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Selected Contemporary Research on Special Needs, Giftedness, and Talent in Slovenia

edited by **Bojan Kovačič**

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Editor
Bojan Kovačič

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Introduction

Bojan Kovačič
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The monograph, which focuses on special needs, giftedness, and talent, covers a wide range of topics across twelve chapters and offers in-depth analyses and innovative research on strategies, challenges, and outcomes associated with the education and care of these particular populations. The publication, featuring twenty-three contributing writers, most of whom are from the Faculty of Education at the University of Maribor, is significant for a wide spectrum of professionals. The monograph not only improves comprehension of these populations' special needs but also accelerates the discussion about how to support, include, and promote the abilities of all students, particularly those requiring a more differentiated and specialised approach. The monograph highlights the need for continual research and enhancement of pedagogical practices to provide more inclusive, supportive, and successful learning environments for every student, irrespective of their challenges or talents.

Authors Milena Ivanuš Grmek, Monika Mithans, and Darja Plavčak explore the development of speech and language therapy in Slovenia in the first chapter, "Speech and Language Therapy in Slovenia: Education, Career Prospects, and Treatment of Speech and Language Disabilities." They emphasize the significance of educational

programmes in preparing professionals for various career paths. In a variety of professional domains, including healthcare, education, and social welfare, these therapists play a crucial role in the management of speech and language disabilities.

The study underlines the increasing demand for qualified professionals, as well as the need to expand speciality training and improve access to early, integrated treatment choices.

In the second chapter, "Reading Adapted Texts of Young Adult Fiction and Reading Motivation of Pupils with Speech and Language Disorders," authors Nika Vizjak Puškar, Tina Vršnik Perše, and Dragica Haramija examine how reading adapted young adult fiction affects speech and language disorder students' reading motivation in Slovene elementary schools. This research involved adapting two complete Slovenian literary works into an easy-to-read format. Fifty pupils from the final three years of elementary school participated in the study, reading both the original and adapted texts. The results indicate that the adapted texts not only improved students' comprehension of literary works, but also greatly raised their motivation to read.

Authors Katja Sevšek and Bojan Kovačič concentrate on adaptations in music lessons for students with autism spectrum disorder (ASD) in regular elementary schools in the third chapter, "Adaptations in Music Lessons: Inclusion of a Student with Autism Spectrum Disorder". Their study utilised a structured survey of music teachers in Slovenia for assessing how their interactions with students with ASD and their own teaching experiences influence their perceived competence and adoption of inclusive teaching strategies.

The inclusion of students with special needs in folklore activities in Slovenian elementary schools that offer special education programmes is examined by authors Bojan Kovačič, Nejc Černela, and Marta Licardo within the fourth chapter, "The Inclusion of Children with Special Needs in Folklore Activities in Slovenian Schools with a Special Educational Programme."

The fifth chapter, "Understanding and Supporting Twice-Exceptional Students: The Role of Educational Professionals in Promoting Inclusive Practices," by Monika Mithans, Jasna Tivadar, and Sabina Ograjšek, explores the unique educational

requirements of twice-exceptional students, i.e., students who are both gifted and have special educational challenges. Their research, conducted with education professionals, reveals widespread misconceptions and challenges in identifying and supporting this group of students. The results highlight the significance of increasing awareness and offering educators specialised training.

Authors Tina Vršnik Perše and Živa Grafenauer Ekart address the significance of student involvement in school-home collaboration in the sixth chapter, "Involving Students in School-Home Cooperation," and emphasise the beneficial effects it has on students' behaviour, motivation, and sense of responsibility. The research focuses on how active student engagement improves communication between teachers, parents, and students, resulting in better achievement of educational and behavioural goals, particularly for children with special needs.

In the seventh chapter, "Perspectives and Practises of Early Childhood Educators on Identifying Mathematically Talented Children," author Darja Antolin Drešar discusses how educators identify children with mathematical talent. The study emphasises the need for enhanced training and resources to assist educators in recognising and nurturing mathematical talent from a young age.

Alenka Lipovec and Jasmina Ferme, the authors of the eighth chapter, "Teaching Mathematically Promising Students: Insights from Classroom Practice," examine how aspiring elementary school teachers engage with mathematically promising students while undergoing practical training. The study provides helpful insights for preparing teachers to meet the needs of exceptional maths students.

In the ninth chapter, "The Development of Musical Talent in Different Life Periods: A Case Study," authors Tjaša Drovenik Adamec and Bojan Kovačič use the internationally renowned organist as a case study to analyse how different factors affect musical talent development at different stages of life, from early childhood to early adulthood (ages 3–35). This study highlights the dynamic nature of musical talent development and the various factors that influence a musician's development over time.

Dance improvisation in early childhood is examined by author Ana Tina Jurgec in the tenth chapter, "Dance Creativity in Kindergarten: Improvisation as a Method for Identifying Dance Talent in Children." The author focuses on children's movement formation and physical activity. The findings provide an important foundation for future research into the observation of dance improvisation in preschool children, as well as a better understanding of the role of body movement in children's creative dance expression.

Barbara Bednjički Rošer and Ines Voršič, the authors of the eleventh chapter, "Expanding Vocabulary Through the Use of Multilingual Reading Materials in Preschool Period," present a case study on vocabulary development in preschool children who use multilingual literary and informative reading materials, specifically picture dictionaries and a literary picture book. The results emphasise the need for improved linguistic support using multilingual resources to promote vocabulary development in a diverse learning environment.

In the twelfth chapter, "Classroom Design as a Way of Motivating Students for Artistic Activities," authors Janja Batič and Petra Lebar Kac present the results of a case study investigating how to design equipment and space in a universal classroom to encourage students' spontaneous artistic expression.

Speech and Language Therapy in Slovenia: Education, Career Prospects and Treatment of Speech and Language Disabilities

Milena Ivanuš Grmek, Monika Mithans, Darja Plavčak
University of Maribor, Faculty of Education, Maribor, Slovenia
milena.grmek@um.si, monika.mithans1@um.si, darja.plavcak@um.si

Speech and language therapy is a discipline dedicated to identifying, treating and preventing speech and language disabilities, thereby making an important contribution to improving people's communication skills. This chapter examines the contributions of speech and language therapists in Slovenia, focusing on their educational pathways, career prospects and the various professional settings they engage with, including healthcare, education and social care environments. A significant emphasis is placed on the education of speech and language therapists, equipping students with the necessary competencies to assist individuals with speech and language disabilities. The chapter also addresses the increasing demand for qualified professionals and the importance of early and integrated treatment for individuals of all ages. The conclusion stresses the need to expand training opportunities and enhance access to speech and language therapy services in Slovenia.

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1 Introduction

Communication plays a fundamental role in our daily existence, facilitating our understanding of the world, interpersonal relationships, and self-awareness. It significantly shapes our attitudes, values, and behaviours. Effective communication is inherently a reciprocal process that encompasses the transmission, reception, and interpretation of messages. Individuals employ various modes of communication, including verbal (both spoken and written) and non-verbal (such as body language), which must be harmonized to achieve successful interaction (Žemva, 2016; Ogrin et al., 2016).

As a specialized discipline focused on communication, speech and language therapy plays a crucial role in enhancing and supporting speech and language mechanisms. It is concerned with diagnosing communication disorders, exploring their underlying causes, and assessing their consequences. In addition, speech and language therapy seeks to prevent such disorders and employs a variety of rehabilitative approaches (Žemva, 2014). Through its efforts, it contributes substantially to enabling individuals with speech and language disabilities to develop effective and coherent communication skills, which are essential for successful interpersonal interactions.

As articulated in the European Convention on Human Rights (1950), which stresses the importance of freedom of expression for all individuals, the ability to communicate and share ideas and opinions constitutes a fundamental human right. In this context, speech and language therapy is crucial, as it provides support to individuals with communication disabilities and obstacles, thereby empowering them to exercise their right to express themselves. By enhancing communication skills, speech and language therapists empower individuals to reach their full potential, foster independence, and actively participate in society.

Due to the growing significance of effective communication in today's world, coupled with the ongoing struggle for equality among all individuals, speech therapy emerges as a pivotal area that significantly contributes to the progress of both the individual and society as a whole.

1.1 The progress and function of speech and language therapy: fields of practice and prospects for professional growth

Speech and language therapy is a discipline that aims to improve or reduce communication disorders, including speech, language and swallowing disorders. This discipline encompasses the processes of diagnosing, treating, and preventing these disorders, to foster improved communication and swallowing capabilities in individuals, thus enhancing their quality of life (ASCHA, 2016). The profession of speech and language therapy, as understood in the present day, occurred at the turn of the 20th century (Gačnik and Istenič, 2023). In its formative years, the primary focus was on treating stuttering among adults and improving children's articulation of sounds (Duchan, 2010). However, the scope of practice for speech and language therapists has evolved significantly since then (Gačnik, 2024), creating numerous career opportunities in various contexts.

A speech and language therapist is a qualified professional who delivers clinical services, engages in preventive measures, offers educational support, and conducts research related to communication and swallowing throughout an individual's life (ASCHA, 2016). As outlined in the Code of Ethics and Professional Standards for Speech and Language Therapists in Slovenia (1995), the speech and language therapist serves as the principal authority in the habilitation and rehabilitation of individuals with speech disorders, encompassing all forms of language modalities. Presently, these professionals operate in various domains that address communication, language, and speech issues for individuals at all stages of life (Gačnik, 2024).

The diverse nature of the work conducted by speech and language therapists and the broad spectrum of clients they engage with results from the various settings in which they practice. They work in healthcare institutions, such as paediatrics, neurology, neurosurgery, and otorhinolaryngology; in rehabilitation and specialized centres for children and adults with communication disorders; and in primary schools, both mainstream and special needs schools. Speech and language therapists engage extensively in early childhood education, as well as in research and training institutions dedicated to professionals in the field of speech and language communication. Furthermore, they participate in associations that assist individuals with communication disorders and are employed in private clinics, hospitals, and

medical dispensaries (Prosnik and Marušič, 1995). This range of working environments creates significant opportunities for professional growth and specialization within the field (Prosnik and Marušič, 1995).

The objective of this article is to analyse the current state of speech and language therapy services available in educational institutions in Slovenia. The study focuses on evaluating the degree to which these services align with the essential requirements and guidelines of the educational system, as well as on investigating the occurrence of speech and language disorders among children and adolescents. Furthermore, the article examines whether accredited academic programmes in Slovenia adequately respond to the growing demand for speech and language therapy by ensuring the availability of a sufficient number of professionally trained specialists. Based on the findings, the study aims to contribute to the discourse on potential improvements in the provision of speech and language therapy support within the Slovenian educational system.

2 Methods

This study employs a qualitative approach and document analysis to examine the field of speech and language therapy in Slovenia. The focus is on evaluating the alignment between the demand for speech and language therapy services and the availability of adequately trained professionals in the educational system, as well as assessing the role of academic programmes in ensuring a sufficient number of qualified specialists.

This analysis is founded on a thorough review of various sources, including professional standards for working with children with special needs. These standards outline and define the role of speech and language therapy within the educational system. The analysis also examines accredited study programmes in speech and language therapy and the education of deaf and hard of hearing individuals, as well as relevant scientific and professional literature that addresses speech and language disabilities, their prevalence, and the necessity for early intervention. Additionally, the study includes an evaluation of statistical data regarding the incidence of speech and language disabilities among children and adolescents in the Slovenian educational system.

The data were processed using descriptive analysis, systematically comparing and synthesizing information from multiple sources to highlight key findings. The study relies on secondary sources and does not include empirical data or systematic quantitative analysis; nonetheless, it provides an indicative overview of the existing conditions of speech and language therapy in Slovenia. The findings enhance the understanding of the challenges faced in this field and facilitate further discussion regarding necessary improvements and future directions.

3 Results and discussion

3.1 Speech and language therapy study programmes in Slovenia

Currently, the only Slovenian academic programme dedicated to speech and language therapy and the education of the deaf and hard of hearing is at the Faculty of Education, University of Ljubljana. The programme was initially established as part of the special and rehabilitation education curriculum. With the introduction of the Bologna Process in 2010, the programme gained autonomy, which allowed the formation of courses focused on the identification, diagnosis and treatment of speech and language disorders. Specialized courses were developed to provide students with comprehensive knowledge in speech and language therapy and in educating individuals who are deaf or hard of hearing. Consequently, the programme prepares students to professionally assist individuals facing difficulties in speech, language, communication, or hearing (Novšak Brce and Kogovšek, 2019).

The academic program is available at both the undergraduate and graduate levels. The undergraduate phase extends over four years and is worth 240 credits. It equips students with fundamental skills necessary for a career in speech and language therapy, as well as sign language therapy. To work independently as a speech and language therapist or within the field of education for the deaf and hard of hearing, it is essential to pursue further studies at the postgraduate master's level. The duration of the master's degree programme is one year and is worth 60 credits. Upon successful completion of the programme, graduates are granted the title of Master Professor of Speech and Language Therapy and Education of the Deaf and Hard of Hearing (Faculty of Education, University of Ljubljana, n. d. 2023a, b).

The primary objective of the study programme is to prepare students for professional engagement with individuals experiencing speech, language, and communication disorders, as well as those who are deaf or hard of hearing. During their studies, students acquire special educational and rehabilitation skills to engage with individuals at every stage of life and in a variety of social environments, such as educational institutions, healthcare facilities, and social care organizations. The programme emphasizes the combination of theoretical knowledge and hands-on training, which encompasses therapy observation, tutorials, performances, and clinical practice. Students acquire professional experience in external organizations under the guidance of certified speech and language therapists and experts in the education of individuals who are deaf or hard of hearing. This model supports a meaningful connection between theoretical insights and practical execution (Kogovšek et al., 2024).

The increasing demand for speech and language therapists and specialists in the education of individuals who are deaf or hard of hearing across various age groups and professional settings underscores the necessity of training in this field. Such training is vital for the advancement of the profession in Slovenia. The Faculty of Education at the University of Ljubljana has witnessed a consistent increase in enrolment for its speech and language therapy programme in recent years. Nevertheless, a significant deficit of professionals in this area remains, indicating a pressing need for alternative strategies to enhance the workforce. According to Žemva and Ogrin (2017), the chronic lack of speech and language therapists can be attributed to the shortcomings in both undergraduate and postgraduate educational systems.

3.2 Speech and language disabilities: from observation, identification, and prevalence assessment to the development of effective treatment strategies

Observation of the child's progress in speech and language development

Recognizing speech disorders requires careful observation of communication patterns, specifically the messages conveyed by children and the reactions they provoke in those receiving these messages. Such observations can provide insights into the child's speech and language development and may reveal potential indicators

of developmental delays (Grilc, 2014). During the initial three months of life, an infant typically expresses its emotional state through crying, screaming, and laughing. A lack of response to loud sounds during this stage may suggest developmental delays.

Additionally, it is important to consider the significant transition that occurs when the child begins school. Children aged 6 to 7 are generally expected to use compound word structures, understand abstract concepts, and name the days of the week. They should be capable of integrating events, people, and topics into their storytelling, modifying their speech to fit various social situations, and participating in lengthy conversations. Furthermore, they should be able to control their vocal volume, show an increased interest in letters and writing, and develop auditory analysis and synthesis skills. This includes isolating the first and last sounds in words, segmenting words into sounds, associating letters with sounds, recognizing letters, and starting to write. However, some children may display signs of developmental delays, characterized by limited vocabulary, simple sentence structures, difficulty in grasping abstract concepts, inability to distinguish between letters and numbers, lack of awareness in auditory analysis and synthesis, and challenges with memorization (Mesec, 2009, in Grilc, 2014).

These observations should not be regarded as a diagnostic tool; they merely reflect expectations and indicate whether the child may require professional support. It is also essential to recognize that speech development is affected by both biological conditions, such as the structure of the speech apparatus and normal hearing capabilities, and environmental factors, including emotional and social interactions and the quality of linguistic stimuli. The influences on speech development can be categorized as both internal, pertaining to physiological factors, and external, related to social and sociological contexts. As discussed previously, it is evident that children with intellectual disabilities may experience varying degrees of deviation in their speech development as they often remain at a certain developmental stage for a longer time. Additional risk factors include premature birth, low birth weight, hearing impairment, brain haemorrhage and, instances of neglect. When observing a child's speech and language development, it is crucial to consider the various components that facilitate communication in its entirety, including vocalization, facial expressions, listening, comprehension, imitation, and verbal expression (Grilc, 2014).

Basic understanding of speech and language deviations, difficulties and disabilities

One of the most frequently observed forms of speech disorders is related to articulation, predominantly seen in preschool and primary school children, with fewer instances reported among adults. Furthermore, speech disorders of this nature are more commonly observed among children with special needs. In Slovenian language, speech sound disorders manifest in three distinct forms: the omission or inaudible articulation of a sound, for instance, a child may pronounce "riba" as "iba"; substitution, for instance, "roka" may be articulated as "loka"; and the incorrect articulation of a sound or group of sounds, such as an example of distortion where š, č, ž are pronounced too softly. Disorders of this nature can be classified as consistent, where a child consistently makes the same types of errors, or inconsistent, where errors occur sporadically or are absent in certain contexts. It is common for inconsistent speech errors to be evident in a child's development until the age of four; should these errors persist past this age, they may be indicative of lexical dyslalia or the incapacity to produce speech phonetically correctly. Articulation disorders can be categorized based on the specific sounds or groups of sounds that a child struggles to articulate. The following types can be identified: sigmatism (sounds /s/, /z/, /c/, /š/, /ž/, /č/ can be substituted with each other or with other sounds, such as /z/, /t/, /d/), rhotacism (inability or difficulty in articulating the /r/ sound), lambdacism (inability or difficulty in articulating the sounds /l/ and /lj/), kapacism and gamacism (inability or difficulty in articulating /k/ and /g/), tetacism and deltacism (inability or difficulty in articulate /t/ and /d/ sounds), and etacism (inability or difficulty in articulating the sound /e/). Children's sound development follows predictable patterns, indicating that specific sounds are anticipated to emerge at particular ages (Grilc, 2014).

Language difficulties are generally classified into three categories: those involving delayed speech and language development with insufficient speech capabilities, instances of insufficiently developed speech, and specific difficulties associated with language use. Speech and language delay refers to a situation in which a child experiences a slower progression in their speech and language development, typically observed in children up to the age of four. If such difficulties continue past this developmental milestone, it is characterized as an insufficiently developed speech disorder. An illustrative example would be a child who communicates less frequently than their peers, employs shorter and more simplistic sentence structures, and

exhibits a range of consistent and inconsistent articulation errors. Insufficiently developed speech is characterized by either the absence of verbal communication or by significantly limited speech in terms of vocabulary and grammatical complexity. Specific language difficulties imply that a child has limited linguistic capabilities and non-verbal skills, yet does not suffer from any physical, hearing, or severe emotional disorders. This condition is often evident through delayed language development, a limited range of vocabulary, incorrect conjugation, average intellectual capabilities, et cetera (Grilc, 2014).

Challenges associated with the rate and rhythm of speech include stuttering, speaking too fast or too slowly and/or slurred speech. Stuttering is characterized by the involuntary repetition of sounds, syllables, words, or phrases (Grilc, 2014). A speech disorder is identified when the listener's focus transitions from the message being conveyed to the manner of its delivery (Podbrežnik, 2012). An accelerated speech rate is typically associated with frequent articulation mistakes, while a notably slow speech pattern is characterized by the elongation of sounds, especially vowels. Children with motor impairments often exhibit slurred speech, which is marked by a slower rate of speech and disrupted rhythm. Furthermore, individuals may also experience voice disorders, which are often characterized by a less optimal vocal quality, such as hoarseness or dysphonia (Grilc, 2014).

Certain deviations in speech and language development are commonly observed among children with special needs, including those with physical disabilities, intellectual disabilities, autism spectrum disorders, and hearing impairments (Grilc, 2014).

3.3 The prevalence of speech and language disabilities within the Slovenian population

Between the school years of 2003/04 and 2020/21, there has been a notable rise in the number of children with disabilities who have been enrolled in various educational programmes in Slovenia. In the research titled "Ensuring Equal Educational Opportunities for Children and Adolescents with Special Needs" by Vovk Ornik et al. (2023), it is reported that the largest segment of children enrolled in a preschool programme featuring adapted basic school curricula along with specialized support is made up of children with speech and language disabilities. This

segment represented 47.4% of all enrolled children. Following this group, children with multiple disabilities comprised 24.9% of the total, often experiencing speech and language difficulties in conjunction with other disabilities.

Similarly, the statistics provided by the Ministry of Education of the Republic of Slovenia (2003a) reveal that there has been a notable increase in the number of students with speech and language disabilities enrolled in primary schools that offer adapted education and additional specialized support. During the school year 2015/16, there were 1,180 such students, which represented 11.7% of the total enrolment. By the school year 2020/21, this number had increased to 1,629, representing 11.5% of all enrolled students. The following year, 2021/22, saw an increase to 1,870 students, representing 12.3% of the total enrolment, and by the school year 2022/23, the number reached 2,066, making up 13.5% of all enrolled students. At the same time, there has been a notable rise in the number of students with multiple disabilities. During the 2015/16 school year, there were 1,836 students (18.2% of the total enrolment) in primary schools receiving adapted education and supplementary specialized support. By the school year 2022/23, this number had risen to 4,331, accounting for 28.3% of all enrolled students.

Over the years, the enrolment of students with speech and language disabilities in secondary education programmes has shown variability. In the school year 2015/16, there were 80 students with these disabilities, making up 2.9% of the total student body. This number grew to 115 students, or 2.2% of all enrolled students, in the 2020/21 school year. By the school year of 2022/23, the count reached 128, which represented 1.8% of the total enrolment. On the other hand, the prevalence of students with multiple disabilities has experienced a significant rise. The data indicates that in the school year 2015/16, there were 232 students with multiple disabilities, which constituted 8.3% of the total enrolment. This number grew to 1,399 in 2020/21, representing 26.2% of all enrolled students. By the school year 2022/23, the figure had reached 2,202, which was 30.4% of the total enrolment (Ministry of Education of the Republic of Slovenia, 2023b).

It has been noted by experts that the demand for speech therapy is on the rise among individuals of all ages. This increase is further emphasized by Žemva and Ogrin (2017), who regard the accessibility of speech therapy services as a significant ethical concern within the field.

3.4 The role of parents and the environment in language development and the assistance of a qualified speech and language therapist

The role of parents and the surrounding environment is crucial in fostering language development as well as pre-reading and pre-writing skills. This can be achieved by expanding the child's vocabulary through interactive experiences, such as looking at picture books, as well as by developing graphomotor skills through activities such as drawing, clay modelling, and threading beads. In instances where challenges arise, however, parents should consult a speech and language therapist. The activities provided in speech therapy can be classified into three groups: (1) activities designed for non-verbal children (level zero), (2) activities for children with limited speech development (level 1), and (3) activities for children experiencing multiple speech disabilities (applicable to all levels). (1) Activities designed for non-verbal children (level zero) include a range of exercises that promote general motor skill development, auditory exercises, visual perception tasks, comprehension of single words, gross motor responses, the ability to follow instructions, exercises targeting the speech organs, and practices in phonation, speech imitation, and basic pronunciation. (2) Activities designed for children exhibiting limited speech development (level 1) encompass a variety of exercises aimed at enhancing their communication skills. These include acoustic and speech organ exercises, as well as attention-focused activities that engage both visual and auditory modalities. Additionally, articulation exercises are employed, alongside tasks that facilitate the recollection of word forms. Children are also guided through exercises that promote the use of adjectives, pronouns, prepositions, conjunctions, and prepositional phrases. Further, there are activities aimed at mastering conjunctions, possessives, and the correct application of plural forms. Activities also include memorization of sentences, as well as exercises addressing compound (negative) and interrogative sentence structures. Moreover, children engage in activities that involve the past tense, learning brief recitations, counting rhymes, and short stories, along with picture descriptions and narratives based on personal experiences. (3) The spectrum of activities available for children with multiple speech disabilities, relevant to all levels, includes (a) exercises aimed at children with delayed speech development, stuttering, excessively fast speech, and abnormally slow speech, (b) targeted exercises for those with delayed speech development and nasal speech, (c) exercises for children with delayed speech development, pseudobulbar palsy, and various types of dysarthria, (d) activities for children with concurrent delayed speech and hearing

disabilities, and (e) exercises for children with both delayed speech and voice disabilities (Grilc, 2014).

The aforementioned discussion reveals a multitude of activities included in speech and language therapy; however, a comprehensive examination of all these aspects is beyond the scope of this text. This text briefly examines stuttering, which Podbrežnik (2012) argues should be tackled at an early stage, although he emphasizes that it is never too late to seek help, provided that individuals are determined and committed to daily exercises. Additionally, Podbrežnik notes that the individual's treatment results are affected by numerous factors, including age, the severity of the disorder, and existing health issues, as well as the support provided by family members and the broader social environment throughout the treatment journey.

While the speech and language disabilities in this chapter are previously discussed as being more common among children and adolescents, it is important to note that these issues can also emerge later in life due to illness or injury. According to Žemva (2010), speech therapy proves beneficial for individuals suffering from aphasia after having a stroke or those having swallowing disorders. However, discussions surrounding the efficacy of such therapies often highlight the necessity for further investigation to determine the factors that contribute to their effectiveness, such as the impact of intensive treatment delivered over a shorter timeframe.

The practice of speech and language therapy follows the clinical guidelines for various speech and language disorders. It also examines the effectiveness and relevance of these guidelines in Slovenia. Among the most important clinical guidelines are those provided by the American Speech and language-Hearing Association (ASHA 3,4) and the Royal College of Speech & Language Therapists (RCSLT 5) (Žemva, 2014).

Širca and Omahna (2015) emphasize that impairments in the right hemisphere of the brain can cause considerable communication difficulties, referred to as cognitive-communication disorders (CCDs), which may frequently be mistaken for aphasia. Consequently, accurate diagnosis is crucial for ensuring appropriate and effective rehabilitation.

Moreover, Ogrin et al. (2016) argue that it is crucial to conduct a proper assessment of communication and swallowing functions to devise suitable speech therapy strategies. To achieve this, a range of both standardized and non-standardized assessments are employed to gather qualitative and quantitative data. Furthermore, Žemva and Ogrin (2017) point out that achieving success requires timely treatment, which poses a significant challenge in Slovenia due to a shortage of qualified professionals. They further stress the necessity of a strong work ethic, interdisciplinary collaboration, continuous professional development, critical thinking, and the ability to empathize.

Slana et al. (2021) conducted an analysis of speech therapy telerehabilitation (remote rehabilitation) across 11 articles and discovered that all participating children exhibited considerable improvement. Nonetheless, there remains a need for further investigation into telerehabilitation specifically for children with neurological impairments. Consequently, telerehabilitation presents a promising alternative to conventional treatment methods.

In addition, Onuk (2024a, 2024b) discusses the function of the speech and language therapist in assisting individuals with dementia, particularly as their communication capabilities decline as the condition advances. The therapist's responsibilities include not only the support to improve the patient's ability to communicate but also to provide essential support to their families in coping with the evolving circumstances.

3.5 The role of a speech and language therapist within the educational context, as outlined in various official documents

In the context of education, it is pertinent to draw attention to specific documents that illustrate the significant role of speech and language therapy.

Within the context of preschool education, the role of a speech therapist is specified in the *Guidelines for Teachers Working with Preschool Children Diagnosed with Autism Spectrum Disorders - ASD* (Werdonig et al., 2009), in the *Curriculum for Kindergartens Providing Specialised Programmes for Preschool Children* (Podboj & Vizjak Kure, 2006), and in the *Supplements to the Curriculum for Kindergartens Providing Specialised Programmes for Preschool Children Diagnosed with Autistic Spectrum Disorders* (Bergauer et al., 2017).

Moreover, within the context of primary education, the document *Criteria for Identifying the Type and Degree of Deficits, Handicaps and/or Impairments in Children with Special Needs* (Vovk-Ornik, 2015) highlights the essential role of speech and language therapists, particularly in the segment dedicated to children with speech and language disabilities. The segment clarifies that the assessment of a child's speech and language disability is performed by the speech and language therapist, who applies defined criteria and professional standards to determine the necessity for structured speech therapy as an integral component of the child's educational experience. According to the *Guidelines for Adapted Implementation of the Basic School Programmes and Special Educational Support* (Likar et al., 2003) it is generally the role of a speech and language therapist to deliver special educational support to children with speech and language impairments. In the *Updated Guidelines for Adapted Implementation of the Basic School Programmes and Special Educational Support for Nine-Year-Old Primary Schools: Guidance for Teaching Pupils with Autistic Spectrum Disorders* (Rogič Ožek et al., 2019) it is noted that children with autistic spectrum disorders generally require an array of specialized services beyond the school environment, including the support of speech and language therapists, whom the school team should collaborate with. Additionally, the document titled *Adapted Primary School Programme with Appropriate Educational Standards for Children with Autism Spectrum Disorder* (Burja et al., 2014) emphasizes the significance of collaborative efforts when working with children diagnosed with autism spectrum disorder (hereafter ASD). Like previously mentioned documents, it highlights the involvement of various professionals in this team-oriented approach, including speech and language therapists. This programme features a distinctive educational activity focused on communication skills, which is scheduled for two hours weekly in grades 1 and 4, and one hour weekly in all other grades. This aspect of the programme may be provided by qualified professionals who possess expertise in speech and language therapy obtained through higher education and who are adept at working with children diagnosed with ASD. Moreover, the importance of the speech and language therapist's involvement in collaborative efforts of teamwork is also highlighted in the *Special Education Programme* (Plavčak et al., 2022), which is designed for the education of students with moderate, severe, and profound intellectual disabilities. These individuals often struggle with speech and language disabilities as well.

Similarly, within the context of secondary education, various documents highlight the significance of speech and language therapists as essential members of the support team for students with speech and/or language disabilities in grammar school programmes (Žnidarič, 2004) as well as in vocational and professional education programmes (Podbrežnik & Steiner, n.d.).

The role of a speech and language therapist within a collaborative team setting and in the context of speech therapy is also prominently featured in the *Educational Programmes for Children and Adolescents with Physical Disabilities in the Form of Full-Day Training* (Logaj & Kaučič Zadnik, 2014) and in the *Special Education Programme for Children and Adolescents with Special Needs - (Post-)Rehabilitation Practicum* (Logaj, et al., n.d.).

4 Conclusion

Speech and language therapy serves a fundamental purpose in advancing and supporting communication skills for individuals throughout their lifespan, with early and timely treatment being particularly important. Speech and language therapists are employed in a range of settings, which not only fosters professional growth but also allows for various avenues of specialization.

In Slovenia, there is a notable increase in individuals affected by speech and language disabilities, a trend that is particularly highlighted in educational research. This is especially concerning for children and adolescents during critical developmental stages where speech plays a vital role in the acquisition of knowledge, experiences, social skills, et cetera. A variety of educational resources are designed to provide professional assistance and support, promote effective speech and language therapy, and encourage collaboration with speech and language therapists.

Thus, the focus of this chapter is to draw attention to the critical importance of ensuring a sufficient number of highly skilled speech and language therapists, equipped with the expertise and skills to diagnose, treat and apply preventive and rehabilitative measures. To realize this objective, it is essential to ensure that a sufficient number of speech and language therapists are available to serve across various domains, including education and healthcare. The Faculty of Education at the University of Ljubljana offers an accredited study programme in Speech and

Language Therapy and the Education of Deaf and Hard of Hearing Students; however, it fails to generate a sufficient number of qualified specialists. Therefore, it is essential to enhance the diversity of study programmes in this area across Slovenia.

In light of the increasing occurrence of speech and language difficulties among people, it is crucial to deliver high-quality, accessible, timely, and comprehensive care to those who require assistance, regardless of their age. There is a pressing need to advance the training of professionals in higher education who will employ scientific research techniques to enhance the critical assessment of recent theoretical developments and to explore practical strategies.

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About the authors

Milena Ivanuš Grmek, PhD, is a full professor of pedagogy at the University of Maribor, Faculty of Education. Her main research areas are learning and teaching in different educational fields, curriculum changes and higher education didactics. She is responsible for teaching students the didactics at the undergraduate and postgraduate levels. She is a supervisor of students' diploma, master's and doctoral theses. She has published scientific and specialized texts in Slovenian and in foreign journals and participated in scientific conferences in Slovenia and abroad. Considering her current position at the University of Maribor, Faculty of Education, she is Dean.

Monika Mithans, PhD, is an assistant professor in the field of pedagogy at the Faculty of Education, Department of Fundamental Pedagogical Subjects at the University of Maribor, Slovenia. Her main areas of research are: school participation, modernization of the educational process and curriculum changes.

Darja Plavčak, PhD, is an assistant professor in the field of special education at the Faculty of Education, Department of Fundamental Pedagogical Subjects at the University of Maribor, Slovenia. Her primary research areas include approaches to fostering social skills in students with special needs, the vulnerability and life circumstances of families of children with special needs, the use of generative artificial intelligence for children with special needs, and intervision among professionals in education.

Reading Adapted Texts of Young Adult Fiction and Reading Motivation of Pupils With Speech and Language Disorders

Nika Vizjak Puškar,[1, 2] Tina Vršnik Perše,[1]
Dragica Haramija[1, 3]
[1] University of Maribor, Faculty of Education, Maribor, Slovenia
nika.vizjak-puskar@csgm.si, tina.vrsnik@um.si, dragica.haramija@um.si
[2] Center for Hearing and Speech Maribor, Maribor, Slovenia
nika.vizjak-puskar@csgm.si
[3] University of Maribor, Faculty of Arts, Maribor, Slovenia
dragica.haramija@um.si

The research studied how reading of adapted young adult fiction effects reading motivation of Slovene elementary school pupils with speech and language disorders. The research involved 50 pupils from the last three years of elementary school. Typically, pupils with these disorders do not enjoy reading during adolescence, as texts that would be suitable to their age and interests in terms of content are most often incomprehensible or linguistically too demanding for them. For the purpose of the research, we adapted two complete works of Slovene literature into an easy-to-read form (passages version in easy language). Pupils intensively read the adapted texts and also looked at the originals. This had positive effects both on their comprehension of the literary texts as well as their reading motivation. The results of the research demonstrated that adapted texts positively influence the reading motivation of pupils and their perception of literature.

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easy-to-read material

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1 Introduction

Speech and language disorders are a specific group of disorders that are hard to define precisely. In English-speaking contexts, the expression speech and language disorders which is used in Slovenia, is mostly covered by terms such as developmental language disorder - DLD, specific language impairment - SLI, language delay, or developmental dysphasia. Persons with speech and language disorders are often overlooked, as these disorders are not immediately noticeable. In appearance and in initial contact, these people are entirely normal individuals, but their disorder hinders their everyday life, especially within the educational process. A broad range of disorders are classified under the speech and language disorder label, both in terms of occurrence and cause, but the common difficulty most people with these disorders have is in communication. Deficiencies are especially reflected in the field of reading and written communication (Bishop, 2014).

The specific developmental deficiency is linked to the period of language acquisition in which the child's abilities in linguistic understanding and/or expression are significantly below the levels expected for their age. When a person grows up, their problems, which previously appeared mainly in the educational process, spread to other areas of their life (Botting & Conti-Ramsden, 2008; Snowling et al., 2006).

In Slovenia, pupils with speech and language disorders are educated either in educational programmes with adapted implementation and additional professional help in mainstream elementary school or in institutions with an adapted educational programme with equivalent educational standards for children with speech and language disorders. Due to the nature of their disorders, these pupils find reading and comprehending literary texts hard, and this normally keeps their reading literacy and reading motivation as one of its components at a very low level.

Reading motivation is affected by a number of factors that encourage a person to read, give them a sense of purpose, and influence the individual into wishing to repeat the reading experience (Pečjak & Gradiškar, 2002). With any motivation for a certain activity, it is important that the individual feels competent in it, so adapting reading challenges to the abilities of each individual pupil is of key importance. Not adapting reading challenges to the pupils' abilities has negative consequences both on pupils who are less competent readers as well as those who are competent

(Bošnjak and Košir, 2020). Reading motivation is an integral part of overall reading effectiveness and is closely related to its development (Baker & Wigfield, 1999; Gambrel et al., 1996; Wigfield & Girthrie, 1997).

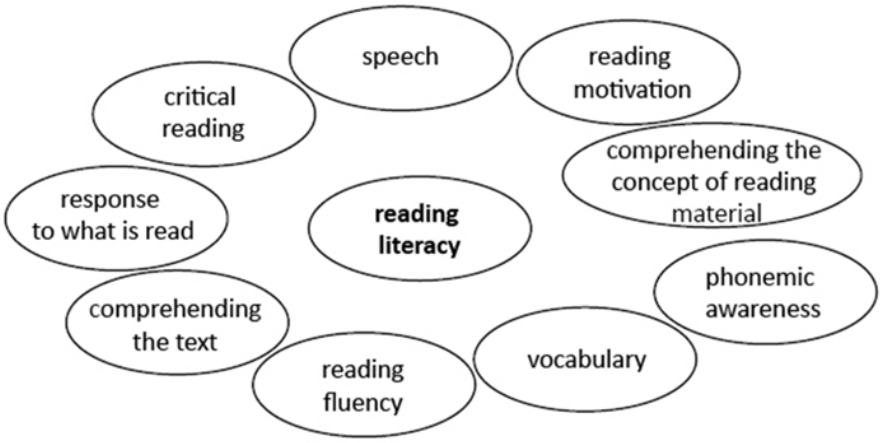

Figure 1: Components of reading literacy
(Haramija, 2020, p. 2)

Among pupils with speech and language disorders who are included in Slovenia's adapted educational programme of nine-year elementary education with equivalent educational standards there are also many pupils with dyslexia. Certain parallels can be drawn between the two disorders (Adolf, 2020). Both often have problems in achieving goals and standards of knowledge set out in the school curriculum. Studies in other countries also indicate this (Bridges et al., 2023; Kurz et al., 2012). Both cases involve pupils who, due to the nature of their deficiencies or disorders, are often unable to recognise the satisfaction that can come from reading a longer literary text on their own. Their comprehension of literary texts is most often limited by the difficulties they have in the area of recalling words and remembering new and abstract expressions. At the same time they find it hard to comprehend complex compound sentences and can find the word order in literary texts confusing (Vizjak Puškar, 2017). They also have difficulties in understanding humour, which is an important element of young adult (YA) literary texts. That there are substantial differences in understanding humour between neurotypical individuals and individuals with dyslexia has also been demonstrated by research (Semrud-Clikeman & Glass, 2008; Wanga et al., 2022).

Pupils with speech and language disorders often have difficulties with picking up vocabulary, which affects many aspects of life even in adulthood. Research (McGregor et al., 2013, Leitão & Fletcher, 2004) has shown that the range of vocabulary significantly affects the acquisition of academic knowledge, as limitations are reflected in pupils' limited abilities in deciphering the meanings of words and thus also the comprehension of what is being read. More often than their peers without recorded disorders, children with speech and language disorders have difficulties with phonological awareness and semantics (Lowe et al., 2022). All this affects their reading comprehension and as a result also their reading motivation. They put a great deal of effort into reading but are at the same time not able to decipher those elements of the literary work that would generally arouse interest and positive emotions in them.

By adapting texts to easy-to-read formats, we enable these individuals to have literary-aesthetic experiences that would otherwise remain unattainable to them. Pupils with speech and language disorders belong to the group of people who need adapted texts on an ongoing basis. Only with an appropriate gradual approach to a literary work can they also attempt the more demanding original. In her work on the didactics of literature in Slovene lessons, Boža Krakar Vogel points out that 'Abridgement or adaptation of literary texts is entirely justified for readers with reading difficulties such as for example readers with disruptions in their emotional development or those with dyslexia.' (Krakar Vogel, 2020, p.185)

The key objective of the didactics in YA literature is to equip pupils for creative communication with the text. This can be achieved by increasing their receptive capacities by enabling pupils to independently read and compose textual meanings. It is essential to enable pupils to have independent and direct contact with the text (Kordigel Aberšek, 2008). Our experiences show that with pupils with speech and language disorders this goal is achievable only with the help of high-quality adapted texts.

Easy-reading abridgements have proved to be a very suitable form of literary adaptations for pupils with speech and language disorders. The first guidelines were set out in the Guidelines for Easy-to-Read Materials (2007, revised 2010) prepared by the International Federation of Library Association (IFLA):

There are two slightly different definitions of the term "easy-to-read". One means a linguistic adaptation of a text that makes it easier to read than the average text but which does not make it easier to comprehend; the other definition means an adaptation that makes both reading and comprehension easier. (Guidelines …, 2010, p. 3)

The United Nations Convention on the Rights of Persons with Disabilities stipulates equal opportunities for all people regardless of their disabilities. Evey individual must be guaranteed access to education and information in a form that is comprehensible to them. This was also the reason why recently guidelines have begun to be developed on forming language that could also be comprehensible to groups of people with reading and comprehension difficulties. Every individual needs to have the choice between information in simplified or standard language that they can choose between according to their needs. This is why it is essential that the easy language form is an accessible, neutral and non-stigmatising option for all communication in society (Lindholm and Vanhatalo, 2021).

Both easy-to read and easy language texts began to develop out of a needs or necessities highlighted by users. The movement began developing simultaneously in numerous countries over the last decade, precisely because of the need for social inclusion of people with reading difficulties. Easy language and easy-to-read texts can thus serve as a bridge between the standard and even professional language and individual target groups. A number of studies in this field unanimously point out the need for simplified texts for individual target groups (Bock et al., 2017).

With the field of easy-to-read material and easy language developing rapidly in recent years, experts are trying to standardise terminology, making it clear and comprehendible to the general public (Lindholm and Vanhatalo, 2021, pp.11-12):

The expression Easy Language is more of an umbrella term for different language varieties than the name for one uniform concept. /…/ Easy Languages have been adapted in terms of content, vocabulary and structure to make them more readable and comprehensible. They are aimed at people who find it difficult to understand standard language. Although the term Easy Language usually refers to various kinds of texts, spoken interactions can also be based on its principles. The term easy to read and understand is used by the UN Convention on the Rights of Persons with

Disabilities (CRPD) in conjunction with inclusion and accessibility, and has equivalents in many European countries and languages.

The chapter then presents the research with which we tested whether we can raise the reading motivation of pupils with speech and language disorders through reading adapted literary texts.

2 Methods

For the purpose of the research (Vizjak Puškar, 2024), we adapted two YA literary texts, the tale by Fran Levstik *Martin Krpan* and the novel *Sprout - From Lanky to Legendary* by Primož Suhodolčan. *Martin Krpan* (*Martin Krpan z Vrha*) by Fran Levstik is one of the most important works of the Slovene literary cannon. It was first published in 1858 in a literary journal; in 1917 it was first published in book form with illustrations by Hinko Smrekar, in what is considered the first original Slovene picture book. Primož Suhodolčan is a contemporary Slovene author. His works are marked with humour, which is especially expressed at the verbal level. In his works he uses colloquial language, slang, dialect expressions, and also many made-up words and metaphoric comparisons, which make his work interesting to young readers.

These two works were chosen on the basis that they are both representative works of Slovene YA literature and are interesting in content and suitable for pupils in their third educational period, but are, in their originals, due to their linguistic features, too demanding for pupils with speech and language disorders. The former due to the archaic vocabulary and syntactic structures, the latter due to its slang, dialect expressions and play on words. Comprehension of these element, which are key to understanding and experiencing literary texts, is very limited with pupils with speech and language disorders.

An application for approval of the research was submitted to the Research Ethics Commission of the Faculty of Arts, University of Maribor, which approved it on June 10, 2021. Before the start of the research, necessary consents for the participation of pupils in the study were also obtained.

At first we adapted the texts by ear, taking into account the rules of easy-to-read, both in terms of design and language, as described in the manual Easy-to-Read for Experts (Haramija and Knapp, 2019). This was followed by test readings. The working version of the text was given to a group of test readers. The initial contact of the test readers with the text showed that certain words and phrases were still too demanding. These words were replaced with others and we also included certain grammatical simplifications. What was deliberately left in the text were a few stylistic elements that we believed were comprehendible to the target audience, pupils with speech and language disorders.

For the next stage of our research, we also adapted a passage from each text into easy language. This means that we simplified the text, replaced archaisms, slang and dialect phrases with literary synonyms, and simplified the syntactic structure of the tale. We chose passages that, based on previous research, we judged to be the ones pupils remembered least after reading the entire text in its easy-to-read adapted version. While we were able to adapt the complete texts to the easy-to-read version, we only adapted the passages that we discussed with the pupils during the research process into easy language.

The research was conducted during Slovene language and communication lessons in the 2022/2023 school year, in schools that offer the adapted educational programme of nine-year elementary education with equivalent educational standards for children with speech and language disorders. The research included 50 pupils from the third educational period (EP) who were part of this adapted programme. Before the start of the research, we obtained the necessary parental consent to the pupils' participating in the research.

According to data obtained from heads of the institutions that offer the abovementioned programme, 115 pupils from the third EP were schooled in the programme during the 2022/2023 school year. The research sample thus includes approximately 43% of all pupils included in the programme in their third EP. This involves pupils in years 7., 8. and 9., who are included in the programme on the basis of assessments on educational guidance. The programme includes mostly pupils with moderate to severe speech and language disorders and only the occasional pupil with milder ones. Beside their speech and language disorders, these pupils also have associated impairments, among them the most common are deficiencies in specific

areas of learning, among which is also dyslexia. The same individuals participated in all stages of the research. If any of the pupils were absent on the day the research was conducted, the research task was conducted with them at a later date. Pupils were not divided into an experimental and control group, and results were also not interpreted according to the age or gender of individuals. Despite this, for the sake of clarity, we present a more detailed description of the sample group. The average age of participating pupils was 14. The sample group included 15 (30%) girls and 35 (70%) boys.

When it comes to age, the pupils included in the abovementioned educational programme are a very heterogenous group, as some pupils had postponed schooling, some had to repeat classes or were included in the programme later. In each class, there might thus be pupils with an age difference of up to three years. Pupils also differ in terms of the disorders based on which they were included in the programme. Pupils with speech and language disorders are classified by their severity, from mild, moderate, serious, to severe. Participating in our sample group were mostly pupils with serious to severe speech and language disorders, often also with other associated disorders.

In this paper we present only part of a broader study in which we compared how two different texts were experienced and understood, first in their original form, then in an adapted versions before finally once again returning to the original form. We studied the advantages and disadvantages of each type of adapted texts and compared how pupils responded. Beside this, we also compared their reading motivation at the start and at the end of the school year. The course and the results of this part of the research are presented below.

To evaluate reading motivation, we used the existing Reading Motivation Questionnaire for Older Students (after Pečjak et al. 2006). This is essentially a questionnaire that author Sonja Pečjak and her colleagues adapted from the 1997 questionnaire by Wigfield and Guthrie. The adapted questionnaire contains 52 statements. Pupils chose on a scale of 1 to 5 to what extent each statement is true for them. The reading motivation questionnaire for older pupils tests four factors of reading motivation:

- factor 1 – external motivation for reading,

- factor 2 – interest and reading in a social context,
- factor 3 – inclusion and immersive reading,
- factor 4 – perceiving reading as a difficult activity.

Due to the considerable length of the questionnaire and the fact that certain terms are not easily understood by pupils with speech and language disorders, we filled out the questionnaire by reading out individual statements to pupils and explaining each one, as this was the only way we could ensure that pupils understood the question and were answering honestly. We summed up the values of each of the four factors for each pupil. Because the research did not focus on the progress of the individual but the progress of the entire group, we calculated the mean average of the entire group and compared it to the Slovene national average.

Pečjak et al. (2006) used the T-scale as a basis for developing norms, converting each individual's result to the T-scale using the following formula:

$$T = \left\lfloor \frac{(x_i - M)}{\mathrm{SD}} \right\rfloor . 10 + 50$$

In this formula, x_i is the raw score on an individual factor, M is the arithmetic mean, and SD is the standard deviation of the factor for the target group. The T-score indicates where an individual student stands within the population of their peers (Pečjak et al., 2006, p. 84).

The same questionnaires were completed in the same way at the start and at the end of the school year, first in September 2022 and then in June 2023. This way we could verify the notion that with adapted literature we can increase the reading motivation of pupils with speech and language disorders and positively influence the way they experience literary texts.

Between the initial and final testing of reading motivation, the research was conducted in two segments. The first segment involved discussing Fran Levstik's *Martin Krpan*, the second segment discussed Primož Suhodolčan's *Sprout - From Lanky to Legendary*. Each segment had five phases.

A graphic representation gives a clearer idea of the research progress.

