TEACHING FOR THE FUTURE IN EARLY CHILDHOOD EDUCATION

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EXECUTIVE FUNCTIONS IN EARLY CHILDHOOD

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Abstract Executive functions are all mental skills that enable and direct behaviors for various purposes. Executive functions begin to appear in infancy, show rapid development from early childhood, grow mature in late adolescence, and regress in late adulthood. Early childhood, which includes critical periods for the development of executive functions, is considered important. In this study, it is aimed to share current studies on executive functions, which is a relatively new concept. In this study, data were collected through document analysis based on the survey model, one of the qualitative research methods. In this study, the definition of executive functions and their neurological basis, components, and development are discussed in the context of early childhood. In addition, executive functions in early childhood are explained in detail as they have an effect that predicts executive function potential in later life.

1   Introduction

Although the concept of executive functions began to be used in the 1970s, the discussion and basis of the concept date back to the 1840s. The case of Phineas Gage is one of the most impressive examples demonstrating executive functions. In 1848, while working as a railroad foreman in the United States, Gage's frontal lobe was punctured by a large iron rod in an accident. Most of his left frontal lobe was damaged, but he survived. After the healing process, it was seen that there were significant differences in Gage's behavior and personality. This and other similar cases have led to various studies related to the frontal lobe and executive functions (Ratiu et al., 2004). As a result of many years of research, Karl H. Pribram named it "executive functions" while investigating the functions of the prefrontal cortex for the first time in 1973 (Pribram, 1973). More than thirty components have been included over time in this concept used by Pribram. Executive functions have been described in various ways using models that include multiple components.

Baddeley & Hitch (1974) named executive functions "central executive" and then Lezak (1983) considered it as a dimension that deals with "how" human behavior is expressed. Executive functions have been defined as the mental capacity required to effectively implement plans, such as being able to express goals clearly, plan how to achieve them, encode and process information in working memory, and determine the next stage in an organized manner in tasks that can occur in succession (Lezak, 1983).

Executive functions are all mental skills that provide and direct the implementation of behaviors for various purposes (Jurado & Rosselli, 2007). Executive functions represent cognitive control processes that aim to regulate, organize, and plan behaviors (Diamond & Lee, 2011). In this context, it can be inferred that executive functions are processes used in situations such as the individual's rapid adaptation to constantly changing environments, regulating his behavior, or controlling his own behavior to achieve a goal.

Executive functions, as an inclusive term, represent all interrelated processes responsible for purposeful and goal-directed actions. These executive processes are necessary for the composition of external stimuli, for shaping goals and strategies, for preparing for behavior, and for examining behavior and plans as they are appropriately implemented. When processes related to executive functions are

examined, it is seen that the most critical elements are "intuition, goal selection, planning, initiation of action, self-regulation, cognitive flexibility, regulation of attention and use of feedback" (Barkley, 2012). However, these processes are thought to contain a wide variety of elements in addition to those mentioned.

Within the scope of executive functions, high-level, top-down cognitive processes that are the source of purposeful behaviors are discussed. Although there are various opinions in the related literature on the definition of executive functions, they all converge on the point that executive functions are the basis of purposeful behaviors, are flexible, and include complex cognitive processes in directed behavioral responses to difficult or new events (Archibald & Kerns, 1999; Banich, 2009; Miyake & Friedman, 2012).

Executive functions in early childhood include all skills such as "working memory, emotion control, maintaining attention, planning, organization, using time, cognitive flexibility, target orientation, inhibitory control/inhibition, and starting a task" (Anderson, 1998). Individuals need these high-level cognitive processes in order to resist, reason, and solve problems during the process of struggling with difficulties from an early period (Diamond, 2013). Therefore, executive functions, as high-level cognitive functions, can initiate, direct, and maintain a cognitive action during this process.

Anderson (2002) suggested that executive function skills function holistically and can be conceptualized as a functional system consisting of four different domains. He proposed the executive function model, which consists of the sub-dimensions "attention control, information processing, cognitive flexibility and goal setting".

Attentional control is the determination and maintenance of attention over a long period, recognizing mistakes, and regulating correct actions during the process of achieving goals. Information processing is the integration of neural connections with frontal lobe processes. It focuses on speed, fluency, and efficiency to complete problem-solving tasks. Cognitive flexibility is the ability to adapt to changes, develop alternative strategies, multitask information, and process temporarily stored information. Goal setting, on the other hand, includes the capacity to plan actions in advance and approach tasks efficiently and strategically, as well as the ability to develop new initiatives and concepts (Anderson, 2002). According to this model,

executive functions operate effectively through the interaction of these areas. Executive functions develop rapidly from early childhood (Welsh et al., 1991).

2   Method

In this study, data were collected through document analysis based on the survey model, one of the qualitative research methods. Document review includes reaching the sources in accordance with the purpose of the research topic and analyzing the studies on the subject (Yıldırım & Şimşek, 2006). In this context, the literature on executive functions, which is a relatively new concept, has been examined.

