of brain development when girls develop a zone responsible for speech functions earlier.

The second task was more complex and required adding or subtracting syllables to form words. Scores for this task were lower than for the first task, averaging 56.6%. This can be explained by the fact that this task required higher levels of conversational skills, analytical skills, and strong critical thinking. Students had to not only recognise syllables but also use language structures to create new words to complete this task. Analysis of the results again showed that girls performed better (73.3%) than boys (46.6%). This difference supports previous findings that girls perform better on tasks that require a detailed understanding of language structure and phonetic elements. In addition, such exercises also contributed to the development of critical thinking, as students had to analyse how words change when syllables are added or removed, which requires a deeper linguistic analysis. The critical thinking element is very important in this task. When forming words, students had to understand the mechanism of addition and subtraction of syllables and also apply this knowledge to form new words, which substantially expanded the field of speech. As this task involved the active formation of language units, students were encouraged to think at a higher level than just recognising syllables. For children, the results of this task may indicate that in the early stages of learning, they are less active in using linguistic resources to solve problems that require analytical thinking. This may be because other cognitive processes in boys develop earlier than language processes, and they are more focused on practical tasks that involve different ways of thinking.

The third task, dividing words into syllables, gave an average result of 60%. This indicates that the vocal training of students is at a fairly high level. As in the first task, this task required students not only to recognise the number of syllables but also to actively participate in syllable segmentation, which is an important element in developing oral skills. Analysis of the results of boys and girls shows that the latter still have a certain advantage. The achievement rate was 40% for girls and 60% for boys. Although this difference is small, it still suggests that girls better understand the phonetic structure of words. This may be due to girls' general propensity for verbal activity and higher levels of vocal communication at an early age. In addition to the results of performing specific tasks, it is also important to consider the overall impact of the study on the development of students' linguocognitive skills. The tasks set contributed not only to the development of vocal skills but also to the active integration of critical thinking and analytical skills. Working with language material at a deeper level allows students to reproduce ready-made language constructions and actively create new ones, which substantially contributes to the expansion of vocabulary and overall speech development. Often, girls start actively communicating earlier, spend more time playing speech games, and communicate more often with adults, which contributes to the development of speech skills. On the other hand, boys may spend more time playing games that don't require active language involvement, which can slow down their development in this direction.

The second stage of the study is a series of training sessions based on interactive methods, vocabulary games, and creative tasks. This stage was aimed not only at improving students' knowledge of the syllabic structure of words but also at stimulating their activity and interest in learning by engaging in various forms of activity. The training programme was carefully designed to consider the individual characteristics of each participant, including cognitive abilities, gender characteristics, and the level of

intellectual disability. This allowed adapting the learning process as much as possible to the needs of each child, which became an important condition for effective assimilation of the material. One of the critical components of the training programme was interactive exercises. They included tasks to recognise syllables in words using visual and audio stimuli. Such exercises allowed students to work with different types of information (visual and auditory), which helped develop their skills in processing complex speech information. For example, students were asked to listen to audio recordings of words, divide them into syllables, and relate what they heard to visual images that depicted the appropriate number of syllables. These exercises were useful for developing auditory attention and the ability to recognise different sounds in speech, which is an important aspect of teaching children with intellectual disabilities.

In addition, interactive methods helped increase students' interest, as they were able to complete tasks in a playful way, which substantially improved their motivation. Another important element of the curriculum was vocabulary games. They consisted of exercises to build new words by adding or removing syllables from the provided base words. This approach contributed to the development of flexible thinking and speech skills, as students were able to experiment with different syllable variants, creating new words. This process helped students better understand the structure of the word and develop their ability to combine different speech elements. These exercises were especially useful for girls, who often showed a greater propensity for creativity in speech activity. In the course of vocabulary games, they actively used their imagination, creating new words and combining syllables in unexpected ways. This enhanced their speech activity and contributed to the development of phonemic hearing. Classes also included working in pairs or small groups, which allowed students to collaborate and interact with each other in the process of solving problems. Group tasks contributed not only to the assimilation of the syllabic structure of words but also to the development of social skills, such as the ability to communicate, share thoughts, and help others. This is especially important for children with intellectual disabilities because such students often have difficulties communicating with their peers. Group tasks were organised in such a way that each student had the opportunity to contribute to the work of the group. Children who usually had a better understanding of structured tasks were offered clear instructions and logical exercises where they could apply their skills to dividing words into syllables. The girls, in turn, were given the opportunity to work on creative tasks that required more flexible thinking and imagination. Special attention in the programme was paid to art therapy methods, such as creative tasks, which were aimed at stimulating the imagination and emotional involvement of students. These tasks were mainly used for girls, as they often show a greater interest in creative and artistic forms of activity. For example, students could draw words as symbolic images or create associative word cards that included both visual and speech components.