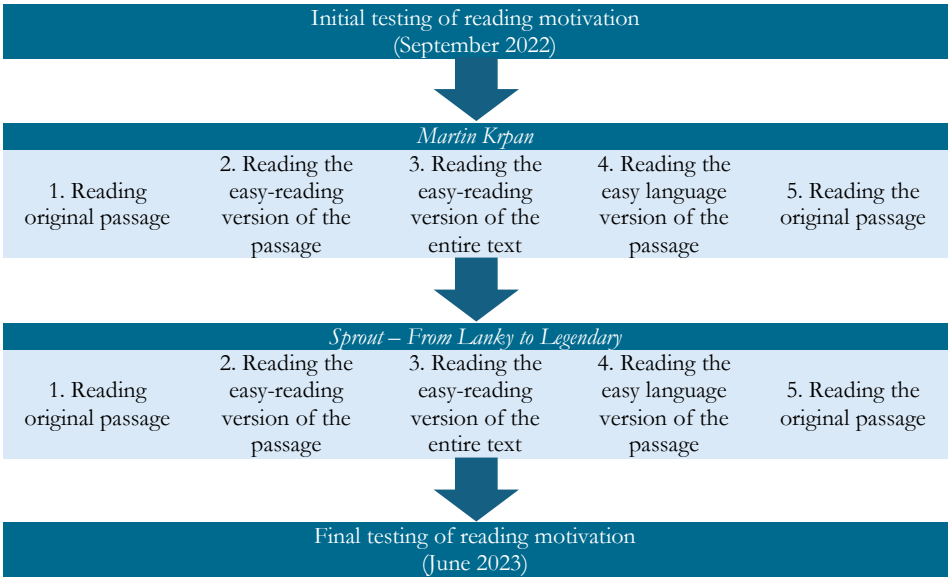

Figure 2: Graphic representation of the progress of the research

In the **first phase**, we gave pupils passages of the original texts to read. This was followed by an analysis of the degree of comprehension of what was read. This was carried out through individual conversations with pupils. Pupils were asked a few questions which did not influence their comprehension or lead them to specific answers. Through this we wished to gain a clear insight into what pupils actually understood and to what degree. The analysis was conducted with the help of questions that were adapted to each pupil and their response during this discussion, also taking into account spontaneous comments and observations by pupils.

In the **second phase** of the research, pupils were given the same passage in an easy-to-read version. This was followed by individual conversations and comparing the comprehension of the adapted version with the original. Once again, we checked comprehension with questions, noting the answers and comments of each of the participating pupils. Initially we had planned to give pupils the second passage in and easy-reading version which was in terms of contents a continuation of the first (original) passage, but after analysing the comprehension of the original passage, we

decided to use the same passage in terms of contents, as comprehension during the first phase was relatively poor with most students.

In the **third phase** of the research, pupils read the entire texts in the easy-to-read version. The texts were read at school during Slovene and communication lessons. After reading, they individually filled out questionnaires with which we verified their comprehension and recognition of certain elements of the texts as well as their feelings while reading and their experience of the longer text. Their responses to the texts were distinctly positive and comprehension of the texts was very good. This phase was followed by a break.

In the following two phases, pupils were once again given passages to read. In the **fourth phase** they read a easy language passage and in the **fifth phase** a different passage from the original text. Based on the fact that the pupils had already read both texts in their entirety when they read the easy-reding version, they already knew the content of both passages. For this part of the research we chose passages that pupils paid least attention to in the third phase but which are full of comic elements. After reading each of these passages, pupils once again answered a set of questions related to the passages read. In this phase of the research we were testing the theory that we can, through different levels of adapted texts, gradually prepare pupils with speech and language disorders for reading more demanding original literary texts.

3 Results

Presented below are the group results at the start and the end of the school year for each factor individually and these are compared with the average, which is based on T-values presented in the guide to measurement and development of reading motivation in schools (Pečjak et al. 2006). T-values up to 40 points mean a below average result, values between 40 and 60 points are an average result, valued above 60 points indicate above averageness. Because boys present a majority of our sample and considering that within this research we are not interpreting the results according to gender, we used the T-distribution table given for boys (Pečjak et al. 2006: pp.85–87).

3.1 Initial testing of reading motivation

Initial testing of reading motivation was conducted in September 2022. The questionnaire was filled out by 50 pupils. The results are given in the table below.

Table 1: Initial testing of reading motivation

Factor	Sample size	Raw score average	Standard deviation	Minimum points	Maximum points	T-values
1 – external motivation for reading	50	30.8	10.22	12	54	40
2 – interest and reading in a social context	50	37.6	12.12	20	65	39
3 – inclusion and immersive reading	50	30.7	9.22	15	56	38
4 – perception of reading as a difficult activity	50	24.4	7.40	10	37	52

On the basis of the raw score average and the corresponding T-values, we can establish that in September 2022 the reading motivation in pupils with speech and language disorders was below average or in the lower margins of average in the first three factors. Only in the fourth factor did pupils on average reach a median result based on T-values. Considering the high statistical deviation in all factors, we note that the values are very dispersed.

Factor 1: In establishing the extent of **external motivation for reading**, the arithmetic mean or raw score average translated into T-values is on the extreme lower margins of the average. Taking into account standard deviation, most results have a raw score between 20.58 and 41.02, which corresponds to a T-distribution between 31 and 49. This means that the sample is very dispersed. This is also evident in the large difference between the minimum and maximum number of points. The minimum in T-value is 29, which is well below average, while the maximum T-value is 61, which is slightly above average.

Based on the results, we can conclude that the pupils in our sample express mostly below average to low average external motivation for reading. Praising them while they read means a great deal to them, they like being successful at reading but we assume that the situations where they are externally motivated for reading are rare.

Factor 2: When determining the **interest in reading in a social context**, the raw score average converted into a T-value, is at the upper limits of below-average. Taking into account standard deviation, most results have a raw score between 25.48 and 49.72, which amounts to a T-distribution between 29 and 49. For this factor the sample is also very dispersed. The difference between the minimum and maximum points is large. The minimum T-value was 25, which is well below average, while the maximum T-value was 61, which is once again just above average.

The interest in reading within a social context is in the upper margins of below average. This means that reading is not a popular activity. Pupils rarely talk about reading with their peers or family and do not often reach for a book on their own initiative.

Factor 3: In the **inclusion and immersive reading** factor, pupils on average reached the lowest results, something which was expected, considering that they need to put a great deal of effort into reading which most often deprives them of the cognitive-aesthetic experience and as a result also of getting absorbed into what they are reading. The raw score average converted into a T-value is at the extreme lower margin of the average. Once standard deviation is taken into account, the raw score for most results is in the range between 21.48 and 39.92, which corresponds to a T-distribution from 29 to 45. This means that the sample is once again very dispersed. The minimum T-value is 24, which is well-below average, while the maximum T-value of 60 is on the lower level of above average.

Factor 4: In determining the **perception of reading as a difficult activity**, the raw score average converted into a T-value is within the average field. Taking into account standard deviation, the raw score for most results is between 17 and 31.8, corresponding to a T-distribution from 38 to 67. This once again means that the sample is very dispersed. There is also a large difference between the minimum and maximum points. The minimum in T-value is 25, which is well below average, while the maximum T-value is 77, which is well above average, and is in fact the highest possible result in this factor.

The results of the factor **perception of reading as a difficult activity** is surprising at first sight. Here pupils reached an average result (T-value of 52), so they perceive reading as an averagely difficult activity. The higher the number of points, the more

difficult pupils see the activity of reading. On average, pupils reached a T-value of 52, which is in the upper half of average. The highest T-value was 77, which indicates that individual pupils indeed perceived reading as a very difficult activity.

When interpreting the results, we need to bear in mind that the research sample are pupils with speech and language disorders who are included in the adapted programme. Their reading, and as a result also their motivation for reading, are difficult to compare to the reading of their peers without evident disorders. Pupils find it difficult to evaluate their reading as they do not compare their reading with peers without evident disorders, and beside this, often reach for texts that are more appropriate for a younger population. As a result they evaluate their reading uncritically. Another fact that also needs to be taken into account is that the adapted programme these pupils follow also includes adapted texts. Their answers were thus most probably formed on the basis of reading adapted texts. The questionnaire did not focus on reading literary texts but on reading in general. Despite this, the results are revealing in themselves, especially when taking into account the big difference between the minimal and maximum number of points.

Below we will interpret in the same way the questionnaire we filled out with the pupils at the end of the school year.

3.2 Final testing of reading motivation

The final testing of reading motivation was carried out in June 2023. In the period from September 2022 to June 2023, pupils read intensely and participated in the research. They independently read who whole books in their easy-reading version. Our hypothesis was that these activities will have a positive effect on the pupils' reading motivation. The questionnaire was completed by 50 pupils. The results are presented in the table below.

At the end of the school year, the combined results of the tested pupils are within the average margins in all factors.

Factor 1: The raw score average converted into a T-value is within the average range when it comes to **external motivation for reading**. Taking into account standard deviation, the raw score of the majority of results falls between 28.52 and 53.28,

which corresponds to a T-distribution between 38 and 51. This means the sample is still very dispersed. Proof of this is also the large difference between the minimum and maximum points. The minimum T-value is 26, which is well below average, while the maximum T-value of 67 is slightly above average.

Table 2: Final testing of reading motivation

Factor	Sample size	Raw score average	Standard deviation	Minimum points	Maximum points	T-values
1 – external motivation for reading	50	40.9	12.38	16	60	49
2 – interest and reading in a social context	50	44.6	11.99	24	81	45
3 – inclusion and immersive reading	50	39.4	10.29	20	60	45
4 – perception of reading as a difficult activity	50	18.7	6.00	9	33	40

According to the results of the final testing, pupils demonstrate average external motivation for reading. Praise while reading means a great deal to them, they like being successful at reading and we can assume that, over the last school year, they had more situations that had a positive influence on external motivation.

Factor 2: The raw score average converted into a T-value is also average in determining the **interest in reading in a social context**. Taking into account standard deviation, the raw score of most results is within the range between 32.7 and 56.59, which corresponds to a T-distribution between 35 and 54. This means the result is very dispersed. This is also evident from the big difference between the minimum and maximum points. The minimum T-value is 28, which is well below average, while the maximum T-value of 73 is well above the average or in the upper range of the above average scores.

Interest in reading in a social context is this time average with a very dispersed range. This means that reading is a partially popular activity with pupils. They occasionally talk about reading with their peers and at home, they also occasionally read on their own initiative.

Factor 3: With the **inclusion and immersive reading** factor, pupils on average reached a similar score as in the second factor. The raw score average converted into T-values is within the average range. Taking into account standard deviation, most of the raw results fall within the range between 29.11 and 49.69, which corresponds to a T-value range from 36 to 54. This means that the sample is once again significantly dispersed, also indicated by the large difference between the minimum and maximum points. The minimum T-value is 28, which is well below average, while the maximum T-value of 63 is above average.

Factor 4: The raw score average converted into a T-value in establishing **perception of reading as a difficult activity** was on the extreme low margins of average. Taking into account standard deviation, most of the results fall within the raw-score range between 12.7 and 24.7 points, which corresponds to a T-value from 31 to 54. This means that in this factor the sample is also dispersed, evident from the large difference between the minimum and maximum points. The minimum T-value was 23, which is well below the average and at the same time the lowest possible number of points, while the maximum was 69 points, an above average result.

4 Discussion

Based on the initial and final testing of reading motivation, we analysed the change or differences in reading motivation of the complete sample of fifty pupils with speech and language disorders. The comparative results are presented in the table below. We compared the arithmetic means of the initial and final testing and calculated statistical significance and Cohen's d-value. The results are presented in the table below and interpreted in the following section.

Table 3: Comparison of the average T-values of the initial and final test of reading motivation

		M	SE	t	df	Significance (2-tailed p)	Difference in arithmetic means	Standard error of the difference	Cohen's d
Factor 1	**Initial**	39,78	1,35	–4,46	98	< 0,001	–9,47	2,12	–0,89
	Final	49,24	1,63						
Factor 2	**Initial**	38,88	1,36	–2,90	98	0,005	–5,58	1,92	–0,58
	Final	44,46	1,35						
Factor 3	**Initial**	37,36	1,14	–4,44	98	< 0,001	–7,61	1,71	–0,89
	Final	44,97	1,27						
Factor 4	**Initial**	52,74	2,00	4,29	98	< 0,001	11,09	2,58	0,86
	Final	41,65	1,62						

Factor 1: In terms of external motivation, students achieved higher scores at the end of the school year (M = 49.24, SE = 1.63) than at the beginning (M = 39.78, SE = 1.35). The difference in arithmetic means (–9.47) is statistically significant (t(98) = –4.46, p < 0.001), and the effect was substantial (d = –0.89). On average, the external motivation for reading increased by over 9 T-points across the entire sample. This indicates that, compared to the general average, it rose from a borderline average value to a clear average level. The result is encouraging and suggests that students received positive reinforcement through the study and intensive reading of adapted texts which was reflected both in their reading success and in their external motivation for reading.

Factor 2: In terms of interest in reading within a social context, students achieved higher scores after reading adapted texts (M = 44.46, SE = 1.35) than before (M = 38.88, SE = 1.36). The difference in arithmetic means (–5.58) is statistically significant (t(98) = –2.90, p = 0.005), and the effect size was moderate (d = –0.58). The increase in interest in reading in a social context shows the smallest average improvement; nevertheless, we observe a shift from a below-average result recorded at the beginning of the school year to an average result recorded at the end. This is also seen as a positive step toward improving reading motivation and interest in reading.

Factor 3: Students achieved higher scores after the study For the factor of engagement and immersion in reading (M = 44.97, SE = 1.27) than at the beginning of the school year (M = 37.36, SE = 1.14). The difference in arithmetic means (–7.61) is statistically significant (t(98) = –4.44, p < 0.001), with a large effect size (d = –0.89). Engagement and immersion in reading increased by the end of the school year, moving from a below-average range to an average level. We can conclude that students were more easily engaged and immersed in reading with the help of easy-to-read texts. Based on their positive responses to the texts, we can assert that some students experienced these kinds of feelings for the first time.

Factor 4: For the factor of perceiving reading as a difficult activity, students achieved higher scores at the beginning of the school year, before the start of the study (M = 52.74, SE = 2.00), than at the end of the study (M = 41.64, SE = 1.62). The difference in arithmetic means (11.09) is statistically significant (t(98) = 4.29, p < 0.001), with a large effect size (d = –0.89). The perception of reading as a difficult

activity showed the largest difference between initial and final testing. The score dropped from an average level to a borderline below-average level, indicating that by the end of the school year, students experienced reading as a less difficult activity compared to their perception at the beginning of the school year.

5 Conclusion

With the research we confirmed the hypothesis that with the help of adapted texts we can positively affect the reading motivation of pupils with speech and language disorders. In the first three factors, the trend of increasing the average values as well as the minimum and maximum values of points achieved was noted, which testifies to the positive influence of the research or reading adapted texts on the reading motivation of pupils. Throughout the school year, pupils were given positive encouragement, and were also in a way rewarded through reading both books in their entirety in their easy-reading versions. The pupils enjoyed reading and often asked when they could read again. In the fourth factor, where the difference was greatest, there is a clear decrease in perceptions of reading as a difficult activity. There is a notable lowering of the maximum and the raw score minimum rose by one point. This rise cannot be attributed greater statistical significance, as this is the result of only one out of fifty pupils.

The change in reading motivation with pupils with speech and language disorders was achieved in a single school year. The initial testing was carried out in September 2022 and the final testing in June 2023. We were thus able, in a relatively short period of nine months, to significantly raise the level of reading motivation with pupils. Based on this, we conclude that such an approach to reading, gradually introducing texts from easier ones to more demanding ones, and one that would last for several years, would prevent a general decline in reding motivation with teenagers with speech and language disorders and even increase it to a higher level. This is where we see the opportunity for further research that would include a longitudinal case study through which we would follow a specific generation through a longer period of elementary school education, or from fifth grade onwards, as, based on experienced of teachers and librarians, it is from the sixth grade onwards that the greatest drop in reading motivation is noted with pupils with speech and language disorders (Vizjak Puškar, 2017).

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About the authors

Nika Vizjak Puškar holds a PhD in Literary Studies. She is employed at the Center for Hearing and Speech Maribor (Slovenia) as a teacher of Slovene language and literature. In her work, she engages with deaf and hard-of-hearing students, students with speech and language impairments, as well as students with autism spectrum disorders. Her research focuses on reading and literacy among primary school students. In her doctoral dissertation, she examined the adaptation of literary texts into more accessible formats for students with speech and language impairments. She also serves as an expert collaborator at the Faculty of Education, University of Maribor.

Tina Vršnik Perše is a PhD of Educational Sciences, employed in the Department of Basic Pedagogical Studies, Faculty of Education, University of Maribor, Slovenia as Associate Professor. The main fields of her research are the inclusion of children with special needs and professional development of teachers. As a project manager and researcher she has participated in several international comparative evaluation studies, basic and applied research projects and national evaluation studies. Currently she is a Vice-Dean for Quality Development the Faculty of Education of the University of Maribor and member of Management Board of the University of Maribor.

Dragica Haramija, PhD, is a full professor of Slovene literature at the University of Maribor; she lectures children's and young adult literature at the Faculty of Education and Faculty of Arts. Her basic field of work is children's and young adult literature (theories of genre and literary history). She is also involved in research on reading literacy and easy-to-read materials (easy reading). She has published 7 monographs, around 70 scientific articles and more than 20 chapters in scientific monographs. In 2023, she was awarded the University of Maribor Prize for outstanding success, achievements and merits in scientific research and education.

Adaptations in Music Lessons: Inclusion of a Student with Autism Spectrum Disorder

Katja Sevšek, Bojan Kovačič
University of Maribor, Faculty of Education, Maribor, Slovenia
katja.sevsek@gmail.com, bojan.kovacic@um.si

The present research explores teaching adaptations in music education for students with Autism Spectrum Disorder (ASD) in mainstream elementary schools. We examined how teaching experience and exposure to students with ASD impact the use of inclusive strategies and teachers' self-assessed competence by conducting a structured survey of music teachers in Slovenian elementary schools. Results show that adaptation practices differ depending on teaching experience, with experienced teachers more likely to implement structured routines, quiet spaces, and environmental modifications. There is a moderate correlation between the frequency of adaptations used by teachers and their ability to identify ASD characteristics. The findings highlight the importance of practical experience and targeted training in fostering teachers' confidence and competence, as well as the need for ongoing professional development to create inclusive and supportive learning environments in music education.

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1 Introduction

Music plays a vital role in human development, impacting emotional, social, creative, communicative, and cognitive functions. Educational studies emphasise the importance of fostering enjoyment and skill development in music education because it promotes not only musical growth but also intellectual, aesthetic, moral, and physical development (Denac 2002). Music allows children to express their emotions, develop empathy, and learn teamwork, all of which are important for their social identity and personal values (Angeli, 2020; Mendelson et al., 2016; Sicherl Kafol, 2015; Vaiouli et al., 2015; Zorba et al., 2020).

Music can serve as a unique medium for expression, connection, and personal growth for children with Autism Spectrum Disorder (ASD), who frequently face communication and social interaction challenges (Habe & Sicherl Kafol, 2020; Quinn, 2016; Tindell, 2010). Prior research indicates that engaging in musical activities such as singing, playing instruments, or rhythm games can improve self-confidence, social skills, and emotional intelligence in children with ASD (Siegel, 2023). Music's structured yet creative nature can be appealing to many children with ASD, providing predictability while also encouraging exploration. Group activities, such as ensemble performances or choral singing, promote collaboration, empathy, and social inclusion, bridging the gap between neurodiverse and neurotypical peers (Cardella, 2014; Cook et al., 2018; Hogle, 2021; Whitcomb, 2013; Zalar et al., 2015). Customised musical experiences can promote holistic development, fostering not only learning but also emotional well-being, inclusion, and a sense of belonging in the classroom and beyond (Gilboa & Ben-Shetrit, 2009; Katagiri, 2009; Rogelj & Štule, 2020). However, although some studies have noted that music has significant educational and therapeutic benefits, it must be carefully adapted to individual needs to avoid overstimulation or misuse as a form of self-stimulation (Scott, 2017).

While including students with ASD in mainstream classrooms and music instruction offers advantages, there may be drawbacks as well. Their presence frequently necessitates changes to teaching methods and classroom management strategies (Lingblom, 2017). Teachers must frequently incorporate structured routines, visual supports, and multisensory approaches, which can benefit both students with ASD and their neurotypical peers. Visual aids, for example, or clear, step-by-step instructions, may ensure that all learners comprehend and engage, fostering an

inclusive environment. In the classroom, students with ASD can also bring a greater awareness of individual differences. The class's overall approach to musical creativity and appreciation can be enhanced by their distinct musical engagement styles, such as a strong preference for patterns, rhythms, or repetition (Križnar, 2019).

1.1 Teaching adaptations

The inclusion of students with ASD in mainstream classrooms prompts teachers to foster a more flexible, inclusive, and compassionate learning environment (Obrul, 2016). While it may necessitate careful planning and adaptability, incorporating these students ultimately improves the educational experience for all. Music lessons, with their distinctive combination of structure and creativity, can be a successful instrument for promoting inclusion, personal growth, and mutual understanding among diverse learners (Denac, 2002).

Students with ASD may have difficulty with group dynamics, such as collaborating during ensemble performances or participating in unstructured activities like improvisation. These challenges may occasionally disrupt the flow of the lesson if not managed properly. Adjustments, such as using noise-cancelling headphones or designated quiet spaces, may be necessary for individuals with sensory sensitivities to loud sounds or sudden changes in the music environment (Deris & Carlo, 2013; Križnar, 2019).

Behavioural differences, such as difficulty taking turns or adjusting to transitions, may necessitate additional assistance from the teacher or classroom assistants. To create an inclusive and effective learning environment, teachers must balance the needs of students with ASD with those of the entire class (Šilc & Schmidt, 2022).

Despite these challenges, including students with ASD in music lessons provides significant benefits to all students. Exposure to neurodiverse peers increases empathy, patience, and collaboration, resulting in a more accepting and supportive classroom environment. Furthermore, adaptations made to assist students with ASD, such as clear communication, structured activities, and an emphasis on sensory regulation, can result in innovative teaching practices. These methods can enhance engagement and learning outcomes for the entire class, as they often cater to various learning styles and abilities (Križnar, 2019).

The research focusses on the implementation of adaptations in music education for students with ASD in mainstream elementary schools. It aims to address three key objectives:

- identify differences in teachers' use of adaptations: A comparison of the self-reported frequency of using adaptations in music classes between teachers who have prior experience teaching students with ASD and those who do not, both at the elementary (elementary teachers) and subject-specific levels (music professors);
- evaluate teachers' perceived competence in working with students with ASD: The research assesses teachers' perceptions of their preparedness and skills in teaching music to students with ASD;
- assess teachers' perception of their ability to recognise ASD characteristics: The research also investigates teachers' confidence in their ability to identify ASD characteristics in students.

The research aims to provide insights into the effectiveness of current practices as well as identify potential areas for improving teacher training and support for inclusive education.

2 Methods

The research was designed to gather comprehensive insights using descriptive and multivariate methods, which were carried out using structured survey questionnaires. The research sample consisted of all elementary school teachers who taught music lessons. To ensure a representative sample, teachers from all 456 general elementary schools in Slovenia, including branch schools, across all 12 statistical regions of the country, were invited to take part. The collected data were systematically processed and analysed with the SPSS software.

2.1 Data collection procedure and sample

Early in October 2024, the Slovenian Ministry of Education sent a survey questionnaire with 43 questions spread across 13 pages and 219 variables to 449 email addresses of Slovenian mainstream school secretariats. The survey was

available until December 2024 and took an average of 17 minutes and 55 seconds to complete (with a median time of 8 minutes and 52 seconds). After seven days of active survey availability, a follow-up request for teacher participation was sent to all principals of mainstream elementary schools that participated. In total, 879 emails were distributed personally, with 1,229 teachers taking part in the survey. Of these, 218 responses were fully completed and used in the analysis. Additionally, 46 teachers provided their email addresses, expressing an interest in learning about the research results or participating in the second phase of the research, which was qualitative in nature.

Table 1: Research sample.

		N	%
Highest completed musical education	No completed musical education	115	52,8%
	Elementary music education	62	28,4%
	Secondary music education (High school with final exam, until 2000)	2	0,9%
	Gymnasium (2000–2010) / Conservatory (2010 onwards) with final baccalaureate	6	2,8%
	Academy of Music	33	15,1%
Pedagogical education	Academy of Music (Music pedagogy)	25	11,5%
	Faculty of Education (Music pedagogy)	28	12,8%
	Faculty of Education (Elementary education)	152	69,7%
	Other	13	6,0%
Teaching experiences	Number of years teaching (M ± SD; min–max)	17,75 ± 11,170; 0–42	
Teaching grade	1st grade	71	32,6%
	2nd grade	55	25,2%
	3rd grade	47	21,6%
	4th grade	69	31,7%
	5th grade	59	27,1%
	6th grade	57	26,1%
	7th grade	57	26,1%
	8th grade	57	26,1%
	9th grade	57	26,1%
Experience teaching music to a student with ASD who is officially included in mainstream elementary school programme with additional professional support	None	91	41,7%
	Very few	40	18,3%
	Little	41	18,8%
	Neither a little nor a lot	29	13,3%
	Many	13	6,0%
	A lot	4	1,8%

While most teachers (69.7%) have finished their studies at an education faculty with a focus on teaching in elementary schools, many respondents (52.8%) lack formal music education. With an average teaching experience of 17.75 years and a standard deviation of 11.17 years, most respondents (32.6%) teach first grade. Furthermore, 58.3% of teachers have experience teaching students with ASD, while 41.7% do not.

2.3 Measurement instruments

The research employed a questionnaire to explore the use of teaching adaptations in music education for students with ASD.

The independent variables were divided into five categories: (1) musical education, (2) pedagogical education, (3) teacher work experience, (4) grade level, and (5) experience teaching music to students with ASD. The dependent variables focused on two key areas: (1) teaching adaptations and (2) ASD characteristics.

This approach allowed the researchers to examine the relationship between the teaching adaptations used and the specific needs of students with ASD in music education settings.

2.3.1 Teaching adaptations

Teaching adaptations included the use of motivators, token systems, visual supports, consistent routines and schedules, consideration of communication and interaction rules, availability of quiet spaces, consistent classroom organisation, providing time for reflection, organisational assistance, attention guidance, reducing sensory distractions, and changes to assessment and grading methods. The teaching adaptations used in this research were taken from ZUOPP-1 (2011) and the Ministry of Health Guidelines (2009).

2.3.2 ASD characteristics

ASD characteristics included social challenges (e.g., decreased social contact and difficulty sharing interests or emotions), communication impairments (e.g., poor verbal communication, mainstream eye contact, and difficulty understanding body language, gestures, or facial expressions), and behavioural challenges (e.g., difficulty

adapting behaviour to different situations, problems with imaginative tasks, difficulty forming friendships, and lack of interest in peers). Other characteristics examined included repetitive behaviours (e.g., repetitive movements, object sorting, throwing objects, echolalia, and idiosyncratic phrases), rigidity, and sensory sensitivities, such as insistence on routines, distress with changes, strong attachment to objects, restricted interests, hypersensitivity, hyposensitivity, and excessive reactions to specific sounds. The main characteristics of ASD were summarised using data from Hyman et al. (2020) and the American Psychiatric Association (2013).

2.4 Hypotheses

ASD is defined by difficulties in social communication and interaction, as well as restricted, repetitive behaviours and sensory sensitivities. These characteristics frequently necessitate teachers using tailored teaching strategies to create an inclusive and supportive learning environment. However, the extent to which teachers are prepared to recognise and address these needs, as well as how these adaptations are implemented in practice, remains an important area of research.

Given the diversity of teachers' qualifications, teaching experience, and exposure to students with ASD, it is critical to look into the factors that influence their ability to implement effective teaching adaptations. This research focusses on two types of teachers: elementary classroom teachers who teach music and music professors. It investigates their experiences, perceived preparedness, and actual use of adaptations when working with students with ASD. To address these objectives, the following hypotheses were formulated:

- (H1) Differences in the use of teaching adaptations: There are statistically significant differences in the use of teaching adaptations in music lessons in mainstream elementary education between teachers with prior experience teaching students with ASD and those without.
- (H2) Impact of teaching experience: Based on the length of time teachers have been teaching, there are statistically significant differences in the use of teaching adaptations in music lessons within mainstream elementary education.

- (H3) Perceived ability to recognise ASD characteristics: Most teachers perceive themselves as having limited ability to recognise ASD characteristics.
- (H4) Perceived competence to teach music to students with ASD: Most teachers perceive themselves as not adequately competent to teach music lessons when a student with ASD is in the classroom.
- (H5) Correlation between perception and adaptation usage: There are correlations between teachers' ability to recognise students with ASD and the perceived frequency of using teaching adaptations in music education within mainstream elementary education.

3 Results

The results of this research offer important insights into the use of various adaptations for students with ASD in mainstream elementary school and music lessons. By analysing teachers' responses, we examined how their experiences and perceived competence influence the implementation of specific strategies tailored to the needs of ASD students.

The results are presented in several key areas, such as differences in the use of different adaptations, the impact of teaching experience, teachers' ability to recognise ASD characteristics, their perceived competence to teach students with ASD, and the connection between these perceptions and the frequency of adaptation use. Together, these results aim to offer a comprehensive understanding of current practices and highlight areas for further improvement in fostering inclusive educational environments for students with ASD.

3.1 Differences in the use of teaching adaptations (H1)

Descriptive statistics were used to examine the teaching adaptations made by teachers with and without previous experience working with students with ASD. First, we looked at which teaching adaptations teachers were familiar with and how frequently they implemented them in both groups. By examining these differences, we hoped to identify patterns in the use of classroom adjustments and investigate how prior experience with students with ASD influences the perceived need and frequency of implementing specific strategies.

This table shows data on teachers' unfamiliarity with various teaching adaptations, comparing those with and without experience instructing students with ASD. The percentages represent the proportion of teachers who checked the box "I do not know (the adaptation)" on the questionnaire, indicating a lack of knowledge about these strategies.

Table 2: (Non)familiarity with teaching adaptations.

		Teachers with no experience in teaching students with ASD (N=91)		Teachers with experience in teaching students with ASD (N=127)	
		N	%	N	%
(1)	Use of motivators	50	54,94%	28	22,04%
(2)	Token reward system	59	64,83%	41	32,28%
(3)	Use of visual support	19	20,87%	6	4,72%
(4)	Always the same routine/scheduling of lessons (announcement of transitions, timetable changes)	6	6,59%	0	0%
(5)	Respecting the rules of communication and interaction (how to give instructions to the student - standing in front of/behind them, beside them, touching them, addressing them by name)	4	4,39%	0	0%
(6)	Quiet space	5	5,49%	3	2,36%
(7)	Always the same room/classroom organisation	2	2,19%	1	0,78%
(8)	Speed consideration/Time for reflection	2	2,19%	0	0%
(9)	Assistance with organising school supplies	3	3,29%	0	0%
(10)	Directing attention	1	1,09%	1	0,78%
(11)	Reduction of sensory distractions and other triggers of undesirable behaviour	7	7,69%	1	0,78%
(12)	Adaptation of assessment and homework	6	6,59%	2	1,57%
(13)	Use of Floortime elements	82	90,10%	100	78,74%
(14)	Use of PECS elements	86	94,50%	103	81,10%
(15)	Use of TEACCH elements	86	94,50%	99	77,95%
(16)	Use of Son-Rise® elements	87	95,60%	106	83,46%
(17)	Use of ABA elements	83	91,20%	102	80,31%
(18)	Use of TRP elements	81	89,01%	98	77,16%
(19)	Supporting positive behaviour	9	9,89%	4	3,14%
(20)	Suggestopedia	65	71,42%	61	48,03%
(21)	Adjustments to instructions (short, clear, specific, check for understanding)	3	3,29%	2	7,87%
(22)	Specific adaptation of the environment (e.g. seating arrangements)	1	1,09%	0	0%

Table 3: Use of teaching adaptations.

		Teachers with no experience in teaching students with ASD		Teachers with experience in teaching students with ASD	
		M	SD	M	SD
(1)	Use of motivators	3,20	0,782	3,09*	1,170
(2)	Token reward system	2,28*	1,143	2,20*	1,273
(3)	Use of visual support	3,83*	0,751	3,79	1,056
(4)	Always the same routine/scheduling of lessons (announcement of transitions, timetable changes)	3,44*	1,128	4,00*	1,168
(5)	Respecting the rules of communication and interaction (how to give instructions to the student - standing in front of/behind them, beside them, touching them, addressing them by name)	4,00*	0,778	4,09*	1,000
(6)	Quiet space	2,65*	1,156	3,35	1,308
(7)	Always the same room/classroom organisation	3,63*	1,049	3,94	1,115
(8)	Speed consideration/Time for reflection	4,22*	0,808	4,20*	1,018
(9)	Assistance with organising school supplies	3,74*	0,928	3,72	1,181
(10)	Directing attention	4,16*	0,686	4,03*	0,857
(11)	Reduction of sensory distractions and other triggers of undesirable behaviour	3,68*	0,838	3,62	1,123
(12)	Adaptation of assessment and homework	3,93	0,997	4,14*	1,200
(13)	Use of Floortime elements	2,56*	1,236	2,00*	1,240
(14)	Use of PECS elements	1,60*	0,894	1,83*	1,435
(15)	Use of TEACCH elements	1,80*	1,304	2,25*	1,481
(16)	Use of Son-Rise® elements	1,75*	0,957	1,62*	1,244
(17)	Use of ABA elements	2,13*	0,991	2,00*	1,414
(18)	Use of TRP elements	2,40*	1,174	2,14*	1,407
(19)	Supporting positive behaviour	4,55*	0,570	4,56*	0,691
(20)	Suggestopedia	3,42	1,027	3,32*	1,217
(21)	Adjustments to instructions (short, clear, specific, check for understanding)	4,45*	0,642	4,51*	0,848
(22)	Specific adaptation of the environment (e.g. seating arrangements)	4,21*	0,841	4,46*	0,949
Cronbach's Alpha		0,693		0,951	

* $p < 0.05$, distribution is not normal.

Results show a significant gap in familiarity with teaching adaptations for students with ASD, particularly among teachers with no prior experience. Teachers with no experience teaching students with ASD report significantly higher unfamiliarity with most adaptations than those with experience. Basic strategies such as motivators, token reward systems, visual support, and all of the specific interventions (Floortime, PECS, TEACCH, etc.) are mostly unknown to inexperienced teachers.

It is concerning that 20.87% of inexperienced teachers are completely unfamiliar with the use of visual support, which is one of the most basic tools for supporting students with ASD in educational settings.

Despite these differences, many advanced ASD-specific interventions (Floortime, PECS, TEACCH, etc.) are widely unknown, even among experienced teachers. These results suggest even those who have worked with students with ASD may lack comprehensive knowledge of specialised teaching methods. Notably, it is concerning that a significant proportion of teachers with experience working with students with ASD are still unfamiliar with important strategies such as the use of motivators, token reward systems, and instructional adjustments, all of which can significantly improve the effectiveness of teaching and support for students with ASD.

These findings highlight the importance of targeted training and professional development programs to increase teachers' familiarity with evidence-based ASD teaching adaptations. Furthermore, basic classroom structure strategies such as positive behaviour support and environmental adjustments should be emphasised in all teacher training curricula to promote more inclusive educational practices.

Cronbach's Alpha scores for both teacher groups show differences in their ability to rate various educational adjustments for children with ASD. For teachers with no experience teaching students with ASD, the Cronbach's Alpha value is 0.693 ($0.7 > \alpha \geq 0.6$), indicating questionable internal consistency. This means that, while their responses are somewhat similar, there is still significant variability. One possible explanation is that inexperienced teachers are less familiar with these adaptations, resulting in uncertainty or variation in their responses about their effectiveness and importance, implying that their responses are reliable but reflect a broader understanding of adaptations for students with ASD. Teachers with experience teaching students with ASD have a much higher Cronbach's Alpha of 0.951 ($\alpha \geq 0.9$), indicating very high internal consistency. This suggests that their responses to the different teaching adaptations were highly consistent and closely related, implying that they likely have a shared understanding of best practices for supporting students with ASD. A reliability value this high implies that their perspectives on the adaptations are well-aligned, likely due to their practical knowledge and direct experience using these strategies in the classroom.

Teachers who have no prior experience working with students with ASD are more likely to rely on adaptations such as motivators, token systems, visual supports, providing extra time for processing and reflection, assisting with school supply organisation, redirecting attention, reducing sensory distractions, and other triggers for unwanted behaviour. These approaches appear to be centred on providing general support and structured strategies to increase engagement and reduce behavioural challenges.

Teachers with experience teaching students with ASD, on the other hand, are more likely to make adaptations that reflect a more in-depth understanding of these students' specific needs. These include sticking to consistent routines and schedules, following communication and interaction principles, creating a designated quiet space for self-regulation, ensuring consistent classroom organisation, and adapting assessments and homework. They also frequently use strategies to encourage positive behaviour, such as tailoring instructions to be brief, clear, and specific while verifying understanding, and making specific environmental changes such as seating arrangements.

Table 4: Mann-Whitney U test to compare the differences in teaching adaptations between both groups of teachers (with and without experience teaching students with ASD).

	Group	N	Mean rank	p
Use of motivators	**Teachers with no experience**	41	70,32	0,971
	Teachers with experience	99	70,58	
	Total	140		
Token reward system	**Teachers with no experience**	32	61,97	0,616
	Teachers with experience	86	58,58	
	Total	118		
Use of visual support	**Teachers with no experience**	72	94,88	0,662
	Teachers with experience	121	98,26	
	Total	193		
Always the same routine/scheduling of lessons	**Teachers with no experience**	85	86,56	0,000*
	Teachers with experience	127	119,84	
	Total	212		
Respecting the rules of communication and interaction	**Teachers with no experience**	87	100,40	0,135
	Teachers with experience	127	112,36	
	Total	214		
Quiet space	**Teachers with no experience**	86	86,58	0,000*
	Teachers with experience	124	118,63	
	Total	210		
Always the same room/classroom organisation	**Teachers with no experience**	89	96,06	0,013*
	Teachers with experience	126	116,44	

	Group	N	Mean rank	p
	Total	215		
Speed Consideration/Time for reflection	**Teachers with no experience**	89	105,49	0,519
	Teachers with experience	127	110,61	
	Total	216		
Assistance with organising school supplies	**Teachers with no experience**	88	106,51	0,761
	Teachers with experience	127	109,03	
	Total	215		
Directing attention	**Teachers with no experience**	90	111,98	0,450
	Teachers with experience	126	106,02	
	Total	216		
Reduction of sensory distractions and other triggers of undesirable behaviour	**Teachers with no experience**	84	102,61	0,852
	Teachers with experience	122	104,11	
	Total	206		
Adaptation of assessment and homework	**Teachers with no experience**	85	94,74	0,024*
	Teachers with experience	125	112,82	
	Total	210		
Use of Floortime elements	**Teachers with no experience**	9	22,17	0,202
	Teachers with experience	27	17,28	
	Total	36		
Use of PECS elements	**Teachers with no experience**	5	15,20	0,946
	Teachers with experience	24	14,96	
	Total	29		
Use of TEACCH elements	**Teachers with no experience**	5	14,90	0,569
	Teachers with experience	28	17,38	
	Total	33		
Use of Son-Rise® elements	**Teachers with no experience**	4	15,00	0,473
	Teachers with experience	21	12,62	
	Total	25		
Use of ABA elements	**Teachers with no experience**	8	18,56	0,564
	Teachers with experience	25	16,50	
	Total	33		
Use of TRP elements	**Teachers with no experience**	10	22,35	0,422
	Teachers with experience	29	19,19	
	Total	39		
Supporting positive behaviour	**Teachers with no experience**	82	100,10	0,502
	Teachers with experience	123	104,93	
	Total	205		
Suggestopedia	**Teachers with no experience**	26	47,08	0,892
	Teachers with experience	66	46,27	
	Total	92		
Adjustments to instructions (short, clear, specific, check for understanding)	**Teachers with no experience**	88	99,69	0,092
	Teachers with experience	125	112,15	
	Total	213		
Specific adaptation of the environment (e.g. seating arrangements)	**Teachers with no experience**	90	94,42	0,001*
	Teachers with experience	127	119,33	
	Total	217		

* $p < 0.05$, statistically significant difference

The hypothesis (H1) suggests that teachers with experience in ASD make more effective and structured adaptations than those without experience ($p < 0.05$). This hypothesis is partially supported by the results, which show statistically significant differences in structured adaptations such as routine consistency, quiet spaces, classroom organisation, assessment and homework modifications, and environmental adaptation. Furthermore, experienced teachers exhibit greater consistency in their responses, indicating a more cohesive approach based on knowledge and practice. However, not all teaching adaptations differ significantly, implying that some strategies, such as the use of motivators and sensory reduction, are widely used by both groups.

The hypothesis is thus plausible, but not universally accepted. Although experience influences the use of structured and specialised adaptations, both groups use some general support strategies in similar ways. These findings emphasise the significance of training and hands-on experience in improving ASD-specific teaching practices to better support the unique needs of students with ASD and create a more structured and predictable learning environment.

3.2 Impact of teaching experience (H2)

Table 5: Kruskal-Wallis test for the adaptations applied in relation to the teaching experience (years of teaching).

	Years of teaching experience	N	Mean rank	p
Use of motivators	**5 years or less**	30	66,43	0,619
	6-12 years	23	63,63	
	13-20 years	20	78,38	
	21-30 years	47	69,94	
	31 years or more	20	77,95	
	Total	140		
Token reward system	**5 years or less**	23	61,13	0,545
	6-12 years	18	56,44	
	13-20 years	18	68,00	
	21-30 years	42	60,35	
	31 years or more	17	49,44	
	Total	118		
Use of visual support	**5 years or less**	37	99,35	0,329
	6-12 years	37	96,64	
	13-20 years	28	114,34	
	21-30 years	63	89,39	
	31 years or more	28	94,16	

	Years of teaching experience	N	Mean rank	p
	Total	193		
Always the same routine/scheduling of lessons	**5 years or less**	44	99,85	0,843
	6-12 years	40	104,01	
	13-20 years	32	115,31	
	21-30 years	68	107,96	
	31 years or more	28	106,88	
	Total	212		
Respecting the rules of communication and interaction	**5 years or less**	43	107,36	0,318
	6-12 years	41	103,89	
	13-20 years	33	122,14	
	21-30 years	69	98,76	
	31 years or more	28	117,29	
	Total	214		
Quiet space	**5 years or less**	40	106,38	0,150
	6-12 years	40	86,21	
	13-20 years	32	121,44	
	21-30 years	69	107,07	
	31 years or more	29	109,59	
	Total	210		
Always the same room/classroom organisation	**5 years or less**	43	111,70	0,825
	6-12 years	41	111,11	
	13-20 years	33	114,29	
	21-30 years	69	104,50	
	31 years or more	29	99,29	
	Total	215		
Speed Consideration/Time for reflection	**5 years or less**	44	104,10	0,239
	6-12 years	42	119,93	
	13-20 years	33	118,35	
	21-30 years	68	97,61	
	31 years or more	29	112,95	
	Total	216		
Assistance with organising school supplies	**5 years or less**	42	106,30	0,678
	6-12 years	42	105,81	
	13-20 years	33	112,94	
	21-30 years	69	102,46	
	31 years or more	29	121,19	
	Total	215		
Directing attention	**5 years or less**	44	109,39	0,959
	6-12 years	42	106,62	
	13-20 years	33	113,12	
	21-30 years	69	105,24	
	31 years or more	28	112,52	
	Total	216		
Reduction of sensory distractions and other triggers of undesirable behaviour	**5 years or less**	43	94,12	0,406
	6-12 years	40	104,49	
	13-20 years	32	114,75	
	21-30 years	65	98,85	
	31 years or more	26	115,29	

	Years of teaching experience	N	Mean rank	p
	Total	206		
Adaptation of assessment and homework	**5 years or less**	42	100,32	0,647
	6-12 years	41	113,44	
	13-20 years	33	112,80	
	21-30 years	66	99,42	
	31 years or more	28	107,38	
	Total	210		
Use of Floortime elements	**5 years or less**	7	15,36	0,009*
	6-12 years	6	10,33	
	13-20 years	5	30,60	
	21-30 years	11	17,00	
	31 years or more	7	22,36	
	Total	36		
Use of PECS elements	**5 years or less**	8	13,69	0,290
	6-12 years	6	11,92	
	13-20 years	1	28,00	
	21-30 years	8	16,06	
	31 years or more	6	16,25	
	Total	29		
Use of TEACCH elements	**5 years or less**	6	11,42	0,051
	6-12 years	7	12,57	
	13-20 years	2	30,00	
	21-30 years	10	18,45	
	31 years or more	8	20,00	
	Total	33		
Use of Son-Rise® elements	**5 years or less**	4	9,00	0,123
	6-12 years	6	10,75	
	13-20 years	1	24,50	
	21-30 years	7	13,14	
	31 years or more	7	15,43	
	Total	25		
Use of ABA elements	**5 years or less**	8	15,94	0,149
	6-12 years	6	11,25	
	13-20 years	2	28,75	
	21-30 years	10	19,00	
	31 years or more	7	16,93	
	Total	33		
Use of TRP elements	**5 years or less**	11	20,73	0,040*
	6-12 years	7	11,14	
	13-20 years	4	32,13	
	21-30 years	10	19,75	
	31 years or more	7	21,14	
	Total	39		
Supporting positive behaviour	**5 years or less**	42	98,82	0,739
	6-12 years	41	95,43	
	13-20 years	32	107,14	
	21-30 years	63	106,50	
	31 years or more	27	107,93	

	Years of teaching experience	N	Mean rank	p
	Total	205		
Suggestopedia	**5 years or less**	19	42,26	0,588
	6-12 years	13	45,88	
	13-20 years	15	56,00	
	21-30 years	26	44,12	
	31 years or more	19	46,92	
	Total	92		
Adjustments to instructions (short, clear, specific, check for understanding)	**5 years or less**	44	89,01	0,166
	6-12 years	42	110,74	
	13-20 years	33	110,47	
	21-30 years	67	111,52	
	31 years or more	27	115,04	
	Total	213		
Specific adaptation of the environment (e.g. seating arrangements)	**5 years or less**	44	98,39	0,459
	6-12 years	42	103,29	
	13-20 years	33	118,62	
	21-30 years	69	111,75	
	31 years or more	29	115,90	
	Total	217		

* $p < 0.05$, distribution is not normal.

The Kruskal-Wallis test was used to determine whether the implementation of teaching adaptations varies by teacher years of experience. We were hoping to identify patterns in how teaching practices evolve with professional expertise and evaluate the impact of experience on the implementation of inclusive strategies.

The Kruskal-Wallis test results indicate that there are no statistically significant differences in the majority of teaching adaptations according to the length of teachers' work experience. Most tested adaptations, including the use of visual aids, structured routines, quiet spaces, token reward systems, motivators, and different behavioural and instructional strategies, have p-values greater than 0.05, indicating that the differences in experience levels are not statistically significant. This implies that teachers, regardless of their years in the profession, tend to use these adaptations in a relatively similar manner.

Teachers with 5 years or less of experience typically use teaching adaptations at a moderate level, with no significant differences between groups in most categories. They use common strategies, such as motivators, token reward systems, structured routines, visual support, and communication rules, in the same way that more experienced teachers do. However, they are less likely to use specialised methods

such as Floortime, TEACCH, and TRP elements, implying that these approaches are not as commonly used in their practice. The lack of statistically significant differences in their adaptation use suggests that their teaching style is consistent with broader educational trends rather than heavily influenced by experience.

The findings for teachers with 6 to 12 years of experience show a similar pattern: they consistently use common adaptations, while their use of specialised methods is limited. Their mean ranks for strategies like visual support, structured routines, and promoting positive behaviour show effective implementation of well-established inclusive teaching techniques. Overall, their relatively low rankings in most variables indicate that they are in a transitional phase, refining their teaching approach but not actively pursuing advanced instructional strategies.

Teachers with 13 to 20 years of experience are more engaged with both general and specialised teaching adaptations, as evidenced by their average rankings across multiple categories. They make extensive use of structured strategies such as visual support, lesson planning, designated quiet areas, and assistance with organising school supplies, emphasising the importance of classroom stability and structure. Furthermore, their higher rankings in specialised methods, such as the use of Floortime, TRP, and TEACCH therapy elements, show that they are more willing to incorporate alternative teaching approaches. This group is the most likely to use both traditional and specific strategies, implying that teachers at this stage may have gained enough experience to confidently explore and apply different teaching methods.

For teachers with 21 to 30 years of experience, the findings demonstrate a consistent approach to teaching adaptations, with moderate rankings for both general and specialised strategies. Their use of structured routines, sensory reduction techniques, and instruction adjustments remains relatively stable when compared to other groups, indicating well-established teaching practices. While they exhibit moderate engagement with specialised adaptations such as Floortime and TRP, their rankings for these strategies are lower than those of the 13 to 20-year experience group. This suggests that, while they use specialised methods, they may rely on traditional, well-established teaching techniques rather than actively implementing new strategies. Their results suggest that they have established consistent teaching patterns that

effectively support inclusive learning, but they may prioritise stability over innovation.

Teachers with 31 years or more of experience show moderate-to-high engagement in most areas, with a slight preference for structured strategies. While they also show engagement with specialized methodologies, such as TRP, TEACCH, and ABA elements, their rankings remain lower than those of the 13 to 21-year group. This suggests that, while experienced teachers understand the importance of specialised approaches, they may not actively seek out or implement them as frequently as mid-career teachers.

As we can see in the results so far, there are a few notable cases in which statistically significant differences were found. The use of Floortime elements ($p = 0.009$) and TRP elements ($p = 0.040$) differed significantly based on teaching experience, indicating that these strategies are not implemented equally across career stages. Furthermore, the use of TEACCH elements is almost identical, with a near-significant p-value of 0.051, indicating a similar trend in their application based on work experience.