3   Results

3.1   Neurological Basis of Executive Functions

According to research performed, executive functions are anatomically associated with the frontal lobe region. The frontal lobe is the largest lobe in the front of the brain. The highest level human functions such as thinking, creativity, and communication are located in this region of the brain. The frontal cortex consists of three parts: the motor, premotor, and prefrontal cortex (Milner & Petrides, 1984).
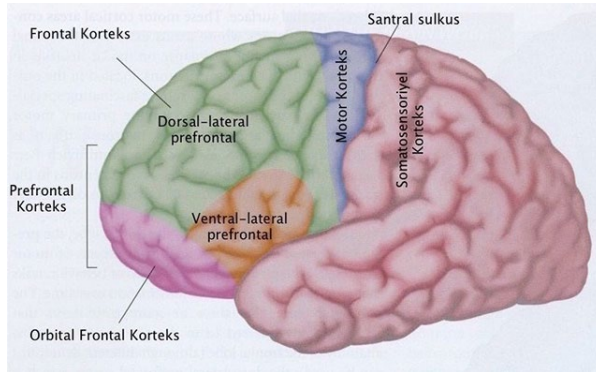
Figure 1: Frontal Cortex and Prefrontal Cortex Anatomy.
Source: Arıkan, 2022.

The prefrontal cortex is the axis of executive functions, working memory, social behavior, and attention. It is the region where functions such as planning and reasoning, implementation, social communication, and language are located. This

cortex is divided into three parts: the dorsolateral, ventromedial, and orbitofrontal cortex. The dorsolateral cortex is responsible for executive functions and the ventromedial cortex for motivation and attention; the orbitofrontal cortex, on the other hand, is responsible for the regulation of impulses and emotions (Powell & Voeller, 2004). Zelazo and Müller (2010) explained executive functions according to their functional changes. Executive functions are divided into two separate classes: hot and cold executive functions. They defined executive functions that evaluate the dorsolateral prefrontal cortex and have cognitive aspects related to attention as cold executive functions. They defined executive functions that evaluate the orbitofrontal prefrontal cortex and have aspects related to emotion as warm executive functions. The ability to make decisions about the future and think about the consequences (impulsivity) has been associated with warm executive functions.

Although the frontal lobe involves many important elements of executive functions, some studies indicate that executive functions are not limited to the functions of the prefrontal cortex. The prefrontal cortex is also associated with other cortical areas, cerebellum, subcortical regions such as the basal ganglia and amygdala, and the limbic system (Strauss et al., 2006).

3.2   Components of Executive Functions

Many views have been expressed that executive functions consist of different interrelated components. It is agreed that the basic components of executive functions are working memory, inhibitory control (inhibition), and cognitive flexibility (Meuwissen & Zelazo, 2014; Carlson et al., 2013; Diamond, 2013; Hughes, 2011; Blair & Diamond, 2008; Garon et al., 2008, Miyake et al., 2000).

3.2.1   Working Memory

Working memory is expressed as a cognitive system that can access and maintain the information necessary for high-level cognitive tasks (Baddeley, 1992). Although it is a multi-component system, it has the ability to actively protect information in situations such as current processing or concentration dispersion. Active conservation represents the harmony of multiple processes (Storbeck & Maswood, 2016). Working memory has an active role in establishing the relationship between old information and new information, understanding expressions, and establishing uncertain connections (Diamond, 2013). It is a capacity system that allows the

individual to temporarily process, store, and manage information with conscious awareness in order to solve a problem related to the purpose. A solid working memory is critical to high-level tasks such as planning and decision making, as it allows an individual to regularly review incoming information. Moreover, working memory appears in various areas of daily life such as making plans, solving problems, communicating, and reading books (Roussel et al., 2012). It is thought that working memory has a significant effect on all high-level cognitive functions.

The ability to control attention and the ability to keep information in the short-term memory begins to develop at around the age of 2. During the kindergarten years, these skills develop rapidly and turn into working memory. Working memory provides support to children in terms of keeping the acquired information in their memory for a short time and completing a task with this information or giving appropriate reactions to a situation. As this structure develops, children can use more complex executive function skills. Thus, they can perform different tasks including complex and multi-step ones and remember and apply the rules in their memory (Baddeley, 1992; Garon et al., 2008). The ability of children in early childhood to follow and apply various instructions, making plans during the day, and chatting about them is an example of working memory skills.

3.2.2 Inhibitory Control (Inhibition)

Inhibitory control, also known as inhibition, is the deliberate inhibition of an overriding answer or response. It is the suppressing of a natural orientation and replacing it with another response that is not so dominant. The ability to inhibit is partially dependent on the development of attention control and working memory. With the development of this skill, individuals can engage in more controlled behaviors (Barkley, 2012). Inhibition is used to master impulses and thoughts, to filter them out, to resist distractions, and to stop and think before acting. It includes the ability to prevent unnecessary behaviors or thoughts that prevent the completion of tasks. Thus, it results in focus on the task and prevents inappropriate automatic responses (Diamond, 2013).