Art therapy helped children express their emotions and experiences through drawings, which had a positive effect on their motivation to learn. In addition, such tasks contributed to the development of motor skills and visual perception, which are important components of speech activity. An important feature of the curriculum was that it was designed with students' gender characteristics in mind. Children were given an advantage in active game tasks, which allowed them to stay involved in the process and maintain motivation to learn. Word division games, logic exercises, and interactive tasks helped them better perceive learning material, which was due to their penchant for structured and clear tasks. Girls, for their part, were more involved in tasks with a creative component. Creative tasks allowed them to show their imagination and use their own imagination to perform exercises to create new words or work with associative cards. This suited their learning style, as girls usually showed a greater interest in speech, communication, and creative expression. Due to the use of interactive and creative methods, it was possible to ensure a high level of student involvement in the educational process. Classes were organised in such a way that each participant could actively take part in the exercises, working individually, in pairs or in groups. The combination of different methods allowed considering the individual characteristics of students, which contributed to better assimilation of the material. Gender-based approaches, which included game tasks for boys and creative exercises for girls, also helped increase students' motivation. Children who usually showed more interest in outdoor and interactive activities were willing to participate in vocabulary games and tasks for dividing words into syllables. Girls, in turn, were actively involved in creative tasks that required the use of imagination and creativity.

The second stage of the study demonstrated the effectiveness of interactive and creative methods in teaching children with intellectual disabilities. Interactive syllable recognition exercises, vocabulary games, and art therapy helped students better assimilate the material, develop speech skills, and increase interest in learning. The use of gender-adapted methods helped maintain motivation in both groups of students, providing different approaches to learning that were consistent with the interests and characteristics of both boys and girls. Evaluation of results after the educational process was identified to be a key component of the study, as it allowed analysing the impact of educational methods on the level of knowledge of students with mild intellectual disabilities. After completing the eight-week training phase, repeated testing was performed, which included the same tasks that were used during the first stage of diagnostic assessment. This provided an opportunity to compare changes in students' knowledge and evaluate the effectiveness of interactive and creative methods used. An overall analysis of the results showed that all study participants showed a substantial

improvement in performing tasks related to the syllabic structure of words. The average increase in results ranged from 20 to 23%, which is a substantial indicator of the effectiveness of implemented training methods. Such a high increase in knowledge can be explained by several factors: an interactive approach to learning, adaptation of methods to individual characteristics of students, gender-differentiated tasks, and high motivation of children due to the game and creative components of classes. A substantial increase in knowledge was observed in all three main categories of tasks. Notably, students showed a noticeable improvement in the ability to correctly determine the number of syllables in words both by ear and visually. This task was one of the most important for the development of phonemic hearing and understanding of the structural elements of speech. The results in this category show that the use of visual and sound stimuli during learning substantially improved students' ability to recognise the number of syllables, which is a critical component in developing speech structure analysis skills. In addition, students began to perform substantially better tasks in dividing words into syllables, which indicates the development of skills in the structural analysis of words. This aspect of the study highlights the importance of a systematic approach to teaching speech elements since the division of words into syllables is one of the basic components for the further development of speech activity and literacy of students. The improvement in this category can be explained by the use of interactive exercises and group tasks, which activated children's work and helped them better understand the syllabic structure of speech. In addition, the task of creating new words by adding or subtracting syllables, which requires creativity and speech flexibility, also showed a noticeable improvement. This is especially true for students who had lower initial results. Engaging creative elements such as vocabulary games and associative exercises helped students develop the ability to work flexibly with syllabic words, which is important for developing speech creativity and adaptability in a learning environment. Thus, the results showed that the educational process had a positive impact on all aspects of the development of students' speech activity, which confirms the high effectiveness of the methods used.

After completing the training process, repeated testing was conducted with similar tasks as in the first stage. The results showed a substantial improvement in the level of knowledge in all participants. The average increase in results ranged from 20 to 23%, which indicates the effectiveness of the method used. Table 3 shows the results of boys and girls after training.