Given these results, the hypothesis is only partially supported. While experience appears to influence the implementation of specific adaptations, the majority of teaching strategies tested show no significant variation across experience levels. This suggests that other factors, such as initial teacher education, school policies, professional development opportunities, and personal teaching preferences, may have a greater impact on the use of most adaptations.

Overall, while experience may influence the application of some specialised methodologies, the data does not support a broad and consistent impact of teaching experience on the implementation of teaching adaptations in music lessons. Future research could investigate additional variables like training background, teacher attitudes, and institutional support to better understand what motivates the adoption of inclusive teaching strategies.

3.3 Perceived ability to recognise ASD characteristics (H3).

The ability of teachers to recognise and address the distinct characteristics of autism spectrum disorders is critical in fostering inclusive classrooms in mainstream elementary education settings. To ensure a focus on practical, experience-based perspectives, this part of the research only included teachers who had firsthand experience teaching students with ASD (N=127).

Table 6: Recognised ASD characteristics.

		M	SD
(1)	Reduced ability to make social contact.	3,65*	0,839
(2)	Reduced ability to share interests or feelings.	3,65*	0,791
(3)	Peculiarities in verbal communication (e.g. specific tone/intonation, overly formal speech, etc.).	3,42*	1,211
(4)	Eye contact irmainstreamities (absence or lack of).	3,50*	0,950
(5)	Deficits in understanding of body language, gestures.	3,25*	0,976
(6)	Deficit in understanding of social context, sarcasm, literal understanding.	3,75*	0,976
(7)	Deficiency of facial expressions or unusual facial expressions.	3,36*	0,981
(8)	Difficulty adapting to different situations, difficulty with transitions (new activity/space/person).	3,85*	0,836
(9)	Difficulty with imaginative play or tasks requiring imagination.	3,37*	1,022
(10)	Difficulties in forming friendships.	3,68*	0,999
(11)	Reduced interest in peers.	3,35*	1,138
(12)	Repetitive movements or tics.	2,99*	1,178
(13)	Sorting things.	2,83*	1,176
(14)	Throwing objects.	2,32*	1,126
(15)	Echolalia.	2,10*	1,174
(16)	Idiosyncratic speech/phrases.	2,17*	1,111
(17)	Insistence on routine/inflexibility.	3,36*	1,005
(18)	Distress at change (e.g. timetable, lesson, location).	3,36*	1,081
(19)	Strong attachment to objects.	3,07*	1,025
(20)	Limited interests.	3,17*	1,047
(21)	Hypersensitivity.	3,26*	0,978
(22)	Hyposensitivity.	2,70*	1,236
(23)	Excessive response to a particular sound.	3,17*	1,089
(24)	Delay in following and responding to instructions.	3,15*	1,047
(25)	Talking to self.	2,53*	1,030
(26)	A specific tone of voice that is specific only to the student.	2,87*	1,287
(27)	Student copies accents, voices and sounds well.	2,57*	1,138
(28)	Student does not greet and/or say hello/goodbye.	2,70*	1,191
(29)	Student laughs at the distress of others.	2,36*	1,232
(30)	Lack of desire to participate in group activities.	3,46*	1,029
(31)	Poor hand-eye coordination.	2,88*	1,021
(32)	Clumsiness.	3,06*	1,122

		M	SD
(33)	Student has no interest in writing down the notes/learning material.	3,27*	1,237
(34)	Strong sense of music (rhythm and/or melody and/or music making).	2,72*	1,206
(35)	Jumping in place, when a student is happy.	2,63*	1,246
(36)	Unusual, repetitive movement patterns (e.g. sudden hand movements, continuous hand movements, rotation, rocking, etc.).	2,81*	1,180
(37)	Walking on tiptoes.	1,93*	1,176
(38)	Creating unusual, often uncontrolled sounds.	2,72*	1,132
(39)	Mood swings.	3,37*	0,880
(40)	Student laughing/crying for no particular reason.	2,52*	1,181
(41)	Restlessness, constant need to move.	3,17*	1,092
(42)	Student interrupts the speech of others.	2,93*	1,190
(43)	Student needs constant supervision because of unpredictability.	2,97*	1,357
(44)	Student walks with head bowed.	2,45*	1,146
(45)	Student often wanders off into his own world in his mind.	3,48*	0,898
(46)	Expression of areas of strength or special interests.	3,31*	1,088
(47)	Unusual habits (thumb sucking, biting, playing with hair, etc.).	2,37*	1,302
Cronbach's Alpha		0,928	

* $p < 0.05$, distribution is not normal.

The high Cronbach's alpha indicates that the 47 ASD characteristics recognised by teachers are closely related and form a coherent scale. This means that teachers' responses to various characteristics are consistent, indicating the data's reliability. The mean (M) values across items show that teachers most frequently identify characteristics associated with social interaction difficulties (for example, difficulty adapting to different situations (8), deficits in understanding social context (6), and difficulties forming friendships (10). Lower mean values for certain behaviours (e.g., walking on tiptoes (37) or echolalia (15)) suggest that these characteristics are recognized less often or occur less frequently in mainstream classrooms. While these characteristics are less common, they still contribute to the broad range of behaviours associated with ASD.

These findings highlight the challenges students with ASD face in managing daily interactions and forming meaningful relationships in the classroom. They also offer a thorough understanding of how ASD presents in students, showcasing both evident and subtle traits that can impact their learning and social experiences.

Table 7: Wilcoxon test to assess the teacher's own perception of their ability to recognise the ASD characteristics in students.

	N	M ± SD	Observed Median	Hypothetical Median	p
Teachers with no experience of teaching students with ASD	91	2,5 ± 0,67	3	2	0,000*
Teachers with experience teaching students with ASD	127	3,2 ± 0,72	3	2	0,000*

* $p < 0.05$, statistically significant difference.

Teachers without prior experience working with students with ASD perceive themselves as partially equipped to identify ASD characteristics in their students, with a median self-assessment score of 2 ($Me = 2$, $p < 0.05$). This suggests an inadequate amount of confidence in their ability to identify the characteristics linked to ASD. Teachers with prior experience working with students with ASD, on the other hand, rate themselves as partially equipped but have a higher self-assessment of their competence when compared to teachers who have never taught students with ASD. Their median self-assessment score is 3 ($Me = 3$, $p < 0.05$), indicating that practical experience enhances their preparedness and ability to identify ASD characteristics.

These findings highlight the importance of direct experience in building teachers' confidence in identifying ASD characteristics. They suggest that those without experience may benefit from targeted training or additional professional development to improve their understanding and ability to recognise ASD characteristics. While the initial hypothesis proposed that most teachers believe they have a limited ability to recognise ASD traits, the data suggest a more nuanced reality. As a result, while the hypothesis is partially supported, it does not fully capture the impact of experience on perceived ability. A more precise conclusion would be that teachers without ASD experience feel less capable of identifying ASD characteristics, whereas those with experience feel moderately equipped, though not entirely confident.

3.4 Perceived competence to teach music to students with ASD (H4)

To effectively work with students with ASD, one must understand their specific needs, identify key characteristics, and employ effective teaching strategies. This approach combines theoretical knowledge, hands-on experience, and continuous

professional training to create inclusive and supportive learning environments that address the educational and social challenges that these students might encounter.

Table 8: Wilcoxon test to assess the teacher's own perception of their competence to teach music to students with ASD.

	N	M ± SD	Observed Median	Hypothetical Median	p
Teachers with no experience of teaching students with ASD	91	2,1 ± 0,68	2	2	0,093
Teachers with experience teaching students with ASD	127	3,0 ± 0,70	3	2	0,000*

* $p < 0.05$, statistically significant difference.

Teachers who have no prior experience working with students with ASD believe they are not adequately trained for this type of work ($Me = 2$, $p > 0.05$). This reflects a lack of opportunities to interact with and support students with ASD, which may have an impact on their confidence in effectively addressing these learners' specific needs. On the other hand, teachers who have taught students with ASD rate their competence higher and consider themselves to be partially trained to teach them ($Me = 3$, $p < 0.05$).

Thus, while the hypothesis is valid for inexperienced teachers, it is not universally applicable. This suggests that hands-on experience significantly improves their perceived readiness and skill set in dealing with the unique challenges of supporting students with ASD, highlighting the importance of practical training and direct involvement in developing teacher competence.

3.5 Correlation between perception and adaptation usage (H5)

We can gain a better understanding of how teachers' awareness and practical strategies align to support students with ASD by examining the relationship between their ability to recognise the characteristics of ASD and their use of a variety of adaptations.

Spearman's correlation coefficient ($rs = 0.481$) shows a moderate positive correlation between teachers' perceived ability to recognise ASD characteristics and the frequency with which adaptations are implemented in music lessons.

Furthermore, the statistical significance of this correlation ($p < 0.01$) confirms that the observed relationship was highly unlikely to occur by chance.

Table 9: Spearman's correlation between teachers' perceptions of their own competence to recognise the characteristics of ASD and the use of adaptations.

		Perceived frequency of using music lesson adaptations in mainstream elementary education
Teacher´s perceptions of their own competence to recognise the characteristics of ASD	r_s	0,481*
	p	0,000
	N	127

* $p < 0.01$, correlation is significant at the 0.01 level.

The results strongly support the hypothesis that there is a link between teachers' perceived ability to recognise ASD characteristics and their frequency of including adaptations in music lessons. This suggests that teachers who are more adept at identifying ASD characteristics are more likely to notice or report making various adjustments to their teaching practices to better support the needs of students with ASD. However, while the correlation is moderate, it suggests that other factors may influence teachers' adaptation usage, which could be investigated in further research.

4 Discussion

The present research emphasises the relationship between teaching experience, adaptation implementation, and teachers' perceived competence in teaching students with ASD. There was a clear difference in how teachers with and without prior experience teaching students with ASD used teaching adaptations (H1). Teachers with more experience implemented tailored strategies more frequently than their less experienced colleagues, confirming that consistent work with ASD students increases the likelihood of adopting effective practices (Hourigan & Hammel, 2017).

Teaching experience also influenced adaptation choice (H2), with more experienced teachers favouring methods such as TEACCH and Floortime elements. However, implementation varied, particularly among mid-career teachers, indicating potential gaps in training or exposure to specific strategies at different stages of their careers. Providing targeted professional development could enhance the consistency and effectiveness of inclusive practices, as previously examined by Šilc & Schmidt (2022).

While many teachers perceived themselves as partially competent in recognising ASD characteristics (H3), the present research discovered that the ability to identify specific ASD traits was strongly related to the frequency of adaptation use (H5). Teachers who felt confident in their recognition skills were better equipped to apply strategies that support their students, highlighting the interconnected nature of awareness and practical application, as confirmed by Schmidt and Čagran (2011). As Križnar (2019) also mentioned, this emphasises the significance of integrated training programmes that combine theoretical knowledge with hands-on experience.

Practical experience also helped shape teachers' confidence and competence. Teachers with firsthand experience teaching students with ASD rated themselves as better prepared to meet their needs (H4), as confirmed by Šilc and Schmidt (2022). This result highlights the importance of providing opportunities for collaborative learning to bridge the gap between theoretical understanding and practical application.

5 Conclusion

The present research demonstrates the vital role of various adaptations in facilitating the inclusion of students with ASD in music education. Teachers who had previously worked with students with ASD were more confident and effective in implementing strategies such as consistent routines, quiet spaces, and environmental modifications, emphasising the importance of practical exposure and experience.

Although many teachers rated themselves as partially prepared to recognise and address the needs of students with ASD, the findings highlight the need for more targeted training, particularly for those with little to no experience. Providing opportunities for hands-on learning could help bridge this gap, ensuring that teachers are adequately prepared to support all students.

Creating inclusive classrooms requires a combination of awareness, adaptability, and support. Schools can create learning environments that promote the growth and well-being of all students, regardless of ability, by cultivating an inclusive culture and providing teachers with the resources and training they require.

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About the authors

Katja Sevšek is a Professor of Music and a PhD Candidate at the Faculty of Education, University of Maribor. She specialises in researching adaptations for mainstream education music lesson classrooms that cater to children with autism spectrum disorders. Her work aims to improve the learning experiences of children with autism spectrum disorder in the mainstream education system, emphasising the significance of inclusive practices.

Bojan Kovačič, PhD, is an Assistant Professor at the Faculty of Education, University of Maribor. He teaches music courses at the Department of Elementary Education. His doctoral thesis focused on the characteristics of musically talented elementary school students (6-10 years old). His research focusses on talent development, music education, teaching methods, musical abilities, musical creativity, musical content, learning media and technology, folklore activities, and special needs.

The Inclusion of Children with Special Needs in Folklore Activities in Slovenian Schools with a Special Educational Programme

Bojan Kovačič,[1] Nejc Černela,[2] Marta Licardo[1]
[1] University of Maribor, Faculty of Education, Maribor, Slovenia
bojan.kovacic@um.si, marta.licardo@um.si
[2] Primary school Bogojina, Bogojina, Slovenia
nejc.cernela@gmail.com

Using a representative sample (240 professionals from all 28 Slovenian primary schools with a special educational programme), we partially confirmed the hypothesis, which states that professionals who teach in schools with a special education programme agree with the statements about the inclusion of students with special needs in folklore activities. The hypothesis, which asserts that there are statistically significant differences between groups of professionals (special and rehabilitation pedagogues, special needs teachers, inclusive pedagogues, social pedagogues, teachers with special pedagogical qualifications and other pedagogical staff) regarding their agreement with statements referring to the inclusion of students with special needs in folklore activities in schools with a special education programme, was rejected based on the results obtained.

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1 Introduction

The origins of music extend back to the beginning of human development. On various occasions, rituals are part of the rich cultural heritage of nations around the world. This embodies folklore, which we understand somewhat differently nowadays – too often, we associate it with something old or irrelevant: as something that has long since faded away. In the field of dance (as in all fields of education), it is necessary to prepare a good foundation for further education. Without proper teaching of the elements of dance, we cannot expect students to show a positive attitude towards what the Slovenian folk-dance tradition offers them (Knific, 2007).

1.1 Special education programme in Slovenia

The starting point of the Slovenian special education programme (Ministrstvo za izobraževanje, znanost in šport; Zavod RS za šolstvo, 2014) is the educational process of children with moderate, severe and more severe intellectual impairments, which is built on a special pedagogical and andragogical foundation. These children need a substantial amount of support for their personal development due to their special characteristics and possible related deficits. The special education programme is divided into two parts: the compulsory part (students aged 7 to 15) and the continuing programme (students aged 16 to 26). The compulsory part consists of three stages, each of which lasts three years. The special programme departments may be located in the same buildings as regular primary schools or primary schools with an adapted programme or in special institutions (Jurišić, 2020). The rules issued on the level of education of teachers and other professionals in special educational programmes of primary schools with equivalent educational standards (Ministrstvo za izobraževanje, znanost in šport, 2015) established the criteria for teaching in a special education programme that teachers and other professionals must meet.

1.2 Ways to include children with special needs in folklore activities

The curriculum for music education in the special education programme (Ministrstvo za šolstvo in šport; Zavod RS za šolstvo, 2004) for the area of movement with music suggests activities such as singing and listening to music (children's folk and original songs) in such a way that children listen to their teacher singing or playing familiar melodies while expressing their experiences in their own

way. Research (Antilla, 2007) has found that children outperform adults in creating their own culture. The extent of children's understanding has been studied, and it has been found through thinking in this direction that children are an active subject of today's society. The situation is similar in the classroom, where some students think differently. Thus, even in dance, children actively seek solutions and diversions, so they can be termed active agents of dance, and being an active agent in learning is very important for children with special needs (Shogren et al., 2015). In the curriculum for movement and physical education of the special education programme (Ministrstvo za šolstvo in šport, Zavod RS za šolstvo, 2004), the following activities are suggested for the first part of the primary school level: dancing regionally specific folk dances, playing counting games and consolidating known dances. Experiences from China and New Zealand have shown the importance of being aware of one's cultural heritage. Preserving awareness has been included in the curriculum so that future generations maintain a positive attitude towards what their ancestors once created (Ashley, 2012). In the Slovenian school area, teachers often find ways to promote such content in electives. In this area, the special education programme (Ministrstvo za izobraževanje, znanost in šport; Zavod RS za šolstvo, 2014) offers the possibility of an elective subject of dance activities (dance, folk dance or social dance) that lasts 32 hours. The elective subject can be taught by all teachers who have the prerequisites for working in a primary school and already have relevant knowledge in the field of dance or acquire it through at least three seminars, amounting to at least 16 hours for each set. The curriculum for teaching music in the special education programme (Ministrstvo za šolstvo in šport; Zavod RS za šolstvo, 2004) states that we must enrich and supplement regular sports activities with optional activities of interest. Students participate in them voluntarily, according to their interests and abilities. We enrich their free time with content and increase their quality of life. When creating a stimulating sound environment, all individuals have the opportunity to make musical progress, despite their different levels of musical potential. It is important to remember that musical development is most intense between the ages of six and nine and then stabilizes, so this time is irreplaceable. Group leaders need to be well aware of the movement and dance abilities of the participants and select dances and songs that are appropriate for the particular age group and students' abilities. Music teachers can involve students who are less developed motor-wise and lack social skills (Gaberščik, 2009). A prerequisite for successful work is communication, which includes parents. When parents are informed about remedial instruction for their child, they often question what is more

important: instruction aimed at achieving minimum standards for that grade or instruction that is more focused on acquiring social skills. Since parents spend the most time with the child, the ideal planning for inclusion would be for the professional to take the parents' opinion into account when setting goals and to make a professional and objective judgement about whether to follow their recommendations. The decision must be communicated to the parents, and they need to know how to justify it appropriately (Bryant et al., 2012).

1.3 Some of the reasons for including children with special needs in folklore activities

Dance, as a consequence of the need for expression, is deeply rooted in humans. The practice of this activity perfects us and, in a certain way, shapes us (Soares & Lucena, 2013). The power of music was already recognized by the ancient Greeks, and it was used for spiritual purposes (Pauwels et al., 2014). The effects of movement and dance activities on the individual has also been researched (West, 1984), and it has been found that they improve self-awareness as they provide tremendous opportunities to form an appropriate body image, reduce impulsive behaviour, help individuals to discover themselves, increase satisfaction, improve non-verbal communication skills, help to improve social skills and trust, establish cooperation and problem solving in a team, follow the rules, distribute attention to all participants, promote empathy, improve leadership skills and learn subordination, provide the opportunity to express emotions and imagination through communication with movements, give a sense of satisfaction and achievement, increase the impact of internal and external stimuli, improve the functional abilities of the neuromuscular system, increase organizational, orientational and co-ordinational skills, and cultivate a positive attitude towards experiencing dance activity. When creating a stimulating sound environment, all individuals have the opportunity to make musical progress despite having different levels of musical potential (Gaberščik, 2009). In addition to promoting students' well-rounded development, music plays an indispensable role in their aesthetic and personal growth (Roblek et al., 2004). The vital role in the acquisition of social skills was highlighted by a study that supported the positive effects of dance with empirical evidence. It was conducted with forty children who came from socially disadvantaged families and were randomly divided into two groups – the experimental and the control group. Those who participated in the dance

programme twice a week were observed to make progress in the areas of attention, behaviour, mind–body connection, communication, safety and contact (Lobo & Winsler, 2006). Teaching children with special needs is difficult because, during the process of education, there is an intertwining of external and internal factors that blurs the line between cause and effect relationships. Children with special needs are less able to perceive things, show reduced motor skills in everyday situations and cannot form complex thought processes (Pečavar, 2004). In this case, folklore offers opportunities for progress because, as B. Kroflič noted, in dance activities, the body acts as a receiver, mediator and performer as it receives and responds to kinaesthetic, rhythmic and social stimuli. The child begins to become aware of the body and its parts and of the many possibilities of movement in time and space with varying levels of energy consumption and with their own unique patterns of movement. Children long for this. Dancing offers them a wide range of challenges and opportunities to use all their senses (Kroflič, 1999). However, we must be careful in selecting content as over-intrusion can cause side effects that are difficult to correct later (Bucik, 2003).

2 Methodology

The main purpose of the research was to focus on the views of some professionals regarding the work and inclusion of folklore activities and content within a special educational programme. We also investigated whether statistically significant differences in statements exist between groups of educational professionals working in Slovenian schools with a special educational programme.

2.1 Hypotheses

H1: Professionals who teach in schools with a special education programme agree with the statements about the inclusion of students with special needs in folklore activities.

H2: There are statistically significant differences between groups of professionals (special and rehabilitation pedagogues, special needs teachers, inclusive pedagogues, social pedagogues, teachers with special pedagogical qualifications and other pedagogical staff) regarding their agreement with statements referring to the

inclusion of students with special needs in folklore activities in schools with a special education programme.

2.2 Sample

We conducted an anonymous survey via mail from November 2019 to February 2020. The research sample consists of 240 professionals from all 28 Slovenian schools with a special education programme, specifically 72 special and rehabilitation pedagogues (30.0%), 69 special needs teachers (28.7%), 41 inclusive pedagogues (17.1%), 32 social pedagogues (13.3%), 22 teachers with special pedagogical qualifications (9.2%) and 4 other pedagogical staff (1.7%). The structure of the sample by gender is completely dominated by women (236 or 98.3%). We evaluated the sample as representative (Černela, 2020).

2.3 Measuring instruments

For the purpose of the study, a questionnaire, which contains formatted statements, was designed. Respondents expressed their agreement with these using a five-point Likert scale: (1) I do not agree at all, (2) I do not agree, (3) I neither agree nor disagree, (4) I agree or (5) I totally agree. The objectivity, from the point of view of testing, is high because the instructions and the statements studied are clear and unambiguous, so all the respondents experienced the same conditions when filling in the questionnaire. The objectivity in terms of scoring the responses is also high because the five-point rating scale was the same for all the participants. The reliability of the questionnaire is high as the value of Cronbach's coefficient $\alpha = 0.846$. The content validity is based on the literature discussed (Černela, 2020; Kovačič, 2021).

3 Results and discussion

3.1 Overall results of the sample in relation to professionals' attitudes towards and experiences regarding the inclusion of students in folklore activities

Table 1 shows the overall results in relation to the statements of the professionals (special and rehabilitation pedagogues, special needs teachers, inclusive pedagogues, social pedagogues, teachers with special pedagogical qualifications and other pedagogical staff) about the inclusion of students in folklore activities.

Table 1: Frequency distribution (f%), mean (M) and standard deviation (SD).

Statement	(1) (%)	(2) (%)	(3) (%)	(4) (%)	(5) (%)	M	SD
Students show interest in engaging with folklore content.	2.1	27.9	32.9	25.0	12.1	3.17	1.04
Children with intellectual impairments can be included in folklore activities.	0.0	1.3	22.9	37.1	38.8	4.13	0.81
Blind and partially sighted children and children with impaired visual function can be included in folklore activities.	0.0	1.3	20.0	44.2	34.6	4.12	0.76
Deaf and hard of hearing children can be included in folklore activities.	0.0	5.0	25.4	42.9	26.7	3.91	0.85
Children with speech and language impairments can be included in folklore activities.	0.0	3.8	14.2	38.8	43.3	4.22	0.83
Children with reduced mobility can be included in folklore activities.	0.0	2.1	17.9	40.0	40.0	4.18	0.80
Children with long-term illnesses can be included in folklore activities.	0.0	0.0	13.8	43.8	42.5	4.28	0.69
Children with learning disabilities can be included in folklore activities.	0.0	0.0	13.3	34.2	52.5	4.39	0.71
Children with autistic spectrum disorders can be included in folklore activities.	0.0	10.4	18.3	28.3	42.9	4.04	1.02
Children with emotional and behavioural disorders can be included in folklore activities.	0.0	2.9	18.3	32.9	45.8	4.22	0.85
Including children with special needs in folklore activities improves their social skills.	0.0	0.0	22.5	36.3	41.3	4.19	0.78
Including children with special needs in folklore activities improves their motoric skills.	0.0	0.0	17.1	33.3	49.6	4.33	0.75
Including children with special needs in folklore activities improves their well-being.	0.0	0.0	18.8	42.9	38.3	4.20	0.73
For including children with special needs in folklore activities, individual work is the most appropriate form of learning.	9.6	15.0	50.4	20.4	4.6	2.95	0.96
For including children with special needs in folklore activities, pair work is the most appropriate form of learning.	0.0	4.6	56.7	31.3	7.5	3.42	0.70
For including children with special needs in folklore activities, group work is the most appropriate form of learning.	0.0	3.3	40.8	34.6	21.3	3.74	0.83

Notes: Column headings: (1) I do not agree at all, (2) I do not agree, (3) I cannot define, (4) I agree, (5) I completely agree; M – mean, SD – standard deviation.

The results presented in Table 1, related to the possibilities of including different groups of children with special needs, are quite similar. A slightly higher percentage of disagreement is apparent for the views on the possibilities of including deaf and hard of hearing students (5.0%) and students with autism spectrum disorders (10.4%). In the other groups, the disagreement is minimal or non-existent. Such a

belief may significantly influence the selection of content to include folklore elements.

The statements relating to the effect of folklore on students were generally met with a positive response, with around 20% of the respondents in each case being unable to decide whether they agreed or disagreed with the statement. Adaptation is necessary because dance activity is performed in multiple domains simultaneously (social skills, motor skills and well-being) (Zagorc, 2008), so the professionals' beliefs confirm the finding (Drev, 2013) that movement with music has a significant impact on improving individuals' physical and mental functioning. In determining the most appropriate form for teaching folklore activities, we found that as many as 24.6% of the respondents disagreed that the most appropriate form of learning is individual work; 4.6% of the respondents disagreed with pair work and only 3.3% disagreed with group work. At the same time, 55.9% of the respondents agreed that the latter form is the most appropriate, while a quarter of the respondents chose individual work. However, about half of the respondents could not decide which form of learning is the most appropriate. We assume that the choice of the most appropriate form depends on the individual situation. The most appropriate form of work is chosen by the contractors themselves as it depends on the chosen goals, incentives and working conditions. Group leaders learn the correct dance postures and the way to teach dance steps in various training sessions. They also adapt certain dance postures and motifs that younger children cannot perform as they should. For example, they adapt the three-step and two-step polka appropriately for children, often adapt the waltz step, adapt the three-step and omit more intense turns, rocking with the hips, kneeling and so on, but this is not always undertaken appropriately (Ramovš, 2000).

The mean values show that most of the professionals agreed with the statements about the possibilities of including students with special needs in folklore activities. The mean values range between 3.91 and 4.39, and the standard deviations range from 1.01 to 0.69. The respondents affirmed the positive impact of folklore activities on social ($M = 4.19$; $SD = 0.78$) and motor skills ($M = 4.33$; $SD = 0.75$) and improved well-being ($M = 4.20$; $SD = 0.73$) in children with special needs. When choosing the most appropriate form of learning, we found a slightly lower mean for individual work ($M = 2.95$; $SD = 0.90$), a higher mean for pair work ($M = 3.42$; $SD = 0.70$) and the highest mean for group work ($M = 3.74$; $SD = 0.83$).

The hypothesis, which states that professionals who teach in schools with a special education programme agree with the statements about the inclusion of students with special needs in the folklore activities, can be partially confirmed. It is confirmed that professionals support the inclusion of children with special needs in folklore activities as effective activities contribute to the improvement of well-being, provide comfort and satisfy arousal needs (Tomori, 2010). Teachers can use creative movements in all areas of teaching (Kroflič, 1999). A stimulating link between appropriate motor activity and the development of cognitive skills or the structure of the central nervous system was noted (Planinšec, 1995). There is a lack of studies involving music and folklore activities in special education settings, although it appears that music can be an effective didactic tool offering many benefits. Thus, research has pointed out that music and dance are forms of communication, a language that addresses our emotions, and motivation, which promotes collaborative learning and helps to create a positive classroom climate (Habe, 2018). Music can help students with developing motor skills and vice versa (Marinšek et al., 2020), and dance can have a positive impact on students' holistic development (Stergulec et al., 2013). In folklore dance activities, the body acts as a receiver, mediator and performer as it receives and responds to kinaesthetic, rhythmic and social stimuli (Palawat & May, 2012; Polak & Wojtuń-Sikora, 2020). Multidisciplinary teaching through the inclusion of students with special needs in music and movement folklore activities is one of the current challenges of modern education (Sutela et al., 2020). The benefits and advantages of folklore activities can relate to the development of physical skills, physical activity and motor development (Patcharapon & Singhanat, 2019; Šipek Vodnjov, 2004). In many ways, participation in dance may also lead to improved physical fitness, socio-emotional gains, and academic gains (Munsell & Bryant Davis, 2015).

3.2 Results of the comparison between groups of professionals regarding their agreement with statements about the inclusion of students in folklore activities

Table 2 shows a comparison between groups of professionals (special and rehabilitation pedagogues, special needs teachers, inclusive pedagogues, social pedagogues, teachers with special pedagogical qualifications and other pedagogical staff) regarding their agreement with statements referring to the inclusion of students in folklore activities.

Table 2: Number (N), mean (M), standard deviation (SD), minimum (min.) and maximum (max.) and Kruskall–Wallis test (p) for statements referring to the inclusion of students in folklore activities.

Statement	Profession	N	M	SD	Min.	Max.	p
Students show interest in engaging with folklore content.	SRP	72	3.26	1.06	1	5	0.374
	SNT	69	3.19	0.96	1	5	
	IP	41	2.93	0.88	2	5	
	SP	32	3.09	1.15	1	5	
	TSPQ	22	3.46	1.22	1	5	
	Other	4	2.75	1.26	1	4	
Children with intellectual impairments can be included in folklore activities.	SRP	72	4.15	0.74	2	5	0.318
	SNT	69	4.19	0.85	2	5	
	IP	41	4.20	0.81	3	5	
	SP	32	4.10	0.73	3	5	
	TSPQ	22	3.77	0.92	3	5	
	Other	4	4.50	1.00	3	5	
Blind and partially sighted children and children with impaired visual function can be included in folklore activities.	SRP	72	4.13	0.73	3	5	0.509
	SNT	69	4.23	0.71	3	5	
	IP	41	4.12	0.81	2	5	
	SP	32	3.91	0.82	2	5	
	TSPQ	22	4.05	0.84	3	5	
	Other	4	4.25	0.96	3	5	
Deaf and hard of hearing children can be included in folklore activities.	SRP	72	3.96	0.83	2	5	0.780
	SNT	69	3.87	0.86	2	5	
	IP	41	4.02	0.82	2	5	
	SP	32	3.81	0.86	2	5	
	TSPQ	22	3.91	0.97	2	5	
	Other	4	4.50	0.58	3	4	
Children with speech and language disorders can be included in folklore activities.	SRP	72	4.18	0.74	2	5	0.747
	SNT	69	4.29	0.85	2	5	
	IP	41	4.29	0.81	2	5	
	SP	32	4.09	0.73	2	5	
	TSPQ	22	4.09	0.92	2	5	
	Other	4	4.50	1.00	3	5	
Children with reduced mobility can be included in folklore activities.	SRP	4,30	0.68	3	5	4.30	0.099
	SNT	4,26	0.76	3	5	4.26	
	IP	4,12	0.71	2	5	4.12	
	SP	4,06	0.80	3	5	4.06	
	TSPQ	3,77	1.19	2	5	3.77	
	Other	4,25	0.96	3	5	4.25	
	SRP	72	4.45	0.60	3	5	0.202

Statement	Profession	N	M	SD	Min.	Max.	p
Children with long-term illnesses can be included in folklore activities.	SNT	69	4.26	0.72	3	5	
	IP	41	4.22	0.69	3	5	
	SP	32	4.19	0.74	3	5	
	TSPQ	22	4.14	0.77	3	5	
	Other	4	4.00	0.82	3	5	
Children with learning disabilities can be included in folklore activities.	SRP	72	4.46	0.67	3	5	0.448
	SNT	69	4.41	0.67	3	5	
	IP	41	4.46	0.71	3	5	
	SP	32	4.28	0.77	3	5	
	TSPQ	22	4.14	0.83	3	5	
	Other	4	4.50	1.00	3	5	
Children with autistic spectrum disorders can be included in folklore activities.	SRP	72	4.10	1.05	2	5	0.270
	SNT	69	3.93	1.05	2	5	
	IP	41	4.32	0.82	2	5	
	SP	32	3.78	1.07	2	5	
	TSPQ	22	4.00	1.02	2	5	
	Other	4	4.25	0.96	3	5	
Children with emotional and behavioural disorders can be included in folklore activities.	SRP	72	4.31	0.85	2	5	0.796
	SNT	69	4.19	0.83	2	5	
	IP	41	4.22	0.88	2	5	
	SP	32	4.16	0.77	3	5	
	TSPQ	22	4.05	0.95	2	5	
	Other	4	4.50	1.00	3	5	
Including children with special needs in folklore activities improves their social skills.	SRP	72	4.22	0.74	3	5	0.724
	SNT	69	4.19	0.79	3	5	
	IP	41	4.24	0.86	3	5	
	SP	32	4.00	0.80	3	5	
	TSPQ	22	4.18	0.73	3	5	
	Other	4	4.50	0.58	4	5	
Including children with special needs in folklore activities improves their motoric skills.	SRP	72	4.31	0.74	3	5	0.318
	SNT	69	4.28	0.85	3	5	
	IP	41	4.41	0.81	3	5	
	SP	32	4.19	0.73	3	5	
	TSPQ	22	4.45	0.92	3	5	
	Other	4	5.00	0.00	5	5	
Including children with special needs in folklore activities improves their well-being.	SRP	72	4.22	0.72	3	5	0.468
	SNT	69	4.10	0.77	3	5	
	IP	41	4.39	0.70	3	5	
	SP	32	4.13	0.75	3	5	
	TSPQ	22	4.14	0.64	3	5	

Statement	Profession	N	M	SD	Min.	Max.	p
	Other	4	4.25	0.96	3	5	
For including children with special needs in folklore activities, individual work is the most appropriate form of learning.	SRP	72	2.76	0.88	1	5	0.942
	SNT	69	2.91	1.09	1	5	
	IP	41	3.17	0.70	2	5	
	SP	32	3.00	1.14	1	5	
	TSPQ	22	3.18	0.85	1	5	
	Other	4	3.25	0.96	2	5	
For including children with special needs in folklore activities, pair work is the most appropriate form of learning.	SRP	72	3.36	0.66	2	5	0.099
	SNT	69	3.30	0.69	2	5	
	IP	41	3.73	0.78	3	5	
	SP	32	3.38	0.61	2	5	
	TSPQ	22	3.45	0.67	2	5	
	Other	4	3.25	0.96	2	5	
For including children with special needs in folklore activities, group work is the most appropriate form of learning.	SRP	72	3.72	0.74	3	5	0.113
	SNT	69	3.70	0.90	2	5	
	IP	41	3.83	0.86	2	5	
	SP	32	3.66	0.87	2	5	
	TSPQ	22	3.86	0.77	3	5	
	Other	4	3.75	1.26	2	5	

Notes: SRP – special and rehabilitation pedagogues, SNT – special needs teachers, IP – inclusive pedagogues, SP – social pedagogues, TSPQ – teachers with special pedagogical qualifications.

For all the statements, the results show that there are no statistically significant differences between the six professional groups. Based on the obtained results, we can reject the hypothesis that states that there are statistically significant differences between groups of professionals (special and rehabilitation pedagogues, special needs teachers, inclusive pedagogues, social pedagogues, teachers with special pedagogical qualifications and other pedagogical staff) regarding their agreement with statements referring to the inclusion of students with special needs in folklore activities in schools with a special education programme. The views of the professional groups are thus unified and implicitly show the potential and awareness of the advantages and benefits of and opportunities for connecting and integrating folklore activities into the field of special needs. Such educational processes can be viewed more uniformly, and the school conditions can be key factors in the quality of the educational process, especially when it comes to music (Borota, 2017). We need to spread awareness that, with the help of music/movement and folklore, a student with special needs can transform from being a passive student into an active participant in the school setting as well as outside the classroom (Sutela et al., 2020).

This situation is also conditioned by the teachers' competences regarding inclusion, which are often related to their general didactic and pedagogical competence (Retar, 2017; Riccarda Kiswarday & Štemberger, 2017; Sevšek & Črčinovič Rozman, 2018; Štemberger, 2013).

4 Conclusion

In this research, we were interested in the views of professionals from Slovenian schools with a special education programme. According to the respondents, students are not particularly interested in becoming involved in folklore activities. Possible reasons could be insufficient teaching of content, insufficiently discussed topics or negative connotations that have been attached to folklore for quite some time. However, it would be particularly interesting to examine in depth the reasons for such attitudes towards folklore. Professionals are otherwise in favour of the idea of including all kinds of students with special needs in folklore activities. A more detailed analysis has shown that, although there are some differences according to specific needs, they are negligible. Professionals agree that the inclusion of children with special needs in folklore activities improves their motor and social skills and increases their well-being, a view that has been confirmed by research in this field. The class is an active system that requires different forms of work, procedures, methodology and didactics to achieve the objectives. In this regard, each professional decides which form of work to choose to provide the students with the conditions for balanced physical, social and mental growth in accordance with their needs. For this reason, it is difficult to determine the most appropriate form of work and teaching of folklore elements. This was also confirmed by the respondents' views, with no significant statistical differences in the form of work. With additional training in the field of folklore, professionals would deepen their knowledge and, together with students, create and at the same time preserve cultural heritage. The traditions of adults cannot be automatically and unthinkingly passed on to children. It is right for children to learn about them, but they should not be passed on in the form in which they exist in the adult world (Knific, B. & Knific, M., 2009). Children's folklore groups should focus on children's play, combining it with simplified folk dances, folk songs and other elements that provide evidence of children's lives in the past (Knific, B. & Knific, M., 2007). In conclusion, it should be stressed that professionals, teachers and dance educators in general must pay particular attention

to the appropriate choice of folk dances, which must not exceed the abilities of children at a certain stage of development, and to their simplification.

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About the authors

Bojan Kovačič, PhD, is an Assistant Professor at the Faculty of Education, University of Maribor. He teaches music courses at the Department of Elementary Education. His doctoral thesis focused on the characteristics of musically talented elementary school students (6-10 years old). His research focusses on talent development, music education, teaching methods, musical abilities, musical creativity, musical content, learning media and technology, folklore activities, and special needs.

Nejc Černela has a Master's degree in Elementary Education.

Marta Licardo, PhD, is a associate professor at University of Maribor, Faculty of Education, Slovenia. Her research interests are pedagogy, didactics, social sciences in early childhood education, inclusion, education of children with special needs and immigrant children. She is country coordinator for European Early Childhood Education Research Association for Slovenia. She participates in numerous projects on national and international level.

Understanding and Supporting Twice-Exceptional Students: The Role of Educational Professionals in Promoting Inclusive Practices

Monika Mithans, Jasna Tivadar, Sabina Ograjšek
University of Maribor, Faculty of Education, Maribor, Slovenia
monika.mithans1@um.si, tivadarjasna@gmail.com, sabina.ograjsek@um.si

In the following chapter, the discussion centres on twice-exceptional students, who are recognized for their unique combination of gifted abilities and special educational needs The research conducted for this study focuses on the prevalence of misconceptions among education professionals and the challenges they face in identifying and working with this group of students. The findings reveal a significant level of awareness among professionals about the complexity of giftedness and special educational needs while pointing out certain misconceptions. Additionally, the overall results collectively point to a strong awareness of the challenges related to twice-exceptionality, highlighting the critical need to address particular deficits and provide individualized support. The diversity of responses by the research participants indicates varying perspectives on how these challenges manifest and how they should be addressed. Moreover, the results indicate that educators familiar with the concept of twice-exceptionality are better equipped to identify the unique needs of twice-exceptional students and are less prone to misconceptions. Finally, the chapter highlights the critical role of further education and training for professionals to improve inclusivity and the success of twice-exceptional students.

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1 Introduction

The concept of inclusion embodies the potential to cultivate a society that not only appreciates diversity but also seeks to create circumstances that allow each person to enjoy dignity and engage fully in society (Kiswarday, 2014). However, despite the widespread adoption of the inclusive paradigm, we still live in a society that fails to fully understand the needs of gifted students and students with special educational needs (Kircher-Morris, 2022). Consequently, this lack of understanding makes it particularly challenging to address the requirements of students who fall into both of these categories.

In literature dealing with the subject, students embodying both, giftedness and being subject to special educational needs, are often referred to as twice-exceptional students (Lee & Ritchotte, 2019; Ronksley-Pavia, 2015; Trail, 2022). Due to their atypical functioning in school environments, they frequently remain unnoticed, undiagnosed, or misdiagnosed (Ančimer Aljaž & Juriševič, 2018; Anderšek-Lep, 2012; 2015; Behrić, 2021; Klingner, 2022; Magajna, 2010; Ozbič & Kogovšek, 2012; Satler, 2016; Trail, 2022), despite the fact that they require significant support (King, 2022). The limited understanding of their situation and life experiences hinders educational professionals and policymakers from addressing their unique needs effectively (Ronksley-Pavia et al., 2019). The contrasts between their strengths and weaknesses lead to conflicts that affect not only the students but also their parents and teachers, thereby making the school experience exceedingly frustrating (Košak Babuder & Kavkler, 2014). Additionally, the extremes of their abilities and specific educational needs can lead to academic, social, and emotional conflicts (Trail, 2022). This is precisely why our research is focused on exploring this phenomenon.

1.1 Definition of Twice-Exceptional Students

Defining the concept of twice-exceptional students is a challenging task due to the diversity of definitions for both gifted students and students with special educational needs (Juriševič, 2012; Ronksley-Pavia, 2015).

The first scholar in Slovenia to write about twice-exceptional students was Magajna (2007), who initially used the term to describe gifted children with specific learning difficulties. She emphasized that these students are a heterogeneous group encompassing various types of giftedness and specific deficits (Magajna, 2010). In her later works, she expanded the term to include gifted children with challenges in other areas, such as emotional or behavioural disorders, sensory impairments or physical disabilities (Magajna & Božič, 2012).

The phenomenon of twice-exceptionality has also been examined by other researchers in Slovenia. Božič (2015) defined twice-exceptional students as gifted individuals with specific learning difficulties. In a broader interpretation, Andrenšek-Lep (2012, 2015) did not only include gifted students with learning difficulties or deficits in specific learning areas but also all children with special educational needs. Furthermore, she argued that a formal diagnosis is not necessarily required, as this group also includes students who are gifted but, for various reasons, struggle to succeed in school (e.g., students from underprivileged backgrounds, low-income families, dysfunctional families, or those with learning challenges that do not meet the criteria for specific deficits but still require classroom adaptations and tailored assessment strategies) (Andrenšek-Lep, 2014).

Satler (2016) described twice-exceptional students as a distinct group of children and adolescents who are simultaneously gifted and face challenges in academic or functional areas. Similarly, Ozbič and Kogovšek (2012) noted that gifted students with special needs form a unique group that cannot simply be seen as a combination of giftedness and learning difficulties but rather as a complex interplay of both.

In Slovenian practice, the terms twice-exceptional, twice-gifted, and multi-exceptional students are used interchangeably (Juriševič, 2012). The term generally refers either to gifted students with special educational needs or to gifted students with specific learning difficulties, particularly those with more severe forms of learning disorders known as deficits in specific learning areas (Ančimer Aljaž & Juriševič, 2018).

One of the primary obstacles faced in the global examination of twice-exceptional students is the absence of a universally accepted definition. Ronksley-Pavia (2015) noted that ambiguous definitions are a hallmark of the concept of twice-exceptionality.

Some authors classify only gifted students with learning difficulties as twice-exceptional (Buica-Belciu & Popovici, 2014; Silverman, 2009; Yenioğlu et al., 2022). In contrast, other experts argue that these students represent merely a subgroup within the broader category of twice-exceptionalism (Bell et al., 2015).

Furthermore, Brody and Mills (1997) argue that twice-exceptional students possess the potential for high achievement but also have characteristics of students with deficits and disorders, which create significant learning challenges. Similarly, Jackson Gilman and colleagues (2013) define them in comparable terms.

The Colorado Department of Education (2017) defines twice-exceptional students as individuals recognized as gifted in one or more areas while also being students with special educational needs requiring adaptations and support. This definition aligns with the predominant usage of the term in international literature, where twice-exceptional students are most commonly described as gifted students with special educational needs (Assouline et al., 2010; Assouline & Whiteman, 2011; Foley-Nicpon & Teriba, 2022; Foley-Nicpon et al., 2013; Kelvington et al., 2022; Ronksley-Pavia, 2015).

1.2 Identification of Twice-Exceptional Students and Working with Them

By the late 1980s, researchers began to acknowledge that twice-exceptional children possess both giftedness and deficits, indicating a need for focused attention and appropriate accommodations in their educational work to effectively address both aspects (Kiswarday, 2017). Their behaviour is often contradictory and at odds with prevailing stereotypes. Additionally, they may develop compensatory strategies that mask their difficulties. Consequently, identifying this specific group of students requires a thorough understanding of the characteristics associated with gifted students, as well as the effects that various deficits may have on their academic performance. Understanding the complex interactive influences, which often hinder

the recognition of exceptional potential or specific deficits, is key. These factors collectively lead to the fact that twice-exceptional students are often not identified, thus not receiving the necessary encouragement and support. (Klingner, 2022; Magajna, 2010; Magajna & Božič, 2012; Nagiy, 2012; Šuligoj, 2014; Trail, 2022).

As Reis et al. (2014) claim, the greatest challenge in identifying twice-exceptional students lies in the coexistence of giftedness and special educational needs. This combination results in unique individual characteristics that are not typically observed in groups consisting solely of gifted students or solely of students with special educational needs. This is echoed by other researchers who emphasize that identifying twice-exceptional students is challenging precisely because of the overlapping of their strengths and weaknesses, which creates a unique learning profile (Bell et al., 2015; Brody & Mills, 1997; Morrison & Rizza, 2007; Trail, 2022).

It is, therefore, clear that twice-exceptional students are a highly heterogeneous group of students with complex educational needs. In the process of identifying and diagnostically evaluating twice-exceptional students, a multidimensional approach is therefore important (Bildiren & Firat, 2020), which connects the student, family, teachers, and other professionals (Magajna & Božič, 2012). Identifying twice-exceptional students requires a comprehensive assessment of both, their giftedness and deficits, as one does not exclude the other. Thus, experts from both fields and those with knowledge of twice-exceptionality should be involved in the identification process (Klingner, 2022; Šuligoj, 2014).

For the successful integration of twice-exceptional students into everyday school practice, it is especially important to identify both exceptionalities early. This enables the prevention of academic failure, promotes the holistic development of the student, and prevents the development of social and emotional problems. The planning of an individual education plan should be multidisciplinary and include cognitive, academic, social, and emotional needs associated with both exceptionalities. Designing an appropriate learning environment requires a comprehensive assessment of strengths and weaknesses, which in turn demands personalized learning approaches and adaptations to the learning process. Equal attention should be given to both extremes: identifying and encouraging potential and strengths while also seeking appropriate ways to compensate for deficits that cause difficulties in various areas of learning. It is important to provide counselling

and measures to promote social relationships, emotional understanding, and acceptance of diversity (Kiswarday, 2017; Klingner, 2022; Trail, 2022). Furthermore, understanding learning and motivational patterns is essential. It is important to work with students to find their natural way of learning (Andrenšek-Lep, 2012). At the same time, it is necessary to maintain high expectations and adjust tasks so that they remain challenging and engaging (Kiswarday, 2017).

Educational professionals play an important role as advocates for students with twice-exceptionality, as the school environment can often be very stressful and frustrating for them (Kiswarday, 2017). The primary task of teachers is teaching, not diagnosing, but this is still a responsibility that falls within the scope of their demanding tasks if they wish for all their students to reach their full potential (Šuligoj, 2014).

This is why teachers should be equipped with appropriate competencies to support students with diverse abilities (Navarro et al., 2016). In addition, teachers should adapt, modify, or differentiate learning so that all students in the classroom can participate according to their abilities (Sharma & Nuttal, 2016).

However, only highly qualified professionals who continuously educate themselves in the fields of giftedness, special needs, and twice-exceptionality can provide such support to students. Teachers should understand what twice-exceptionality means and how to adapt teaching content, goals, assessment, and other elements of the educational process to ensure that this group of students can succeed.

Unfortunately, research shows that teachers often lack sufficient professional training to effectively identify and address the needs of twice-exceptional students (Ančimer Aljaž & Juriševič, 2018; Ozbič & Kogovšek, 2012). Therefore, the research investigates misconceptions about gifted students with special educational needs and the challenges educational professionals face when working with this unique population.

2 Methods

2.1 Research Questions

The research addresses the lack of comprehensive understanding and awareness among educational professionals regarding the complexities of twice-exceptional students – those who are both gifted and have special educational needs. While educational professionals play a critical role in identifying, supporting, and fostering the development of these students, misconceptions and inadequate knowledge can hinder effective intervention and equitable support.

We posed two central research questions:

1. What misconceptions about gifted students and students with special educational needs are prevalent among educational professionals?
2. How do educational professionals perceive the challenges they may face when working with gifted students and students with special educational needs?

For both research questions, we are particularly interested in whether there are differences between professionals familiar with the term "twice-exceptional students" and those who are not.

2.2 Sample

The research is based on a non-probability convenience sample of 312 educational professionals from primary schools across Slovenia.

The sample included a diverse group of educational professionals. About a third of the participants (37.5%) were subject teachers, followed by nearly a quarter of elementary school teachers (24.0%). Approximately a fifth of the respondents were teachers providing additional professional support (20.2%). School counsellors accounted for 14.4%, while teachers working in the morning/after-school care and extended programmes represented the smallest group, at merely 3.8%.

The participants demonstrated a diverse range of professional experience in education. Nearly a third (29.5%) had between 19 and 31 years of experience, followed closely by those with 7 to 18 years (28.5%). Professionals with 32 to 40 years of experience accounted for 15.4%, while those with up to 3 years represented 13.1%. A slightly smaller group had 4 to 6 years of experience (12.2%). The smallest group comprised those with over 40 years of experience, making up merely 1.3%.

Participants held various professional titles, reflecting their career progression and expertise. Just under two-fifths of respondents (37.5%) held the title of advisor. A little over a fifth (22.1%) did not hold a professional title, followed closely by those with the title of mentor (21.8%). The highest designation, counsellor, was held by slightly less than a fifth of respondents (18.6%).

Participants were also asked whether they had attended training related to special educational needs or gifted students in the past five years. About two-fifths (39.1%) reported attending training focused on special educational needs, while a quarter (26.0%) had participated in training that addressed both special educational needs and gifted students. A much smaller proportion (5.4%) had attended training exclusively on gifted students. Nearly a third (29.5%) had not participated in such training.

An important question for our research was whether participants were familiar with the term "twice-exceptional students." Just over half of the respondents (52.2%) indicated familiarity with the term, while slightly less than half (47.8%) reported that they were not. This fairly equal distribution highlights a concerning issue: many educational professionals work with twice-exceptional students but are unfamiliar with the terminology defining this unique group. Consequently, this lack of awareness may hinder their ability to understand and fully address these students' specific needs.

2.3 Measurement Instruments

This study utilized a questionnaire designed specifically to meet its objectives, incorporating relevant insights derived from existing literature. The initial part of the questionnaire included demographic questions, followed by several thematic sections, with two particularly relevant for this research. The first section explored

misconceptions surrounding gifted students and students with special educational needs, while the second addressed the challenges professionals face in working with these groups. Participants rated their responses using a scale ranging from 1 (not agree at all) to 5 (completely agree).

2.4 Data Collection Procedure

The data for the research were collected using an online questionnaire. Educational professionals completed the questionnaire in April 2022. The link to the questionnaire was sent to the management staff of primary schools. The email addresses were obtained from primary school websites.

2.5 Statistical Analysis

The collected data were processed and analysed using the SPSS software. The analysis was conducted using descriptive and inferential statistics. Initially, descriptive statistical methods were applied. Before further analysis, the Kolmogorov-Smirnov test was performed, revealing that the variables deviated from a normal distribution, as statistically significant differences were observed in all cases ($p < .05$). Consequently, the non-parametric Mann-Whitney test was used to compare two independent samples.

3 Results

3.1 Misconceptions About Gifted Students and Students with Special Educational Needs

We examined whether educational professionals in primary schools have misconceptions about gifted students and students with special educational needs. Specifically, we investigated teachers' agreement with the following statements on a scale from 1 (not agree at all) to 5 (completely agree):

- A student cannot be identified as both a student with special educational needs and gifted simultaneously.

- A gifted student with special educational needs does not require special attention and care, as they can compensate for learning and thinking deficits with their giftedness.
- A student identified as gifted excels in all academic areas.
- Poor academic performance of a gifted student is mostly a reflection of their lack of effort and poor study habits.
- A gifted student with deficits in reading, writing, or mathematics can overcome these difficulties independently due to their giftedness.
- A gifted student encounters challenges only in the domains of behaviour and emotions.
- Addressing deficits should take precedence over developing strengths and potential.

The descriptive statistics highlight prevailing attitudes towards misconceptions about gifted students and students with special educational needs. Across the seven statements, the means predominantly fall below the scale's midpoint ($M \leq 3.00$), indicating a general tendency among respondents to disagree with these misconceptions.

The statement suggesting that more time should be dedicated to addressing deficits than developing strengths has the highest mean ($M = 2.50$, $SD = .96$), indicating it is perceived with less disagreement than other misconceptions. Similarly, the idea that poor academic performance of a gifted student reflects a lack of effort and poor study habits ($M = 2.31$, $SD = 1.05$) is rated higher than most other statements.

Statements regarding self-compensation for learning deficits ($M = 1.88$, $SD = .78$) and the presumption of universal academic excellence among gifted students ($M = 1.64$, $SD = .74$) were met with stronger disagreement, reflecting an understanding that giftedness does not inherently resolve specific challenges or guarantee success in all academic domains.

The lowest mean scores are associated with misconceptions that a gifted student with special educational needs does not require special attention ($M = 1.58$, $SD = .82$), that difficulties of a gifted student are confined to behavioural and emotional domains ($M = 1.52$, $SD = .66$), and that dual identification of giftedness and special

educational needs is not possible (M = 1.47, SD = .82). These results demonstrate a consensus among respondents in rejecting these overly simplistic views. Overall, the findings underscore a high level of awareness regarding the complexities of giftedness and special educational needs.

Furthermore, the study aimed to explore the relationship between educational professionals' familiarity with 'twice-exceptional students' and their agreement with common misconceptions about gifted students with special educational needs. Educational professionals were divided into two groups: those familiar with the term and those not. The data was analysed using the Mann-Whitney U test to compare mean ranks between groups and determine if there is a difference in educational professionals' perspectives on these misconceptions based on their familiarity with the term.

Statistically significant differences were found in six out of seven statements between educational professionals familiar with and those unfamiliar with the term 'twice-exceptional students.' The following misconceptions showed significant differences:

- A student cannot be identified as both a student with special educational needs and gifted simultaneously: $U = 8951.50$, $p < .001$.
- A gifted student with special educational needs does not require special attention and care, as they can compensate for learning and thinking deficits with their giftedness: $U = 9047.50$, $p < .001$.
- A student identified as gifted excels in all academic areas: $U = 10066.50$, $p = .004$.
- Poor academic performance of a gifted student is mostly a reflection of their lack of effort and poor study habits: $U = 8534.00$, $p < .001$.
- A gifted student encounters challenges only in the domains of behaviour and emotions: $U = 8986.50$, $p < .001$.
- Addressing deficits should take precedence over developing strengths and potential: $U = 10237.00$, $p = .011$.

Across these misconceptions, educational professionals familiar with the term were consistently more likely to reject misconceptions compared to those unfamiliar with the concept.

For the remaining misconception, no statistically significant differences were observed:

- A gifted student with deficits in reading, writing, or mathematics can overcome these difficulties independently due to their giftedness: $U = 11975.50$, $p = .818$.

3.2 Challenges in Working with Gifted Students and Students with Special Educational Needs

We were also interested in understanding the challenges educational professionals face when working with gifted students and students with special educational needs. Educational professionals rated their level of agreement with the following statements on a scale from 1 (not agree at all) to 5 (completely agree):

- A student's strengths or potential may be overlooked due to their giftedness.
- A student's potential may be overlooked due to deficits or difficulties.
- Identifying giftedness in a student with special educational needs is challenging.
- A gifted student may experience difficulties with reading, writing, or mathematics.
- A gifted student with deficits, obstacles, or disorders, like a student with special educational needs, requires an individualized program, additional support, and appropriate accommodations.
- It is important to focus on addressing a student's deficits and difficulties, as this is the only way to strengthen their areas of potential.

The descriptive statistics reveal key insights into educational professionals' challenges when working with gifted students and students with special educational needs. Across the six statements, the mean scores range from agreement to neutrality, indicating varying levels of awareness and consensus about these challenges.

The statement emphasizing that a gifted student may experience difficulties in reading, writing, or mathematics has the highest mean (M = 4.39, SD = .79), reflecting agreement among respondents. Similarly, the recognition that gifted students with deficits, obstacles, or disorders require individualized programmes, additional support, and accommodations (M = 4.23, SD = .85) is also rated highly, demonstrating a widespread understanding of the need for tailored approaches to support twice-exceptional students.

Moderate levels of agreement are observed for the statement that a student's potential may be overlooked due to deficits (M = 3.71, SD = 1.22). Meanwhile, responses for the statement emphasizing the importance of addressing deficits to strengthen potential (M = 3.44, SD = 1.21) and the statement that a student's strengths or potential may be overlooked due to their giftedness (M = 3.37, SD = 1.26) hover closer to the neutral midpoint of the scale. These mean scores indicate mixed perspectives, with some professionals agreeing and others either neutral or disagreeing, highlighting variability in their views about these specific challenges.

The lowest mean score is associated with the statement that identifying giftedness in a student with special educational needs is challenging (M = 2.83, SD = 0.93). Although this score is below the neutral midpoint, it is closer to neutrality than disagreement.

Overall, the findings highlight a strong awareness among educational professionals regarding the challenges associated with twice-exceptionality, particularly the need to address specific deficits and provide individualized support. However, some response variability points to differing perspectives on how these challenges manifest and should be addressed.

Further, we explored the relationship between educational professionals' familiarity with the term 'twice-exceptional students' and their perspectives on challenges related to gifted students with special educational needs. The data was analysed using the Mann-Whitney U test to compare mean ranks between the groups and determine if there is a difference in educational professionals' perspectives on these challenges based on their familiarity with the term.

Statistically significant differences were found in three out of six challenges between educational professionals familiar with the term 'twice-exceptional students' and those unfamiliar. The following challenges showed significant differences:

- A student's strengths or potential may be overlooked due to their giftedness: $U = 10260.50$, $p = .014$.
- A gifted student may experience difficulties with reading, writing, or mathematics: $U = 9491.00$, $p < .001$.
- A gifted student with deficits, obstacles, or disorders, like a student with special educational needs, requires an individualized program, additional support, and appropriate accommodations: $U = 9827.00$, $p = .002$.

Across the statistically significant challenges, educational professionals familiar with the term 'twice-exceptional students' were consistently more likely to recognize the unique needs and challenges of this group of students compared to those unfamiliar.

For the remaining three challenges, no statistically significant differences were observed:

- A student's potential may be overlooked due to deficits or difficulties: $U = 11060.00$, $p = .148$.
- Identifying giftedness in a student with special educational needs is challenging: $U = 11512.00$, $p = .404$.
- It is important to focus on addressing a student's deficits and difficulties as the only way to strengthen their areas of potential: $U = 11268.50$, $p = .258$.

These findings emphasize the importance of professional development and training to raise awareness of twice-exceptionality among educational professionals, thereby improving their ability to provide effective and equitable support to this diverse population.

4 Discussion

The research findings address both central research questions and provide insight into the prevalence of misconceptions and perceptions of challenges in working with twice-exceptional students.

Although Trail (2022) emphasizes that twice-exceptional students are often misunderstood and overlooked, our research reveals a positive shift towards greater awareness among educational professionals about the complexity of this phenomenon. The findings show that professionals demonstrate a high level of understanding of the coexistence of giftedness and special educational needs. However, the results also indicate that some misconceptions persist, albeit to a lesser extent. This is reflected in statements such as, "Addressing deficits should take precedence over developing strengths and potential" and "Poor academic performance of a gifted student is mostly a reflection of their lack of effort and poor study habits". These results suggest that while the understanding of twice-exceptionality among professionals is improving, certain misconceptions still exist, underscoring the need for further education and development.

Notably, statistically significant differences were found between professionals familiar with the concept of twice-exceptional students and those who are not in terms of rejecting misconceptions. Familiarity with this concept is associated with lower agreement with misconceptions, confirming that awareness is critical to developing effective pedagogical approaches. This highlights the need to strengthen educational programmes aimed at understanding twice-exceptional students.

The research also explored the challenges professionals face when working with gifted students with special educational needs. Overall, our findings emphasize a high level of awareness among professionals regarding the challenges associated with twice-exceptional students, particularly the need to address specific deficits (e.g., in reading, writing, and mathematics) and to provide individualized support. The high level of agreement with statements emphasizing the importance of tailored programmes and additional support for twice-exceptional students reflects a recognition of their unique needs. However, the diversity of responses indicates varying perspectives on how these challenges manifest and how they should be addressed.

There are statistically significant differences between professionals who are familiar with the concept of twice-exceptional students and those who are not. This finding suggests that well-informed professionals are better equipped to identify and address the unique needs and challenges of these students. Experts (Ančimer Aljaž & Juriševič, 2018; Klingner, 2022; Ronksley-Pavia et al., 2019; Trail, 2022) have

highlighted how a lack of knowledge about twice-exceptional students can lead to misdiagnoses and inadequate support.

The findings also suggest that embedding the concept of twice-exceptionality into teacher education curricula could significantly enhance future educational professionals' understanding of these students' needs. This would allow for earlier identification and more effective interventions that address both their strengths and their challenges.

In light of the research findings, we propose expanding professional development programmes for educational professionals in the areas of gifted students, students with special needs, and twice-exceptional students. Furthermore, fostering collaboration between experts in gifted education and special education could enhance shared knowledge and improve approaches to supporting twice-exceptional students. Only through such initiatives can professionals be better equipped to identify and appropriately address the needs of these students, contributing to a more equitable and inclusive educational environment for all learners.

5 Conclusion

Recognition of twice-exceptional students and their characteristics is crucial for providing appropriate support and intervention. It is important to highlight that in Slovenia, twice-exceptional students are not mentioned in any official state documents (Ozbič & Kogovšek, 2012), which hinders the awareness of educational professionals and impacts the quality of work with gifted students with special educational needs. Although this gap was partially addressed with the Guidelines for Revising the Approach to Identifying and Educating Gifted Children and Students (2019), it remains evident that further awareness-raising and integration of the concept into daily pedagogical practice are essential to effectively support twice-exceptional students.

The contribution of our research lies in identifying the level of awareness among educational professionals regarding twice-exceptional students and emphasizing the importance of their recognition and adaptation of teaching approaches for this group of learners. Our findings underline the need to incorporate the topic of twice-exceptionality more extensively into educational programmes and professional

development programmes. By doing so, we aim to encourage the development of more inclusive and tailored pedagogical practices that will enable the optimal development of the potential of twice-exceptional students.

Based on the findings, we can conclude that fostering equal opportunities and success for twice-exceptional students demands a systematic effort to raise awareness, deliver appropriate training and tailor pedagogical practices that reflect a comprehensive understanding of their unique needs.

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About the authors

Monika Mithans, PhD, is an assistant professor in the field of pedagogy at the Faculty of Education, Department of Fundamental Pedagogical Subjects at the University of Maribor, Slovenia. Her main areas of research are: school participation, modernization of the educational process and curriculum changes.

Jasna Tivadar, a student at the Faculty of Education, University of Maribor. She provides additional professional support in mainstream schools, striving for the equal inclusion of all children in the educational process.

Sabina Ograjšek, a PhD student, is a teaching assistant at the Faculty of Education, University of Maribor, Slovenia. She is responsible for teaching methodology to both undergraduate and postgraduate students. Her research interests include statistical and research methodology in education, the research-teaching nexus, and learner-centred approaches in higher education.

INVOLVING STUDENTS IN SCHOOL-HOME COOPERATION

TINA VRŠNIK PERŠE,[1] ŽIVA GRAFENAUER EKART[2]
[1] University of Maribor, Faculty of Education, Maribor, Slovenia
tina.vrsnik@um.si
[2] Woodwork High School Maribor, Maribor, Slovenia
ziva.ekart@gmail.com

The paper discusses the importance of involving students in school-home cooperation and its impact on their responsibility, motivation and behaviour. Great emphasis is placed on the active involvement of students, as it contributes to a better understanding of learning objectives, more effective communication between teachers, parents and students, and greater success in achieving educational and behavioural goals. Particular attention is paid to children with special needs, where participation further promotes their independence and enables an inclusive attitude. Based on qualitative research, we conclude that students who participate in three-way conferences are more motivated and better able to monitor their progress. Despite the benefits, there are challenges in implementing such practices, as teachers and parents often doubt students' ability to participate. On this basis, we propose to increase the systematic involvement of students in school-home cooperation and to provide additional education and training for educators and parents to promote students' active participation.

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1 Cooperation between school and home

Effective communication between teachers, parents and students is key to creating a positive and productive learning environment and to the holistic integrated development of students. This is also fostered by building collaborative partnerships between teachers, parents and students and encouraging students to actively participate (Derfler et al., 2019; Eggert-Schmid Noerr et al., 2011; Sacher, 2008). Through active participation, students develop life skills, such as self-advocacy or help-seeking (Newman, 2000), responsible decision-making (Sever & Ersoy, 2019) and taking responsibility for achieving goals (Christenson, 2004). This is particularly important when it comes to children with special needs, where the development of these skills is crucial for their holistic integrated development and later empowerment (Licardo & Schmidt, 2014), especially during periods of transition between educational stages (Strnadová et al., 2023).

School and family are areas that contribute significantly to the formation of a child's (student's) personality and performance (Gwiazdowska-Stańczak, 2014). If we want to offer children the best possible development, both areas must be integrated, which requires active and conscious collaboration between teachers and parents (Betz, 2015; LaRocque et al., 2011). Collaboration is even more important when children with special needs are involved (Howland et al., 2006). Cooperation should be based on a partnership relationship that includes: 1. all parties working together toward a common goal; 2. an awareness that all members of the relationship (teachers, parents, and students) are extremely important and valuable; 3. consideration of the perspectives of all parties involved in the collaboration; 4. a focus on the purpose of the collaboration; and 5. trust and a sense of shared responsibility (Coutts et al., 2014). Teacher-parent partnerships are not simply about the flow of information from one system to another, but about active joint action and systematic mutual support (Mundwiler, 2017; Sacher, 2016). In this form of collaboration, the teacher shares power with the parents and sees them as equal and valuable partners in the children's educational process, without forgetting the students, who play an important role in the collaboration (Bryan & Henry, 2012). The need for collaboration between school and home is even greater in the case of children (students) with special needs, which in school can include all those whose development, well-being and learning are at risk if they do not receive specific

intervention (Vršnik Perše, 2005), as partnership is essential for the development of inclusive practices (Adams et al., 2016).

1.1 The importance of involving students in school-home cooperation

In an educational partnership, there are two ways in which the role of the student can be considered: 1. students are included and seen as equal partners, or 2. their inclusion is not welcomed and they are not involved (Sacher, 2016). In some cases, parents collaborate intensively with the school and their child's teachers, but the students are excluded from this involvement. This creates an obstacle to optimal cooperation between school and home (Sacher, 2014).

Achieving optimal results in collaboration requires planned, continuous and systematic communication between teachers, parents and students, based on the equality of all parties involved (Bezić, 2015). However, when we talk about the equality of all stakeholders, several dilemmas arise. Jensen & Jensen (2011) and Juul & Jensen (2009) state that the relationship between teachers and parents is asymmetrical because it is based firstly on the relationship between the expert (teacher) and the layperson (parent) (see also Mundwiler, 2017; Sacher, 2008) and secondly on the teacher's commitment to the country's public education system, which has recognised and entrusted the teacher with an important role in education (ibid., see also Betz, 2015). We can speak even more clearly of an asymmetry of relational roles when it comes to students. Teachers and parents are adults, but students are children or adolescents, which makes it difficult to speak of an equal relationship between them. Each of them also has a different role and varying expectations. The teachers know the child as a student; the parents know the child in other roles. In the teacher-parent-student relationship, it is the students who still have to learn their responsibilities, which is why we cannot speak of an equal relationship between all parties (Jurič Šenk, 2014). However, while it is important to clearly define the responsibilities and roles of all parties involved, it is also important to clearly address how students' agency can be included in the collaboration (Vedeler, 2023) or in other words, their active engagement.

The school-home partnership can therefore be understood as the active involvement of all parties, i.e., students, parents, and teachers, in a collaborative process (Eggert-Schmid Noerr et al., 2011). It is not enough to involve only parents and teachers

(Robinson & Harris, 2014), as a well-functioning educational partnership requires the cooperation and consent of all, including students (Paseka, 2014, see also Betz, 2019). Students can participate in the partnership between school and home in various ways and to varying degrees, and this involvement enables them to plan and reflect on their own learning and life at school and in the classroom (Liening-Konietzko, 2017). Gesing (2011) points out that we can only speak of participation in the school context if both students and their parents are involved in (all) decisions that affect school life and teaching.

One-on-one meetings between teachers and parents are usually a central part of the collaboration. These meetings also offer the opportunity for involving students (Strle et al., 2017). Involving students in communication or conversations between teachers and parents presents a particular challenge, especially when engaging them to actively participate in the conversation (Beveridge, 2005). Active participation means that students go from being passive recipients of information to active and responsible participants. Optimal student development is only possible when students are actively involved in planning their future goals and evaluating their performance (Hogan, 1975). However, the extent and form of their involvement should be adapted to the student's age or stage of development, abilities and preferences (Beveridge, 2004, 2005; Textor, 2009, see also Fthenakis et al., 2014).

There are several reasons why it is important for students to be actively involved in meetings with their parents and teachers: 1. because they have the right to hear what their parents and teachers say about them; 2. because they have the right to express their opinions and views and thus shape their education and lives; and 3. because this gives them the opportunity to experience all the processes that adults also experience when they are sad or worried (Juul & Jensen, 2009). All of this can be facilitated by meetings with parents and teachers. These represent a new dimension not only in the quality of collaboration between school and home, but also in the quality of educational work as a whole (Westfall-Greiter, 2012). Involving students in setting goals for their own learning and behaviour and in evaluating their own performance guarantees an improvement in the quality of work at any given school (Beutel, 2010).

1.2 Three-way conferences

Three-way conferences are a special type of collaboration in which the students are actively involved in meetings with parents and teachers. These are discussions between the student, the parents and the teacher (or several teachers, if applicable), wherein the students learning and development are discussed. These meetings offer students the opportunity to discuss their progress with teachers and parents and to set further goals together. In doing so, students develop responsibility for their actions and learning, and are often more successful in achieving their goals because they are actively involved in formulating them (Bastian, 2012). Three-way conferences (sometimes they are also referred to as student-led conferences) are well established in many countries, e.g., Austria, Canada, the Czech Republic, Finland, New Zealand, Norway and Sweden. In Slovenia, this type of involvement of students in collaboration with teachers and parents is not mandatory and is not common in school practice (Strle et al., 2017). Students are usually only involved in parent-teacher meetings if there is a specific problem, be it an educational or behavioural problem. However, the purpose of three-way conferences is not to solve problems once they have arisen, but to prevent them, as all students are included, regardless of whether they have experienced problems at school.

There are usually two meetings with parents and students per school year, always involving teachers, parents and the student. The first meeting takes place at the beginning of the school year and the second at the end of the school year. The purpose of the first meeting with parents and students is to establish the students' starting point and to determine the next steps. To this end, the student's achievements and skills to date are reviewed, such as, their independence in work, their understanding and application of knowledge, their performance of tasks, their personal development, and their behaviour. The discussion focuses primarily on the student's areas of strength (rather than weakness) (Derfler et al., 2019; Jäckl & Moser, 2016).

Three-way conferences include the following steps:

1. A welcoming introduction and an explanation of the plan for the meeting.
2. A previously prepared presentation by the student in which they present their learning achievements to date.

3. Parents' and teachers' reactions to the student's presentation in the form of a dialogue (e.g., asking questions, listing things that were a surprise, etc.).
4. Parents' views on their child's learning and development.
5. Teachers' presentation of their views on the student's learning and development based on the evidence gathered.
6. Sharing of information among all participants and joint discussion on the next steps in the student' s development.
7. Joint agreement on the next steps and objectives.
8. A summary of the discussion, given verbally by the teacher or, if necessary, in writing and signed by all participants.
9. A conclusion with positive thoughts for the future, including, if necessary, the handing out of an evaluation questionnaire to parents and/or students on the conduct of the meeting (Jäckl & Moser, 2016).

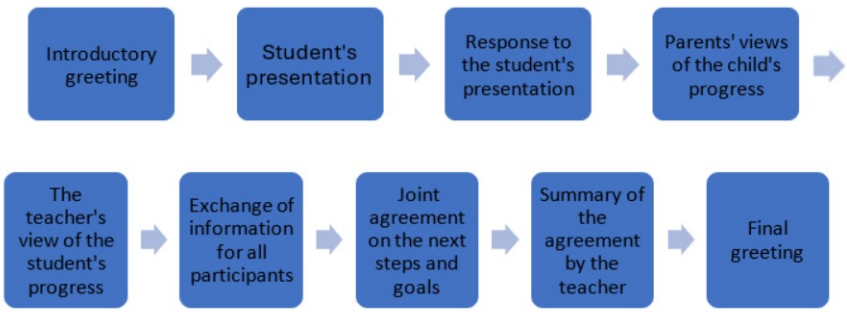

Figure 1: Three-way conferences
(Jäckl and Moser, 2016, p. 11)

Meetings allow teachers to engage in constructive dialogue with students and parents. The focus is not on students' grades, but on empowering students to reflect on their learning and working process. They also provide students with insights into their learning process and help them to identify what it is that helps and hinders them in their learning (Gössinger, 2012).

1.3 Team meetings to prepare and monitor individualised programmes for children with special needs

Another form of discussion that involves the participation of students is the expert group's team meetings, which are designed to discuss individual programmes (IPs) for students with special needs. This format is well established in various countries, e.g., the USA, Australia, Canada, the United Kingdom (known as individual education plan (IEP) team meetings), Finland, Norway and Slovenia, where there is a legal basis for this format. According to Article 36(1) of the Placement Of Children With Special Needs Act (Official Gazette of the Republic of Slovenia, 2011; hereinafter referred to as ZUOPP-1), an educational institution must draw up an individualised programme (hereinafter referred to as IP) for a child with special needs on the basis of the guidance decision. The IP sets out, among other things, the objectives and forms of work in the individual educational areas, strategies for integrating the child with special needs into the group, the necessary adjustments in the assessment and evaluation of knowledge, the achievement of standards and progression, the use of adapted and assistive educational technology, skills for maximising independence in life (adaptive skills), etc. In order to prepare and monitor the implementation of the IP, the school principal appoints an expert group, composed of the professionals who will be involved in the implementation of the IP, in accordance with Article 37(1) of the ZUOPP-1 (ibid.). Article 36(4) of the ZUOPP-1 (ibid.) requires the parents and the student with special needs to be included in the preparation and monitoring of the IP, taking into account the child's maturity and age. It is therefore essential that children (students) are involved in decisions concerning the preparation, implementation and evaluation of the IP, in addition to their parents. Given that decisions are made in team meetings, it is reasonable that students with special needs, if their maturity and age allow, and their parents, are also actively involved in this form of cooperation. Küpper (2000) also takes the view that students should be present at team meetings. This gives them the opportunity to have their voice heard on the topic of their own education, while at the same time learning to make decisions for themselves. Each member of the team contributes to the team's overall success.

Partnership between teachers, parents and students is ideal in the educational process in general, but the need for this partnership is particularly evident when children with special needs are involved (Beveridge, 2004). However, achieving

quality relationships between all partners is often difficult in practice (Gwernan-Jones et al., 2015). In order to cooperate effectively, it is important that parents of children with special needs are involved from the outset, as their presence has an impact on the child's socio-emotional development and on the adaptive skills the child will develop (Fenning et al., 2007). However, it is important to recognise that even if parents of children with special needs are involved from the outset, difficulties in cooperation with the school cannot be ruled out (Grillitsch & Stanzel-Tischler, 2016). These problems may arise from the teacher's lack of information about the individual student with special needs, their lack of knowledge about students with special needs in general, their lack of experience with such students and inadequate communication (Vršnik Perše, 2005), but they may also be caused by inadequate or inappropriate communication with parents (Butler et al., 2019) or by systemic aspects identified by both parents and teachers (Means, 2023).

For the cooperation between the school and the parents of students with special needs to be successful, it is important that all the school's professionals are involved: the class teacher, the other teachers, the headmaster, and the counsellors. The involvement of the latter is important, as their advice helps to achieve the goal of prevention or intervention and planning relevant to the school (Vršnik Perše et al., 2008). However, the students themselves must also be involved in the process (Kern, 2017). No help is good enough if students do not have the opportunity to co-research, co-define and co-determine, which they often do not get in practice, as adults commonly assume that they know everything about them and what is best for them (Čačinovič Vogrinčič, 2008).

Only students who are given the opportunity to participate can feel that they are understood and taken into account (Geppert et al., 2018). Research confirms that learners want to be accepted as equal partners and want their needs and wishes to be considered (Andresen & Wilmes, 2017). All of the above can be facilitated by actively involving students with special needs in team meetings, i.e., in the planning and evaluation of the IP. Actively involving students with special needs in meetings whose topic is IPs is what Čačinovič Vogrinčič (2008) calls exploratory conversation. This should include all those involved in the process of helping a child with special needs, and in particular, such a conversation involves dialogue with the student, which, according to Čačinovič Vogrinčič (2008), is often overlooked. Furthermore, the guidelines for the preparation and monitoring of the IP provided by Košnik et

al. (2023) also assume that parents and students should be actively involved in the preparation and monitoring of the IP, that there should be conditions for their involvement in the planning, implementation and evaluation of the IP, and that students should be involved in all phases of the IP, in accordance with their age, maturity and abilities. For example, they can set their own goals, evaluate their own progress, make suggestions … (ibid.). Uphold et al. (2007) also believe that students with special needs can be involved in all phases of the IP: in the planning phase of the IP, which includes the identification of strengths, needs and goals; in the drafting phase of the IP, in which the learners themselves identify their strengths, needs and goals; in the implementation phase of the meeting or discussion, in which the learners can be involved in various ways depending on their age and developmental level; and in the evaluation phase of the IP (ibid.).

If we want students to develop confidence in their abilities and take responsibility for their own learning and development, the following two conditions must be met: 1. students must have individual goals and individual pathways to reach these goals, and 2. students must have: a. the opportunity to co-determine their goals, b. the opportunity to co-determine the pathways to reach these goals, and c. the opportunity to participate in the evaluation of their own success (Bartnitzky, 2010). The vast majority of school counselors in Slovenia also see the involvement of students in the process of solving learning difficulties as a key factor in helping students effectively and efficiently. School counselors also note that the level of student participation in the problem-solving process has an impact on how successful their problem-solving will be (Kodele, 2017). Similarly, as many studies in the past have found (Arndt, 2006; Agran & Huges, 2008), contemporary research confirms that parents' and students' involvement in team meetings dealing with the construction of an individualized program is still too low (Sandereson & Goldman, 2022), and, above all, their level of active involvement is too low; too often they are simply passive participants (Agran & Huges, 2008; Gosciski et al., 2023). In Slovenia, the majority of teachers involved in a national evaluation study (Košak Babuder et al., 2023) reported that parents are always or often involved in IP planning and IP evaluation, and that they are always or often informed about changes to the IP. The teachers also stated that students are largely informed about changes in IP, while two-fifths of teachers stated that students with special needs are only often involved in IP planning, and a good third stated that students are rarely or never involved in IP planning. In light of the above data, it is interesting to note that about half of the

primary school teachers surveyed (ibid.) believed that IPs in their institution were always the result of cooperation and coordinated agreement among all members of the professional team.

The aim of involving students with special needs in the development and evaluation of an IP is to help them learn how to defend their own decisions and views and to learn to develop goals that pursue their own interests. However, Pounds & Cuevas (2019) note that students with special needs, especially those in the lower grades of primary school, are not yet able to set their own goals. They see the reason for this in the age of the students and, above all, in their lack of familiarity with this way of working. In fact, the students in the study were the first to encounter team meetings in which they could participate in setting their own goals (ibid.). They therefore conclude that the participants (teachers, students and parents) need to be properly trained to engage in these forms of collaboration (Sanderson & Goldman, 2020).

Students' active participation in team meetings depends, among other things, on whether they have sufficient knowledge of IP, whether they have the learning skills related to the preparation of IP, and whether they have developed the collaborative skills needed to engage actively in the cooperation. Active involvement of learners in the preparation and monitoring of the implementation of the IP allows learners to choose and follow objectives and develop skills related to self-determination. It is also a way for students to practise speaking up for themselves. All of these skills are crucial for success in further education and life (McGahee et al., 2001). It is important that learners are involved in the development of the IP and the setting of goals based on their preferences and interests. This is the only way to make them feel involved in the process. They are also more likely to pursue and achieve their goals as a result of their involvement (Arndt et al., 2006). Booth & Ainscow (2002) even state that the whole principle of inclusive education is based on community and collaboration between professionals, parents, and students.

Here, we present the results of two studies. The first one explored, among other things, a class teacher's views on the involvement of students in three-way conferences. In the second, we sought the opinions of various elementary school practitioners (class teachers, additional professional assistance teachers for special needs students, and school counsellors) on the involving students with special needs in team meetings. The purpose of the study was to see how the involvement of

students in school-home cooperation is implemented in practice, as this involvement is one of the fundamental factors in the development of an inclusive school.

2 Methods

The aim of the empirical study was to analyse the data obtained in two separate surveys. We included the results of a survey that determined the extent to which students in a particular elementary school class were actively involved in three-way conferences, as well as the results of a survey that determined the extent to which students with special needs were involved in team meetings for planning and evaluating IP.

2.1 Participants

The first study concentrated on analysing three-way conferences that were carried out in an elementary school class (hereafter referred to as Study 1). We interviewed a class teacher of this class who was part of a larger study in the 2020/21 school year. During this study, an experiment of implementing three-way conferences was used to investigate the effects of students' active participation in three-way conferences. This study was carried out on an ad hoc sample of Year 4 students from a selected elementary school, their parents, and the class teacher. The data for the study were obtained through surveys and interviews conducted concurrently with the implementation of the experimental three-way conference model. In this paper, we only highlight the answers given by the class teacher during the individual interview. Since 2020/21 the class teacher has been conducting three-way conferences regularly. Therefore, we repeated the same interview with her again in the 2024/25 school year. The interview questions were designed specifically for the purpose of the study, covering the class teacher's opinion on the meaningfulness and effects of students' active participation in the parent-student interviews.

The second study focuses on the active involvement of students with special needs in the preparation and monitoring of the implementation of IPs (hereafter referred to as Study 2), which most often takes place in team meetings aimed at preparing and monitoring an IP for students with special needs. The survey was carried out in the 2024/25 school year and involved eight female practitioners (class teachers, additional professional assistance teachers for special needs students, and school

counsellors) in elementary schools. All the practitioners were members of expert groups dedicated to the preparation and monitoring of IPs. The practitioners came from six different elementary schools. Individual interviews were carried out with all the practitioners to determine whether students with special needs were actively involved in team meetings and therefore in the preparation, monitoring, and implementation of the IPs. We were interested in whether the student's voice is heard during the preparation and evaluation of their IP. The questions for the interview with the practitioners were specifically designed for the purpose of the study. The interview questions dealt with their experience with team meetings and their opinions on the meaningfulness and effects of actively involving students with special needs in team meetings.

2.2 Data collection procedure

In Study 1, in the 2020/21 school year, we conducted: 1. an individual interview with the class teacher, 2. a student survey, and 3. a parent survey before and after the experiment's implementation (i.e., three-way conferences). Additionally, after the experiment, we conducted a focus group interview with students and individual interviews with parents. For the purpose of this paper, only the answers given by the class teacher in the individual interview after the experiment were used. The three-way conferences were conducted separately for each student. They were carried out twice, 5 months apart. At each meeting, the class teacher, the student, and the student's parents were present. Before the first meetings, the class teacher, parents, and students were given guidelines to help them prepare for the meeting. The guidelines were sent to the parents in printed form by post (note: owing to the COVID-19 pandemic, face-to-face contact between parents and teachers was banned or discouraged for some time). In the 2024/25 school year, we repeated the individual interview with the class teacher.

In Study 2, individual interviews were conducted with practitioners (class teachers, additional professional assistance teachers for special needs students, and school counselors) working at six different elementary schools in the 2024/25 school year. All of them had been working at their elementary schools for several years and had on several occasions been present at team meetings to prepare and monitor the implementation of IPs for students with special needs.

2.3 Data processing

In order to obtain more in-depth information on the active involvement of students in school-home cooperation (in three-way conferences and in team meetings for students with special needs), we analysed the answers given by participants in two different studies in individual interviews after the implementation of the experiment (i.e., after meetings with parents and students) (Study 1) and the team meetings for planning and evaluation of the IPs for students with special needs (Study 2). Furthermore, the findings of the two surveys were compared and related to each other to see how the involvement of students in school-home cooperation is implemented in practice.

3 Results and discussion

At the beginning, we wanted to know how often students attend meetings. To this end, we present the results of the practitioners' responses to the question of who was present at the three-way conferences (Survey 1) and the team meetings (Survey 2).

The class teacher in survey 1 said:

R: "In all three-way conferences, the student, his parents and I were present."
After four years of conducting three-way conferences the class teacher added:
R: "Sometimes, on the first day of school, students ask me when we will have three-way conferences where they can also be present, because they have heard about three-way-conferences from older students."

The survey 2 practitioners had the following to say:

S1: "During team meetings, we had the following present: the class teacher, the DSP provider, the parents and, if necessary, the counsellor."
S2: "The team meetings were attended by the additional professional assistance teachers for special needs students, the mobile special educator, and the class teacher."
S3 "At the team meetings, the additional professional assistance teachers for special needs students, the class teacher, the parents, and often the student are present. Furthermore, if an external professional service is involved in the work with a student with special needs, a representative of that

service is also present at the team meeting. Whether the student is present at the team meeting depends primarily on his or her age and maturity, which is a matter for the professionals to decide."

This is confirmed by several authors (Beveridge, 2004, 2005; Textor, 2009, see also Fthenakis et al., 2014), who state that the extent to which students are involved and the form of student involvement in teacher-parent cooperation should be adapted to the age or developmental stage of the student, their abilities, and their preferences. We can see from the practitioners' responses that in Study 1, students were present at all three-way conferences alongside the class teacher and parents, which is to be expected, as the experiment in this study was conducted with the aim of introducing three-way conferences. In Study 2, however, parents were mostly present in team meetings alongside at least one practitioner (i.e., additional professional assistance teachers for special needs students, class teacher, school counsellor), while students were often present in team meetings, as reported by only one practitioner – the other practitioners did not report having students present during meetings. This is certainly an interesting finding, given that Article 36(4) of the ZUOPP-1 Act foresees the parents and the child with special needs being involved in the preparation and monitoring of the IP (which most often takes place during team meetings), while taking into account the child's maturity and age. This means that most of the time, according to the practitioners in Study 2, students with special needs are not actively involved in the preparation and monitoring of their IP. It is possible that they are involved in the preparation and follow-up of the IP, but in a different way than actively participating in team meetings.

We were further interested in the reasons why the practitioners thought that students were absent from team meetings (Survey 2). The practitioner from survey 2, who said that students were often present at team meetings, also said the following about the reasons for students being absent from team meetings:

S3: "We have had cases where we have invited a student to a team meeting but the parents did not agree."

However, other practitioners in Survey 2 said the following about the reasons for students being absent from team meetings:

S4: "I hadn't even thought about having a student present at the team meeting. I think it would have a bad effect on their self-esteem."
S2: "We don't invite students to team meetings because they might misunderstand their deficits."

Walker (2002) also notes that some teachers are reluctant to involve students because they feel that they cannot give parents realistic information about the student in the presence of the student. Furthermore, parents and teachers in Minke & Anderson's (2003) study expressed concerns about expressing negative information in front of students. However, they both agree that a student can hear some discouraging information as long as it is presented in an appropriate way and with an emphasis on how they can improve things (ibid.). This is the purpose of three-way conferences, such as those carried out in Study 1, and as they should be carried out in the context of team meetings to prepare and monitor the implementation of IPs for children with special needs. Hannemann (2007) further emphasises that the active involvement of students in school-home cooperation helps the student to develop a positive self-image, to be able to sort out their strengths and weaknesses, and to learn to cope with them. In order to overcome the fear of engaging students in collaboration, it would be beneficial to educate professionals and parents on the importance of engaging students and its positive effects (Munthe & Westergård, 2023).

Furthermore, the following reasons for students being absent from team meetings were also given by the practitioners in Survey 2:

S5: "I don't see the need for a student to be present at the team meeting."
S6: "We don't invite students to team meetings. We only invite them if the parents explicitly want us to. If a student were to attend, it would reflect badly on his self-image."
S7: "I have had parents bring a student to a team meeting, but the special educator decided that the student should not be present at the team meeting and had to wait outside. She felt that only the adults should talk to each other about the IP."

All of the above is inconsistent with the findings of Kodele's (2017) survey, in which the vast majority (91%) of counsellors saw student involvement in the process of solving learning problems as key to helping students effectively and efficiently. The same study (ibid.) finds that the degree of student participation in the process of understanding their learning difficulties has an impact on how successful the

problem-solving process will be. Indeed, it is not enough to involve only parents and teachers to reduce the collaboration gap (Robinson & Harris, 2014), as a well-functioning educational partnership requires the participation and agreement of all, including the students (Paseka, 2014, see also Betz, 2019). It follows that we should systematically encourage school practitioners and parents to implement this kind of collaboration (and by this we also mean team meetings), where students and parents are present.

We also wanted to know whether, in three-way conferences, and in team meetings, students and parents are given the opportunity to be actively involved in the conversation. The class teacher in survey 1 said:

R: "The talks gave parents the opportunity to get involved in the conversation, to express their views and their wishes. The discussions also gave students the opportunity to participate actively. If they didn't join the conversation themselves, I encouraged and guided them. They were involved in setting goals, which I think motivated them to want to achieve said goals.

From the class teacher's answer, one can understand that both parents and students had the opportunity to participate actively in the three-way conferences. This, according to the class teacher, contributed to the students' increased motivation to achieve the set goals. Foster-King (2011) also found that discussions with parents and students contribute to students making a greater effort to do well. Furthermore, Pihlgren (2013) points out that the advantage of talking to parents and students is that it gives students the opportunity to set their own goals, which makes them more likely to achieve them.

Of the active involvement of students and parents, Survey 2 practitioners said:

S4: "Yes, all[1] members of the conversation can join in the conversation. Parents always have the floor first, followed by school staff."
S1: "Everyone can give their opinion, but adaptations are mostly decided by the special educators."
S7: "Parents can give suggestions and preferences, as they are part of the team."
S5 "Parents are usually the ones who are the listeners in team meetings. This is especially evident in the first team meeting. But in the evaluation team meeting, parents also have more to say."

[1] By everyone, we mean practitioners and parents, not students, as according to the practitioners in Study 2, students were not present during team meetings except in one case.

The practitioner from Survey 2 who said that students are often present at team meetings maintained that students and parents are actively involved:

S3: "In a team meeting, everyone has the opportunity to have their say. We give everyone a voice. Most often, the class teacher has the floor first, then the rest of the team, and finally we give the floor to the parents. If there is a student present at the team meeting, he/she has the floor more towards the beginning."

Given the responses of the practitioners in Survey 1 and Survey 2, it is clear that when both parents and students are present, both have the opportunity to actively engage in the conversation. However, students were mostly absent from team meetings aimed at preparing and monitoring the implementation of IPs for children with special needs; therefore, they did not have the opportunity to actively participate in the collaboration between teachers and parents. Also, not all practitioners reported parents being actively involved in team meetings to prepare and monitor the implementation of IPs for children with special needs, which is an additional problem in the implementation of the inclusion paradigm in the educational context. According to Wingert (2006), in order to develop a good partnership between school and home, it is important that both students and parents are active interlocutors in the discussions, have the opportunity to express their opinions, ask questions, give feedback on the work done so far, express criticism, and are involved in the school's activities. These findings therefore also confirm the usefulness of systematically encouraging (future) educational professionals to promote the active involvement of students and parents in school-home cooperation.

We also wanted to know whether the requests and suggestions made by students and parents during the meetings with parents and students (Survey 1) and the requests and suggestions made in the team meetings by parents and students (Survey 2) were taken into account.

The class teacher in Survey 1 said:

R: "Parents and students stated their opinions and gave suggestions during the discussions, all of which were taken into account. Finally, at the end of the discussion, we signed a contract in which we all set objectives together."

Survey 2 practitioners said:

S1: "Parents don't usually have a say in team meetings, but they can certainly make suggestions if they want to. Taking their suggestions into account depends on whether they are feasible or not."

However, Kern (2017) points out that a student's problems can only be solved by working together, not individually. Thus, neither teachers nor parents can solve a child's problems on their own. They must come to an agreement (ibid.).

The practitioners in Survey 2 also said the following about listening to and taking on board parents' suggestions:

S4: "In principle, parents' wishes and suggestions are taken into account. However, this depends on each individual parent. The more reasoned and sensible their suggestions are and the more parents insist on them, the more they are taken into account in the decisions we make. Parents' wishes are taken into account as far as they are realistic. Because their expectations are often too high."
S7: "Parents are actively encouraged to give their suggestions and ideas during the team meeting. The parents' suggestions and ideas are then discussed by the expert team, which decides whether to take them into account. In doing so, we check that they are in line with the law and the student's guidance decision.
S6: "The parents' opinions were taken into account if the expert team considered it to be in the best interests of the child and in accordance with school policy."
S5: "The more educated the parents are, the more they take the initiative and influence decisions, while other parents mostly just listen quietly and go along with what we suggest."

From the responses of the practitioners in Study 2, one can conclude that parents' wishes are taken into account insofar as they are realistic and contribute to the student's development as deemed by the other members of the expert group. For good cooperation between parents and teachers, it is certainly important that the expectations of one and the other are clarified, coordinated and realistic (Ažman et al., 2015; Kalin et al., 2008; Miller, 2011; Olender et al., 2010; Sacher, 2008; Sächsisches Bildungsinstitut, 2011; Wegner, 2016). Similarly, as one practitioner in Study 2 noted, the more educated the parents, the more actively they are involved in the collaboration, as also found in the study by Cugmas et al. (2010) in Slovenia. This study found that highly educated parents are more involved in school than parents who are less educated.

A comparison of the responses of the practitioners in Survey 1 and Survey 2 showed that in Survey 1, both students and parents were given the opportunity to be actively involved in the discussion and to make their wishes and suggestions known, and that their wishes and suggestions were taken into account, as noted in a written agreement that was agreed upon and signed at the first meeting. On the other hand, the responses of the practitioners in Survey 2 show that, in most cases, the absence of the students from the team meetings meant that they did not have the opportunity to make suggestions at all. However, some parents did make suggestions, which were only taken into account if they were in the student's best interest, in line with the law, and realistic. It would make sense to plan to introduce rules for three-way conferences in order to conduct team meetings to prepare and monitor the implementation of IPs for children with special needs.

Since the purpose of school-home cooperation is to make agreements in order to achieve educational goals, we were interested in which agreements are usually made in three-way conferences (Survey 1) and in team meetings (Survey 2), and to what extent these agreements are implemented.

The class teacher in Survey 1 said:

R: *"During our talks, we agreed on both curricular and educational issues. In the first three-way conferences, all students set themselves specific goals to achieve by the end of the school year. All but one of the students achieved their targets."*

We also wanted to know what the class teacher in Survey 1 attributed as the reasons for achieving the goals. She stated the following:

R: *"The reason I see for achieving the objectives is that the students themselves were asked to reflect on their areas of strength and areas where they want to improve. They also had to sign a contract containing the objectives and our agreements. Because they signed a contract, they wanted to fulfil it."*

From the class teacher's response, one can see that agreements were reached with parents and students in both curricular and educational areas, and that all but one student achieved the targets set. The class teacher saw the reason for the

achievement of the targets as the signing of a written agreement, which she believed had a motivational effect on the students.

The practitioners in Survey 2 had the following to say about making agreements in team meetings:

S3: "The purpose of the team meeting is to agree on what adaptations and aids the student will receive, how the work will be monitored, how and how often we will contact each other."
S5: "We agree on the organisation of the work itself (additional professional support timetable, practitioners, etc.)."

In terms of reaching agreements, the practitioners in Survey 2 said:

S1: "The implementation of the agreements differs from student to student."
S7: "The agreements we make are strictly enforced, especially when it comes to adjustments, because parents are quick to complain."
S3: "The goals we set are mostly realised by the professionals, but sometimes not by the parents. Occasionally, parents only stick to certain agreements and not to others, or only stick to them for a short time."
S6: "At the organisational level, all the agreements are being implemented. Other agreements are not quite all being realised. On the school side, all the agreements are implemented, but not on the parents' side."

Given the answers of the practitioners in Survey 2, it is clear that team meetings are mainly used to agree on the organisation of the additional professional support itself and on the adaptations and aids that the students receive. The implementation of the agreements varies from student to student, according to the practitioners, and it depends on the students' and parents' commitment. However, the responses of the practitioners also indicate that the agreements mainly relate to the practitioners and parents, but not to the students. In fact, the practitioners stated that the agreements are most often implemented by the school, but not by the parents, and only one practitioner in Survey 2 reported on students participating in creating their agreements.