Table 3. Results of boys and girls after training, %

Indicators	Boys (%)	Girls (%)	Differences (%)
Recognising the number of syllables	80%	86.6%	+6.6%
Forming words with addition/subtraction of syllables	73.3%	80%	+7.3%
Dividing words into syllables	80%	93.3%	+13.3%

Source: compiled by the author

This category of tasks allowed assessing how students of both sexes use their speech abilities and logical thinking to complete tasks. Building new words by adding or subtracting syllables this task revealed the most noticeable gender differences in student outcomes. The girls demonstrated a higher ability for creative thinking and flexibility in using the syllabic structure of words. They experimented more actively with adding and subtracting syllables, which allowed them to create new words, even if some of these words were unusual or little used. The boys, on the contrary, showed more caution in their answers and tended to stick to familiar and safer options. They were more likely to use words they already knew or had heard before and less likely to experiment with new syllable combinations. This may indicate that boys are more focused on proven strategies, while girls tend to be creative and flexible in solving speech problems.

Several types of statistical analysis were performed: the Student's t-criterion to check the significance of differences between the average results before and after training to check the statistical significance of changes in students' knowledge. The obtained values showed that the difference between the indicators is statistically substantial ($p<0.05$), which confirms the effectiveness of the training activities conducted. The Fischer criterion was used to analyse the variability of results in groups. It showed that gender differences are not substantial, but confirm the overall trend towards better outcomes in girls. Table 4 shows the results of the statistical analysis in detail.

Table 4. Results of statistical analysis

Indicators	Value of the t-criterion	P-value	Fischer's criterion
Recognising the number of syllables	2.14	$p < 0.05$	1.85
Forming new words	2.65	$p < 0.05$	1.72
Dividing words into syllables	2.31	$p < 0.05$	1.93

Source: compiled by the author

As a result of the study, several important conclusions and recommendations aimed at improving the learning of children with mild intellectual disabilities can be drawn. Firstly, the use of interactive and creative teaching

methods has proven to be extremely effective in developing students' speech abilities. Interactive exercises, such as tasks for recognising the number of syllables in words, vocabulary games, and creative tasks, provided a high level of student engagement and encouraged them to actively participate in the learning process. This confirms the need for further implementation of such methods in the practice of teaching children with intellectual disabilities. It is recommended to further develop curricula with an emphasis on the individual characteristics of students, considering their speech capabilities and level of cognitive development. The use of gender-differentiated methods has also proved effective. In particular, active game tasks were more attractive to boys, while girls showed a higher level of engagement when performing artistic and creative tasks. Thus, educational tasks should be adapted to the interests and needs of each child, which will contribute to their better assimilation of the material.

Another important aspect to consider is the need to involve parents and guardians of children in the educational process. Family support can substantially increase students' motivation to learn and help consolidate their knowledge in everyday life. It is important to regularly consult with parents about their children's academic success and difficulties, providing them with recommendations on opportunities for additional support at home. Based on the results of the study, it can be concluded that to achieve successful results in teaching children with mild intellectual disabilities, it is necessary to use an integrated approach that combines interactive, creative, and socially oriented methods. For example, group tasks where students collaborate with each other contribute not only to the development of speech skills but also to the socialisation of students, which is an important component of their personal development. It is recommended to continue implementing elements of art therapy in the educational process, as they have proven to be an effective tool for increasing the involvement of students, especially girls, in educational activities. The use of visual and creative stimuli allows students to better assimilate complex speech information and develop their creative abilities.

Separately, the importance of constant monitoring and correction of curricula, based on the results of an intermediate assessment of students' knowledge, is notable. Regular diagnostic tests, such as sound recognition tests, help assess how many sounds or syllables a student hears in words, allowing them to identify gaps in knowledge in time and make appropriate changes to the teaching methodology, which will help ensure a more individualised approach to each student. An important factor is also the training of teachers working with children with intellectual disabilities. It is necessary to ensure the continuous professional development of teachers, in particular, in terms of using interactive and creative teaching methods and in the field of correctional pedagogy and psychology. This will help improve the effectiveness of the educational process and help teachers better adapt to the needs of their students. As a result, the study confirms that interactive and creative teaching methods have a substantial positive impact on the development of speech skills of students with mild intellectual disabilities.

DISCUSSION

The problem of teaching children with intellectual disabilities is one of the initial and simultaneously the most difficult tasks of modern pedagogy. It covers a wide range of issues related not only to teaching methods but also to socialisation, development of communication skills, and self-determination of such students. The specific feature of this category of children is that their cognitive processes have their own specific features: a decrease in the level of abstract thinking, the power of cognitive operations, difficulties in the formation of speech skills, and problems with the assimilation of new information. Accordingly, this requires the development of special programmes and approaches that would consider the individual development characteristics of such students as much as possible. In the context of modern education of children with intellectual disabilities, special attention is paid to the inclusion and adaptation of educational programmes.