Given the responses of the practitioners in Survey 1 and Survey 2, one can see that the extent to which learners are involved in setting goals and making agreements contributes to increased realisation of goals and agreements, especially if the agreements are linked to other areas, not only organisational aspects. Other researchers (e.g., Bastian, 2012) have also noted that learning is an active process, and learners need to be actively involved in it if it is to be successful. Pihlgren (2013) also points out that if students are given the opportunity to set their own goals, they are more likely to achieve them. Based on the findings of our study and other research, it would be useful to actively involve students in holistic goal-setting and coming to agreements related to their learning and development, as this increases the likelihood of them realising these goals.

Finally, we were also interested in how practitioners assess students' progress, based on three-way conferences (Survey 1) and team meetings (Survey 2).

After the experiment, the class teacher in Study 1 reported positive changes in several areas for her students.

First, she reported progress in the area of motivation to do school work. She said:

R: "I see a significant increase in motivation to do school work in all students. Only one student showed a minimal increase in motivation. I think that the main contributors to the increase in motivation were the three-way conferences, because during the discussions, the students set their own goals and defined their own paths to reach them. We have also had several discussions on this topic during class. In addition, parents also reported to me that they talk a lot with their children at home about the contract and the agreements reached during the meetings."

After four years of conducting three-way conferences the class teacher said:

R: "Every year I notice that three-way conferences contribute to students' progress in both behavioural and educational areas. Above all, their motivation to achieve their goals increases."

The class teacher's answers illustrate her belief that the students have made progress in the area of motivation to do school work. She attributed the progress to the discussions she had with parents and students, especially the fact that students were able to set their own goals. She also found that repeated discussions about school

between students and their parents had a motivational effect. This increase in student motivation is consistent with the findings of studies by Derfler et al. (2012), Eder et al. (2015) and Pihlgren (2013). Similarly, Foster-King (2011) reports that one of the benefits of talking to parents and students is improved student achievement and higher student motivation for school work.

Furthermore, in Survey 1, the class teacher reported on the students' behavioural progress:

R: "Before the experiment, each individual student was seen 3 times a week for behavioural issues, and after the experiment, that reduced to once a week."

The class teacher's answer shows that she believed the students had also made progress in their behaviour. Based on these responses, we suggest that three-way conferences can contribute to a reduction in the number of behavioural difficulties in students. Other studies also support this. Bilton et al. (2017) found that talking to parents and students leads to parents and teachers joining forces and working together to change the children's inappropriate learning or behavioural habits. Similarly, Kodele (2011) found that students' active participation during parent-teacher meetings had positive effects. The results of the study showed that 82% of the students broke fewer class and school rules.

Furthermore, the class teacher's answers in Survey 1 show that students also made progress in the area of taking responsibility. She said:

R: "The most positive changes I see in students at the end of the school year (author's note: after the experiment) *are in their taking responsibility for their own performance and work. I attribute this to the fact that the students set their own goals during the discussions, which made them feel responsible for achieving them. They had a stronger desire to achieve the goal."*

After four years of conducting three-way conferences the class teacher said:

R: "It happens often that during the school year, students want my feedback on how successful they are in achieving their goals and what they still need to do to achieve the goal. I think that this reflects their feeling of responsibility for their schoolwork."

According to the class teacher's answers, she believed that the meetings with parents and students caused the students to make progress in taking responsibility for their own success and work, to feel more motivated for school work, and to better their behaviour. This progress can be attributed at least in part to the meetings with parents and students, and in particular to the fact that students were able to set their own goals and pathways to them through active participation in the discussions, which motivated them to achieve these goals.

The Survey 2 practitioners reported the following on the students' progress after the team meetings:

S1: "Overall, I see very little progress from the students. Because students quickly forget their responsibilities."
S2: "The biggest change I see is in the area of students taking responsibility for their own success and work. The changes depend on how much the student understands what he/she has to do."
S5: "The biggest improvement I see is in the area of motivation to work. Often, I can see that students are more motivated at the beginning, but that motivation decreases over time."
S6: "I don't notice any major changes in the students."

The practitioner who said that students were often present at team meetings, said the following about their progress:

S3: "If the student is present at the team meeting, I notice more positive changes than if the student is not present. I see the most changes in the area of taking responsibility for one's own performance and work, and the least progress in the area of motivation to do school work and behaviour."

Given the responses of the practitioners in Survey 2, we found that they reported little progress in the students' motivation for school work and in taking responsibility for their own success and work. Some practitioners reported that they did not observe any progress in their students. However, the practitioner who said that students often attend team meetings, reported that students make more progress when they attend team meetings than when they do not, especially in terms of taking responsibility for their own success and work, which can be linked to the views of the class teacher in Study 1 who made a similar observation.

Given the responses of the practitioners in Survey 1 and Survey 2, and the findings of other studies presented here, we conclude that the active participation of students in school-home cooperation can contribute to better ownership of their own performance and work, as well as to greater motivation for school work and fewer behavioural problems.

4 Conclusion

The results of our study show that the integration of three-way conferences (as presented in the theoretical part and as implemented in Survey 1) in school-home cooperation can contribute positively to the active participation of students in school-home cooperation. In fact, the class teacher in Study 1 reported not only that the students were always present at the three-way conferences, but also that both parents and students had the opportunity to participate actively in the discussions. Both parents and students gave suggestions, made requests and shared opinions during the discussion, which were taken into account, as was evident in the written agreement signed at the end of the first meeting. In the written agreement, they jointly set objectives which, according to the class teacher, all but one of the students achieved. Thus, when the model of three-way conferences was implemented, the students showed improvement in their motivation for school work, in taking responsibility for their own performance and work, and in their behaviour. The class teacher attributed this progress to the fact that the students were able to set their own goals during the meetings, i.e., that they had the opportunity to participate actively.

On the other hand, in Survey 2, in most cases except for one, the practitioners reported that various school professionals and parents were present at team meetings for the preparation and follow-up of the IP for children with special needs. Only one practitioner in Survey 2 reported that students were (often) present at team meetings. This suggests that students are mostly absent from IP team meetings and thus do not have the opportunity to participate actively in school-home cooperation. Perhaps the little or no progress reported by the practitioners in this part of the survey could be at least partly attributed to this. The reasons given by the practitioners for the absence of students from team meetings were the age of the students, the fear that the student's attendance would have a negative impact on their self-image, the perception that only adults should discuss IP with each other,

and the fact that they had not thought to have students attend team meetings at all. Furthermore, the responses of the practitioners in Survey 2 also show that, in addition to the students, parents are not often actively involved in team meetings; rather, they are just listeners.

Based on the above, we conclude that the active participation of students in decision-making, and therefore in school-home cooperation, has many positive effects; hence, it would make sense to introduce educational programmes or additional training for all professionals on the involvement of students in decision-making. This could strengthen cooperation between teachers, parents and students, contribute to an inclusive attitude and to resolving the dilemmas that practitioners have regarding active participation of students, and of course, above all, to the students' educational progress.

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About the authors

Tina Vršnik Perše is a PhD of Educational Sciences, employed in the Department of Basic Pedagogical Studies, Faculty of Education, University of Maribor, Slovenia as Associate Professor. Her main research areas are the inclusion of children with special needs, professional development of teachers and cooperation between schools and parents. She has participated in several international

comparative evaluation studies, basic and applied research projects and national evaluation studies. She is currently the Vice-Dean for Quality Development the Faculty of Education of the University of Maribor and a member of the Management Board of the University of Maribor.

Živa Grafenauer Ekart attended Faculty of Education at the University of Maribor and graduated as a professor of pedagogy and sociology. After graduating, she worked at the DOBA Business School in Maribor, at Duplek Elementary School and she currently teaches at the Maribor School of Woodworking and also part-time works as an assistant at the Faculty of Education, University of Maribor. She is a doctoral candidate in pedagogy at the Faculty of Arts, University of Maribor. Her research primarily explores the collaboration between schools and families and focuses on strengthening partnerships in the educational process.

Perspectives and Practices of Early Childhood Educators on Identifying Mathematically Talented Children

Darja Antolin Drešar
University of Maribor, Faculty of Education, Maribor, Slovenia
darja.antolin@um.si

This study examines early childhood educators' perceptions and experiences in identifying mathematically gifted children, addressing a critical gap in early education research. Using a quantitative research design, data were collected through an online questionnaire completed by 47 educators. Findings reveal that educators generally believe mathematical talent can be identified in preschool and agree on the importance of differentiated teaching approaches. However, many reported limited confidence in their ability to identify such children. Educators with positive attitudes toward mathematics showed a stronger recognition of differentiated instruction and early numerical concept development as key indicators of giftedness. Additionally, more experienced educators rated early counting skills as a more significant indicator than their less experienced counterparts. Despite frequent observations of children's mathematical abilities, only 40.4% reported encountering mathematically gifted children. No significant differences were found in observation frequency or encounters based on teaching experience or attitudes toward mathematics.

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1 Introduction

Early childhood is a critical period for identifying and nurturing individual talents, including mathematical ability. Research highlights that early identification of mathematical talent fosters cognitive development and contributes to long-term academic and professional success (Campbell, 1996). Kindergarten teachers play a crucial role in this process, as they engage with children daily in both structured and unstructured learning environments. Through their observations, they are uniquely positioned to identify early indicators of mathematical talent, such as advanced numerical and spatial reasoning (Bakker et al., 2024; Waxman, et al., 1996). However, despite their important role, many educators—including those teaching older children—face challenges in recognizing and supporting mathematically gifted students (Leikin & Stanger, 2011). Limited formal training in gifted education, time constraints, and personal biases often hinder their ability to accurately identify and nurture these abilities (Al-Hroub & Whitebread, 2008).

This chapter explores the perspectives and practices of Slovenian early childhood educators regarding mathematical talent, addressing a critical gap in early childhood education research. By investigating educators' experiences, challenges, and beliefs, the study aims to provide actionable insights to improve teacher training and classroom practices, ultimately to better support young children's potential.

1.1 Mathematical Talent in Children

The definition and measurement of mathematical giftedness have long been subjects of academic discussion (Dai, 2010; Ziegler & Heller, 2000). While traditionally associated with scoring above the 95th percentile on standardized tests (Sheffield, 2003), recent research emphasizes that mathematical giftedness encompasses more than test performance. Traits such as motivation, persistence, and mathematical creativity are now considered integral to mathematical giftedness (Kontoyianni, et al., 2013).

To gain deeper insights into mathematical giftedness, researchers have examined the cognitive processes underlying exceptional mathematical ability. Krutetskii's (1976) seminal 12-year study described mathematical giftedness as a unique combination of cognitive abilities that manifest during successful problem-solving. According to

Krutetskii, mathematically gifted students excel at analyzing and synthesizing mathematical material, quickly generalizing content and solution methods, and effortlessly shifting between cognitive processes. These findings, further supported by Lester and Schroeder (1983), emphasize that the defining characteristic of mathematically gifted children is their advanced cognitive strategies for approaching mathematical tasks. Neurological research aligns with these insights, indicating that mathematically gifted children exhibit enhanced right-hemisphere development and stronger interhemispheric connectivity, suggesting greater neural efficiency in mathematical processing (O'Boyle, 2008).

Leikin et al. (2017) offered a nuanced framework for understanding mathematical giftedness by categorizing students into three groups: those excelling in mathematics without general giftedness (NG-EM), generally gifted students excelling in mathematics (G-EM), and super mathematically gifted students (S-MG). Their study examined three dimensions of mental processing: domain-general cognitive traits, domain-specific mathematical creativity, and neuro-cognitive functioning during problem-solving. Notably, the study identified four distinct characteristics of S-MG students: accumulative (extensive knowledge and skills), G-related (linked to general intellectual abilities), unique (specific individual traits), and unraveling (emerging and developing over time).

Further insights into the cognitive traits of mathematically gifted individuals are provided by Sipahi and Bahar (2024), who conducted a systematic review of 22 studies. Their analysis identified two primary dimensions of mathematical giftedness: domain-specific abilities, such as problem-solving, reasoning, and mathematical creativity, and domain-general abilities, including visual-spatial skills, memory, and perceptual abilities. They also highlighted significant within-group variations, reflecting the complex interplay of cognitive traits that contribute to mathematical giftedness.

Mathematically gifted children exhibit distinct cognitive and neural characteristics, including superior logical reasoning, mental imagery, and creative thinking skills (Zhang et al., 2017). They excel in unique capacities, such as memorizing and manipulating complex mathematical structures, transitioning between representational modes, and understanding relational concepts (Assmus, 2018). However, these abilities are often underrepresented in conventional achievement

tests, which fail to capture the depth and complexity of their thought processes (Lester & Schroeder, 1983).

To effectively support these learners, educators must employ instructional strategies that leverage their unique strengths. These include using multimodal teaching methods, emphasizing visual-spatial tasks, and fostering creative problem-solving opportunities (O'Boyle, 2008). Without tailored educational interventions, mathematically gifted children risk underachievement, highlighting the urgent need for policies and teaching practices that nurture their exceptional abilities.

1.2 Mathematically Talented Preschool Children

Much of the research on mathematical giftedness has traditionally concentrated on older children, including school-age students and adolescents (e.g., Krutetskii, 1976; Leikin et al., 2017; Sipahi & Bahar, 2024). However, there is growing recognition of the importance of identifying mathematically talented children during the preschool years, as early detection and support can play a critical role in fostering their potential and laying a foundation for lifelong mathematical achievement.

Cognitive abilities crucial for mathematical development often emerge well before formal schooling begins. Espy et al. (2010) highlighted the significance of executive functions, particularly working memory and inhibitory control, in early mathematical skills. Their study of 96 preschoolers found that inhibitory control uniquely predicted arithmetic proficiency even after controlling for age, maternal education, and vocabulary, underscoring its pivotal role in early math development. Similarly, Bakker et al. (2024) conducted a longitudinal study demonstrating that preschoolers who later achieved high mathematics scores in Grades 1 and 3 exhibited early cognitive advantages in numerical skills, proportional reasoning, and number order. These findings affirm that early mathematical competencies serve as strong predictors of future academic success.

From a developmental perspective, Okamoto et al. (2007) examined mathematically precocious children, observing that while their working memory growth was comparable to peers, their numerical conceptual understanding was approximately a year ahead. This aligns with neo-Piagetian theories, suggesting an interplay between conceptual growth and cognitive processing that drives early mathematical talent.

Beyond cognitive skills, creativity and environmental factors also play a significant role in nurturing mathematical talent. Steinberg (2013) explored the abilities of a mathematically advanced four-year-old, Danny, who demonstrated exceptional problem-solving skills, creativity, and an ability to conceptualize large numbers and arithmetic operations. Danny's case underscored the importance of parental support in fostering curiosity and exploration, with implications for early education strategies aimed at encouraging mathematical creativity.

To effectively support mathematically gifted preschoolers, researchers emphasize the need for advanced and stimulating curricula. Waxman et al. (1996) conducted a two-year intervention study demonstrating that these children consistently outperformed their peers in mathematical reasoning, with spatial reasoning emerging as a stronger predictor of mathematical performance than verbal reasoning. Their findings also revealed gender differences, with boys exhibiting higher mathematical reasoning scores than girls. The study highlighted the effectiveness of targeted interventions, such as the Saturday Club, a biweekly enrichment program designed to enhance young children's mathematical reasoning skills. Based on these results, Waxman et al. (1996) recommended strategies to sustain engagement and provide appropriate challenges, including curriculum compacting, enrichment activities, and advanced lessons tailored to students' abilities. They also advocated for flexible grouping practices, such as cross-grade and cluster grouping, early kindergarten entry, and specialized classrooms. To foster deep conceptual understanding and creative problem-solving, they emphasized introducing big ideas in mathematics—such as infinity, number systems, equivalence, and probability—at an early age.

Parents also play a pivotal role in identifying and supporting mathematically precocious children. Pletan et al. (1995) investigated parental observations of mathematically advanced kindergarteners and found that these children demonstrated exceptional skills in areas such as spatial reasoning, relational knowledge, and memory. Using standardized measures like the K-ABC and WPPSI-R, the study showed that parents can reliably describe their children's mathematical abilities, offering valuable insights that complement teacher observations.

1.3 Identification of Mathematical Talent in Children

The early identification of mathematical talent in children is crucial for providing tailored educational opportunities and fostering their potential. Parents play an essential role in recognizing young children's mathematical abilities (Pletan et al.), but teachers are pivotal in formal identification processes. However, teacher accuracy in identifying mathematically gifted children varies widely. Al-Hroub and Whitebread (2008) argue that teacher nomination is a critical first step, yet it is prone to misidentifications, which can lead to misplaced interventions. Similarly, traditional methods such as standardized tests often fail to reliably identify mathematical giftedness. For instance, Niederer et al. (2003) demonstrated that over-reliance on such tests risks both overlooking gifted children and misclassifying others as gifted.

To address these challenges, innovative tools and approaches have emerged. Pavlekovic et al. (2010) introduced the Math Gift expert system, a decision-support tool designed to help teachers identify mathematically gifted fourth-grade students. Unlike traditional methods that focus primarily on mathematical competencies, this system adopts a holistic framework, evaluating cognitive abilities, personal traits, and environmental influences. Their findings confirmed that this approach offered a more reliable and comprehensive framework for identifying mathematical giftedness compared to conventional methods.

Accurate identification also requires diverse and nuanced assessment strategies. Waxman et al. (1996) emphasize the value of out-of-level assessments and systematic teacher observations to evaluate students' conceptual mastery and identify appropriate support measures. Professional development for teachers is paramount to improving their ability to recognize and nurture mathematical talent effectively. Al-Hroub and Whitebread (2008) stress the need for targeted training programs that enable teachers to identify gifted students, including those with dual exceptionalities such as learning difficulties, ensuring equitable access to educational opportunities.

Teachers' perceptions of mathematical giftedness are influenced by several factors, including teaching experience, grade level taught, and cultural background. Ficici and Siegle (2008) found that experienced teachers placed greater emphasis on computational skills, practical applications, and creative problem-solving as indicators of giftedness, whereas teachers in higher grades were less likely to value

these traits. Additionally, cultural perspectives shape how teachers conceptualize mathematical talent. For example, South Korean teachers, despite their students' strong performance in international assessments, were less inclined to view mathematical talent as innate, emphasizing the role of practice and effort instead. These findings underscore the importance of professional development to address biases and improve the accuracy of identification practices.

Furthermore, teachers' mathematical content knowledge and pedagogical expertise significantly impact their ability to engage and challenge gifted students. Smedsrud et al. (2022) highlighted that students' perceptions of their teachers' mathematical competence varied over time, influencing their engagement and, in some cases, leading to underachievement. This underscores the need for ongoing professional development to equip educators with the skills necessary to foster mathematical talent effectively.

Finally, Yazgan-Sağ (2022) examined prospective mathematics teachers' views on mathematical giftedness, revealing that their perceptions were shaped by personal experiences and cultural contexts, often due to a lack of formal training. These teachers identified traits such as quick thinking, creativity, and curiosity as hallmarks of giftedness and emphasized the importance of effort and supportive social environments. This research highlights the pressing need to provide teachers with formal training to enhance their capacity to identify and nurture mathematically gifted children effectively.

1.4 Focus of the Current Study: Early Childhood Educators' Perspectives

While much of the existing research on mathematical talent centers on school-age children and relies heavily on standardized tests for identification, this study highlights the often-overlooked role of early childhood educators in recognizing mathematical giftedness in preschoolers. Through daily interactions in diverse learning environments, early childhood educators are uniquely positioned to observe emerging mathematical abilities, identifying exceptional talent through children's problem-solving strategies, pattern recognition, and creative approaches during both structured activities and unstructured play.

Leikin and Stanger (2011) underscore a notable gap in the literature concerning teachers' perspectives on mathematically gifted students, particularly among elementary school educators. Addressing this gap at the preschool level, the present study examines how early childhood educators perceive, identify, and support young children with advanced mathematical abilities. By exploring their practices, challenges, and experiences, this research aims to enhance early recognition and support for mathematical talent. Given the limited studies in this area, the findings underscore the need for targeted training and resources to equip educators with the confidence and skills to effectively nurture mathematically gifted preschool children.

2 Methods

This study employed a quantitative research design, utilizing an online questionnaire to explore early childhood educators' beliefs, practices, and experiences in identifying mathematically talented children. By investigating their beliefs, practices, and experiences, this study seeks to enhance understanding of early talent recognition and inform strategies for supporting mathematically gifted children in early childhood education settings.

2.1 Research Questions

The study was guided by the following research questions:

- What are early childhood educators' beliefs regarding the existence and identification of mathematical talent in young children?
- What indicators do early childhood educators perceive as signs of mathematical talent in young children?
- Have early childhood educators encountered children they considered mathematically gifted in their professional experience?
- How often do early childhood educators actively observe children with respect to their mathematical abilities?

Additionally, the study explored whether differences in beliefs, practices, and identification practices exist based on early childhood educators' attitudes toward mathematics and their years of teaching experience.

2.2 Sample

The study sample consisted of 47 early childhood educators, all of whom were female. The majority (80.9%) reported having less than four years of teaching experience, while 19.1% had between five and fifteen years of experience. This distribution reflects a focus on early- to mid-career professionals, offering valuable insights into how early childhood educators with varying levels of experience perceive and address the identification of mathematically gifted children in kindergarten settings.

Participants' attitudes toward mathematics were also examined, as these attitudes could influence their ability to recognize and nurture mathematical talent in young children. To gather this information, participants responded to the question, How would you describe your attitude toward mathematics? The responses are summarized in Table 1.

Table 1: Participants' Attitudes Toward Mathematics

Attitude Description	f	f%
I never liked mathematics.	2	4.3%
I never particularly liked mathematics, but I accept it as part of my job.	13	27.7%
I somewhat like mathematics and find it practical.	18	38.3%
I like mathematics very much and enjoy it.	14	29.8%
Total	47	100.0%

The results indicate that only a small proportion of participants (4.3%) expressed a strong dislike for mathematics, while 27.7% indicated that, although they do not particularly enjoy the subject, they accept it as part of their professional responsibilities. Most participants reported positive attitudes toward mathematics, with 38.3% describing it as somewhat enjoyable and practical, and 29.8% expressing a strong liking for and enjoyment of the subject.

For further analysis, participants were categorized into two groups based on their attitudes toward mathematics. The first group (70.2%) comprised individuals with less positive attitudes toward the subject. The second group (29.8%) included participants with positive attitudes, characterized by a strong appreciation for and enjoyment of mathematics. This categorization facilitated an exploration of potential

differences in early childhood educators' perceptions and practices regarding the identification of mathematically gifted children.

2.3 Data Collection Procedure

The data for this study were collected using an online questionnaire distributed at the end of 2024. The questionnaire was disseminated via Facebook groups specifically targeting graduates of the Faculty of Education at the University of Maribor. This approach ensured access to a relevant population of qualified early childhood educators with appropriate educational and professional experience. The questionnaire included a combination of closed-ended and scaled questions, carefully designed to capture a comprehensive range of perspectives on the identification and support of mathematically talented children.

2.4 Statistical Analysis

To assess the normality of the data for various statements related to mathematical giftedness, the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed. Both tests revealed significant deviations from normality ($p < 0.001$) for all variables, indicating that the data were not normally distributed. As a result, non-parametric statistical tests were utilized for further analysis to ensure the robustness and reliability of the findings.

3 Results

In the following section, the main findings are presented, focusing on early childhood educators' perceptions, confidence levels, and practices in identifying and supporting mathematically gifted children. The results also explore differences based on educators' work experience and attitudes toward mathematics.

The results reveal that early childhood educators generally agree that mathematically gifted children can be identified as early as in preschool ($M = 4.00$) and believe that such children often stand out in their peer groups ($M = 3.83$). Additionally, early childhood educators agree on the need for a differentiated teaching approach for mathematically talented children ($M = 3.83$). However, participants were less

confident in their knowledge regarding the identification of mathematically gifted children, as indicated by a mean score of 3.06.

Table 2: Descriptive Statistics for early childhood educators' Perceptions on Identifying and Supporting Mathematically Gifted Children

Statement	N	Mean	Std. Deviation	Min	Max
Mathematically gifted children can be identified as early as in preschool.	47	4.00	1.063	1	5
I have sufficient knowledge to identify mathematically gifted children.	47	3.06	0.734	2	5
Children with exceptional mathematical abilities often stand out in the group.	47	3.83	0.842	2	5
I believe that mathematically gifted children require a different teaching approach than their peers.	47	3.83	1.028	1	5

Table 3: Results of Mann-Whitney U Test for Differences in Responses Based on Work Experience

Statement	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Mathematically gifted children can be identified as early as in preschool.	Less than 5 years	38	25.17	956.50	126.500	-1.287	0.198
	5 years or more	9	19.06	171.50			
I have sufficient knowledge to identify mathematically gifted children.	Less than 5 years	38	23.76	903.00	162.000	-0.268	0.789
	5 years or more	9	25.00	225.00			
Children with exceptional mathematical abilities often stand out in the group.	Less than 5 years	38	24.76	941.00	142.000	-0.858	0.391
	5 years or more	9	20.78	187.00			
I believe that mathematically gifted children require a different teaching approach than their peers.	Less than 5 years	38	25.70	976.50	106.500	-1.825	0.068
	5 years or more	9	16.83	151.50			

The results in Table 3 reveal that for all statements except "I have sufficient knowledge to identify mathematically gifted children," early childhood educators with less than 5 years of experience reported slightly higher agreement compared to

their peers with 5 or more years of experience. However, these differences were not statistically significant.

For the statement "I believe that mathematically gifted children require a different teaching approach than their peers," early childhood educators with less than 5 years of experience (Mean Rank = 25.70) reported higher agreement compared to early childhood educators with 5 or more years of experience (Mean Rank = 16.83). This finding showed a tendency toward significance ($p = 0.068$), suggesting that further investigation with a larger sample might reveal meaningful differences in perceptions between the groups.

Table 4: Results of Mann-Whitney U Test for Differences in Responses Based on Attitudes Towards Mathematics

Statement	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Mathematically gifted children can be identified as early as in preschool.	Negative attitude	33	23.38	771.50	210.500	-0.510	0.610
	Positive attitude	14	25.46	356.50			
I have sufficient knowledge to identify mathematically gifted children.	Negative attitude	33	23.65	780.50	219.500	-0.294	0.769
	Positive attitude	14	24.82	347.50			
Children with exceptional mathematical abilities often stand out in the group.	Negative attitude	33	22.12	730.00	169.000	-1.578	0.115
	Positive attitude	14	28.43	398.00			
I believe mathematically gifted children require a different teaching approach than peers.	Negative attitude	33	20.24	668.00	107.000	-3.018	0.003*
	Positive attitude	14	32.86	460.00			

Note: *$p < 0.05$ indicates statistical significance.

Early childhood educators with positive attitudes toward mathematics demonstrated slightly higher agreement regarding the ability to identify mathematically gifted children in preschool, expressed greater confidence in their knowledge to do so, and were more likely to agree that such children stand out compared to those with negative attitudes. However, these differences were not statistically significant. Notably, early childhood educators with positive attitudes (Mean Rank = 32.86)

showed significantly higher agreement than those with negative attitudes (Mean Rank = 20.24) on the need for a different teaching approach for mathematically gifted children ($p = 0.003$). These findings highlight the critical role of early childhood educators' attitudes in shaping their perceptions and approaches to effectively support mathematically talented children.

Table 5: Descriptive Statistics for Teachers' Perceptions of Indicators of Mathematical Giftedness

	N	Mean	Std. Deviation	Min	Max
Early counting skills indicate mathematical giftedness.	47	3.70	0.907	2	5
Early writing of numbers indicates mathematical giftedness.	47	3.53	0.881	2	5
Early development of numerical concepts indicates mathematical giftedness.	47	4.34	0.915	1	5
Continuing and creating complex patterns indicates mathematical giftedness.	47	4.36	.942	1	5
Advanced problem-solving indicates mathematical giftedness.	47	4.45	.996	1	5
Exceptional spatial awareness indicates mathematical giftedness.	47	4.30	.976	1	5

This table presents the descriptive statistics for early childhood educators' perceptions of various indicators of mathematical giftedness in young children. The highest mean scores were observed for "Advanced problem-solving" ($M = 4.45$) and "Continuing and creating complex patterns" ($M = 4.36$), highlighting these as key attributes perceived by educators. Similarly, "Early development of numerical concepts" ($M = 4.34$) and "Exceptional spatial awareness" ($M = 4.30$) were also considered strong indicators. In contrast, "Early writing of numbers" ($M = 3.53$) and "Early counting skills" ($M = 3.70$) received comparatively lower mean scores, indicating less consensus among early childhood educators regarding their significance as markers of mathematical giftedness.

Table 6: Mann-Whitney U Test Results for Perceived Indicators of Mathematical Giftedness Based on Work Experience

Indicator	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Early counting skills indicate mathematical giftedness.	Less than 5 years	38	21.93	833.50	92.500	-2.278	0.023*
	5 years or more	9	32.72	294.50			
Early writing of numbers indicates mathematical giftedness.	Less than 5 years	38	23.96	910.50	169.500	-0.043	0.965
	5 years or more	9	24.17	217.50			
Early development of numerical concepts indicates mathematical giftedness.	Less than 5 years	38	23.42	890.00	149.000	-0.664	0.507
	5 years or more	9	26.44	238.00			
Continuing and creating complex patterns indicates mathematical giftedness.	Less than 5 years	38	24.04	913.50	169.500	-0.046	0.964
	5 years or more	9	23.83	214.50			
Advanced problem-solving indicates mathematical giftedness.	Less than 5 years	38	24.24	921.00	162.000	-0.295	0.768
	5 years or more	9	23.00	207.00			
Exceptional spatial awareness indicates mathematical giftedness.	Less than 5 years	38	24.12	916.50	166.500	-0.135	0.893
	5 years or more	9	23.50	211.50			

Note: *p < 0.05 indicates statistical significance.

The results indicate that, apart from early counting skills, no significant differences were observed between early childhood educators with varying years of experience in their perceptions of mathematical giftedness indicators. Specifically, for early counting skills, educators with 5 or more years of experience (Mean Rank = 32.72) rated this indicator significantly higher than their counterparts with less than 5 years of experience (Mean Rank = 21.93), with the difference reaching statistical significance ($p = 0.023$).

Table 7: Mann-Whitney U Test Results for Perceived Indicators of Mathematical Giftedness Based on Attitude

Indicator	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Early counting skills indicate mathematical giftedness.	Negative attitude	33	22.23	733.50	172.500	-1.460	0.144
	Positive attitude	14	28.18	394.50			
Early writing of numbers indicates mathematical giftedness.	Negative attitude	33	22.94	757.00	196.000	-0.872	0.383
	Positive attitude	14	26.50	371.00			
Early development of numerical concepts indicates mathematical giftedness.	Negative attitude	33	21.65	714.50	153.500	-2.011	0.044*
	Positive attitude	14	29.54	413.50			
Continuing and creating complex patterns indicates mathematical giftedness.	Negative attitude	33	23.65	780.50	219.500	-0.301	0.764
	Positive attitude	14	24.82	347.50			
Advanced problem-solving indicates mathematical giftedness.	Negative attitude	33	24.24	800.00	223.000	-0.226	0.821
	Positive attitude	14	23.43	328.00			
Exceptional spatial awareness indicates mathematical giftedness.	Negative attitude	33	23.58	778.00	217.000	-0.361	0.718
	Positive attitude	14	25.00	350.00			

Note: *p < 0.05 indicates statistical significance.

The results reveal that early childhood educators with more positive attitudes toward mathematics consistently rated all indicators of mathematical giftedness higher than their counterparts with less positive attitudes. However, a statistically significant difference was observed only for the indicator of early development of numerical concepts, where educators with more positive attitudes (Mean Rank = 29.54) rated it significantly higher than those with less positive attitudes (Mean Rank = 21.65; $p = 0.044$).

Table 8: Frequency of Encountering Mathematically Gifted Children in Professional Experience

Response	Frequency	Percent
Yes	19	40.4%
Not yet	28	59.6%
Total	47	100.0%

The results indicate that 40.4% of early childhood educators reported having encountered children they considered mathematically gifted during their work, while the majority (59.6%) had not yet identified such children. This suggests that direct recognition of mathematical talent in young children may not be widespread among educators, highlighting the need for further awareness and training in identifying mathematical giftedness.

Table 9: Mann-Whitney U Test Results for Encountering Mathematically Gifted Children Based on Work Experience

Did you encounter children during your studies or work whom you considered mathematically gifted?	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	Less than 5 years	38	24.84	944.00	139.000	-1.018	0.309
	5 years or more	9	20.44	184.00			

The results indicate no statistically significant difference between educators with less than 5 years of experience (Mean Rank = 24.84) and those with 5 or more years of experience (Mean Rank = 20.44) in encountering mathematically gifted children during their studies or work (p = 0.309). This suggests that the likelihood of encountering mathematically gifted children does not vary significantly with the length of work experience.

Table 10: Mann-Whitney U Test Results for Encountering Mathematically Gifted Children Based on Attitude

Did you encounter children during your studies or work whom you considered mathematically gifted?	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	Negative attitude	33	24.95	823.50	199.500	-0.862	0.389
	Positive attitude	14	21.75	304.50			

Educators with a negative attitude toward mathematics (Mean Rank = 24.95) reported slightly more instances of encountering mathematically gifted children compared to those with a positive attitude (Mean Rank = 21.75). However, the difference was not statistically significant (p = 0.389), indicating that educators' attitudes toward mathematics did not significantly impact their reported experiences of identifying mathematically gifted children.

Table 11: Frequency of Actively Observing Children's Mathematical Abilities

Response	Frequency	Percent
Always	4	8.5%
Often	22	46.8%
Sometimes	16	34.0%
Rarely	5	10.6%
Total	47	100.0%

The results show that nearly half of the early childhood educators (46.8%) reported actively observing children's mathematical abilities "often," while 34% stated they do so "sometimes." Only a small percentage (8.5%) indicated that they "always" observe children's mathematical abilities, whereas 10.6% reported doing so "rarely."

Table 12: Actively Observing Children's Mathematical Abilities Based on Work Experience

How often do you actively observe children regarding their mathematical abilities?	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	Less than 5 years	38	24.51	931.50	151.500	-0.570	0.569
	5 years or more	9	21.83	196.50			

Early childhood educators with less experience (Mean Rank = 24.51) observed children's mathematical abilities slightly more frequently than those with more experience (Mean Rank = 21.83), but the difference was not statistically significant (p = 0.569).

Table 13: Actively Observing Children's Mathematical Abilities Based on Attitude

How often do you actively observe children regarding their mathematical abilities?	Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	Negative attitude	33	26.09	861.00	162.000	-1.734	0.083
	Positive attitude	14	19.07	267.00			

As with attitudes toward mathematics, early childhood educators with a negative attitude reported slightly more frequent observations of children's mathematical abilities than those with a positive attitude, but this difference was not statistically significant ($p = 0.083$).

4 Discussion

This study explored early childhood educators' perceptions and practices related to identifying mathematically gifted children. The findings provide insight into how early childhood educators recognize and support mathematical talent, highlighting key differences based on years of experience and attitudes toward mathematics.

The results indicate that early childhood educators generally believe that mathematically gifted children can be identified as early as in preschool and that these children often stand out in a group. These findings align with research emphasizing the early emergence of mathematical talent and the importance of identifying it during the preschool years (Espy et al., 2010; Bakker et al., 2024). However, the lower confidence expressed by educators in their ability to identify mathematically gifted children highlights a pressing need for enhanced professional development in this area. Waxman et al. (1996) underscore the necessity of specialized training and robust evaluation tools for accurate identification. Similarly, Al-Hroub and Whitebread (2008) emphasize the value of targeted training programs to equip educators with the skills to identify gifted students effectively, including those with dual exceptionalities such as learning difficulties, ensuring equitable access to appropriate educational opportunities.

When analyzing differences based on teaching experience, results showed that educators with less than five years of experience reported slightly higher agreement on most statements regarding mathematical giftedness. The only notable trend was for the belief that mathematically gifted children require a different teaching approach, where teachers with less experience showed a greater tendency to agree ($p = 0.068$). The tendency for less experienced educators to agree that mathematically gifted children require a different teaching approach may reflect their recent exposure to contemporary pedagogical frameworks emphasizing differentiated instruction. Teacher education programs likely highlight the importance of adapting methods to diverse learners, including mathematically gifted

children (Waxman et al., 1996), whereas more experienced educators may rely on traditional practices, perceiving existing methods as sufficient.

Regarding attitudes toward mathematics, educators with more positive attitudes rated all indicators of mathematical giftedness higher than those with less positive attitudes. A statistically significant difference was found for the belief that early development of numerical concepts indicates mathematical giftedness, with teachers who enjoy mathematics rating it significantly higher than those with a negative attitude ($p = 0.044$). Additionally, those with more positive attitudes were significantly more likely to believe that mathematically gifted children require a different teaching approach ($p = 0.003$). These findings align with research suggesting that educators' attitudes significantly influence their ability to recognize and support mathematically gifted children (Ficici & Siegle, 2008).

Despite recognizing key indicators of mathematical giftedness, only 40.4% of early childhood educators reported having encountered mathematically talented children in their professional experience. This finding suggests that many mathematically gifted preschoolers may go unidentified, highlighting the need for improved assessment methods and targeted teacher training. Tools such as structured observation protocols or expert systems, as proposed by Pavlekovic et al. (2010), could help bridge this gap.

Most educators reported frequent observations of children's mathematical abilities; however, no significant differences were found in observation frequency based on experience or attitudes toward mathematics. This finding suggests that regular observation of children's mathematical abilities is a common practice among early childhood educators, regardless of personal teaching experience or confidence in mathematics.

The findings underscore the importance of professional development programs focused on mathematical giftedness. Given that educators with positive attitudes toward mathematics were more likely to recognize the need for differentiated instruction, training programs should emphasize mathematical confidence-building among early childhood educators (Leikin et al., 2017; Waxman et al., 1996). Additionally, structured observation tools and assessment strategies, as highlighted in studies by Sipahi and Bahar (2024) and Pavlekovic et al. (2010), may help

educators systematically identify and support mathematically talented children more effectively.

5 Conclusion

This study highlights the critical role of early childhood educators in identifying and supporting mathematically gifted children in preschool settings. The findings indicate that while teachers generally believe in the early identification of mathematical talent, many feel uncertain about their ability to recognize such abilities, underscoring the need for targeted professional development. Educators with positive attitudes toward mathematics were more likely to advocate for differentiated instruction, emphasizing the influence of attitudes on instructional practices.

Despite frequent observations of children's mathematical abilities, a significant proportion of educators reported not encountering mathematically gifted children, suggesting that many may remain unidentified. These results reinforce the importance of equipping educators with structured tools, training programs, and strategies to systematically observe, assess, and nurture mathematical talent. By addressing these gaps, early childhood educators can play a pivotal role in fostering mathematical potential during the critical preschool years.

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About the authors

Dr. **Darja Antolin Drešar** is an associate professor at the Faculty of Education, University of Maribor, in the Department of Preschool Education. Her academic focus is in mathematics education, with a particular emphasis on the teaching and learning of early mathematics. Through her involvement in various projects and collaborations, she integrates research with innovative practices to advance early childhood mathematics education, while maintaining a strong interest in parental involvement in children's mathematical development. As the practical training coordinator, she plays a pivotal role in bridging theoretical knowledge with hands-on experience for students.

TEACHING MATHEMATICALLY PROMISING STUDENTS: INSIGHTS FROM CLASSROOM PRACTICE

ALENKA LIPOVEC,[1] JASMINA FERME[2]
[1] University of Maribor, Faculty of Education, Maribor, Slovenia
alenka.lipovec@um.si
[2] University of Maribor, Faculty of Natural Sciences and Mathematics, Maribor, Slovenia
jasmina.ferme1@um.si

This chapter explores how future primary school teachers engage with mathematically promising students. The study analysed 40 records from student teachers' practical training, focusing on their experiences working with at least one mathematically promising pupil. The findings highlight key characteristics of mathematically promising students, including their proficiency in mathematical operations, ability to handle complex tasks, and intrinsic motivation. Future teachers employed a range of approaches, such as personalized teaching, supplementary activities, and problem-solving tasks. While many future teachers recognized the need for adaptive strategies, only half engaged students in problem-based or divergent thinking tasks. This limited use of advanced pedagogical methods indicates a need for further training to enhance instructional practices for mathematically promising students. These findings contribute to understanding the challenges and opportunities in educating mathematically gifted learners.

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1 Introduction

The TIMSS 2023 report for fourth-grade students, finalized in December 2024, presents significant new insights into higher cognitive milestones achieved in mathematics and science. The TIMSS 2023 international assessment, conducted across 59 countries and 6 educational systems, focused on three cognitive domains: knowledge of facts and procedures, application, and reasoning. Particularly notable are findings related to reasoning, a key higher-order cognitive skill, which requires students to integrate knowledge, analyse complex scenarios, and draw conclusions. The study revealed that Slovenian fourth graders performed moderately well in mathematics, with a mean score of 514, slightly above the TIMSS international average of 500 but trailing behind many European peers. Tasks emphasizing reasoning—such as interpreting patterns, solving novel problems, and engaging in multi-step logical processes—highlighted disparities in higher-level thinking skills. Only a small proportion of students consistently achieved success in tasks requiring abstract reasoning and the application of relational concepts. These findings underscore the need for targeted educational strategies to enhance reasoning skills at higher taxonomic levels. The TIMSS 2023 advocates for incorporating complex problem-solving tasks, fostering mathematical investigations, and using adaptive learning tools to challenge and support students, especially those with higher mathematical promise. This new evidence provides a strong basis for refining teaching practices and curricular frameworks to better cultivate advanced cognitive abilities in young learners.

Identifying and supporting mathematically promising students at an early age is essential to foster their development and address their unique needs. These students often demonstrate advanced problem-solving, creativity, and enthusiasm for mathematics, even before formal identification processes begin. This highlights the importance of teachers' ability to recognize and nurture their potential early on.

While much is known about the characteristics of mathematical giftedness and effective teaching strategies, little research has explored how future primary teachers engage with mathematically promising students. Understanding how preservice teachers perceive and support these learners during their practicum is crucial for bridging the gap between theory and practice in mathematics education.

2 Theoretical Framework

Traditionally, mathematical giftedness was framed through attributes like high reasoning skills, problem-solving ability, and creativity. Renzulli's triadic model of giftedness—above-average ability, creativity, and task commitment—remains influential (Sternberg et al., 2024), while Gagné's differentiated model emphasizes the role of environmental factors in converting gifts into talent (Gagné, 2023). Mathematically gifted primary students often exhibit creativity through problem-solving and problem-posing activities. These students can vary given problems and create new mathematical objects, demonstrating their ability to engage in theory-building processes even with limited mathematical knowledge (Assmus & Fritzlar, 2018). Creativity in mathematics is closely linked to divergent thinking and originality, which significantly impact the problem-solving process (Kim et al., 2016).

Identifying and nurturing mathematically promising students—those who show potential for mathematical giftedness or exceptional aptitude in mathematics Sheffield et al. (1995)—is essential in primary education to foster their development and address their unique needs. Identifying mathematically gifted students aged 6–11 involves recognizing characteristics such as thinking in concepts and relationships, high motivation, perseverance, and a systematic and reflective mind. Traditional methods often rely on high achievement in standardized tests, and specially devised problem sets (Wagner & Zimmermann, 1986). This concept encompasses not only those identified through traditional assessments but also students who show a strong interest and enthusiasm for mathematics, reflecting diverse expressions of mathematical ability. Therefore, it is crucial to consider a broader range of indicators, including dynamic and informal assessments, historical data, and input from parents and teachers, to capture the full spectrum of giftedness, especially in students with learning difficulties (Al-Hroub, 2011).

In Slovenia, formal identification of gifted students typically occurs in the fourth grade. However, many students with significant mathematical promise may emerge at younger ages. This creates a critical need for teachers to recognize and support such potential early on, even before formal identification processes begin.

Effective teaching approaches for mathematically gifted students include the use of complex, non-routine problems designed to foster critical thinking and advanced problem-solving skills (Wagner & Zimmermann, 1986; García-Moya et al., 2024). Instructional strategies aimed at nurturing mathematical talent emphasize advanced content, conceptual depth, and higher-order thinking. These methods encourage students to approach mathematics with creativity and innovation, engaging with tasks that reflect the intellectual challenges faced by professional mathematicians (Gavin, 2024). Incorporating hands-on, activity-based learning further enhances students' creative thinking abilities, particularly in primary education, where student-centered methods can be especially effective (Nwoke, 2021). Collaborative tasks on challenging problems further promote shared cognition and mutual support, helping students to enhance their critical thinking and problem-solving capabilities through teamwork (Diezmann & Watters, 2001).

Enrichment programs, such as extended Saturday classes (Wagner & Zimmermann, 1986) or introducing dedicated math clubs or long-term programs (Gavin, 2024)., play a pivotal role in supporting mathematically gifted students. These opportunities complement advanced curricula and foster sustained engagement with mathematics.

Creativity-based mathematics instruction (CBMI) further highlights the importance of fostering divergent thinking and a creative learning environment for gifted students (Kozlowski & Chamberlin, 2019). Programs emphasizing problem-posing as a tool for cognitive variety encourage students to reframe problems and explore abstract concepts, aligning with strategies shown to enhance mathematical creativity and understanding (Singer, 2018). Additionally, digital tools have been found to deepen engagement, as dynamic representations facilitate the exploration of complex mathematical ideas (Pitta-Pantazi et al., 2022). Together, these strategies underscore the critical role of tailored interventions in nurturing mathematical giftedness.

The Didactic Pentagon program in Slovenia exemplifies how field-based teacher education can simultaneously support mathematically promising students and develop preservice teachers' pedagogical skills. This program brought together students aged 7 to 12, preservice teachers, classroom teachers, parents, and teacher educators in a collaborative framework (Lipovec & Bezgovšek Vodušek, 2006). Weekly math club activities allowed preservice teachers to design and implement

cognitively challenging tasks, fostering their confidence and competence in mathematical communication and teaching. For students, the program provided exposure to creative mathematical tasks, such as open-ended problems and data generalization, which supported higher-order cognitive skills like abstraction and relational thinking (Lipovec & Pangrčič, 2008; Lipovec, 2009)

The purpose of the presented study is to address a notable gap in the literature concerning the engagement of mathematically promising students in primary education classrooms. While extensive research has focused on identifying mathematically gifted students and proposing theoretical guidelines for their teaching, far less is known about the concrete practices and strategies teachers employ in real-world settings. The originality of this study lies in its focus on future primary teachers, a group that has been largely overlooked in existing research regarding their interactions with gifted students. Specifically, the study investigates how future primary teachers perceive and engage with mathematically promising students during their practicum. By examining the alignment between theoretical recommendations and practical implementation, the study seeks to shed light on the challenges and opportunities involved in nurturing mathematical potential among young learners, thereby offering new insights into this relatively underexplored area.

3 Methods

3.1 Research Question

Two research questions were formulated.

1. How do prospective primary teachers perceive the characteristics of mathematically promising students?
2. How do prospective primary teachers describe their teaching approaches, materials, and strategies when working with mathematically promising students?

The study employed a non-experimental qualitative methodology within pedagogical research, using a narrative approach to analyse reflections written by preservice teachers during their practical training. This design allowed for an in-depth

exploration of experiences and insights related to teaching mathematically promising students.

3.2 Participants

The sample consisted of 40 reflections written by 40 future primary teachers during their teaching practicum in 2024. Although 62 students participated in the practicum, some reflections were excluded due to insufficient detail or irrelevance to the study's focus. Future primary teachers in the primary education program (4+1 model) undertake an intensive practicum during the spring semester of their fourth year. Prior to this, they complete a substantial number of mandatory courses in general pedagogy and psychology, a mathematics course designed for primary school teachers, and two courses in mathematics didactics. Additionally, they deliver two teaching sessions in each subject taught at the primary level, including two sessions where they teach mathematics in pairs.

3.3 Data Collection Procedure

Data were collected over three weeks in March and April 2024, during a concentrated practicum period for fourth-year students enrolled in the 4th year of Elementary Teaching study program at the Faculty of Education, University of Maribor. Students chose schools for their practicum independently, ensuring diverse educational settings.

3.4 Measurement Instruments

Reflections on working with a mathematically promising student were part of the journal from the intensive practicum, which included multiple elements (reflections on the student teacher's own lessons and observations of the mentor teacher's teaching, reflections on working with a student with special needs, descriptions of the didactic tools and resources used, etc.). The instructions were intentionally broad: *Write a reflection on your work with a mathematically promising student in approximately 200 words. You may use the following questions to guide you: What stood out to you the most? What were the strengths? Did you notice anything unusual about the students/teacher? Was there anything about the mathematical content that confused you? What did the students learn during the lesson? What would you change, and how?*

3.5 Data Analysis

Data were analysed using qualitative content analysis with the assistance of the ATLAS.ti software. Following a data-driven approach, initial AI-assisted coding was manually reviewed, refined, and organized into subcategories and broader categories. The approach was primarily inductive, except for two predefined themes. Analysis was done using thematic analysis in six phases suggested by Braun and Clarke's (2006): (1) familiarizing with the data (reading and re-reading the data while simultaneously noting initial ideas), (2) generating initial codes (systematic coding of interesting features of the data and collating data according to the codes, partially AI assisted), (3) searching for themes (collating of the codes into potential subcategories and then categories), (4) reviewing (sub)categories (checking of themes against the coded statements and the data as a whole), (5) defining and naming categories (refining each theme and generating clear definitions for each theme), (6) producing the report (providing extracts for each subcategory theme to illustrate the participants' accounts).

3.6 Limitations

This study has several limitations that should be acknowledged. First, the sample size was relatively small, consisting of 40 reflections from future primary teachers, which limits the generalizability of the findings. Although the data provide valuable insights, a larger sample would have allowed for a broader understanding of the practices and perceptions related to teaching mathematically promising students.

The second limitation pertains to the content of the reflections, which were highly diverse in terms of length and the inclusion of (sub)categories, as reflected in the number of cases. Also, the quality and clarity of some reflections were inconsistent. In several cases, it was challenging to extract detailed or meaningful information due to vague or incomplete descriptions. This variability may have influenced the depth of the data analysis. Since this is a qualitative study, the overall aim is not quantification, but still, the number of cases is provided as additional information for the reader.

Third, not all future primary teachers had the opportunity to work with the same mathematically promising student over an extended period. This lack of continuity may have limited their ability to observe and reflect deeply on the student's learning process and needs.

Lastly, as with all qualitative research, this study is inherently subject to certain subjective interpretation, which, despite rigorous methods, may introduce biases. To mitigate this, established protocols for trustworthiness and peer validation of coding were followed, and participant citations were used to ensure authenticity.

Despite these limitations, the study offers valuable contributions to understanding the teaching practices and challenges associated with mathematically promising students, highlighting areas for further research and teacher education. The study adhered to four primary criteria to ensure trustworthiness: credibility, transferability, dependability, and confirmability. Although coding was performed by the lead author, two additional researchers reviewed the process to validate the findings. Excerpts from participants' reflections were included to provide transparent evidence supporting the findings (Braun & Clarke, 2021). This systematic approach ensured a rigorous and trustworthy analysis of the data.

4 Results

The findings are organized into two themes that emerged from the content analysis: *Characteristics of gifted students* and *Teaching gifted students*. These themes capture the essential aspects of the experiences, observations, and strategies described by participants in their work with mathematically gifted students. Below, each theme and its corresponding categories, subcategories and codes from which the categories were derived, are presented in more detail.

4.1 Characteristics of Gifted Students

The following section describes the characteristics of gifted students as identified by prospective teachers, organized into two main categories: *Cognitive skills and behavioural attributes* and *Affective-motivational strengths*. Each category encompasses unique attributes, which are detailed further in respective tables.

The category *Cognitive skills and behavioural attributes* includes four subcategories (explained in more detail in Table 1).

Table 1: Category Cognitive skills and behavioural attributes

Subcategory	Codes	Excerpts
Mathematical strengths (30 cases)	Strong in mathematics, proficient in math operations, excel in basic math skills, fast calculation, good at math, precise.	*I found that mathematics, with its logic, spatial and numerical representations, as well as reading comprehension, is a very strong area for the girl.*
Logical thinking (18 cases)	Logical thinking, logical tasks, Logical monster, critical thinking.	*We did more logical exercises, one of which was Sudoku.*
Quick learning and understanding (16 cases)	Quick learners, quick understanding, quick task solving, fast problem solving, quick problem solving, fluent in reading, encyclopaedic knowledge, knowledgeable.	*He solved all the tasks first, very quickly and correctly, and immediately moved on to more challenging tasks.*
Exceptional problem-solving skills (10 cases)	Advanced problem-solving, exceptional problem-solving abilities, efficient problem solving, standing out, handle advanced tasks, drawing as a tool for solving problems.	*For the problem-based task, he quickly found a successful solution method.*

The category *Affective-motivational strengths* (details in Table 2) captures the emotional and motivational traits of mathematically gifted students, including *independence and persistence* (9 cases), *creativity* (7 cases), and *curiosity and motivation* (7 cases).

Table 2: Category Affective-motivational strengths

Subcategory	Codes	Excerpts
Independent and persistent (9 cases)	Independent, focused, systematic, persistent, minimal explanations, focused.	*What surprised me about the students was that they were very persistent and eager to get to the solution, so surrendering was not an option for them.*
Creative thinker (7 cases)	Creative, original, making correlations, multiple solution paths, pattern recognition.	*He was able to solve more challenging tasks and approach problems in a creative way.*
Curious and motivated (7 cases)	Curious, motivated, enthusiastic, positive attitude, interesting tasks, enjoying challenging tasks, encouraging knowledge.	*He greatly enjoys solving complex and logical tasks, assembling puzzles, tangrams, and Rubik's cubes, as well as completing Sudoku puzzles. He is highly motivated to solve mathematical problems and engage in logical thinking.*

4.2 Teaching Gifted Students

This section explores approaches and resources for teaching gifted students, categorized into three main categories. The first, *Approaches to working with gifted students* (Table 3), highlights strategies such as personalized and adaptive teaching, supplementary activities and support, collaborative learning, encouraging critical and creative thinking, and encouraging problem-solving and logical thinking. The second, *Tools and materials* (Table 4), focuses on resources such as supplementary and advanced materials, interactive and visual tools, competitions, traditional materials, and games and mathematical puzzles.

In the continuation, a detailed description of all three mentioned categories is provided.

The category A*pproaches to working with gifted students* (Table 3) outlines strategies and methods used to support gifted students in their learning.

Table 3: Category Approaches to working with gifted students

Subcategory	Codes	Excerpts
Supplementary support (25 cases)	Additional activities, additional lessons, additional support, extra math classes.	*During each lesson, I prepared additional worksheets for him because he always completed everything much faster than the others.*
Encouraging problem-solving and logical thinking (18 cases)	Problem-solving, logical reasoning, logical thinking, pattern recognition training, multiple solution paths.	*I tried to find tasks that offered multiple solution paths. For such tasks, the student needed only a few minor hints before independently finding the solutions.*
Personalized and adaptive teaching (13 cases)	Adapting to individual student, adapt lessons, adapt teaching, personalized approach, individualized learning, individual observation, no extra guidance.	*Working with gifted students during math lessons and preparing them for the Logical Monster math competition can be a particular challenge for teachers, as it requires adapting to the specific needs and abilities of these students.*
Encouraging critical and creative thinking (10 cases)	Critical thinking, independent thinking, encourage independence, independent work, independent problem-solving.	*It is also important for the teacher to encourage gifted students to think outside the box and adopt a creative approach to problem-solving.*
Encouraging collaborative learning (4 cases)	Collaboration, collaborative problem solving, group work, engaging in discussions.	*They solved three logical tasks, including one where they had to decipher a calculation involving vegetable values. Starting with the initial clue (tomato = 2), they deduced the values of the other vegetables (1–6) and worked on solving the tasks in groups.*

The category *Tools and materials* highlights the various tools and materials used to engage and challenge gifted students in mathematics. The subcategories are described in Table 4.

Table 4: Category Tools and materials

Subcategory	Codes	Excerpts
Traditional materials (18 cases)	Math worksheets, written math problems, textbook, workbooks, notebooks, tasks with three stars.	*I took the tasks from old notebooks, most of which were marked with three stars.*
Games and mathematical puzzles (16 cases)	Math games, domino games, crosswords, memory games, Rubik's cubes, interactive games, didactic games, online puzzles, math-related games, logic puzzles, sudoku, Wolf, goat, and cabbage, Frogs.	*The student was not familiar with the game Minesweeper, so I first explained the rules and played one game myself, explaining along the way where the mines were most likely located and how we could determine that.*
Interactive and visual tools (15 cases)	Interactive tasks, interactive math tasks, visual aids, Powerpoint presentation, geoboards, computers, tablets, online platforms.	*The tasks required the student to engage in problem-solving, recognize that different calculations could yield the same result, and maintain precision. I worked on these tasks with the student using a tablet, with the tasks increasing in difficulty.*
Competitions (14 cases)	Competition preparation, competition problems, math competition tasks, previous competition tasks, past competition problems, Logical monster, Kangaroo.	*When preparing for the mathematical competition Logical Monster, it is crucial for gifted students to become familiar with various types of mathematical problems they might encounter in the competition.*
Supplementary and advanced resources (12 cases)	Additional materials, advanced math problems, additional workbooks, extended tasks, advanced math workbooks, additional tasks.	*I offered extended assignments and gave him access to additional materials in the classroom.*

4.3 Procedurally Based Computational Tasks Versus Problem-Based/Divergent Thinking Activities

A specific focus was given to the distinction between procedurally based computational tasks and problem-based/divergent thinking activities, emphasizing the diversity of tasks utilized in teaching. These categories collectively underscore the varied strategies and tools that support gifted students in developing their potential.

Among the 40 participants, 17 explicitly referenced procedurally based computational tasks in their reflections. These activities were curriculum-aligned and typically involved structured, guided methods emphasizing accuracy and the reinforcement of standard mathematical procedures. Examples included solving textbook exercises, completing worksheets, and engaging in tasks that prioritized the correct application of algorithms. Conversely, 17 participants described problem-based or divergent thinking activities. These tasks fostered independent exploration, logical reasoning, and creativity, requiring students to devise their own strategies or consider multiple approaches. Examples included open-ended problems such as the wolf, goat, and cabbage, logical puzzles, and activities focused on pattern recognition or generalization. Notably, only one participant reported using both types of activities. Additionally, in the records of seven participants, the type of activities employed could not be clearly identified from the considered perspective.

5 Discussion

The discussion section is organized into two themes that emerged from the content analysis: *Characteristics of gifted students* and *Teaching gifted students*.

5.1 Characteristics of Gifted Students

This study reports the key characteristics of mathematically gifted younger students, as identified by future primary teachers. The findings revealed that future primary teachers recognize these students based on distinct cognitive and behavioural traits (e.g., advanced mathematical abilities, logical reasoning, quick learning, and deep understanding) as well as affective and motivational characteristics (e.g., independence, persistence, creativity, curiosity, and intrinsic motivation). Several studies align to our results by emphasizing superior cognitive abilities in mathematically gifted students, such as quick problem-solving, abstract thinking, and creativity (Arabacı & Danişman, 2023; Lubinski & Humphreys, 1990). Similarly, a comparison between Golle et al. (2022) and the findings of this study, highlights shared cognitive strengths in gifted students, such as problem-solving and quick learning, while Golle et al. also emphasize demographic influences like gender and parental education, which are absent in our skill-focused approach. Both studies align on affective traits, such as curiosity and motivation, but this research uniquely highlights mathematical strengths, like proficiency and independence. By identifying

cognitive traits such as critical thinking, and affective qualities such as creativity, the results of this study are, similarly to that of Jawabreh et al. (2022), shaped by cultural contexts. This study adds depth by categorizing traits into structured domains, such as mathematical proficiency and persistence. Similarly to the work of Reis-Jorge et al. (2021), this study focused on advanced cognitive abilities and the challenges of limited teacher training. However, while this study emphasizes mathematical and motivational traits, Reis-Jorge et al. (2021) focus on intellectual and socio-emotional dimensions, reflecting differing educational contexts.

On the other hand, the findings of this study do not correspond with those of Assmus (2018) and Assmus & Fritzlar (2018), who identified specific mathematical strengths such as the ability to recognize and construct mathematical structures, switch between different modes of representation, reverse lines of thought, and applying relational concepts.

The results showed that future primary teachers, despite their limited classroom experience, are able to identify some key characteristics of mathematically gifted students, particularly cognitive traits such as quick learning and logical reasoning, as well as affective traits like creativity and persistence. However, their ability to recognize more specific mathematical strengths—such as the capacity to construct mathematical structures, switch between modes of representation, reverse lines of thought, and apply relational concepts—appears to be less developed. This suggests that while pre-service teachers demonstrate a basic understanding of giftedness, there is a clear need for more targeted training to help them identify and support the full range of abilities in mathematically gifted students.

5.2 Teaching Gifted Students

Future primary teachers, according to the findings of this study, employ effective teaching strategies similar to those highlighted in other studies, such as personalized and adaptive teaching models (Trpin, 2024), active and collaborative learning (Diezmann, & Watters, 2001), and problem-solving tasks with visual and computer assisted tools (Stambaugh, & Pierce, 2019). In this study, future primary teachers emphasized the use of personalized and adaptive teaching approaches, tailoring lessons to the unique needs and abilities of mathematically gifted students. For example, additional tasks and challenges were frequently prepared to accommodate

their advanced skills and quicker learning pace. Collaborative learning was less prominent but was observed in activities that encouraged group discussions and teamwork to solve logical problems. Problem-solving tasks, particularly those utilizing visual and interactive tools, also featured in our findings. Teachers used resources like puzzles, dynamic representations, and digital platforms to foster creative and independent exploration. While the findings echo established effective practices, they also underscore areas for improvement, particularly in the broader adoption of collaborative and problem-based methods in primary education.

The findings of this study also align with Diezmann's (2005) emphasis on the need for cognitively challenging strategies to support mathematically gifted students. Diezmann identifies several effective approaches, including problematising tasks, conducting mathematical investigations, extending the use of manipulatives, and modifying educational games. Similarly, this research observed how prospective primary teachers implemented strategies to address the unique needs of mathematically promising students but also revealed areas for growth in their application. Diezmann (2005) underscores the role of manipulatives in supporting visual-spatial and higher-level thinking. Similarly, teachers in this study utilized tools like geoboards, interactive puzzles, and dynamic representations to deepen conceptual understanding. Visual and interactive tools were used in 15 cases, enhancing engagement and helping students explore complex mathematical ideas. Diezmann's focus on adapting games for rich learning opportunities aligns with our findings, where 16 participants incorporated educational games such as Sudoku, Minesweeper, and logic puzzles. These activities were particularly effective in fostering pattern recognition, persistence, and creativity among mathematically promising students. Our findings suggest that while some teachers adopt cognitively demanding strategies like those outlined by Diezmann (2005), many still default to less challenging, procedurally based tasks.

A comparison of the results of this study with the findings of the study by Pitta-Pantazi et al. (2022), reveals interesting parallels and distinctions in the use of interactive and visual tools for fostering mathematical creativity. Both studies emphasize the role of dynamic representations and manipulatives in supporting higher-order thinking and conceptual understanding. In this research, interactive and visual tools were employed by approximately 37% of participants to enhance engagement and facilitate problem-solving among mathematically promising

students. These tools included geoboards, puzzles, and interactive digital platforms, which were effective in helping students visualize patterns, relationships, and spatial configurations. Notably, Slovenia has a national open-access platform which hosts numerous applets akin to those described by Pitta-Pantazi et al. (2022), such as dynamic balance models and visual tools. Despite its potential, the platform is underutilized, and none of the future primary teachers in this study referenced it in their reflections, suggesting a lack of awareness or integration into their teaching practices. Pitta-Pantazi et al. (2022) describe the use of a technologically enhanced learning environment based on the PMMI (Personalized Mathematics and Mathematics Inquiry) framework. Their study, focusing on teaching the arithmetic mean, utilized a dynamic digital applet that enabled students to manipulate visual representations, such as balance models and number lines, to deepen their understanding of the concept. This approach was particularly successful in fostering "mini-c" creativity, defined as the process of personal knowledge construction. Students exhibited abilities to create, manipulate, and connect representations, as well as to generalize and apply the concept in novel contexts. A key distinction lies in the targeted outcomes.

The findings of this study complement those of Gabrijelčič Kukonja and Konrad Čotar (2019), who highlight key challenges in educating gifted students in Slovenia. Their research emphasizes that teachers often lack knowledge and confidence in identifying and teaching gifted students, leading to the use of inappropriate strategies. They stress the importance of teacher training to address these gaps and advocate for tailored instructional approaches and well-trained personnel to support gifted learners. This study focused specifically on mathematically gifted younger students, identifying their strengths, such as quick learning, problem-solving, and creativity. The value of personalized teaching, problem-posing tasks, and interactive tools, was emphasized. However, just like in the findings of Gabrijelčič Kukonja and Konrad Čotar (2019), it was also observed in this study that teacher preparation often limits effective approaches. Specifically, only half of the participants in this study engaged mathematically gifted students in problem-based or divergent thinking activities, which are crucial for fostering creativity and independent exploration. The other half relied on procedurally based tasks that focused on reinforcing standard algorithms and accuracy, reflecting the need for stronger emphasis on creative teaching strategies in teacher training.

6 Conclusions

This study provides valuable insights into how prospective teachers perceive and engage with mathematically promising students during their practical training. By analysing their reflections, key cognitive, affective-motivational, and pedagogical strategies were identified that are effective for supporting such students. The findings highlight some of the strengths of mathematically promising students, as perceived by future primary teachers, including advanced problem-solving abilities, quick learning, and logical thinking, alongside their persistence and intrinsic motivation. These traits underline the need for teaching approaches that challenge students cognitively and nurture their mathematical potential.

The analysis also uncovered several areas for improvement. The study findings indicated that certain characteristics of mathematically gifted students, such as creativity, originality, and making unique correlations, were recognized in a smaller proportion of cases compared to traits like logical thinking or quick learning. Regarding instructional approaches, collaborative learning was notably underutilized, with only four instances of group problem-solving or discussions, as opposed to more frequently observed individualized or procedurally guided methods. The most worrying is that only half of the teachers employed problem-based or divergent thinking activities, emphasizing the need for greater emphasis on fostering creativity and independent exploration in teacher education programs.

This study reinforces the importance of providing future primary teachers with comprehensive training that equips them with the ability to recognize and support mathematically promising students. By integrating theoretical knowledge with practical tools, educators can better meet the unique needs of these students. Despite its limitations, including the small sample size and inconsistent quality of reflections, this research offers a foundation for improving instructional practices and shaping future studies on mathematical giftedness in primary education.

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About the authors

Alenka Lipovec, PhD, is a full professor of mathematics education at the Faculty of Education and the Faculty of Natural Sciences and Mathematics at the University of Maribor. Her research interests include the early development of mathematical concepts, parental involvement in education, and the meaningful integration of technology into teaching and learning processes. She has contributed to projects such as SETCOM, which focuses on supporting environments for the promotion of transversal competences in education. Additionally, she has been involved in initiatives like the renewal of educational programs through the updating of key curriculum documents. Her work emphasizes the importance of developing a mathematical identity among teachers and effectively utilizing technology in mathematics education.

Jasmina Ferme, PhD, is an assistant professor of mathematics and teaching assistent of mathematics education at he Faculty of Education at the Unviersity of Maribor. Her research focuses on didactics of mathematics and graph theory. In the field of mathematics education, she has explored topics such as mathematics homework, mathematical word problems, and the integration of technology into teaching and learning. Additionally, she investigates fundamental mathematical concepts from a teaching and learning perspective, such as division.

The Development of Musical Talent in Different Life Periods: A Case Study

Tjaša Drovenik Adamec, Bojan Kovačič
University of Maribor, Faculty of Education, Maribor, Slovenia
tjasa.drovenik1@um.si, bojan.kovacic@um.si

Through a case study of the internationally renowned organist, Tea Kulaš, we aim to investigate the influence of 29 factors on the development of musical talent at different stages of life, from early childhood to early adulthood (i.e., 3–35 years of age). The results show that in childhood and earlier stages of life, the development of musical talent is significantly influenced by external factors, while the importance of the influence shifts to internal factors in later stages of life.

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1 Introduction

Insight into the development of musical talent requires a number of contextual dimensions of giftedness and talent to be handled, both in the context of musical development (a broader view), as well as the development of musical abilities (a narrower view) and the many factors that influence the development of an individual across the lifespan. Early-developed abilities (Christiner & Reiterer, 2018; Wesseldijk et. al., 2021) and starting to learn music in earlier life periods (Da Costa & Lubart, 2016) influence better developed musical abilities and greater achievement in later life periods. Overall, four key aspects emerge in the field of giftedness, as follows: giftedness in childhood as an exceptional deviation from peers and as an outstanding achievement in a professional domain in adulthood (the relative nature of giftedness), giftedness that gradually develops from potential to professional competence (the developmental nature of giftedness), domains differ depending on the starting and ending points (the temporal nature of giftedness), and the influence of environmental factors in fostering achievement in a specific domain change (the contextual aspect of giftedness) (Olszewski-Kubilius et. al., 2017). According to Gagné (2005, 2009), talent development means the transformation of specifically innate abilities (giftedness) into systematically developed exceptional abilities (talents). This process is influenced by various external and internal factors, which are illustrated by some models of giftedness in the literature (Gagné, 2005, 2009; Heller, 1992, 2001; Heller & Schofield, 2008; McPherson & Williamon, 2006; Mönks, 1992; Mönks & Katzko, 2005; Perleth, 1997, 2000, 2001; Piirto, 2008; Ziegler & Heller, 2000). From these models, a number of factors were extracted in Drovenik Adamec et. al. (2020), which we examined in a case study of the organist Aleksey Vylegzhanin. The results of the case study show that the influence of these factors varies according to different life stages and personality traits, with external factors having a more intense influence at earlier life periods and internal factors having more influence in later life periods.

A large body of literature will be used to support our general thesis that external and internal factors influence the development of musical talent in different directions (positive/negative) and at different stages of life with different intensities. Motivation is important in development. Woolfolk (2016) points out that within the motivational continuum, both extrinsic and intrinsic motivational factors are important for success. Intrinsic motivation in music is explained as the personal

pleasure and satisfaction that comes from performing music (Barry, 2007). This term can also be described as the feeling that an instrumentalist has when performing music out of sheer enjoyment (O'Neill & McPherson, 2002). Hallam et al. (2016) highlight the complexity of musical motivation and the changes in motivation as expertise develops. They cite self-belief; enjoyment and pleasure in musical activities and performance; the level of support from parents, teachers and friends; attitudes towards and perceptions of the value of playing an instrument; and beliefs about the importance of musical ability as important elements of motivation. Encouragement and support from family, teachers and peers; the child's expectations and motivation to become competent on the instrument; the joy of playing the instrument; and the self-regulatory strategies that the child acquires to improve instrument learning are highlighted by McPherson & Zimmerman (2002) and Sloboda et al. (1996) as key factors for playing an instrument. Pereira-Fradin & Dubois (2007) state that motivation and passion are essential for a child's musical performance and play a key role in musical development. Parental encouragement is closely related to aspects of motivation (Bogunović, 2008; Dai & Schader, 2001, 2002; Kiewra & Witte, 2018; Kong, 2021), which is linked to playing an instrument (through frequency and length of practice). It is important that the mother and father are equally involved in establishing the habit of practice at home, especially during the early years of learning an instrument. Parental support is the most important factor at critical life stages (i.e., between the ages of 4–5 and 6–7) for both the development of skills and interest in pre-school development, and for the early identification of talent (Sisk, 1990; Stadler Elmer, 1996) and guidance in learning an instrument at a life stage when children are generally most susceptible to external stimuli and talent has the richest response (Bogunović, 2008).

The teacher, alongside the family, is another key factor in the child's learning environment. The influence of music and instrumental teachers encompasses two components: 1) the nature and quality of the teacher-student relationship, and 2) the appropriateness of the match between the teacher's teaching style and the child's individual needs (Pereira-Fradin & Dubois, 2007). It is important for the instrument teacher to be familiar with the relationships in the student's home environment, and to encourage collaboration between the school environment and the student's everyday life to stimulate and upgrade the student's musical development (Ho & Chong, 2010). At a later stage of development, the gifted student relies primarily on personal strengths, alongside innate potential (innate predispositions of musical

talent) and other environmental influences, to take charge of their personal, musical, professional and social development (Peterson, 2018).

The literature suggests that are several links between the different concepts that we see as relevant in the context of the musical talent development. For example, the term musical ability refers to (innate) potential (Bogunović, 2008; Davidson et. al., 1997; Hallam, 2006, 2010; Hallam & Shaw, 2002; Haroutounian, 2009). In addition, it has been shown that there is a significant correlation between musical ability and general intelligence (Rose et. al., 2019). Sternberg (2001) and Shi (2004) find a link between intelligence and creativity in their research, while Oikkonen et al. (2016) cite intelligence and musicality as a common background to a complex phenotype of creativity. Research findings (Kapliyenko-Iliuk, 2019) confirm that musical creativity is a complex process of artistic and creative thinking, whose psychological predispositions are talent, skill, intuition, creativity and improvisation.

Acquisition of musical skills, focus on aural abilities and prior success in public performance contribute to successful outcomes in music (Upitis et al., 2017). Factors such as the cultural environment in which an individual's musical development takes place (McPhee et. al., 2005), social skills and dedicated work (Rinn, 2007; Zhukov & Rowley, 2021), or hard work (Corno et al., 2002; Winner, 2000) are also important factors for outstanding achievement. Pereira-Fradin & Dubois (2007) cite passion as one of the most important factors for success in music. However, the quality and quantity of practice (Da Costa & Lubart, 2016; Dai & Schader, 2001, 2002; Davidson et. al., 1997; McPherson & McComick, 1999; Morrongiello, 1992; Reis, 2009; Sloboda et al., 1996; Williamson & Valentine, 2000) are crucial for achieving a level of expertise, which can influence an individual's musical perception (Ilari, 2002; Madsen & Madsen, 2002; Morrongiello, 1992; Trehub et. al., 1997). Wesseldijk et. al. (2021) confirm that starting musical training in earlier life periods has an impact on greater ability and higher achievement in later life periods. In addition to these factors, self-image (Fiedler & Spychiger, 2017), goal-setting, learning strategies (Green, 2010), realistic evaluation of achievements, performance, commitment, coping with stress, and music performance anxiety (Orlick & Partington, 1988) also influence the development of excellence. Dobos et. al. (2018) show a strong link between music performance anxiety, social anxiety and perfectionism. According to Skoogh & Frisk (2019), music performance anxiety should not be considered as a stand-alone problem but should be understood as a broader structural issue, with a

focus on perfection and virtuosity. Dobos et. al. (2018) state that music performance anxiety (MPA) is complex and multifactorial, and can occur at an early age. Therefore, it is important for the mental health of students that it be identified, intervened and managed in a timely manner by parents, teachers and professionals. Identifying these factors is helpful in understanding why, despite equal potential and similar conditions, not all children achieve at the same level in music (Pereira-Fradin & Dubois, 2007).

It can be concluded that the development of musical talent is influenced by a number of factors, which are the subject of the present case study.

2 Method

2.1 Goals

The purpose of this research is to investigate the influence of the 29 factors of the musical talent development of an excellent musician in different life periods. The participant in the case study is a professional organist, musicologist and artistic deirector of the international organ festival Zadar Organ Fetsival, Tea Kulaš (Croatia/Austria) (hereinafter T.K.).

2.2 Research questions

In the exploratory case study, we were interested in (1) what influence different external and internal factors had on the development of Tea Kulaš's musical talent, and (2) whether and how the influence of these factors changed through the participant's life stages.

2.3 Measurement instruments

For the purpose of this research, we developed and used a measurement instrument (i.e., a questionnaire). The questionnaire includes a set of 29 factors that influence musical talent development, and for which it is necessary to make a note of influence's intensity at different stages of life: early childhood (3–6 years), middle childhood (6–8 years), late childhood (9–11 years), early adolescence (12–14 years), middle adolescence (15–17 years), late adolescence (18–20 years), and early

adulthood (20–35 years). Intensity of influence is assessed by life stages using a seven-point rating scale containing the following levels: 1. not at all important influence, 2. low important influence, 3. slightly important influence, 4. neutral, 5. moderately important influence, 6. very important influence, and 7. extremely important influence. These 29 factors are divided into two areas to assess their influence on the development of a musical talent: external factors (9 items) and internal factors (20 items). The external factors are: mother (1), father (2), family encouragements (3), parental education (4), music instrument teacher (5), quality of music instruction (6), class climate (7), peers (8), and critical life events (9). The internal factors are: motivation (10), interest (11), passion (12), intellectual abilities (13), creative abilities (14), emotional intelligence (15), hard work (16), perseverance (17), perfectionism (18), perception (19), intuition (20), social competence (21), psycho-motor skills (22), musicality (23), learning and working strategies (24), achievement motivation (25), coping with stress (26), performance anxiety (27), assessment anxiety (28), and control expectations (29).

2.4 Data collection procedure

The research was conducted remotely. Data collection took place in April 2024. A questionnaire was administered to the study participant T.K. and was sent in an electronic form (in English). The participant returned the electronic form after one week. The review of the answers was followed by a consultation conversation with the participant via videoconference (Zoom application). T.K. read the case study before publishing and approving the publication of the findings.

2.5 Participant

Tea Kulaš (Croatia/Austria, 1994) is the artistic director of the Zadar Organ Festival and Artistic Organisation *Zara*, organist and musicologist with a Master's degree from the Music Academy in Zagreb (Croatia). She started her artistic journey at the age of 6 as a piano student at *Blagoje Bersa* Music School, Zadar. Apart from her piano studies, she finished contemporary dance, music theory and organ (M. Lazar). She graduated her organ high school studies at *Pavao Markovac* Music School in Zagreb (P. Mašić), which resulted in awards at regional and national competitions. She continued her award-winning education of organ and chamber music at Zagreb Music Academy with Lj. Očić and graduated in July 2018. Within the artistic and

scientific project *Religiophony* (2016) she has performed as a soloist accompanied by Orchestra of the Zagreb Music Academy in Zagreb, Čakovec and Ljubljana, and had held a lecture called *Josip Štolcer Slavenski – composer on the margins* in collaboration with her colleague, Daniela Perković. In 2019, she performed as a soloist with the Zadar Chamber Orchestra and the Croatian Radiotelevision Choir (HRT). Her versatile artistic affinities and curiosity have also led her to the School of Applied Art and Design in Zadar, where she finished a graphic design course. She started studying organ under G. Rost at University of Music and Performing Arts in Graz (Austria) after receiving an Erasmus scholarship in 2016. For two years in a row, she has been a prize-winner at *Martha Debelli* Competition (Graz). She has regularly performed throughout Croatia and foreign countries, as well as at several international festivals. She has attended numerous organ interpretation masterclasses (H. Fagius, M. Schmeding, T. Ospital, R. Prieto Ramirez, K. Volostnov, T. Sevšek Šramel, N. J. Laube, S.-Y. Lee, W. Reisinger, H. Fairs).

3 Results

3.1 External factors

T.K.'s mother (1) had an extremely important influence on the development of her musical talent throughout her childhood. At the beginning of adolescence (12–14 years), T.K.'s mother still had an extremely important influence, which later (15–17 years) decreased to a very important influence, and at the end of adolescence (18–20 years) became a moderately important influence. From early adulthood (20–35 years), her mother's influence has been neutral. The influence of T.K.'s father (2) was moderately important throughout her childhood. Her father had a moderately important influence in adolescence (12–17 years), which became neutral in early adulthood (20–35 years). Throughout T.K.'s childhood, family encouragement (3) had an extremely important influence on the development of her musical talent. In adolescence (12–17 years), family encouragement still had an extremely important influence, which decreased to a very important influence at the end of adolescence (18–20 years). From early adulthood (20–35 years), T.K.'s reported influence of family encouragement was moderately important. Parental education (4) had a very important influence on the development of T.K.'s musical talent in early childhood (3–6 years) and middle childhood (6–8 years). In late childhood (9–11 years), significance of the influence of parental education decreased to moderately

important influence. In adolescence (12–17 years), the influence of parental education was moderately important. It was fairly neutral at the end of adolescence (18–20 years) and remained neutral from early adulthood (20–35 years).

Music instrument teacher (5) in early childhood (3–6 years) had no influence on the development of T.K.'s musical talent because the participant had not yet attended instrumental music lessons at that time. In middle childhood (6–8 years) and late childhood (9–11 years), the instrument teacher had a very important influence, which became neutral at the beginning of adolescence (12–17 years). At the end of adolescence (18–20 years), the influence of the music instrument teacher increased again to become a very important influence and remains very important in early adulthood (20–35 years). As with the music instrument teacher, the quality of music instruction (6) in early childhood (3–6 years) did not have an influence on the development of T.K.'s musical talent because she had not yet attended musical instrumental lessons at that time. In middle childhood (6–8 years) and late childhood (9–11 years), as well as early adolescence (12–14 years), the influence of the quality of music instruction was very important, while in the middle of adolescence (15–17 years) it decreased significantly to a slightly important influence. At the end of adolescence (18–20 years), the quality of music instruction again had a very important influence on the development of T.K.'s musical talent. The influence of quality of music instruction remains very important in early adulthood (20–35 years). Classroom climate (7) in early childhood (3–6 years) had no influence on the development of T.K.'s musical talent because she was not involved in any institutional music education during this period. In middle childhood (6–8 years) and late childhood (9–11 years), as well in early adolescence (12–14 years), class climate had a very important influence, which increased to an extremely important influence in later adolescence (15–20 years) and decreased significantly to neutral in early adulthood (20–35 years).

Peers (8) in early childhood (3–6 years) had no influence. However, peers had a very important influence in middle childhood (6–8 years) and late childhood (9–11 years), and throughout adolescence, which decreased to a moderately important influence in early adulthood (20–35 years). The influence of critical events (9) was neutral throughout childhood. At the beginning of adolescence (12–14 years), critical life events still had a neutral influence on the development of T.K.'s musical talent, while later in adolescence (15–17 years) their influence became moderately important, and

at the end of adolescence (18–20 years) it increased to a very important influence. Finally, even in early adulthood (20–35 years), the influence of critical life events remained very important.

3.2 Internal factors

Motivation (10) and interest (11) had a very important influence on the development of T.K.'s musical talent throughout her childhood. At the beginning of adolescence (12–14 years), motivation and interest had a very important influence, which increased to an extremely important influence for both factors later in adolescence (15–17 years). Both motivation and interest were still extremely important at the end of adolescence (18–20 years) and remain extremely important in early adulthood (20–35 years).

Passion (12) had a moderately important influence throughout childhood, which increased to a very important influence in early adolescence (12–14 years). Later in adolescence (15–17 years) passion began to have an extremely important influence on the development of T.K.'s musical talent, and it also had an extremely important influence at the end of adolescence (18–20 years) and in early adulthood (20–35 years).

Intellectual abilities (13) had a moderately important influence in early childhood (3–6 years). It was still moderately important in middle childhood (6–8 years), but increased to very important influence in late childhood (9–11 years). Throughout adolescence (12–20 years), intellectual abilities thus have an extremely important influence on the development of T.K.'s musical talent, and they also have an extremely important influence in early adulthood (20–35 years).

Creative abilities (14) and emotional intelligence (15) had a very important influence on the development of T.K.'s musical talent throughout childhood. In early adolescence (12–14 years), the influence of creative abilities and emotional intelligence increased to an extremely important influence, and remained extremely important in later adolescence (15–17 years and 18–20 years) and early adulthood (20–35 years).

Hard work (16) had a moderately important influence in early childhood (3–6 years), increasing to a very important influence in middle childhood (6–8 years). In late childhood (9–11 years) and early adolescence (12–14 years), hard work had a very important influence on the development of T.K.'s musical talent. Later in adolescence (15–17 years), the influence of hard work increased to an extremely important influence, and remained extremely important at the end of adolescence (18–20 years) and at the beginning of adulthood (20–35 years).

In early childhood (3–6 years) to middle childhood (6–8 years), persistence (17) and perception (19) had a moderately important influence on the development of T.K.'s musical talent. In late childhood (9–11 years), the influence of persistence in perception increased to a very important influence, and remained very important into early adolescence (12–14 years). Later in adolescence (15–17 years), the influence of both factors increased to an extremely important influence. Persistence and perception also had an extremely important influence at the end of adolescence (18–20 years) into early adulthood (20–35 years).

The influence of perfectionism (18) was neutral in early childhood (3–6 years) but increased to a very important influence in middle childhood (6–8 years). Perfectionism had a very important influence on the development of T.K.'s musical talent in late childhood (9–11 years) and early adolescence (12–14 years). Later in adolescence (15–17 years) the influence of perfectionism became extremely important and had an extremely important influence also at the end of adolescence (18–20 years) into early adulthood (20–35 years).

Intuition (20) had a neutral influence in childhood but in adolescence its influence is moderately important. Throughout adolescence (12–20 years) into early adulthood (20–35 years), the influence of intuition is moderately important. Social competence (21) had a very important influence in childhood, decreasing to a moderately important influence in adolescence. Throughout adolescence (12–20 years) into early adulthood (20–35 years), the influence of social competence is moderately important.

Throughout the all of her life periods (early childhood**,** middle childhood**,** late childhood, adolescence and early adulthood)**,** psycho-motor skills (22) and musicality (23) had a very important influence on the development of T.K.'s musical

talent. Learning and working strategies (24) had a moderately important influence in early childhood (3–6 years) and middle childhood (6–8 years). In late childhood (9–11 years), the influence of learning and working strategies increased to a very important influence.

At the beginning of adolescence (12–17 years), learning and working strategies still had a very important influence on the development of T.K.'s musical talent. At the end of adolescence (18–20 years), the influence of learning and working strategies became extremely important and remained extremely important in early adulthood (20–35 years).

Achievement motivation (25) had a neutral influence in early childhood (3–6 years), which increased to a moderately important influence in middle childhood (6–8 years). In late childhood (9–11 years), achievement motivation still had a moderately important influence on the development of T.K.'s musical talent. The influence of achievement motivation became very important in adolescence (12–17 years), increased to an extremely important influence at the end of adolescence (18–20 years), and remained extremely important in early adulthood (20–35 years).

Coping with stress (26) had a neutral influence in early childhood (3–6 years), increasing to a moderately important influence in middle childhood (6–8 years). Coping with stress still had a moderately important influence in both late childhood (9–11 years) and early adolescence (12–14 years), which increased to a very important influence later in adolescence (15–17 years). It had a very important influence on the development of T.K.'s musical talent at the end of adolescence (18–20 years) and in early adulthood (20–35 years).

Performance anxiety (27) had not at all important influence in early childhood (3–6 years) and middle childhood (6–8 years), which became slightly important in late childhood (9–11 years), and in adolescence moderately important. Throughout adolescence (12–20 years) and early adulthood (20-35 years) performance anxiety had a moderately important influence on the development of T.K.'s musical talent.

The influence of assessment anxiety (28) was neutral throughout childhood. Similarly, assessment anxiety had a neutral influence in early adolescence (12–14 years), increasing to a moderately important influence later in adolescence (15–17

years). Even at the end of adolescence (15–17 years) and in early adulthood (20–35 years), the influence of assessment anxiety remains moderately important.

Control expectations (29) had a moderately important influence on the development of T.K.'s musical talent in early childhood (3–6 years). In middle childhood (6–8 years), the influence of control expectations is very important, and remains very important throughout the remaining life period considered (late childhood (6–8 years), adolescence (12–20 years), and early adulthood (20–35 years)).

4 Discussion

4.1 External factors

During her childhood and early life periods, external factors were in the foreground and had a more significant influence on the development of T.K.'s musical talent. Among these, mother and father, parental education and family encouragement had an extremely important to moderately important influence on the development of T.K.'s musical talent. Her musical instrument teacher also had a very important influence on T.K.'s musical development. As Pereira-Fradin & Dubois (2007) and Reis (2009) cite, the role of parents and teachers is crucial in the development of a child's talent. Parents contribute to the development of a child's talent through early recognition of talent and ongoing support of the child's potential. During adolescence, parents help talented teenagers to cope with the identity issues and pressures that are associated with their musical development.

Teachers become role models for many students, encouraging their musical development and contributing to their musical performance and success. Therefore, it is important that both parents and teachers recognise and understand the challenges that accompany each stage of a student's development of musical talent (Reis, 2009). Recent research also confirms the importance of parent-teacher collaboration in supporting children's musical development, which benefits not only the children but also parents who do not have a musical background or education (Kong, 2021).

The results of our research are consistent with Peterson's (2018) findings that family and teacher support are particularly important in the earlier stages of musical talent development. Wesseldijk et. al. (2021) confirm the important role of family factors in the period between the onset of musical training in childhood and skills in adulthood. In addition, Huisman Koops (2018) cites the crucial importance of family influence on a child's motivation to learn an instrument. Hallam (2002) also sets out the role of peers as one of the factors influencing a child's motivation. In this study, peers had very important influence on the development of T.K.'s musical talent in middle and late childhood and throughout adolescence. The influence of critical life events on T.K.'s musical development became moderately important in adolescence (15–17 years) and very important from late adolescence (18–20 years). In this regard, we can refer to Peterson et. al. (2009), who found that gifted students may face critical life situations (e.g., coping with stress, upsetting events and experiences in the home or school environment, school transitions, difficulties in interpersonal relationships, lack of self-confidence, behavioural problems, etc.) but persist in their high achievement in spite of these critical life situations.

4.2 Internal factors

At later stages of life, the importance of influence shifts to intrapersonal catalysts (Garret & Moltzen, 2011), as shown in our results. In adolescence (15–17 years), motivation, interest, passion, intellectual abilities, creative abilities, emotional intelligence, hard work, perseverance, perfectionism, perception, and in late adolescence (18–20 years) learning and working strategies and achievement motivation had an extremely significant influence on the development of T.K.'s musical talent. The influence of internal factors on T K's musical development increased with age and with the increasing influence of intrinsic motivation. Intrinsic motivation is the most important factor of enjoyment, persistence and musical self-efficacy in highly engaged students (Upitis et al., 2017). Pereira-Fradin & Dubois (2007) cite that motivation and passion play a key role in musical development and are indispensable for a student's musical performance. Focusing on fundamentals and hard work are also crucial for the development of musical talent (Kiewra & Witte, 2018). This was shown by our results because hard work had a moderately important influence on T.K.'s musical development from childhood onwards, escalating to extremely important influence.

The results of our research suggest that there are positive links between creative abilities and other internal factors. According to Kapliyenko-Iliuk (2019), creative tasks are realised through creative-psychological settings, among which emotions, intuition, reason, logic, rational principle, intelligence and fantasy play an important role. Based on our results, we can confirm the findings of Den Hartigh et al. (2016) that excellence comes from the dynamic interplay of interacting components, such as genetic endowment, motivation, practice and coaching. However, in the education of a contemporary music performer, it is essential to develop all of the elements of performance expression, such as technique, musicality, emotionality, awareness and artistry (Šeduikytė-Korienė & Meilūnaitė, 2018).

5 Conclusion

The results of our case study showed that some external factors (e.g., mother and family encouragement) had an extremely important influence throughout childhood. Meanwhile, in adolescence, in addition to external factors (mother, family encouragements and class climate), other internal factors began to came to the fore and thus had an extremely important influence on the development of T.K.'s musical talent (e.g., intellectual abilities, motivation, interest, passion, creative abilities, emotional intelligence, hard work, perseverance, perfectionism and perception). At the end of adolescence (18–20 years) and in early adulthood (20–25 years), in addition to all the internal factors mentioned above, learning and working strategies, and achievement motivation had an extremely important influence. These results are consistent with the findings of the case studies of a renowned organist Aleksey Vylegzhanin, which showed that external factors have a greater influence on the development of musical talent at earlier life stages, while internal factors have a greater influence later stages of life (Drovenik Adamec et. al., 2020). In addition, with sufficient support of environmental factors, the expression of the characteristics of musical talent intensifies over the years and becomes increasingly above average when compared to peers (Drovenik Adamec & Kovačič, 2022).

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About the authors

Tjaša Drovenik Adamec (1991), Master of Arts, academic organist, organ teacher and music pedagogue, completed her studies in Organ Concert Performance and Music Education – Voice and Instruments (IGP) at University of Music and Performing Arts in Graz (Austria), as well as in Music Education at Faculty of Education, University of Maribor. Since October 2019, she has been a doctoral student of Education Science at the Faculty of Education at Maribor University, within which she researches the areas of musical talent development, particularly among organ artists. In January 2025, she began teaching as an assistant for music subjects at the Department of Elementary Education at the Faculty of Education, University of Maribor.

Bojan Kovačič, PhD (1979), is an assistant professor at the Faculty of Education, University of Maribor. He teaches music didactic subjects and music pedagogical practicum at the Department of Elementary Education. The content of his doctoral thesis focused on the study of the characteristics of musically talented students at the elementary school level (age 6-10) of primary school. His research focuses on the study of talent development, music teaching, teaching methods, musical abilities, musical creativity, musical content, learning media and technology, and folklore activities in schools for students with special needs.

Dance Creativity in Kindergarten: Improvisation as a Method for Identifying Dance Talent in Children

Ana Tina Jurgec
University of Maribor, Faculty of Education, Maribor, Slovenia
ana.jurgec1@um.si

Dance improvisation is a spontaneous and free form of expression that intertwines movement and imagination, creating space for creativity. The creativity expressed through dance improvisation represents a key category in identifying dance talent in children, as it provides insight into their ability for free expression and original movement. The aim of our study was to explore the characteristics of dance improvisation in early childhood, with a focus on physical activity and the formation of movement in children. We employed a quantitative research approach, collecting data through an observational protocol. The study included 246 children aged 5–6 years from 38 public kindergartens across Slovenia. Our findings serve as an important foundation for further research on monitoring dance improvisation in preschool children and for a deeper understanding of the role of body movement in children's creative dance expression.

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1 Introduction

Dance originates from a child's natural need for movement and self-expression (Koff, 2000). It represents one of the most fundamental ways in which individuals connect with the world, emerging even before language development. Dance is inherent to children—it precedes verbal communication—and serves as a medium for expressing thoughts and emotions that may be too profound for words (Faber, 1994).

In early childhood education, dance is increasingly recognized for its role in holistic development and talent identification. Preschool teachers integrate dance activities into curricula, emphasizing their significance for children's overall growth (Hornos & Nicolás, 2019; Pastorek Gripson et al., 2021).

Scholars and educators stress the need for diverse methods to identify dance talent (Baum, Owen & Oreck, 2004; Warburton, 2002; Williams & Reilly, 2000; Wolstencroft, 2002). Among the six key areas identified in dance talent recognition, creativity—particularly expressed through dance improvisation—plays a crucial role (Baum, Owen & Oreck, 2004). Dance improvisation serves as a powerful tool for discovering and nurturing children's natural movement potential and creative abilities.

The preschool years provide an optimal period for encouraging children's natural movement exploration. During this time, they can engage with various dance elements, such as energy, space, and time (Kaufman & Ellis, 2007). The emphasis is on spontaneity, originality, and individuality, enabling children to develop unique movement expressions in different contexts (Joyce, 1994, in Lobo & Winsler, 2006). Rather than focusing on predetermined choreography, dance activities should stimulate creativity, allowing children to express emotions, thoughts, and experiences in their own way.

In Slovenia, research on identifying dance talent in preschool children remains scarce. While studies on musical talent and aptitude primarily focus on primary school levels (Kovačič & Črčinovič Rozman, 2014; Kovačič, 2015; Kovačič & Matejek, 2020), the preschool stage remains largely unexplored.

Given the significance of dance improvisation in fostering creativity and identifying dance talent, this study aims to examine its characteristics in preschool children. The theoretical framework first explores the concept of dance talent, followed by an analysis of dance improvisation as a key element in talent recognition. The chapter concludes with an explanation of the study's purpose.

1.1 Creativity as an Element of Dance Talent

The development of dance talent is a complex process influenced by multiple factors. Research suggests that talented dancers exhibit a combination of physical abilities, psychological traits, creativity, and motivation (Chua, 2014; Walker et al., 2010). Successful dancers not only demonstrate advanced technical skills but also develop strong psychosocial competencies and benefit from supportive environments that provide optimal learning opportunities (Chua, 2015). Social support from family, peers, and teachers plays a crucial role in nurturing dance talent, enhancing psychological well-being, self-esteem, and motivation (Sanchez et al., 2013). This talent development process is shaped by instrumental, emotional, and informational support from these social networks (Chua, 2015).

Several theoretical models contribute to understanding talent development. Gardner's (1983) theory of multiple intelligences and Gagné's (1985) Differentiated Model of Giftedness and Talent (DMGT) emphasize the interaction between innate abilities and environmental influences. However, these models have been critiqued for their lack of empirical support, limiting their applicability in dance education.

To address challenges in talent identification, Baum, Owen, and Oreck (2004) developed the Talent Identification Instrument (TII), which was applied during a seven-week audition process involving students from urban, low socioeconomic backgrounds. Grounded in Renzulli's (1978) three-ring model of giftedness—encompassing above-average ability, creativity, and task commitment—this instrument assessed physical skills, creativity, and motivation. The TII was later refined into the Talent Assessment Process (TAP), a multi-session approach in which evaluators collaboratively scored students based on these criteria while also forming an overall impression. In the field of dance, three core criteria have been emphasized: technical skills, motivation, and creativity (Baum, Owen & Oreck, 2004).

Creativity, a fundamental component of dance talent, is a multifaceted concept that offers insight into human behavior. It is shaped by variables such as environmental influences, individual traits, and intrinsic motivation (Amabile, 1993). While creativity is generally defined as the ability to generate original and effective outcomes (Runco & Jaeger, 2012), ongoing debates persist regarding the precise criteria for its assessment. In the context of dance, creativity is understood through a combination of cognitive, sociocultural, and post-human perspectives, incorporating elements such as creative pedagogy and multicultural influences (Chappell & Hathaway, 2019).

Within movement studies, creativity is described as the ability to produce novel solutions within the realm of physical activity (Pagona & Costas, 2008). This definition is particularly relevant to dance education, where creativity is considered a universal trait that can be expressed by individuals regardless of formal training. In young children, creative exploration fosters innovative thinking and problem-solving, even in the absence of structured techniques or predefined frameworks. This aligns with the broader goal of fostering creativity in early childhood education, though challenges remain in effectively evaluating creative movement. Pica (2008) suggests that creative movement serves as a vital medium for establishing a connection between the mind and body, which is essential for unlocking creativity.