Inclusive education ensures the integration of children with special needs into the general education process, where they have the opportunity to interact with their peers, receive help from teachers and assistants, and participate in general social processes. Therewith, the question arises about the effectiveness of such approaches in cases where children with intellectual disabilities cannot cope with the general education programme due to special difficulties because of their cognitive development. These tasks require the development of separate teaching methods adapted to the level of intellectual capabilities of children. Independence as a life skill is one of the key elements of successful social adaptation of such students. However, its development depends on the effectiveness of educational programmes, which should form the functional life skills necessary for a full life. This applies to aspects such as decision-making ability, ubiquitous tasks, and social interaction. It is important to use approaches based on the individual needs of students, their capabilities and strengths to do this.

In the modern world, there is a strong tendency to integrate such students into the overall social structure. However, this is often accompanied by certain problems, in particular, stigmatisation, misunderstanding on the part of society, and difficulties in communicating with peers. The role of teachers is important, as they are not only carriers of knowledge but also assistants who help children adapt to social norms and rules. Thus, G. Moljord (2019) conducts a content-analytical review of educational programmes for students with intellectual disabilities. The author identified key trends in curriculum development for this group of students, emphasising that cognitive academic content is the dominant area of research compared to functional life skills. The author emphasised the need for a discursive link between the normative framework of educational programmes

and the real needs of students for their further social integration. This study also concerns the problem of forming functional speech skills in children with intellectual disabilities. However, this study focuses more on the development of grammatical categories of adjectives and the sound-component structure of speech that reflect the practical needs of these children, while supporting the ideas of G. Moljord on the need for a cognitive and functional approach.

B.L. Kassah *et al*. (2018) examined special schools for children with intellectual disabilities in Ghana. They determined that these institutions play an important role in educating such students, despite the presence of international calls for universal education. The authors emphasised the positive impact of dedicated teachers, the variability of learning activities, and other factors that contribute to effective learning in special schools. However, the current study focuses on the details of speech development, while B.L. Kassah *et al*. (2018) cover more general education processes. V. Garrels & P. Arvidsson (2019) in their study practised the development of self-determination skills in students with intellectual disabilities from the standpoint of Vygotsky's approach. Researchers have shown that such skills can be developed through adequate social interaction with competent mentors and maintained by focusing on the need to adapt interventions to match the cognitive abilities of students with intellectual disabilities. This study also focuses on the social aspects of learning but more so on the methodology used, which improves the assimilation of grammatical constructions and speech skills.

P. Tan *et al*. (2019) analysed disability in the context of math education for people with intellectual disabilities. They underlined that research data in this area focuses on identifying shortcomings while humanising approaches to such students can improve their participation in the educational process. A.E. El Banna (2019) conducted a study on the impact of the multiple intelligence programme on improving reading skills in children with reading disabilities. The results show that methods based on multiple intelligence theory contribute to more effective development of reading comprehension, which may be important in the context of this study, which examines various aspects of language development. B.C. Elder & B. Kuja (2019) focused on inclusive education practices in primary schools in Kenya. The authors highlighted the importance of developing inclusive programmes that promote the involvement of students with disabilities in general education and ensure further integration of such approaches at the national level. In this study, Inclusion approaches are also important, but the accent is on specific methods of speech teaching, especially in specialised schools, rather than general education. O. Hrybiuk (2019) described the importance of creating intellectual development centres to improve the educational process at the conference. The author emphasised the importance of scientific and technical creativity in the development of students' intellectual abilities. While this study agrees with her approach to intellectual development, it focuses more on specific language and grammar skills, which are crucial components of cognitive development in students with intellectual disabilities.

A.J. Harrison *et al*. (2019) analysed the impact of inclusive post-school education on students' explicit and implicit attitudes to intellectual disability. The authors concluded that students who participated in the volunteer programme when interacting with people with intellectual disabilities had lower levels of discomfort and negative stereotypes than students who did not have such experiences. Importantly, volunteers who worked with people with intellectual disabilities showed a deeper understanding of the causes of these disorders and were more open to social interaction with such people. This study shows that inclusive post-school education programmes have a positive impact on the formation of students' tolerant attitudes towards people with intellectual disabilities and contribute to their social integration. Comparing it with this study, some similarities and differences can be noticed. For example, the positive impact of adaptive teaching methods on the development of speech skills of students with intellectual disabilities was noted. However, the focus of this study is different, as it concentrates on the development of speech skills in primary school-age children, whereas A.J. Harrison *et al*. focus on high school students. However, both studies confirm the importance of social interaction and inclusive approaches in working with people with intellectual disabilities.