Recent research highlights the critical role of creativity in dance education, not only as a means of enhancing artistic expression but also as a key factor in cognitive and social development. Further studies are needed to deepen our understanding of the relationship between dance talent and creativity and to refine methods for identifying and nurturing creative potential in diverse populations (Walker et al., 2010; Chua, 2014).

1.2 Children's Dance Improvisation

Dance improvisation is a unique form of artistic expression that allows children to explore and develop their movement creativity. The concept of improvisation is closely associated with spontaneity, creativity, and the absence of predetermined planning, providing opportunities for movement experimentation and the expression of individual ideas (Carter, 2000). The primary medium for improvisation

is the human body and its interaction with others, encouraging children to discover new ways of moving and engaging in cognitive exploration.

Biasutti (2013) defines dance improvisation as the art or act of creating and performing something new without prior preparation. In early childhood, improvisation manifests as play through movement, where children, with appropriate stimulation (e.g., music or material prompts), are guided toward creating their own movement expressions (Kroflič & Gobec, 1995). Dance improvisation originates from children's internal experiences and expressions. By encouraging children to use their natural movements, they are guided to explore various elements of dance, such as energy, space, and time (Kaufman & Ellis, 2007).

Improvisation in dance is not only an artistic activity but also a valuable pedagogical tool that fosters children's creative potential. When dance instructors focus solely on the repetition of movements (i.e., memorization-based learning), they underestimate the power of creative learning and the cognitive processes that can unfold within dance activities. Through improvisation, children face the challenge of creating something entirely new, stepping beyond their habitual movement patterns, and overcoming the risk of falling into repetitive routines that may limit their expression. This process demands continuous idea generation, exploration of movement possibilities, and an element of surprise, both for themselves and their observers (Carter, 2000).

A distinct value of dance improvisation lies in its ability to enable children to express thoughts and emotions beyond the limitations of verbal communication. Movement becomes a medium through which they explore their emotional states and creatively express their inner worlds. This process enriches their movement vocabulary, builds self-confidence and curiosity, and enhances their adaptability to new situations (Chappell, 2007).

Research underscores the significant benefits of dance improvisation for creativity and cognitive development. Studies indicate a positive correlation between improvisational dance and creativity enhancement, primarily due to the cognitive comprehension and exploratory skills it fosters (Wright, 2018). Dance improvisation creates a shared creative space where dancers co-create and communicate ideas non-verbally, distributing intentionality among participants (Łucznik, 2015). Expert

dance educators recognize the potential of improvisation in fostering creativity in children, highlighting its role in holistic development and education (Biasutti & Habe, 2021). The spontaneous kinesthetic responses required in dance improvisation facilitate the creative process by enabling innovative movement (Savrami, 2017).

Moreover, dance improvisation contributes to the development of motor and communication skills while promoting children's overall growth in physical, cognitive, and emotional domains (Biasutti, 2013; Pavlidou et al., 2018). It also provides insights into the relationship between consciousness and movement, potentially advancing our understanding of mind-body connections (Savrami, 2017). Collectively, these studies highlight the multifaceted benefits of dance improvisation for fostering creativity, cognitive skills, and personal development.

By emphasizing exploration and self-expression through movement, dance improvisation makes a significant contribution to the holistic development of children, offering them a unique opportunity to discover their own creative voices through physical expression.

1.3 Research Aim

In the Slovenian context, there is a lack of research focusing on the identification of dance talent in preschool children through the lens of dance improvisation.

Therefore, the aim of this study is to gain insight into the characteristics of dance improvisation in preschool children and to examine potential differences between boys and girls, with an emphasis on physical activity and movement formation. Physical activity encompasses motor skills such as coordination, strength, speed, balance, flexibility, precision, and endurance (Goodway, Gallahue, & Ozmun, 2013), all of which influence the quality of dance performance (Kostić et al., 2002; Nožinović et al., 2006; Srhoj, 2002; Uzunović & Kostić, 2005). Movement formation, on the other hand, refers to the structuring of individual movements into movement motifs, through which children express themselves in dance (Kroflič & Gobec, 1995). Both elements are fundamental components of dance improvisation, contributing to children's exploration and creative expression through movement.

2 Methods

A descriptive empirical pedagogical research method was employed. We conducted a quantitative analysis of children's dance improvisation performance, focusing on physical activity and movement formation.

2.1 Research Questions

The study aimed to answer the following research questions:

- What are the characteristics of preschool children's dance improvisation in terms of physical activity and movement formation?
- Are there differences between boys and girls in their performance of dance improvisation regarding physical activity and movement formation?

2.2 Sample

The study was conducted in 38 public kindergartens across the Savinja, Podravje, Koroška, and Prekmurje regions of Slovenia. A total of 246 randomly selected children aged 5–6 years participated, including 147 girls and 99 boys. In each kindergarten, eight children from the 5–6-year-old age group were randomly selected to take part in the study.

2.3 Measurement Instruments

For the purposes of this study, we developed and utilized an observational protocol to assess dance improvisation in preschool children. This protocol is being developed as part of a doctoral dissertation focusing on the planning and implementation of dance activities in kindergartens. The items included in the protocol were designed based on theoretical frameworks established by experts in the field of dance (Kroflič & Gobec, 1995; Laban, 2002; Zakkai, 1997).

The protocol employs a four-point Likert-type scale, with the following response categories: 1 – Never, 2 – Rarely, 3 – Often, 4 – Very often. Before its implementation, the content validity of the protocol was assessed by experts in dance education. The measurement instrument consists of 22 items, categorized into four

domains: physical activity, movement formation, use of space, and integration of dance with music.

The instrument is designed for the observation of small groups of children, specifically those aged 5 to 6 years. It is essential that all assessments reflect real-time observations of the children's performance during the activities.

2.4 Data Collection Procedure

In each kindergarten, a dance improvisation activity was conducted with eight randomly selected children from the 5–6-year-old age group. Each activity lasted approximately 15 minutes. The session began with children listening to a piece of music. Based on their experiences and interpretations of the music, they engaged in free movement creation to express their own dance improvisations. Each child was observed using the prepared observational protocol.

2.5 Statistical Analysis

The collected data were processed and analyzed using SPSS, version 24. Both descriptive and inferential statistical methods were applied. Descriptive statistics were used to summarize the fundamental characteristics of the data, including means, standard deviations, and minimum and maximum values for each variable.
To examine gender differences in dance improvisation performance, an independent samples t-test was conducted. The goal was to determine whether statistically significant differences existed between boys and girls in items related to physical activity and movement formation. Prior to conducting the t-tests, Levene's test for equality of variances was applied to assess variance homogeneity between groups. If the p-value was greater than 0.05, equal variances were assumed, and the standard t-test was used.

3 Results

3.1 Characteristics of Children's Dance Improvisation in Terms of Physical Activity

Table 1: Descriptive Statistics of Children's Physical Activity During Dance Improvisation

Items on Physical Activity	N	Min	Max	Mean	Std. Deviation
During dance, the child combines various locomotor movements (e.g., jumping, crawling, hopping, running, rolling, gliding)	246	1	4	3.12	0.856
During dance, the child uses the lower body (e.g., legs, feet, hips)	246	1	4	3.15	0.845
During dance, the child uses the upper body (e.g., arms, head, shoulders)	246	1	4	3.24	0.807
During dance, the child coordinates different body parts (e.g., arms and legs, shoulders and legs)	246	1	4	2.87	0.826
During dance, the child maintains balance (e.g., shifting weight from one leg to another, standing on one leg)	246	1	4	2.98	0.899
During dance, the child performs spins	246	1	4	3.23	0.947

Note: The scale ranges from 1 (never) to 4 (very often).

Table 1 presents the descriptive statistics for various variables related to physical activity during dance. All variables were rated on a four-point scale, where 1 indicates that the child never engages in a particular activity, and 4 signifies that the child performs the activity very frequently. The analysis reveals that children most frequently use their upper body during dance improvisation, as this item received the highest mean score (M = 3.24). This was closely followed by spinning movements (M = 3.23), suggesting that these elements are commonly observed in dance improvisation. Conversely, the coordination of different body parts, such as arms and legs or shoulders and legs, received the lowest mean score (M = 2.87), indicating that children engage in this activity less frequently. Similarly, balance maintenance (M = 2.98) appeared less commonly in children's dance improvisation.

Table 2: T-Test Results for Gender Differences in Movement Formation During Dance Improvisation

Items on Movement Formation	Gender	N	Mean	Std. dev.	Levene's Test for Equality of Variances	T-test
During dance, the child combines various locomotor movements (e.g., jumping, crawling, hopping, running, rolling, gliding)	Boys	99	3.17	0.783	F=0.822 p=0.365	t=0.809 p=0.419
	Girls	147	3.08	0.903		
During dance, the child uses the lower body (e.g., legs, feet, hips)	Boys	99	3.03	0.863	F=0.670 p=0.414	t=-1.776 p=0.077
	Girls	147	3.22	0.826		
During dance, the child uses the upper body (e.g., arms, head, shoulders)	Boys	99	3.11	0.856	F=0.107 p=0.744	t=-2.135 p=0.034
	Girls	147	3.33	0.762		
During dance, the child coordinates different body parts (e.g., arms and legs, shoulders and legs)	Boys	99	2.66	0.785	F=0.622 p=0.431	t=-3.464 p=<.001
	Girls	147	3.02	0.823		
During dance, the child maintains balance (e.g., shifting weight from one leg to another, standing on one leg)	Boys	99	2.88	0.895	F=0.042 p=0.838	t=-1.507 p=0.133
	Girls	147	3.05	0.897		
During dance, the child performs spins	Boys	99	3.07	1.042	F=2.327 p=0.128	t=-2.205 p=.028
	Girls	147	3.34	0.864		

Table 2 presents the t-test results for various variables examining movement formation and their association with gender. Before conducting the t-test, Levene's test for equality of variances was applied, confirming that the assumption of equal variances was met. In examining the ability to combine different locomotor movements (jumping, crawling, hopping, running, rolling, gliding), no statistically significant differences were observed between boys and girls ($p = 0.419$). Similarly, no significant differences were found in balance maintenance ($p = 0.133$).

However, the results indicate a tendency for gender differences in the use of the lower body (legs, feet, hips) ($p = 0.077$), suggesting that girls tend to use their lower body more frequently than boys, although the difference is not statistically significant.

Statistically significant gender differences emerged in the use of the upper body (arms, head, shoulders) in dance, with girls using their upper body more frequently during improvisation, achieving a mean score of M = 3.33 compared to M = 3.11 for boys ($p = 0.034$). A statistically significant difference was also observed in the coordination of different body parts (e.g., coordinating arms and legs), where girls demonstrated better coordination during dance (M = 3.02) compared to boys (M = 2.66) ($p < 0.001$). A statistically significant gender difference was also detected in spinning movements, where girls engaged in spinning more frequently than boys ($t = -2.205$, $p = 0.028$), with a mean score of M = 3.34 compared to M = 3.07.

3.2 Characteristics of Children's Dance Improvisation in Terms of Movement Formation

Table 3: Descriptive Statistics of Children's Movement Formation During Dance Improvisation

Items on Movement Formation	N	Min	Max	Mean	Std. Deviation
During dance, the child finds original and unusual movement solutions.	246	1	4	2.41	0.955
During dance, the child uses familiar movement patterns.	246	1	4	3.13	0.784
During dance, the child combines at least three different movement motifs and does not repeat just one.	246	1	4	2.93	0.899
During dance, the child imitates the movements of other children.	246	1	4	2.63	0.950
During dance, the child combines large and small movements.	246	1	4	2.73	0.859

Table 3 presents the descriptive statistics for the items related to movement formation during dance improvisation. All items were rated on a four-point scale, where 1 indicates that the child never engages in a particular activity, while 4 signifies that the activity is frequently present.

The analysis reveals that children most frequently use familiar movement patterns, as indicated by the highest mean score (M = 3.13). This is followed by the ability to combine at least three different movement motifs without repeating only one (M = 2.93). The item related to combining large and small movements received a mean score of M = 2.73, suggesting a moderate presence of this activity.

Imitating the movements of other children (M = 2.63) and finding original and unusual movement solutions (M = 2.41) were observed less frequently, as these items had the lowest mean scores. The standard deviations indicate relatively diverse engagement levels among children across all items.

Table 4: T-Test Results for Gender Differences in Movement Formation During Dance Improvisation

Items on Movement Formation	Gender	N	Mean	Std. dev.	Levene's Test for Equality of Variances	T-test
During dance, the child finds original and unusual movement solutions.	Boys	99	2.28	0.926	F=1.694 p=0.194	t=-1.6773 p=0.096
	Girls	147	2.49	0.968		
During dance, the child uses familiar movement patterns.	Boys	99	3.05	0.813	F=0.000 p=0.999	t=-1.376 p=0.170
	Girls	147	3.19	0.762		
During dance, the child combines at least three different movement motifs and does not repeat just one.	Boys	99	2.82	0.908	F=0.885 p=0.348	t=-1.620 p=0.107
	Girls	147	3.01	0.887		
During dance, the child imitates the movements of other children.	Boys	99	2.75	0.930	F=0.858 p=0.355	t=1.540 p=0.125
	Girls	147	2.56	0.959		
During dance, the child combines large and small movements. Items on Movement Formation	Boys	99	2.60	0.856	F=0.318 p=0.573	t=-1.985 p=0.048
	Girls	147	2.82	0.852		

Table 4 presents the t-test results for the items related to movement formation, analyzing gender differences. Before conducting the t-test, Levene's test for equality of variances was applied, confirming that the assumption of equal variances was met for all analyzed items.

The results indicate that there were no statistically significant gender differences ($p > 0.05$) for most of the items, including finding original movement solutions ($p = 0.096$), using familiar movement patterns ($p = 0.170$), combining three different movement motifs ($p = 0.107$), and imitating the movements of other children ($p = 0.125$). The mean values for these items differed minimally between boys and girls, suggesting similar patterns of engagement in these aspects of dance improvisation.

The only statistically significant difference was observed in the combination of large and small movements, where girls (M = 2.82) combined these movements more frequently than boys (M = 2.60) (t = -1.985, p = 0.048).

Overall, the results indicate that gender differences in movement formation during dance improvisation are generally small, with girls showing a slight advantage in certain aspects, such as combining different types of movement. These findings highlight the importance of individual differences rather than gender alone when analyzing dance improvisation in preschool children.

4 Discussion

The aim of this study was to address the research questions related to preschool children's dance improvisation. Dance improvisation is considered a key criterion for creativity in identifying children's dance talent (Baum, Owen, & Oreck, 1996). Therefore, we sought to examine the characteristics of dance improvisation in preschool children, with a particular focus on physical activity and movement formation. Additionally, we explored potential differences in these characteristics between boys and girls.

In the Slovenian context, there is a lack of research examining various aspects of identifying dance talent in early childhood. The findings of this study reveal several key aspects of children's movement expression, creativity, and gender differences. The results indicate that children frequently use their upper body and perform spinning movements during dance improvisation, whereas coordination and balance maintenance appear less developed. These findings align with the observations of Kroflič and Gobec (1995), who emphasize the importance of encouraging movement diversity and developing motor skills through dance activities in early childhood. The lower frequency of certain elements, such as coordination, suggests the need for targeted activities to enhance these specific movement skills. Motor abilities, including coordination, balance, strength, and flexibility, play a crucial role in the quality of dance performance (Kostić et al., 2002; Nožinović et al., 2006; Srhoj, 2002; Uzunović & Kostić, 2005). Coordination enables precise and fluid movement, balance contributes to stability, strength ensures dynamic execution, and flexibility allows for a greater range of movement. Well-developed motor skills enable dancers

to perform complex choreography and enhance the technical and expressive quality of their dance performance.

The analysis of gender differences revealed that girls more frequently used their arms, head, and shoulders, meaning that they engaged their upper body more actively than boys. Additionally, girls demonstrated better coordination of different body parts and were more likely to perform spinning movements, consistently achieving higher mean scores than boys. The findings also indicate that children primarily rely on familiar movement patterns during dance improvisation, while exploring original solutions and combining diverse movement motifs remains less prominent. This suggests the need for greater educator involvement in encouraging creative movement expression in preschool children. Research highlights the positive effects of creative movement as an approach for fostering creativity in children (Alper & Ulutaş, 2022; Cheung, 2010; Wang, 2003). Creative movement allows children to explore their own physical expression and discover new movement solutions, emphasizing spontaneity, originality, and individuality, which enables children to develop their unique movement expression in different contexts (Joyce, 1994, in Lobo & Winsler, 2006).

Based on our findings, we recommend greater integration of dance improvisation into the preschool curriculum, as it not only promotes the development of motor skills and creativity but also supports social, cognitive, and emotional skill development (Biasutti & Habe, 2021; Savrami, 2017).

5 Conclusion

This study focuses on the characteristics of dance improvisation in preschool children, with particular attention to physical activity and movement formation. Dance improvisation serves as a valuable method for identifying dance talent in children, as it enables free expression and the development of movement creativity.

The research questions aimed to analyze the characteristics of dance improvisation performance and examine potential gender differences in physical activity and movement formation. Using an observational protocol, we assessed the frequency of different movement elements and the extent to which certain physical activities were performed.

The findings indicate that children most frequently use their upper body and engage in spinning movements during dance improvisation, whereas coordination of different body parts is less pronounced. Statistically significant gender differences were observed in upper body use, coordination, and spinning movements, with girls achieving higher mean scores than boys. Additionally, the results show that children often rely on familiar movement patterns, while the exploration of original movement solutions is less prominent.

These findings provide a foundation for future research, which could further investigate the role of dance improvisation in fostering creativity and identifying dance talent in early childhood. Future studies should also explore the impact of different pedagogical approaches on encouraging children's creativity in dance. Longitudinal studies could examine the development of dance abilities over time and the role of educators and parents in promoting dance creativity. Furthermore, exploring the influence of musical and spatial factors on the quality of dance improvisation and investigating the effects of dance activities on other aspects of child development, such as social and cognitive skills, would be valuable directions for future research.

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About the authors

Ana Tina Jurgec is a senior lecturer in Dance Education Didactics at the University of Maribor's Faculty of Education. Her research field is dance in the preschool period Formerly a ballet ensemble member at the Slovenian National Theatre Maribor, she studied pedagogy and Slovenian language at the University's Faculty of Arts. With years of experience teaching ballet to children in music schools, she now imparts this knowledge to her students. Additionally, she's pursuing a PhD in Educational Sciences at the same university, specializing in preschool dance research.

Expanding Vocabulary Through the Use of Multilingual Reading Materials in Preschool Period

Barbara Bednjički Rošer, Ines Voršič
University of Maribor, Faculty of Education, Maribor, Slovenia
barbara.bednjicki@um.si, ines.vorsic@um.si

The chapter focuses on vocabulary development in preschool children exploring multilingual literary and informative reading materials, namely a literary picture book and picture dictionaries. We conducted a case study to examine the familiarity with animals, i.e. the ability to name individual animals in Slovenian, in preschool children of the second age group (5–6 years). A total of 25 children (n = 25) participated in the study: 11 with Slovenian as their native language and 14 who learn Slovenian as a second language. The study results demonstrate significant differences in the naming of selected animals between children born in Slovenia and immigrant children. A particularly disquieting finding is that children who are soon to enter school have difficulty naming animals not only in Slovenian, but also in their mother tongue.

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1 Introduction

Human communication is a conscious and deliberate social activity, and the most complete symbolic social interaction is the use of language as a composition of signs for verbal communication (Rajh, 2013, pp. 9–11), which in each individual depends on their biological developmental stage and their mental capacities, by means of which language is used as a symbolic activity. Language ability is one of the fundamental anthropogenic factors. People use language and words to express their needs, thoughts, sensations, to solve conceptual problems, to acquire knowledge and, last but not least, to use and understand linguistic elements. Hence, from the grammatical perspective (Toporišič, 2000, p. 116), words bear both factual (e.g., heart, play, yellow) and grammatical meaning (e.g., and, from), and are thus the essential part of language structure, which we refer to as the vocabulary, glossary, lexicon or even dictionary. The foundations of linguistic ability depend on cognitive and mental abilities. As they grow, expand and strengthen, so does the linguistic ability, which is so vast that it is virtually never used to its full potential. People learn new words and advance their linguistic skills throughout their lives, as language itself is in a constant state of flux. In early childhood, children acquire basic naming and grammatical elements of verbal language. The process of developing and expanding their vocabulary is then deepened throughout their secondary school education, in accordance with the curricula's didactic recommendations. Yet, since language is a highly complex living structure, constantly evolving and enriching itself, adopting new words from other languages, creating new words through systemic and non-systemic patterns of formation, and redefining familiar and established words, the vocabulary of a language can never be fully mastered, which makes the development of communicative competence a lifelong activity. It is nevertheless essential to build the appropriate foundations in the preschool years (Bešter Turk, 2011, p. 127), as children's vocabulary has been repeatedly confirmed as one of the key aspects of their speaking ability (Taylor et al., 2013) and as a fundamental predictor of reading literacy (Voršič & Ropič Kop, 2020, pp. 139–157).

1.1 Vocabulary in Preschool Period

People acquire expressive language skills gradually: first we learn to pronounce individual sounds and syllables, then we begin to use our first words, which we gradually combine into logically meaningful phrases and subsequently into

meaningful multi-word sentence forms (Rajh, 2013, p. 15). The development of a child's vocabulary begins as soon as they are born. Children have an innate capacity to distinguish voices in all languages, and about the age of 6 months they focus their attention on the specific voices of their mother tongue (Marjanovič Umek & Fekonja, 2019, p. 2). Thus, in the second half of their first year of life, children can already produce language sounds, phones, which can vary from cooing and babbling to the pronunciation of distinctive sounds (Rajh, 2013, p. 15). Children can actually recognise and understand many words even before they learn to speak. A child begins to produce their first words through voice combinations and compound forms at an average age of 12 months. They name things or phenomena that are part of their everyday environment, which is an essential characteristic of language communication. Children are similar to each other regarding their first words; they tend to talk about people they are close to and who are in their immediate environment (e.g., mum, dad), as well as about food, clothes, objects that interest them, toys, animals, and the environment in which they live. Some of their first words also pertain to social interactions (Marjanovič Umek & Fekonja, 2019, p. 10). Thus, the majority of the children's words are those used by adults that they are close to in their daily routines and activities. Children usually accompany their first spoken words with gestures (Krajnc Ivič et al., 2017, p. 62).

Most children speak their first words between the ages of 12 and 20 months. During this period, the development of vocabulary is extremely rapid, both in terms of quantity and quality. Research conducted by Bates, Marchman, Thal, Fenson, Dale, Reily, et al. (1994, in Marjanovič Umek & Fekonja, 2019, p. 2) found that infants aged 12 months can speak from 0 to 52 words, toddlers aged 16 months from 0 to 347 words, and children aged 30 months from 208 to 675 words. Results of a Slovenian longitudinal study (Marjanovič Umek et al., 2017) have indicated that between the ages of 16 and 31 months, toddlers' vocabulary increases by an average of 34 words per month and that individual vocabulary gains per month range between 6 and 51 words (Marjanovič Umek, Fekonja & Hacin Beyazoglu 2020, p. 18).

Vocabulary development research mainly points out two so-called jumps; a study by Slovenian authors (Marjanovič Umek et al., 2013; Marjanovič Umek et al., 2023, p. 11) has found that between the ages of 18 and 25 months, toddlers' vocabulary

increases on average from 79 to 256 words, and between the ages of 25 and 30 months, from 256 to 394 words.

This means that the vocabulary increases rapidly in the preschool period between the ages of 16 and 31 months (Figure 1), during which time there is significant variability in the amount, type and content of the words that children understand and speak (Marjanovič Umek, Fekonja & Hacin Beyazoglu, 2020; 2023).

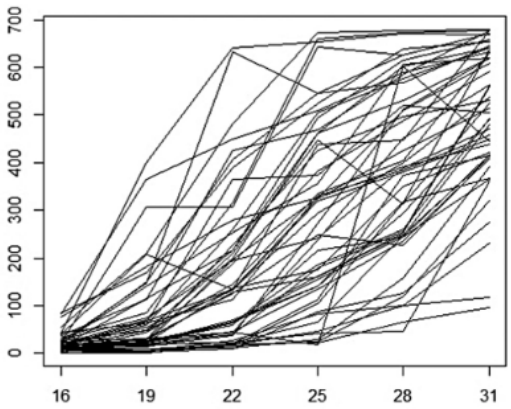

Figure 1: Individual Differences in Vocabulary Growth Rate and Vocabulary Size
Source: Marjanovič Umek, Fekonja & Hacin Beyazoglu (2023, p. 10).

Even in the early years, children's vocabulary exhibits strong development, with the range of words they understand and speak constantly increasing. Children aged five speak on average over 5,000 words, with their receptive vocabulary, which is at all ages broader than their active vocabulary, amounting to over 10,000 words. The vocabulary range in the early developmental period is one of the best predictors of a faster vocabulary development in later periods, as it provides the basis for the acquisition and learning of newer and increasingly complex words (Marjanovič Umek, Fekonja & Hacin Beyazoglu, 2020, p. 21; 2023, p. 13). A child who possesses an extensive vocabulary, comprehends its meaning, and utilizes it effectively is more likely to understand the texts they encounter, both in spoken and written forms, and to produce and compose texts with greater ease. This is due to the fact that vocabulary development is intrinsically linked to the grammatical development. In other words: language learning requires the acquisition of grammatical categories of

words in a language, and learning these categories necessitates the understanding of the syntactic roles of words (Walker et al., 2020).

Between the ages of 11 and 14 months, children use only interjections and nouns (Marjanovič Umek et al., 2016). As S. Kranjc (1996, p. 319) explains, the use of interjections is entirely expected, since this is the first linguistic phase in the speech development, a kind of transition from the so-called pre-linguistic period; the use of nouns proves that the child's speech is still very specific at this stage. New parts of speech, namely verbs, adjectives, pronouns, adverbs and articles, appear between the ages of 19 and 22 months, and the vocabulary expands to include all parts of speech around the age of 30 months (Marjanovič Umek et al., 2016), when the child also begins to include function words such as conjunctions and prepositions. The proportion of interjections steeply declines with age, while the noun remains the most frequent part of speech (Marjanovič Umek et al., 2013; Marjanovič Umek et al., 2023, p. 11–12). Thus, children initially produce one-word statements (e.g. *kitty* meaning *I see a kitty*), followed by two-word statements (e.g. *Kitty sleeps*); this means that they use words with full meaning, or words that, in their estimation, most accurately reflect what they want to convey (Krajnc Ivič et al., 2017, p. 62). Toddlers' progress in syntax learning is reflected in the addition of adjectives (e.g. *white kitty*) and locations of objects (e.g. *kitty bed*); by the age of 24 to 27 months, children can form three- or four-word sentences and their use of syntax and morphology becomes increasingly accurate (e.g. *A kitten sits on a chair*). (Marjanovič Umek & Fekonja, 2019, p. 3). When narrating a story in Slovenian, children aged three form sentences with an average of three words, children aged four form sentences with an average of 4.2 words, and children aged five form sentences containing an average of 5.3 words (Marjanovič Umek, Fekonja & Hacin Beyazoglu, 2020, p. 22; Marjanovič Umek et al. 2000, p. 22; Marjanovič Umek et al. 2020, p. 22; Marjanovič Umek et al, 2023, p. 16). In this context, large individual differences have been found to occur: in a study by Marjanovič Umek, Hacin and Fekonja (2019), children aged 5 used an average of between 4.8 and 8.7 words when narrating a story while using a picture book. Research (Bates et al., 2002) also indicates that the correlations between vocabulary breadth and word linking in sentences are stronger than the correlations between a child's age and word linking in sentences. Furthermore, several factors influence differences in vocabulary development, such as the child's characteristics (e.g. gender, age) and their living environment (e.g. parents' education, frequency of conversations, frequency of shared reading, child's enrolment in

kindergarten). A study by Hart and Risley (2003, in Marjanovič Umek et al., 2023, p. 16) found that the vocabulary of children aged 3 whose parents received mid-level education exceeded by more than 200 words the vocabulary of children whose parents received lower education. Additionally, their vocabulary fell short of that of their peers with highly educated parents by roughly 400 words. The differences in vocabulary size further increased with age. Frequent and regular reading is another particularly important factor in developing children's vocabulary and their speaking skills, as quality reading materials include vocabulary which is up to a third more extensive and varied than that used by an adult in communicating with a child. Marjanovič Umek et al. (2023) state the existence of differences in vocabulary between boys and girls, with the latter being earlier to acquire speech and having a larger vocabulary. Yet, Crawford (2001) states that interpersonal differences within each sex are greater than those between the sexes.

The cornerstone of social inclusion is the proficiency in the language of the majority population and in the language of teaching (Vižintin, 2022, p. 306). The second language or the language of the environment is the one the child learns in kindergarten and from the environment and "is the official language and/or language of public life in a particular country, learned to meet the communication needs" (Ferbežar, 1999, p. 417). For most learners, the process of learning the language of a new environment is not easy and takes a long time, but how long depends on a number of factors – proficiency in the native language, linguistic proximity of the first and second languages, the individual's language learning ability, etc. (Vižintin, 2022, p. 306). In Slovenia, Slovenian is the second language to members of the Italian and Hungarian national minorities as well as to the Roma and immigrants who arrived in Slovenia temporarily or permanently for various reasons (Rot Vrhovec, 2016, pp. 22–23). Vocabulary acquisition is very important in the learning and teaching (of Slovenian) as a second (and foreign) language (Nikolovski & Pšeničnik, 2023, p. 251), where all aspects of word knowledge have to be considered, namely the form, meaning and usage (Nation 2013, p. 49), with the early teaching of Slovenian as a second/foreign language in kindergarten requiring dedicated teaching methods and approaches grounded in the knowledge of children's development and learning in early childhood. The so-called communicative model, based on the use of language in concrete speaking situations and with consideration to contexts and contents that are appropriate and interesting to children (Marjanovič Umek et al., 2006, p. 146), is being implemented, mainly due

to important findings (Floccia et al., 2018) indicating that monolingual two-year-olds understand (on a 100-word test) on average 81.8% of words and pronounce 53.7% of them, whereas bilingual two-year-olds understand 67.9% of words and pronounce only 41.2% of them, which is statistically significantly inferior to monolinguals.

According to Cummins (2001), a child's level of proficiency in their first language is a strong predictor of their second language development; children with a solid linguistic foundation and a developed vocabulary in their first language develop better literacy in their language of instruction as they transfer their linguistic knowledge and skills to their second language; and, in terms of the child's development of linguistic schemes and mental abilities, the first and second languages are interdependent. Additionally, experiences that underpin both languages are of importance for the successful development of competence in both languages. In contrast, Goodrich, Loningan and Farver (2013, in Rot Vrhovec 2016, p. 42) caution that the vocabularies of the first and second languages are not interdependent: while children may be able to use their conceptual vocabulary knowledge and transfer it to their second language, they have to learn new words in the second language even if they already know them in the first language.

1.2 The Importance of Vocabulary Enhancement in Children Whose Mother Tongue is not Slovenian

In Slovenia, the planning of the educational process in public kindergartens follows the objectives and principles of the national document by the name of *Kurikulum za vrtce* (1999) [Curriculum for Kindergartens], which provides an expert basis for quality work, and a framework for the optimal development of each child with consideration to individual differences in development and learning. Other such documents are *Smernice za vključevanje otrok, učencev in dijakov iz drugih jezikovnih in kulturnih okolij v slovenski vzgojno-izobraževalni sistem* (2024) [Guidelines for the Inclusion of Children, Pupils and Students from Other Linguistic and Cultural Backgrounds into the Slovenian Education System] and *Smernice za izvajanje dejavnosti pri prehodu otrok iz vrtca v šolo in uvajanje učencev v prvi razred (2024)* [Activities During the Transition of Children from Kindergarten to School and the Introduction of Pupils to the First Grade]. Marjanovič Umek, Fekonja and Hacin Beyazoglu (2020, p. 21) stress that children learn new words mainly while listening to texts read by adults and while talking about various topics. It is particularly important to empower

educators for the earliest language teaching and for the use of modern didactic strategies for teaching Slovenian as a first and second language or as a foreign language. At the same time, it is crucial to monitor the child's language knowledge and progress, as well as to foster collaboration between parents and kindergarten based on inclusion and respect. Licardo and Leite (2022) conducted a study which revealed that educators in Slovenia have high regard for moral values and ethical behaviour, but that with regard to teaching immigrant children they need more support from the educational environment and government institutions, more translators and, most importantly, more didactic tools and children's multilingual literature. Similarly, a study by Skubic and Ocvirk (2024) indicates that educators recognise kindergarten as an important factor in the acquisition of Slovenian, but they expressed the lowest agreement with the statement that they have kindergarten-level guidelines for working with children whose mother tongue is not Slovenian.

Smernice za vključevanje otrok, učencev in dijakov iz drugih jezikovnih in kulturnih okolij v slovenski vzgojno-izobraževalni sistem [Guidelines for the Inclusion of Children, Pupils and Students from Other Linguistic and Cultural Backgrounds into the Slovenian Education System] (2024, p. 13) underline that children in kindergarten perceive language learning as a means of exploring life and their surroundings. The gradual acquisition and expansion of vocabulary and the development of communicative competence are of particular importance for children's easier and faster social integration, as successful communication is key to social inclusion among peers and the acquisition of new knowledge (Bednjički Rošer, 2021). Concurrently, there is a receptiveness to language acquisition in the preschool years, as children are able to fill in the gaps between recognised meanings by understanding key words, and to learn vocabulary for naming concrete reality in familiar themes and with supporting images. Pulko and Haramija (2021, p. 19–20) list a range of inclusive practices and activities to overcome language barriers, in particular artistic activities, didactic games, sports activities, communication through gestures and facial expressions, illustrative aids, etc. Marjanovič Umek, Fekonja and Hacin Beyazoglu (2023, pp. 5, 13) emphasise the importance of vocabulary for the development of other areas of speech (e.g. grammar, storytelling, communicative abilities) and of early and future literacy. Additionally, the number of words children speak is significantly related to the number of words they are able to write down later. They developed a metric tool to assess the vocabulary of children aged 2 to 7 years, namely the picture vocabulary test Slikovni preizkus besednjaka (SPB: 2–7 let)

for children aged 2 to 7 years, with a set of 27 vocabulary words (different parts of speech) within each age group. SPB: 2–7 let (Marjanovič Umek, Fekonja & Hacin Beyazoglu, 2023, pp. 19–54) is designed for individual testing, which enables reliable and objective assessment of vocabulary and identification of deviations from the normative development of vocabulary, but its usage (implementation, evaluation and interpretation of achievements) is not intended for educators due to its specialist requirements. Educators can use the early literacy rating scales *Lestvice zgodnje pismenosti – LZP* to monitor the children's speech (Marjanovič Umek, Fekonja & Hacin Beyazoglu, 2020, pp. 217–238), which enable them to monitor progress and more individualised work. To promote comprehension and learning of new words, they can use joint reading of pictographs, implement gap fill activities, activities with puppets, picture aids, illustrations, didactic games, etc. Vocabulary is a cornerstone of communicative ability and reading literacy. Its range is the best indicator of *reading comprehension* (Pečjak, 2010), although it should be acknowledged that progress also depends on planning interdisciplinary curricular activities and promoting opportunities for language use. In order to gain insight into the basic lexical vocabulary of preschool children, we conducted a study to examine their knowledge of selected animals and their ability to name them.

2 Methods

The research follows the qualitative method of scientific research in teaching. We used a case study (Vogrinc, 2008, p. 14; Mesec, 2023) focusing on the understanding and interpretation of language ability, especially the aspects of naming and orthoepy, of participants.

2.1 Research Questions

The aim of the research was to assess the recognition and the naming of animals in Slovenian, i.e. the language of instruction, using multilingual reading materials. We set ourselves the following research questions:

- Which reading material (literary or informative) will appeal more to children?
- How many animals will the children name correctly in Slovenian?
- Which animals will the children not be able to recognise in the pictures?

– Will we find differences in the range of vocabulary about animals (by gender, mother tongue) between the participants?

2.2 Participants

The study included 25 children: 15 girls and 10 boys. The research used convenience sample (n = 25); it included children of the second age group attending the preschool divisions of the Smetanova Street unit of the Ivan Glinšek Kindergarten Maribor in the school year 2024/2025. The study was conducted on Tuesday, 19 November, 2024. 16 of the participating children were from the Violica division (aged 5 to 6 years) and 9 from the Marjetica division (aged 4 to 6 years). The research included all preschool children attending kindergarten in the Smetanova unit who were born in 2019 and attended kindergarten in the year preceding the research and were therefore close to entering school. Slovenian is the mother tongue of eleven of the participating children. Fourteen children are immigrants, mostly from the former common state of Yugoslavia (six from Bosnia, one from Croatia, one from Serbia, one from Kosovo), while three are from Ukraine, one is of the Roma ethnic group and one from Syria. To them, Slovenian is the second language or the language of instruction.

2.3 Measurement Instruments

Our data collection technique consisted of individual interviews accompanied by pictures of selected animals, which also allows for the monitoring of non-verbal communication and the adaptation to the specific situation of children who cannot yet read. In the individual interviews, we encouraged children to name animals using pictures, namely illustrations of multilingual reading materials, which allowed us to examine the validity of the answers even in children whose mother tongue is not Slovenian. The onomatopoeias that clearly indicated the meaning (e.g. *kikiriki* for *petelin*) were considered in the case of immigrant children who had not yet developed (pragmatic) speaking skills in Slovenian, their language of instruction.

2.4 Data Collection Procedure

In accordance with the ethical principles of research, the data collection was conducted alongside the usage of selected multilingual (Slovenian, Albanian, English, Bosnian and Russian) literary picture book by Nina Mav Hrovat and Kristina Krhin *Posluh, jazbec gre!* (2020), informative reading materials, and picture dictionaries by Barbara Majcenovič Kline and Ajda Erznožnik: *Slovensko-srbski slikovni slovar* (2016), *Slovensko-albanski slikovni slovar* (2020), *Slovensko-ukrajinski slikovni slovar* (2018), *Slovensko-ruski slikovni slovar* (2017), *Slovensko-hrvaški slikovni slovar* (2017a) in *Slovensko-arabski slikovni slovar* (2016a). The authors also produced the following picture dictionaries: Slovenian–Italian, Slovenian–Chinese, Slovenian–French, Slovenian–Macedonian, Slovenian–English, Slovenian–German, Slovenian–Spanish, and Slovenian–Hungarian. The selected reading materials meet the literary (Haramija, 2017) and visual (Zupančič, 2017) quality criteria.

3 Results

The recognition and naming of farm animals was assessed using the picture dictionaries by Barbara Majcenovič Kline and Ajda Erznožnik (2020, 2018, 2017, 2017a, 2016, 2016a, pp. 42–43). We chose (Figure 2) seven animals, namely *pujs, kokoš, petelin, piščanec, krava, teliček* and *ovca* [pig, hen, rooster, chicken, cow, calf and sheep], assuming the children would know them, as studies (Jelenc, Slana & Groleger Sršen, 2021, p. 18; Marjanovič Umek et al., 2013) had found that in the early expressive vocabulary of toddlers, which is dominated by lexical words, especially nouns, the naming of animals is the most frequent naming, apart from the naming of persons (family members).

Additionally, Haramija and Batič (2022), in their article on picture books in the first age group, refer to picture books in the form of a depicted animal, tactile books of animal puppies, audio picture books of animal voices, books about animals with movable elements, and examples of high-quality original Slovenian picture books with animal characters. Animals (and their dwellings) also form part of the basic thematic units in the learning of Slovenian as a second and foreign language as early as in the preschool period, an example being Križ kraž (Knez et al., 2015), a textbook for the introductory learning of Slovenian as a second and foreign language for non-literate children. A separate thematic unit is dedicated to animals as entities or

phenomena that learners encounter in their daily lives, but animals also appear as part of the core vocabulary in other learning units or thematic units, such as numbers (Mira Voglar's poem *Živali jeseni*); toys (teddy bears); and food and drink (What does an elephant eat?).

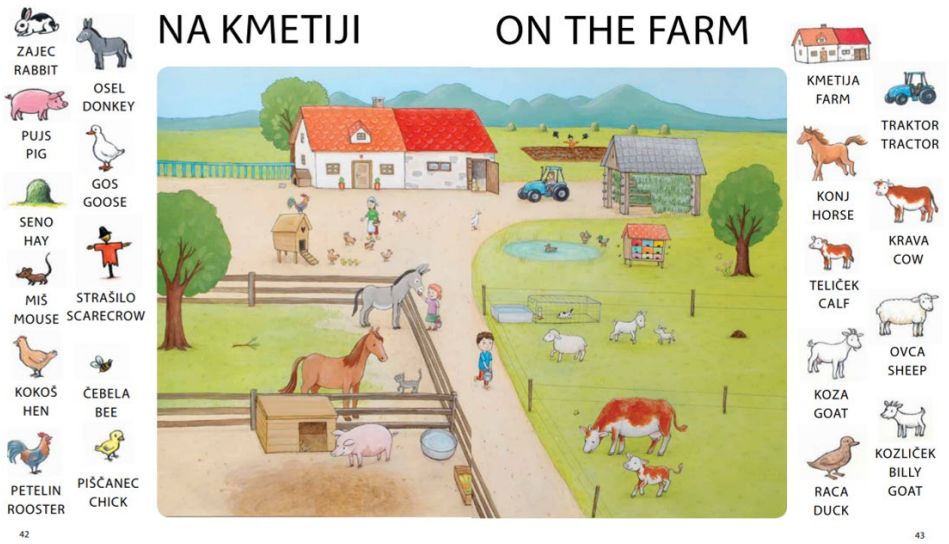

Figure 2: Animals on the farm
Source: Majcenovič Kline & Erznožnik (2025, pp. 42–43)

Table 1 displays the results of the naming of domestic animals. The results reveal that a third of the children cannot name domestic animals. Only 11 children (44%) named all the selected domestic animals appropriately, five of whom did so in a mother tongue other than Slovenian (two in Ukrainian, one in Bosnian, one in Croatian and one in Serbian).

The children most frequently failed to name the calf. We considered as correct also the diminutive form cow, namely *kravica, mala krava*. The second most problematic animal to name was the rooster, where we also considered as correct the onomatopoeic *kikiriki* used by the Roma child. In Slovenian-speaking children, we also took note of the pronunciation, which was incorrect in all ten children: they placed the accent on the letter *i* in *petelin* (dictionary SSKJ2: *petêlin -ína*). For piščanec (*chicken*), we also considered as correct the diminutive *piščanček* and the dialect *pišek*, and for *zajec* (rabbit) also the dialect *zajc*. Four answers were assessed as inadequate:

papagaj (parrot) for a rooster, *ofca* (sheep) for a calf, *koza* (goat) for a sheep and *račka* (duckling) for a chicken.

Table 1: Naming Domestic Animals

domestic animals	children's answers						total	
	naming in Slovenian		naming in the mother tongue (other than Slovenian)		incorrect/no response			
	f	f %	f	f %	f	f %	f	f %
pujs	**17**	68.0	**4**	16.0	**4**	16.0	**25**	100.0
kokoš	**11**	44.0	**7**	28.0	**7**	28.0	**25**	100.0
petelin	**10**	40.0	**4**	16.0	**11**	44.0	**25**	100.0
piščanec	**10**	40.0	**6**	24.0	**9**	36.0	**25**	100.0
krava	**14**	56.0	**3**	12.0	**8**	32.0	**25**	100.0
teliček	**11**	44.0	**2**	8.0	**12**	48.0	**25**	100.0
ovca	**10**	40.0	**5**	20.0	**10**	40.0	**25**	100.0

Table 2 displays the results of the naming of forest animals. The children named the animals using the picture dictionary (Figure 3) of the literary picture book *Posluh, Jazbec gre!* (Mav Hrovat & Krhin, 2020, pp. 24–25). The results suggest that, in comparison with the naming of domestic animals, children are more likely to name forest animals correctly, with the exception of badger, which was named correctly by only a fifth of the participating children. Only five children (20%) correctly named all the selected forest animals, including one who is not a native speaker of Slovenian (*borsuk* for badger in Ukrainian). Fourteen children (56%) correctly named the selected animals excluding the badger, including 5 children who are not native speakers of Slovenian.

Table 2: Naming forest animals

Forest animals	Children's answers						total	
	naming in Slovenian		naming in the mother tongue (other than Slovenian)		incorrect/no response			
	f	f %	f	f %	f	f %	f	f %
jazbec	**4**	16.0	**1**	4.0	**20**	80.0	**25**	100.0
polž	**17**	68.0	**2**	8.0	**6**	24.0	**25**	100.0
jež	**16**	64, 0	**3**	12.0	**6**	24.0	**25**	100.0
zajec	**14**	56.0	**4**	16.0	**7**	28.0	**25**	100.0
veverica	**14**	56.0	**3**	12.0	**8**	32.0	**25**	100.0
lisica	**14**	56.0	**3**	12.0	**8**	32.0	**25**	100.0

Children were most likely to give no name to badger, which was followed by fox and squirrel. Four answers were assessed as incorrect: *veverak* (squirl) and *vuk* (wolf) for badger, *kengur* (cangaroo) for rabbit and *sovica* (owlet) for fox. In the result analysis we also deemed as correct all of the used diminutives—*ježek, zajček, veverička, lisička* and *polžek*—as they unambiguously express the semantic understanding or the adequacy of the naming of the animals.

Figure 3: Forest animals
Source: Mav Hrovat & Krhin (2020, pp. 24–25).

In the pronunciation of two children, we also observed typical articulation errors (dyslalia) or incorrect pronunciation (difficulty articulating sounds and swapping them) – *zajsek, veverisa, beberička.* Speech-language pathologists recommend that parents bring their child[1] to a medical consultation after the child's first three years of age, if they notice any deviations in the child's articulation. Additionally, numerous didactic games are available to educators to encourage correct pronunciation of

[1] https://www.gingotalk.com/blog/tag/artikulacija/ (accessed on 22 December 2024)

sounds (such as Keršič & Steiner, 2000; speech therapy fictional tales,[2] talking games,[3] Nikisch, 2018).

Table 3 displays the results of the naming of zoo animals. The results indicate that the animal most often named correctly by the children was the elephant (92%) followed by the monkey (88%), the snake, the shark and the zebra. All the selected animals (Figure 4) were named correctly by seven children, three of them in a native language other than Slovenian.

Table 3: Naming Zoo Animals

Zoo animals	children's answers						total	
	naming in Slovenian		naming in the mother tongue (other than Slovenian)		incorrect/no response			
	f	f %	f	f %	f	f %	f	f %
zebra	17	68.0	0	0	8	32.0	25	100.0
elephant	21	84.0	2	8.0	2	8.0	25	100.0
snake	16	64.0	5	20.0	4	16.0	25	100.0
monkey	15	60.0	7	28.0	3	12.0	25	100.0
shark	14	56.0	6	24.0	5	20.0	25	100.0
rhinoceros	7	28.0	2	8.0	16	64.0	25	100.0
kangaroo	11	44.0	4	16.0	10	40.0	25	100.0

The children most often failed to name the rhinoceros and kangaroo. We have also considered as correct the name *šark* for the shark and *deževnik* (earthworm) for the snake (due to its distinctive colour in the illustration). The answers that were considered incorrect were: *krokodil* (crocodile), *delfin* (dolphin) and *kit* (whale) for shark (morski pes), *nilski konj*, *povodni konj* (hippopotamus) and *dinozavrus* (dinosaur) for rhinoceros and *zeka* (rabbit) for kangaroo. In Slovenian-speaking children, we also took note of the pronunciation, as they all incorrectly pronounced the word *pes* (dog), namely with the wide *ê* (dictionary *SSKJ2*: pès psà). Dyslalia was again observed in two children's pronunciations, namely those of the words *kaca, kasa* (snake), *opisa* (monkey) and *motni pes* (shark).

[2] https://www.lahkonocnice.si/zbirke/serija-logopedskih-pravljic (accessed on 22 December 2024)
[3] https://vrtec-litija.si/wp-content/uploads/2021/02/ZA-STARSE-Govorne-igre-za-krepitev-delovanja-govornega-aparata.pdf (accessed on 22 December 2024)

Figure 4: Zoo animals
Source: Majcenovič Kline & Erznožnik (2025, pp. 50–51).

We should mention in particular the girl from Syria, who did not speak or name anything at the time of the research. Her teacher explained that she was just starting kindergarten, as her family had recently moved to Slovenia. Similarly, a boy from Bosnia also did not speak, but pointed to the elephant, the snake and the shark, which suggests that he likely recognised these animals, but was just starting kindergarten, did not speak much, and did not name the animals even in his mother tongue. It also bears stressing that we found significant differences in the size of the vocabulary regarding animals among the participants, especially in terms of sex of the participants and their mother tongue. Apart from the Syrian girl and the Bosnian boy, not a single animal was named correctly by the Roma boy, who used the onomatopoeic *kikiriki* for the rooster, said *mleko* (milk) when observing a cow, and stated *I don't know* for the rest of the animals. When we named the animals for him, he only pointed correctly at the elephant, the monkey and the zebra. A similarly modest vocabulary regarding animals was observed in the case of a girl whose mother tongue is Albanian. She could only name individual zoo animals (zebra, elephant, monkey, shark) and a sheep in her mother tongue. Slovenian-speaking children, especially the girls, were the most successful in naming the animals. Although we expected the children to easily name all the animals, the results reveal that they do not know all the domestic animals, especially the names for the males,

females and offspring of each of the animal species (e.g. *hen, rooster, chicken; cow, bull, calf,* etc.). A comparative analysis of the selected vocabulary regarding animals reveals notable differences between the children from Bosnia and those from Ukraine, the latter naming almost all animals in their mother tongue, which aligns with the teacher's observation that their parents engage more often with the kindergarten, attend kindergarten events and take courses of Slovenian.

4 Discussion

Provision of education to linguistically and culturally heterogeneous groups of children is a challenging task for educators, as they strive to create an effective and supportive learning environment. Skubic and Ocvirk (2024) write that many parents want to raise multilingual children, as children have the capacity to learn more than one language, and doing so allows them later (e.g. at school) to take advantage of learning opportunities, participate in social life and develop a sense of belonging to their environment. García (2008 in Skubic & Ocvirk, 2024) emphasises that in order to work in multilingual units, educators should possess linguistic knowledge, knowledge about languages, teaching knowledge and sociocultural understanding.

Our study results demonstrate significant differences in the naming of selected animals between children born in Slovenia and immigrant children, a particularly disquieting finding being that children who are soon to enter school have difficulty naming animals not only in Slovenian, but also in their mother tongue. This confirms the findings of several studies (e.g. Hart & Risley, 1995): in formal education, which strives for equity for all children in the education system, it is revealed that the home environment significantly influences their reading literacy. This yields a significant insight that a child can only comprehend (in a language they understand) what they have already had certain experiences of: what they have encountered in their life, seen, heard, touched, and regarding which they have certain ideas or conceptual structures /.../" (Rutar, 2009, p. 67).

Only five of the preschool children (20%) correctly named all 20 animals: four girls in Slovenian and one girl, whose first language is not Slovenian, in Ukrainian. By contrast, the results demonstrate that the Slovenian-speaking children were considerably more successful in recognising animals, naming between 14 and 20 animals. The majority of their incorrect answers or *I don't know* statements was

recorded in the category of domestic animals. Children to whom Slovenian is the language of their environment, and not their mother tongue, were less successful in naming the animals (from 0 to 12 animals), with the exception of the Ukrainian children (13, 18 and 20 animals), who were the only children whose level of animal naming ability was comparable to that of the Slovenian-speaking children.

The children had the most difficulty recognising the badger, which was named by only 5 children (4 girls and 1 boy), 80% of the answers were incorrect or the children answered with *I don't know*. The second most difficult to name was the rhinoceros, with a notable 64% error rate, followed by the calf with 48% error rate and the kangaroo with 40%. Educators can also use didactic games (e.g. Where do animals live?, 2020; Junior Alias, 2021) and picture books (e.g. Algarra & Bonilla, 2017; Babin & Tisserand, 2022) to help children to become familiar with animals and consolidate their naming.

The Eurydice network (European Commission, 2020, 294–295) warned in a review of European education systems that the gap in reading literacy between the children born in Slovenia and the immigrant children is one of the largest in the EU, while the observation that the achievements of immigrant children tend to be lower than those of the native-born children is also demonstrated in our study as well as in the results of other studies (OECD 2015, Strand 2014).

To expand vocabulary, as well as to acquire and consolidate language patterns in Slovenian, educators can use the didactic tool *Slika jezika* (Knez et al., 2021), which consists of 1882 picture cards organised into 18 thematic sections. The accompanying handbook offers a variety of suggestions for activities or games with cards, which children can name, sort into various categories (e.g. animals, occupations, family), describe, put in sequences, discover opposites (e.g. *moker–suh, vesel–žalosten*), etc.

In preschool children who are not yet literate, vocabulary can also be developed with the help of didactic materials by Mihaela Knez, Matej Klemen, Tjaša Alič and Damjan Kern (2023, 2019), which rely on a communicative approach and can be tailored by educators to the needs and linguistic abilities of the children in the group. A large part of the activity in the 12 thematic sets (animals, clothes, colours, toys, food, etc.) is aimed at learning vocabulary or developing the naming ability with the

aid of pictures and various language-learning games. To motivate, induce relaxation, listen and experience the language, the authors suggest the usage of songs accompanied by written lyrics and notation, included in the educator's handbook. The latter also contains general didactic recommendations and examples of joint activities. All materials and audio recordings are accessible on the website of the *Centre for Slovene as a Second and Foreign Language*[4]. Activities can also be supplemented and vocabulary reinforced with online *interactive materials*[5] (e.g. memory games, find a pair, listen and choose).

We conducted individual interviews for our research in the book corner of the children's main playroom, while the other children played. We asked each child to name for us the animals in the book that they liked best. We expected children to be more likely to choose a literary picture book, given that the production data by type of material indicates an 80% to 20% ratio in favour of such books compared to educational and informative books (Haramija, 2022b). However, the children's choices were surprising; 16 (64%) of the children initially opted for a visually appealing picture dictionary featuring illustrations by Ajda Erznožnik.

Another tool designed for a playful approach to language teaching to kindergarten children is an early Slovenian learning handbook by Martina Šolc and Majda Kaučič Baša: *Moj dan v vrtcu* [*My Day in Kindergarten*] (2021). This modern didactic material enables the teachers to help the children learn vocabulary and communicative patterns in 9 units, thematically relating to individual spaces in the kindergarten (playroom, dining room, wardrobe, toilet) and with greetings, colours, numbers, shapes, antonyms, all part of the life and operation of a kindergarten unit. To help expand vocabulary, the handbook presents examples of speaking games, which are among the most frequently used vocabulary expansion methods by kindergarten teachers, namely counting games; riddles and similar games; fast speaking games; phonological, lexical and syntactic speaking games; speaking games including movement; and acting games. The handbook also provides a vocabulary and speech pattern table for descriptive assessment and ongoing monitoring of the children's progress and achievements in language learning.

[4] https://centerslo.si/za-otroke/gradiva/gradivo-za-neopismenjene-otroke/kriz-kraz/ (accessed on 22 December 2024)
[5] https://cs.ijs.si/tools/rpus/krizkraz/index.html (accessed on 22 December 2024)

The projects DEAL – Development of Literacy and Language Learning for Disadvantaged Young Learners[6] in DECODE[7] – DEveloping the CognitivE Potential of Preschoolers from Disadvantaged Backgrounds have produced two collections of good practice examples that provide comprehensive methodological support for educators, with access to a variety of activities in four languages. The learning and teaching of Slovenian as a second or foreign language is framed in an intercultural and multilingual context in the handbook *Z drobnimi koraki v slovenščino* (Baloh et al., 2021), which also focuses on the development of intercultural competences and sensitivities of educators. Excellent didactic materials for expanding vocabulary in preschool children are also always available in children's periodicals (*Cicido, Ciciban, Zmajček*). Additionally, educators can use didactic aids such as *ABC cards* (Grginič, 2009), storytelling cubes *Rory's Story Cubes* (2020), etc.

Vocabulary building can also be thematically planned by kindergarten teachers alongside quality reading materials, especially picture dictionaries (e.g. Majcenovič Kline & Erznožnik, 2020; Wieker & Štrancar, 2022), pictographs (e.g. Hanuš & Bartolj, 2024; Kosec & Komadina, 2023; Remškar & Kočevar, 2024; Sokolov & Šubic, 2024; Štefan & Reichman, 2024), and informative and literary picture books, especially multilingual picture books with accompanying picture dictionaries (e.g. Hanuš & Manček, 2020; Hanuš & Zavadlav, 2011, 2010; Mav Hrovat & Krhin, 2021, 2020). After reviewing bilingual and multilingual picture books, Haramija (2022a) states that in terms of literary type, most of them are realistic short fiction texts with a child protagonist, which is expected, as it is particularly the everyday events and important events (e.g. holidays) in a child's life that enable the basic vocabulary that they acquire in the preschool period (e.g. food, Bednjički Rošer, 2024). There is also some fantasy short prose, especially tales. Grosman (2010, p. 147) notes that multilingual picture books are an invaluable aid for learning Slovenian and for linking one's mother tongue with Slovenian, and that each can make an important contribution to family reading and to language preservation.

[6] https://project-deal.eu/sl/naslovna-3/ and https://project-deal.eu/sl/rezultati-2/ (accessed on 22 December 2024)
[7] https://decode.raabe.cz/wp-content/uploads/2024/05/RA-Prirucka-Decode-SLO-w161-final.pdf (accessed on 22 December 2024)

5 Conclusion

In this chapter, we focused on vocabulary development in preschool children alongside the usage of multilingual literary and informative reading materials. Using a literary picture book and picture dictionaries, we assessed the recognition of animals, i.e. the ability to name individual animals in Slovenian, in preschool children aged 5 to 6 years, who were approaching their entry to primary school. Among the 25 children who participated in the study, there were 11 children whose mother tongue or first language is Slovenian, and 14 immigrant children to whom Slovenian is a second language, the language of the environment or the language of instruction.

We selected the semantic category of animals due to their significance in early vocabulary development. At this stage, toddlers' speech primarily consists of interjections (mimicking the sounds of animals) and nouns, with animals being among the first entities they tend to name, alongside familiar people. Also very common in the first age group are picture books with illustrations of animals, original picture books featuring animal characters, tactile books about animal offspring, and animal picture books with movable elements, flaps. As part of the basic entities or phenomena that children encounter in their daily lives, animals also form part of the basic vocabulary in the introductory learning of Slovenian as a second (and foreign) language as early as in the preschool period.

Only five of the preschool children (20%) correctly named the selection of 20 animals from the basic lexical vocabulary. Four children named the animals in Slovenian and one, a non-native speaker of Slovenian, in Ukrainian. However, the results show that the children whose mother tongue is Slovenian, especially the girls, were more successful in recognising animals. Children, to whom Slovenian is not their mother tongue, but the language of their environment, were less successful in naming the animals. The study results demonstrate significant differences in the naming of selected animals between children born in Slovenia and immigrant children, a particularly unexpected finding being that children who are soon to enter school have difficulty naming animals not only in Slovenian, but also in their mother tongue.

Vocabulary is the foundation for the development of the speaking ability, while its volume is also the best indicator of reading comprehension. Differences in vocabulary size of preschool children can have a significant impact on their future educational success. Early and systematic vocabulary development supported by adequate approaches grounded in the knowledge of the child's development and learning are crucial for their later academic and personal success. Vocabulary expansion, especially with the aid of multilingual reading materials, opens up new possibilities for further research as well as for the development of teaching approaches in child-friendly and engaging contexts and content.

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About the authors

Barbara Bednjički Rošer is a lecturer at the Department of Early Childhood Education, Faculty of Education, University of Maribor. Her research focuses on the study of reading literacy and the didactics of language education in the preschool period.

Ines Voršič is an assistant professor at the Department of Elementary Education, Faculty of Education, University of Maribor. Her research work is focused on the Slovenian language, especially its lexicology and the development of children's linguistic abilities.

Classroom Design as a Way of Motivating Students for Artistic Activities

Janja Batič,[1] Petra Lebar Kac[2]
[1] University of Maribor, Faculty of Education, Maribor, Slovenia
janja.batic@um.si
[2] Primary School Janko Padežnik Maribor, Maribor, Slovenia
petra.lebar-kac@guest.arnes.si

In this chapter, we present the results of a case study that we conducted to discover how the equipment and space of a design in a universal classroom can encourage students' spontaneous artistic expression. The study included fifth-grade students and their generalist teacher. In the 2022–2023 school year, pupils were offered an art station that included various art materials and art challenges. We aimed to determine how students would utilize the space for artistic expression, their approach to selecting art materials, and their attitude toward art activities outside of art classes. Data were collected by analysing the teacher's observation diary, photographs of the art works, and student surveys. The results showed that the art station was very well received by the students and that the most popular material for modelling was clay. Spending free time with friends was also a very important aspect of the art station.

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1 Introduction

Researchers' interest in children's artistic expression dates back to the 19th century and coincides with the emergence of public education in Europe and America (Efland, 1990). Under the influence of the tendencies of modern art, in the 20th century admiration for the artistic expression of foreign cultures increased, and the interest in children's artistic expression also grew. The first scientific debates on the artistic development of children and progressive ideas about art education emerged around this time, but they were suppressed by fascism and World War II. Two important directions can be observed; the first has a starting point in the Bauhaus movement, and the second has its starting point in the work of Herbert Read (Karlavaris, 1991). Based on the Bauhaus movement, many art education experts shifted their concepts from spontaneous and expressive artistic expression to rational systematic learning and mastery of visual language. They proposed the idea that art design can be learned because students can learn certain laws of art theory and then apply them in their art work. This concept was significantly anchored in art pedagogical practices. Another concept, more characteristic of the United States and Great Britain, is based on Read's (1945) work *Education Through Art*. The idea behind this work is that art has such a strong humanistic potential that it can help educate a modern, free, and creative person. This concept significantly expanded the objectives of art education, which had previously been focused on narrow professional aspects (Karlavaris, 1991). As a result, the International Society for Education Through Art (InSEA) was formed; it was officially created, with the adoption of its constitution, at the first General Assembly in Paris in July 1954. The 2018 InSEA Manifesto highlights the various aspects of visual art education, including, among others, the importance of creative verbal and non-verbal communication skills, the importance of making art alongside learning about art, the development of visual literacy and other transferable skills, and the importance of visual art education, which enables students to better understand themselves and others and contributes to students' well-being . InSEA's vision of 2050: Futures of education (Coleman et al., 2021, pp. 1–2) emphasises the importance of drawing, which is 'a natural and universal human activity, one that is about exploring the world, investigating, communicating, and understanding' and identified the following important areas: decolonising learning; collaborative and participatory co-designed learning; innovative learning spaces; and creativity and imagination. This document also states that

> The concept of the classroom will be envisioned to be more like a studio. These studio spaces, which may be mobile, will be filled with opportunities for exploring the world and interrogating complex problems. Innovative learning spaces will cultivate artistic inquiry with access to a variety of materials, play-based objects and artefacts. Nonetheless, it will be important for learners to have a separate physical structure, space, and time for collective learning as a permanent, sustainable and open structure. (2021, p. 6)

There is a significant difference between studio classrooms and ordinary classrooms. In studio classrooms, the space is set up 'to promote work-flow, there is sometimes music playing to create a mood and to sustain and/or modulate students' energy, and students are usually absorbed by handling (often messy and sometimes complex and even dangerous) materials and tools' (Hetland et al., 2013, p. 15). The studio classroom should be organised in such a way that it allows easy access to art materials, storage of art works, changing the layout of furniture according to the tasks set to stimulate interest in learning and creating, and so on (Hetland et al., 2013; Lancaster, 1990). According to Ellis (1998), it is the use of various materials that allows students to explore freely, test their ideas, and solve art problems in a creative way while at the same time also providing enough room for their personal expression and creativity. The studio space or classroom should not be too clean and tidy, because this can discourage the teacher from offering more challenging art materials to younger students (e.g. paint), and at the same time it should not be untidy and poorly organised (Barnes, 2015). Hickman (2005, p. 42) compared a classroom with a work of art and stated that 'art classrooms are complex and multi-layered; it is up to the art teacher to ensure that the layers are meaningful and the activities that take place are worthwhile with due regard for reflection'.

The question arises as to which pedagogical approaches might correspond to this idea of studio art education in elementary school. One of the approaches to teaching fine art, in particular, emphasises the importance of space. This approach is called teaching for artistic behaviour (TAB); it is learner-centred, gives students a structure for independent studio work, and allows teachers to replicate an authentic artistic experience for students (Douglas & Jaquith, 2018). The teacher helps students do what artists do: play with material; come up with their own ideas; change ideas; consult others (e.g. classmates); take risks in their work and abandon failed experiments; use art materials in traditional ways and/or in purely individual ways; combine art fields; express themselves through their work; and communicate their ideas and beliefs (Douglas & Jaquith, 2018). Studio centres in TAB classrooms offer

students the opportunity to work with different art materials and provide access to multiple choices; also, 'classroom space is organised around these hubs, complete with essential materials, tools, and resouces' to support students' learning and creative expression (Douglas & Jaquith, 2018, p. 7). Studio centres in art classrooms can enhance the implementation of differentiation strategies that teachers use to tailor instruction for diverse student needs, especially for gifted students (VanTassel-Baska et al., 2020).

As we can see, space plays an important role in the implementation of choice-based art education lessons. The shape and organisation of the space dictates the students' behaviour, their expectations, and their motivation to work. Children must be able to move about the classroom, gathering materials and tools (Douglas & Jaquith, 2018). As Lawson (2001, p. 15) noted, 'The space that surround[s] us and the objects enclosing that space may determine how far we can move, how warm or cold we are, how much we can see and hear, and with whom we can interact'. Space in connection with artistic expression can have a significant impact on people's well-being or, as Cannatella (2015, p. ix) observed, 'How art makes us feel shouldn't be taken lightly bearing in mind how much it can affect our human conduct in the world'.

In elementary school, art activities occur in several forms. They are primarily related to the teaching of fine arts and the realisation of set learning objectives. Art activities are also an important part of cross-curricular teaching and learning. At the same time, they can play a central role in ensuring students' well-being: 'Arts activities can involve aesthetic engagement, involvement of the imagination, sensory activation, evocation of emotion and cognitive stimulation' (Fancourt & Finn, 2019, p. 4). Art activities provide students with a non-verbal medium to express their emotion and can act as a form of therapy, given that art materials 'can evoke feelings in the person using them' (Hogan, 2014, p. 12). There are some parallels between art education and art therapy – among others, Dunn-Snow and D'Amelio (2000) mentioned similarities between the therapeutic and creative processes and empathic conversations with students. They also noted that art activities 'that bring pleasure and a measure of safety can also reveal children's potential to adapt, cope, and thrive' (Dunn-Snow & D'Amelio, 2000, p. 52).

Art activities can also play an important role in students' social and emotional learning. By researching the works of artists, and by doing their own art activities, students can develop different competences relating to the following dimensions: self-awareness; self-management; social awareness; relationship skills; and responsible decision-making (Irman Kolar et al., 2020). Incorporating art activities into free play during recess in elementary school can be a valuable way to support children's holistic development; as Keeler (2015, p. 21) pointed out, recess 'can be a place for creation, collaboration, construction, and rich social engagement'.

Art activities in upper classes of elementary school usually take place in specialised art classrooms with the appropriate equipment and accessories. In the lower classes of ekementary school, art classes take place in the universal classroom. In the first three years of elementary school in Slovenia, and especially in the first grade, stations for various activities are often present. In the fifth grade, there are usually no additional stations in the classrooms. If the art is taught by a specialised art teacher, classes usually take place in a designated art classroom. However, if the lessons are conducted by the generalist teacher, classes usually take place in the universal classroom, and they usually do not enable students to gain rich experience by exploring different art materials and tools. The purpose of the research is to examine possibilities for unguided artistic expression among students outside of formal art classes, specifically during recess and transitions before or after class in the universal classroom.

2 Methods

2.1 Research Questions

We were interested in the unguided artistic expression that takes place outside of class (during recess and before or immediately after class) and posed the following four research questions:

To what extent will students use the offered space for artistic expression?

How will they approach the free selection of art materials?

What will be the attitude of students toward art activities outside of art education classes (during recess)?

How do students imagine their ideal classroom?

2.2 Participants

Twenty-one fifth-graders (12 male and 9 female) and their teacher were included in the survey.

2.3 Measurement Instruments

In the 2022–2023 school year, we offered students an art station that was intended for artistic expression outside of art education (especially during recess). A variety of materials and accessories were placed in that part of the classroom, along with various artistic challenges.

2.4 Data Collection Procedure

We designed a case study to examine how the equipment and layout of spaces in a universal classroom can encourage students to spontaneously express themselves. We followed the students for 8 weeks and collected data by analyzing the teacher's observation diary, photographs of the resulting artworks, and surveys completed by the students.

3 Results

3.1 Art Activities During Recess

The students noticed the differently arranged station of the classroom. They were interested in what they could do in the art station. The teacher informed them that they could make whatever they wanted from the materials offered. In doing so, she set the condition that they clean up after themselves at the end. During the first week, the students went to the art station during each recess, collected different materials, and took them to their desks. They understood that this was a free-time

activity; only one student asked the teacher if he could engage in an art activity during class. In the first week, the students used the following materials the most:

- veneer,
- coloured sticks,
- paper straws, and
- buttons.

Among the products, architectural models (Figure 1, Figure 2) and greeting cards (Figure 3) appeared to the greatest extent (in the first week it was Valentine's Day, and four female students designed greeting cards for their mothers during the recess in the art station).

Figure 1: Student's artwork
Source: own.

Figure 2: Student's artwork
Source: own.

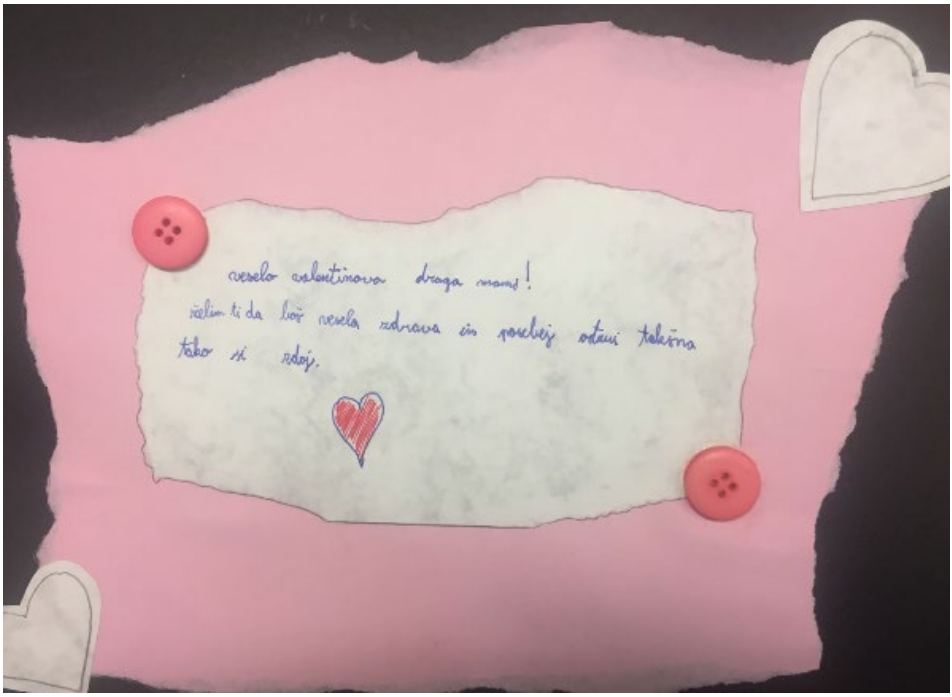

Figure 3: Student's artwork
Source: own.

In the second and third weeks, the students had less time to play with art materials because of other activities (festival, school events, a sports day). A few students asked the teacher for additional art materials (paper straws and liquid glue). The teacher noticed that, in the second week, fewer students stayed in the art station than in the first week, the students were mainly engaged in completing architectural models (Figure 4, Figure 5). On Wednesday, the students asked the teacher if they could exchange the reading recess for creative play with art materials, but the teacher did not allow it because of a prearranged agreement at school that everyone reads on Wednesdays during recess.

Figure 4: Student's artwork
Source: own.

Figure 5: Student's artwork
Source: own.

In the third week, the students realised that there was also clay in the art station. Clay had not yet been used by the students in this school year, and all the students who were present in the school in the third week (18 students) wanted to work with clay. They approached the work very spontaneously; through play, they independently discovered the characteristics of the material. The teacher noticed that after the initial game (pounding the clay, throwing the clay against the table), one group of students started to form simple shapes (Figure 6, Figure 7), while the other group spent the time during the recess by kneading the clay, pressing it, and talking to classmates. The teacher had the most problems and reservations when students were using clay. This was because she always used clay in a very planned and guided way in art classes: she first introduces working with clay to the students through the method of direct learning of art techniques, and only then does the students' independent work follow.

Figure 6: Student's artwork
Source: own.

Figure 7: Student's artwork
Source: own.

This time, however, the focus was on the independent research of art materials. Quite a few students found out, while playing with art materials, that the clay product falls apart when water is used excessively, that the pieces that are not put into a plastic bag in time dry out, and so on. Because there was a lot of interest in working with clay, the next day the teacher gave the students some guidelines for working with the material, and then the work went more smoothly.

During the fourth week, about seven students stayed in the art station, and their work went well. They made shapes out of clay, with some asking for wooden sticks to help them in their task.

After the end of the first month, we used a questionnaire to check students' attitudes towards art activities. First, we were interested in whether the students had made any art products in their free time at school. Fourteen students made two or more art works, six students made one, and only one student did not create any work of art. We also wanted to find out whether the students were satisfied with their art work. Nineteen students answered that they were satisfied with some of their products; only two students did not express satisfaction with their products. Ten out of 19 students also wrote which artwork they were most satisfied with. Five students mentioned a clay product (e.g. clay cat, clay marmot, other clay sculpture). Three students mentioned the architectural model (e.g. swing, house). One student pointed out a greeting card for his mother, and one student wrote down a car.

In addition, we were interested in whether, during this time, they had tried to do similar art work at home in their free time. Most students (18) wrote that they worked on art only in school, while three students said that during this time they expressed themselves artistically at home as well.

Furthermore, we wanted to know what the students liked the most about the art station. We sorted their responses by frequency of occurrence:

- We can create there (7 students)
- Using clay (5 students)
- There are a lot of different materials (4 students)
- We can do what we want (2 students)
- Drawing (2 students)
- Everything (1 student)

We also asked the students what materials they would like to work with but that are not currently in the art station. According to the frequency of the material, we got the following responses:

- Linoleum (7 students)
- A tree (3 students)
- Thicker sticks (2 students)
- Painting canvases and paints (2 students)

The following materials appeared only once: string, watercolour paints, crepe paper, glass, modelling clay, and Styrofoam. One student wrote that he did not want anything. Linoleum was an unexpected answer. The teacher explained that during class they did linocuts, which they really liked and wanted to continue it in the art station. Of course, this was not possible because it is a demanding technique for which the presence of a teacher is mandatory.

Finally, we were curious to know whether artistic expression is part of the students' leisure activities at home. We asked them whether they also express themselves artistically at home and, if so, what materials they use. Almost half of the students (n = 10) said they did not engage in art activities at home. Other students stated that they draw (n = 5); design products from clay, cardboard, paper, or wood (n = 3); paint on canvas (n = 2), and design with glitter (n = 1).

Figure 8: Cards with art challenges
Source: own.

After 4 weeks, the art station was complemented by art challenges that were printed on cards (Figure 8). Whoever wanted to could take a card and try to draw what the instructions stated (e.g. draw a door leading into space, draw a cross between a pear and a fish with one stroke of a pencil). All other materials were still available in the station.

After the end of the second month, we again checked the students' attitudes towards art activities and the art station. We asked them whether they had used the prepared cards as an art challenge and, if so, whether they liked them. Just over half of the students ($n = 11$) used the cards for the art challenge, and everyone liked the activity offered.

The students were also asked which of the activities that took place throughout the entire period in the art station would they remember the most. Here, clay came first. Almost half (10) of the students remembered the statue or architectural model of clay the most ; they also mentioned making shapes with wooden sticks (2 students), drawing an insect (1 student), a swing made of different materials (1 student), and working with buttons (1 student).

Additionally, we asked them to describe their experience of exploring the different art materials in the art station. More than half of the students (12 students) responded. Two students wrote that they had fun and two said that they felt happy. Other answers appeared only once: 'super', 'beautiful', 'pleasant', 'relaxed', 'hard to describe', 'excellent', 'interesting'.

Our next questioned concerned what the students enjoyed most about the art station. Eleven students responded, more than half of whom answered this question wrote that they enjoyed being able to work with friends (6 answers; Figure 9). The other answers appeared only once: 'whenever the teacher gave new clay'; 'when I researched the materials'; 'when I created on my own'; 'when I created'; 'when I created with paper'.

Figure 9: Socialising with friends during an art activity
Source: own.

With the next question, we checked to see whether students had ever felt uncomfortable in the art station. Most students (17) wrote that they never felt uncomfortable. Two wrote that they were uncomfortable when it was crowded. Other answers appeared only once: 'when it was loud', 'when I realised there were no straws'.

3.2 Architectural Sketch of an Ideal Classroom

In the end, we were interested in what students' ideal classroom would be, what special stations they would have. Students were able to express their ideas in words and sketches. They wrote that they would love to have the following in the classroom:

- reading station (4 answers),
- sports station (3 answers),

- sofa (3 answers),
- garden station,
- music station,
- animal station,
- air conditioning, and
- that the classroom should be larger.

Fourteen students also presented their answers in sketches. We analysed the sketches, taking as a point of view the size of the space that students set aside for individual classroom activities.

In the first group, we included six sketches, from which it is clear that the students devoted almost half of the entire space to different activities (Figure 10, Figure 11).

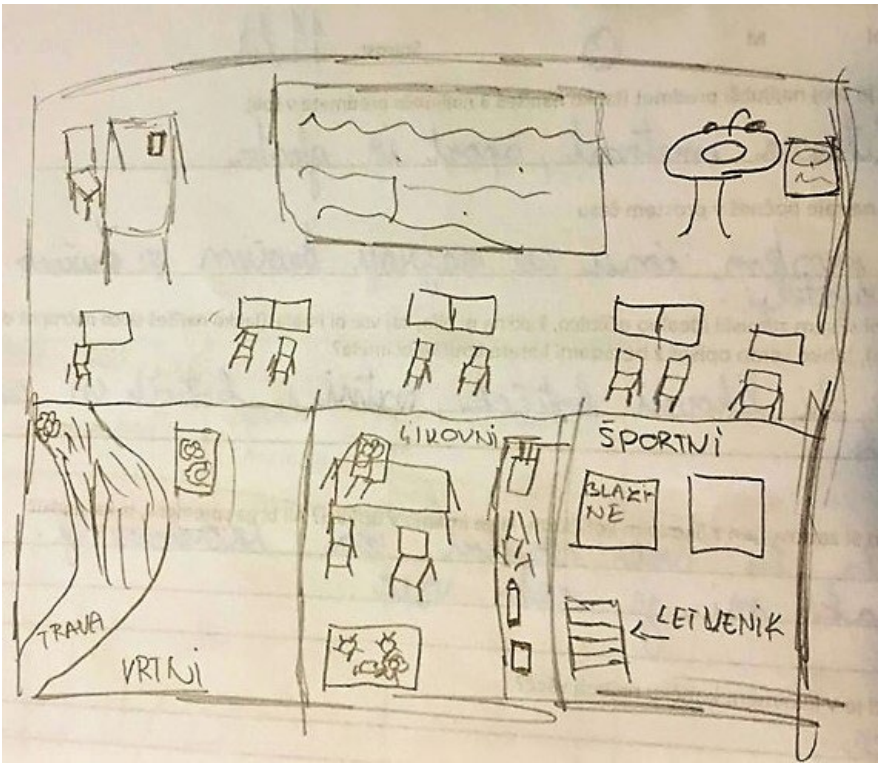

Figure 10: Classroom floor plan (Example 1)
Source: own.

Example 1: A student divided the floor plan of the classroom into two parts. In the upper part, there is a place for learning (a desk for the teacher, tables and chairs for students, a blackboard, and a sink). In the lower part, the student divided the floor plan into three units of equal size. The student placed a garden in the classroom (he specifically marked where the grass would grow); the second part is dedicated to art activities (space for art materials and art work is indicated); and the third part is dedicated to sports. The student specially marked the climbing frame and cushions.

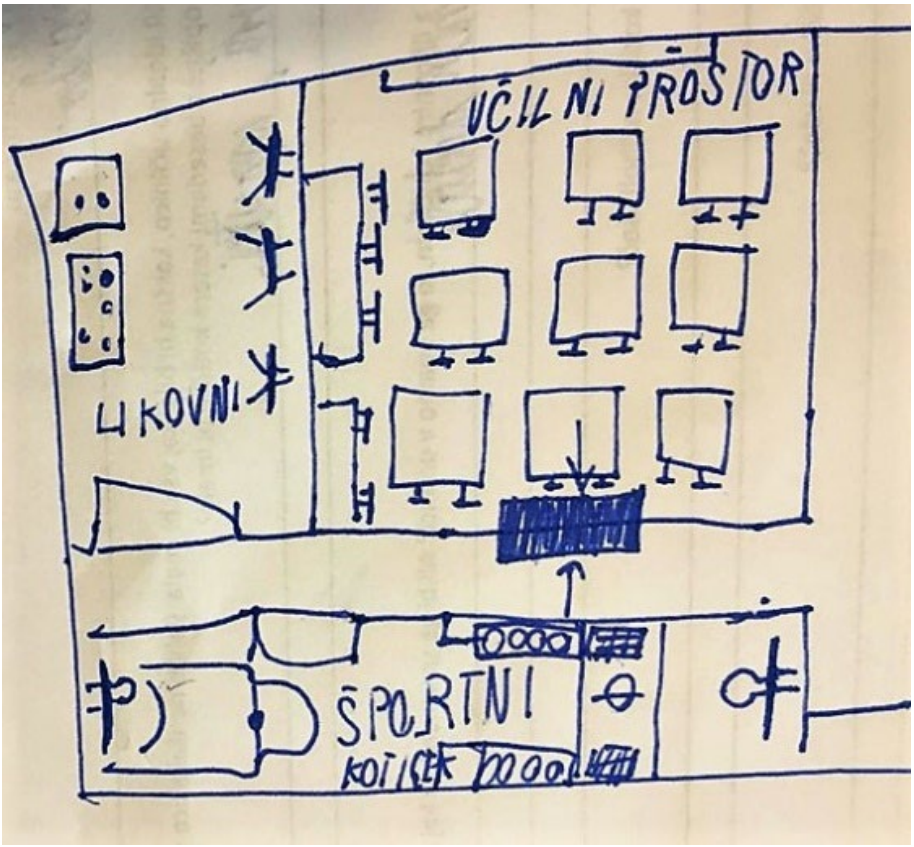

Figure 11: Classroom floor plan (Example 2)
Source: own.

Example 2: The student divided the floor plan into the upper part, which is wider, and the lower part, which is narrower. He divided the upper part into two spaces. The left part is slightly smaller and is intended for art activities (the student placed

tables and easels for painting in this space). The larger space next to it is dedicated to a classroom (tables, chairs, blackboard). In the lower part, a longer and narrow space is dedicated to sports (a basketball court and a football court are marked).

In the second group, we included four sketches in which students placed stations on the edge of the classroom, which occupied a smaller part of the space (Figure 12, Figure 13).

Example 3: The student took into account the floor plan of the existing classroom. The central part of the classroom is dedicated to tables and chairs for students. On the left side there is a school blackboard on the wall, and in the lower left station are a table and a chair for the teacher. There are many cupboards placed in the back of the classroom. The student also added an art station to the classroom, a space for relaxing, with a sofa, and a place for lunch.

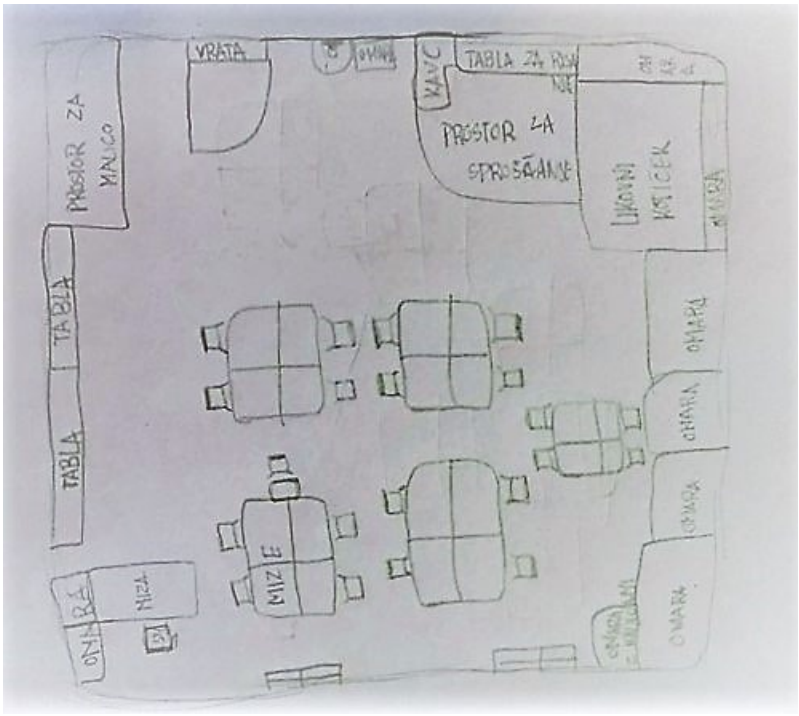

Figure 12: Classroom floor plan (Example 3)
Source: own.

Example 4: In the front of the classroom, the student placed a desk for the teacher and a large air conditioner. There are desks for students in the central part. In the back part of the classroom are an art station, cupboards, and a sofa.

In the last category, we included four sketches from which stations are not visible, the central part of the classroom is occupied by tables, some less common items have been added (e.g. a sofa; Figure 14, Figure 15).

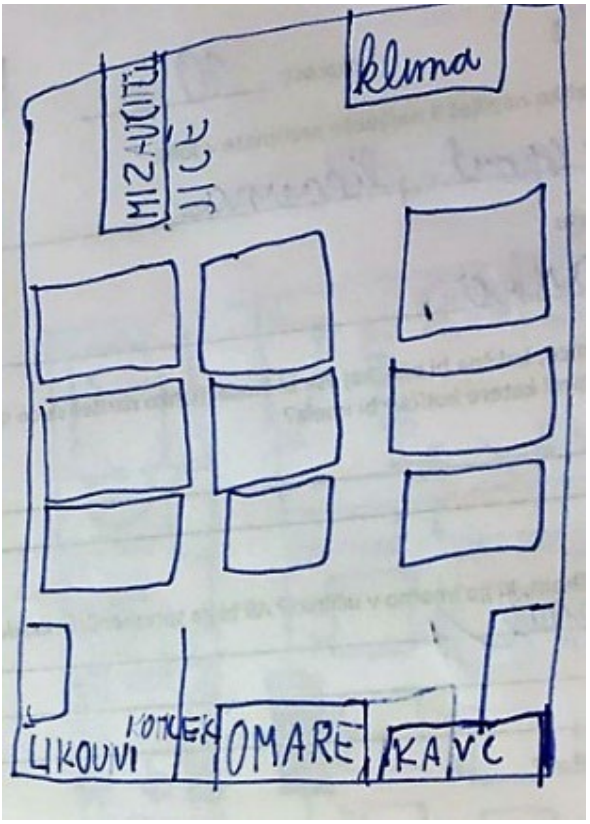

Figure 13: Classroom floor plan (Example 4)
Source: own.

Example 5: The student did not set up stations for special activities in the classroom. He used words to mark individual objects, namely, a door, a cupboard, a table, a chair, and a computer. The classroom seems very large and spacious.

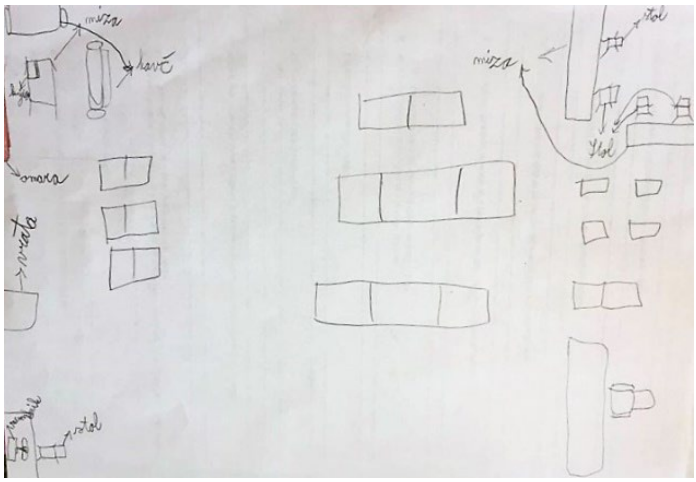

Figure 14: Classroom floor plan (Example 5)
Source: own.

Example 6: The student designed a very spacious classroom. In the central part, there are tables and chairs for students. The classroom also has a large desk for the teacher, a large blackboard, a couch, a special drawing board, and a sink.

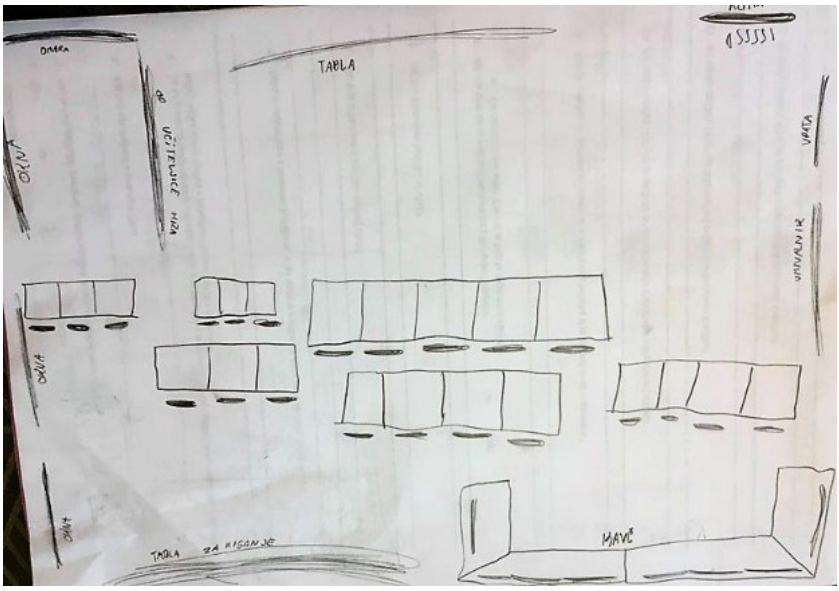

Figure 15: Classroom floor plan (Example 6)
Source: own.

From the analysis of the students' architectural sketches, we can conclude that all the spaces planned by the students are much more spacious than the existing classroom in which the students have lessons every day. Eight students used their existing classroom as a starting point when designing their ideal classroom. As many as six students imagined a completely new layout of the classroom that includes very specific elements for individual activities. The indoor garden is certainly among the most unexpected spaces to be found in the classroom.

3.3 Interview with the Teacher

At the end of the survey, we conducted an interview with the teacher. First, we were interested in why she had decided to arrange an art station in her class. The teacher stated that students often do not know what to do during recess, so she decided to offer them different activities. At the beginning of the school year, they arranged a play station, but because not all students like to play – some are calmer (i.e. not rambunctious) – and prefer to express themselves artistically, she decided to offer them a creative station. Additionally, activities in the art station were intended for students who finished their schoolwork earlier, allowing them to choose between reading and creative activities.

We were also interested in how satisfied the teacher was with the art station and what the greatest advantages and disadvantages were. The teacher noted that the art station proved successful, as the students were happy to go there. However, the size of the space was a challenge; it was too small for everyone, causing the work to spread throughout the entire classroom. Initially, students 'forgot' the rules of working in the stations and, for example, did not tidy up after themselves. After a conversation the teacher held with her students, the situation improved. Since the clay material used at the station dries quickly, the teacher provided zip bags for storing smaller pieces of clay. Other general challenges included storage of art works, drying of creations, an abundance of created pieces, and the overall lack of classroom space. In such cases, the teacher would need more furniture. She also noted that cleaning utensils for artistic expression was difficult due to having only one sink and cold water in the classroom.

Moreover, the teacher recognised that this approach provided additional opportunities for artistically gifted students to express themselves through creative activities.

4 Discussion

In this short study, we found that the organisation of a classroom art space had a significant impact on students' spontaneous engagement with art materials. Our results cannot be generalised because of the nature of the case study, but they can provide us with a better insight into the understanding of the importance of the learning space. The arrangement of space in a classroom is not only a matter of practicality but can also reflect the teacher's attitude towards learning and teaching (cf. Park & Choi, 2014). In our case, the teacher consciously decided to offer the opportunity to play with art materials during recess and thus also the possibility of creative expression for the students. We found that even small adaptations of the learning space can encourage students to express themselves with art materials during recess.

Most of the students used the art station and created art works with different materials. The students chose art materials very spontaneously, often choosing the same ones, which means that they frequently were grouped into pairs or smaller groups. The material, not the teacher, dictated the composition of these groups. Clay was generally the most popular art material among students. This, of course, does not surprise us, for two reasons. First, in art classes students have clay available only occasionally; other art materials are more often present and used. Second, clay has therapeutic properties: modelling clay can have a significant impact on students' well-being (Wong & Au, 2019). Kimport and Robbins (2012, p. 77) proved in their study that 'a 5-minute period spent manipulating clay produced more mood enhancement than the same amount of time spent manipulating a soft stress ball'. Therefore, we are not at all surprised that some students used the recess time to talk with their classmates while pressing the clay, without focusing on the end result.

We also found that socialising with friends was an important aspect of spending free time in the art station during recess. Socialising during recess is of an informal nature and at the same time very important for students, as confirmed by a study in which researchers examined the importance of mealtimes for students, finding that

students enjoy mealtimes because they can talk freely with their classmates about things that are important to them (cf. Baines & MacIntyre, 2022).

In addition, we were interested in how students imagine their ideal classroom. One can see in the students' architectural sketches that they would like a larger space with more diverse equipment for different activities. The small size of the classroom and the availability of only cold water made both the students and the teacher unhappy. Nevertheless, in our case study, the space (art station) encouraged the students to devote their free time to playing with art materials and creating art works. However, this required a great deal of engagement from the teacher, namely in regard to the rearrangement of furniture, the collection and adoption of materials for artistic expression, the recycling of waste material, and an understanding of the importance of artistic expression outside of art education classes (during recess).

The teacher also recognized possible implications for working with artistically gifted students. Play is essential for these children as it provides a space for them to explore their creativity and express their unique perspectives (Beisser et al., 2013). Engaging in playful activities, particularly with art materials inspired by the art station and art challenges, allows artistically gifted students to experiment with different techniques and concepts. Engaging in free play provides a safe space for exploration, where children can learn to navigate their environment, develop autonomy, and communicate their ideas effectively (Shively & Taylor, 2023). In addition to free play, a creative environment is essential for gifted students, as it provides the supportive conditions needed to cultivate their unique talents (Lee et al., 2021). The teacher transformed the classroom into a creative environment with minimal material changes. This restructured classroom positively influenced engagement and motivation, allowing children to fully explore and develop their abilities.

It is important to emphasise that this study employs a case study design with a small convenience sample, which limits the generalisability of the findings. Nevertheless, we can highlght two important conclusions. First, in the art station, the emphasis is on free play with art materials and experimentation. This activity basically follows the goals of art classes but is not time-limited in the way that a formal art class is. In the art station, students could play with the materials over a longer period of time; the final product was not important. If such an art station were available throughout the entire school year in the context of free time in school (e.g. during recess), it

would provide many opportunities for artistically gifted students, allowing children to fully explore and develop their abilities. Second, there is the social aspect – that is, socialising with friends and working together. In art classes, students work individually, in pairs or groups, depending on the task. The teacher, not the students, usually chooses the form of work. The art station provides more freedom. In both situations, students can develop social skills, but in the art station students can also retreat, work alone, calm down, and so on.

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About the authors

Janja Batič, PhD is an assistant professor for art education at the Faculty of Education at the University of Maribor, Slovenia. She has more than eighteen years of experiences working with future classroom teachers. Since 2019, Janja Batič has been educating future art teachers at the Department of Fine Arts. Her research area includes art education, visual literacy, multimodal literacy and picture books research.

Mag. **Petra Lebar Kac** completed her Master's degree in Education at the primary level at the Faculty of Education in Maribor and graduated in Pedagogy from the Faculty of Arts in Maribor. She works as a classroom teacher and educator at Janko Padežnik Primary School in Maribor. She is active in several areas, such as preparing the curriculum for visual arts, working with Roma and foreign students, and exploring various aspects of classroom activity, including formative assessment and creating a safe and supportive learning environment.

Selected Contemporary Research on Special Needs, Giftedness, and Talent in Slovenia

Bojan Kovačič (ed.)
University of Maribor, Faculty of Education, Maribor, Slovenia
bojan.kovacic@um.si

This monograph covers an extensive array of topics related to special needs, talent, and giftedness in the Slovenian educational system. It consists of twelve insightful chapters written by twenty-three authors, mostly from the University of Maribor's Faculty of Education. Addressing a wide range of professionals, the book examines innovative research and strategies to enhance the support and education of these special populations. The topics covered include speech and language therapy, reading adaptations and adjustments to music lessons for autistic students, the inclusion of children with special needs in folklore, and the identification and support of twice-exceptional students. It also discusses student involvement in school-home cooperation, early identification of mathematically gifted children, musical talent development, dance creativity in kindergarten, multilingual reading to expand vocabulary, and classroom design to encourage artistic expression. Overall, the monograph promotes a better understanding of these populations' specific needs and encourages discussion about creating inclusive, supportive, and effective educational environments.

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