Another important study, conducted by M. Osei (2020), considers the effectiveness of learning strategies in teaching adaptive skills to students with intellectual disabilities in special schools in Hawaii. Other approaches, such as cooperative learning, direct learning, and interactive methods, were also used in this study. Consequently, he established that interactive and direct methods were most effective in developing adaptive skills in these students. In addition, teachers who applied a comprehensive adaptive skills development programme achieved better results in teaching children. The study highlighted the importance of regular professional development of teachers and the use of audiovisual materials to ensure high-quality education for students with intellectual disabilities. This study also used interactive and adaptive learning methods to develop speech skills in children with intellectual disabilities. Consequently, all of these studies complement their findings, highlighting the importance of adaptive learning methods, inclusion, and focusing on the real needs of students with intellectual disabilities.

CONCLUSIONS

The study focused on the importance of developing language skills in children with intellectual disabilities and the methods and approaches that contribute to this goal. The results also suggest that teachers can use this information to form study groups and adapt their teaching methods. Periodic diagnostic testing is an important tool for identifying gaps in students' knowledge, enabling teachers to adjust the curriculum in a timely manner and ensure an individual approach to each student.

The key to success is the use of interactive and didactic methods that allow children to actively interact with the material. This may include game elements, critical thinking tasks, and working in small groups. This is especially important for children with intellectual disabilities. An important aspect of the study was the confirmation of the importance of social interaction in learning. The interaction between students and their teachers has a substantial impact on the development of oral skills. Cooperation and support of classmates create conditions for the exchange of experience, which contributes to the formation of even deeper knowledge and skills. Equally important is the focus on developing functional life skills in children with intellectual disabilities.

For further research, it is important to expand the sample to include students from different types of schools, including those with substantial intellectual disabilities. It is also necessary to analyse the impact of social, extracurricular, and family environments on the speech development of children with intellectual disabilities. Investigating the relationship between speech and communication skills can be the next step in further improving educational methods.

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CONFLICT OF INTEREST

None.

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Складова структура слова: обстеження і формування знань в учнів з інтелектуальними порушеннями початкових класів

Анотація. Метою статті було дослідити формування звуко-складової структури мовлення учнів з інтелектуальною недостатністю на уроках української мови. Для досягнення поставленої мети використовувалася методика спостереження, тестування та анкетування. Об'єктом дослідження були учні з незначною розумовою відсталістю. Основна увага в дослідженні була зосереджена на розробці індивідуальних підходів, що враховують особливі потреби учнів, та інтерактивних методів навчання, спрямованих на стимулювання мовленнєвої активності, були використані дидактичні ігри та вправи для стимулювання мовленнєвої діяльності. Також досліджувалася роль дидактичних ігор, наочних посібників та вправ у розвитку мовленнєвих та граматичних навичок дітей з порушеннями інтелекту. Результати показали, що систематичне ознайомлення зі звуковою будовою слів та розвиток фонематичного сприйняття позитивно впливає на мовленнєвий розвиток розумово відсталих дітей. Учні виявили значні труднощі у розвитку мовленнєвих навичок, особливо у вживанні компонентного складу слів, за результатами. При роботі зі складними словами часто плутають кількість складів і оцінки. Повільно, але впевнено завдяки систематичному використанню дидактичних прийомів відбувався прогрес у розвитку фонетичного слуху та аналізі будови мовлення. Учні, які пройшли спеціально розроблені вправи, повинні значно покращити свої мовні здібності. 75% учнів, які брали участь у дослідженні, показали покращення розуміння звуко-складової структури слів, що підтверджено статистичними даними. Існують певні фактори, які перешкоджають навчальному процесу, зокрема недостатня увага до розвитку комунікативних навичок у навчальному процесі. Необхідно забезпечити індивідуальні особливості кожної дитини з метою вдосконалення мовленнєвого розвитку дітей з інтелектуальною недостатністю. В отриманих результатах можна знайти основу подальших корекційних програм у сфері спеціальної освіти

Ключові слова: мовна еволюція; інклюзивна освіта; корекційна педагогіка; ігрові методи; соціальна інтеграція