Inhibition skill enables the individual to make better plans, organize, solve problems, and stop and think before acting. It is of critical importance for individuals to control their behavior in daily life. It develops from early childhood and is seen primarily as the control of motor responses at around 1 year of age. Inhibition begins to be used

for the purpose of controlling behavior, emotions, and thoughts when children begin to notice and understand the limitations imposed by their families (Barkley, 2012). While performing complex tasks for inhibition, especially when the tasks have contradictory rules, children display the expected behaviors by using working memory. It starts during the early period and shows great development during the preschool period and beyond, but slows down from the age of 11 to adulthood (Fuster, 2008; Romine & Reynolds, 2005; Tregay et al., 2009). The ability of children in early childhood to delay gratification and to comply with classroom rules when they do not want to is an example of inhibition skill.

3.2.3 Cognitive Flexibility

Cognitive flexibility includes adapting to priorities, changing demands, and various views and being able to evaluate a situation from a different or new perspective. It also includes knowing that the rules differ according to the differences in the environments, switching between perspectives, and thinking abstractly (Nguyen & Duncan, 2019; Neitzel, 2018). Therefore, Diamond (2013) expressed cognitive flexibility as the third component of executive functions. Cognitive flexibility requires attentional control. It is the last component of executive function, built on working memory and inhibitory control (Garon et al., 2008). Multidimensional thinking about an open situation occurs thanks to cognitive flexibility (Zelazo, 2015). Cognitive flexibility is the individual's adaptation to various situations, willingness to be flexible, awareness of alternative options, believing that they have the ability to think flexibly, and feeling self-confident (Martin & Anderson, 1998).

Cognitive flexibility has a significant impact on unusual tasks and problem-solving skills in daily life. It develops from early childhood and it is seen that children fulfill their cognitive flexibility tasks from the age of one and a half. These skills develop with age (Stahl & Pry, 2005). The development of cognitive flexibility skills increases rapidly from the age of three to the age of eight, but slows down from the age of eight to adulthood (Anderson, 2002). The ability of children in early childhood to change their behavior to adapt to changing rules is an example of cognitive flexibility.

3.3   Development of Executive Functions

Executive functions begin to appear in infancy, develop rapidly from early childhood, mature in late adolescence, and regress in late adulthood (Diamond, 2013). Developments in the structuring of the brain show parallelism with the development of executive functions. Accordingly, myelination, synapse formation, and pruning of nerves progress during childhood and adolescence, and developmental stages are observed in the frontal lobe subregions during certain periods. These changes result in changes observed in the information processing capacity and speed of the brain and the interactions of its various regions (Anderson et al., 2002).

Executive functions develop in three basic stages. The first stage covers the period from 18 months to 5 years. During this stage, working memory, impulse control, and basic cognitive flexibility skills are seen in tasks based on motor responses. Young children around the age of 2 exhibit emotional breakdowns, disorganization, and impulsive behaviors due to the lack of development of executive function skills. Children between the ages of 3 and 5 show significant progress in the development of goal-related behaviors. Significant changes are observed in the neuronal density of the prefrontal cortex during this process (Diamond, 2013). As a result of this rapid growth in executive functions in this age range, children regulate their thoughts and behaviors with increasing flexibility. They also engage in self-regulated behaviors (Garon et al., 2008). The second stage covers the period from 5 years to 10 years. Metacognition, emotion control, impulse control, and simplified planning skills are seen during this stage, when executive function development is the fastest. However, at the end of this period, adult performance levels cannot be achieved in various executive function tasks. The third stage covers the period from 10 years to 14 years. During this stage, the development in working memory, impulse control, and cognitive flexibility continues and matures (Welsh et al., 2006).

Executive functions begin to emerge during infancy; they develop from childhood to adolescence and play an effective role in children's cognitive functions, behaviors, emotional control, and social interactions (Anderson, 2002). With the increase in life experiences and the maturation of the brain during early childhood, executive function skills develop significantly (Harris, 2016). Knowing how these skills develop during this period is important for understanding what children in different age groups can do and how much they can control themselves. In this way, it can be

predicted how much support children should receive and how from adults during their education life (Dawson & Guare, 2010). Since early childhood is a period of high plasticity of the brain, it is of critical importance in this regard (Blair & Raver, 2012; Diamond, 2013; Harris, 2016; McClelland et al., 2007; Welsh et al., 2010).

The components of executive function skills show varying developmental progression in different age groups. The development processes of executive function skills are given in Table 1.

Table 1: Development of Executive Function Skills

Working Memory	Inhibitory Control (Inhibition)	Cognitive Flexibility
Adulthood: Can recall multiple tasks, rules, and strategies that vary from situation to situation.	Adulthood: Develops consistent self-control. Responds appropriately to situations (e.g., may resist saying something socially inappropriate)	Adulthood: Can reexamine actions and plans in differing circumstances.
	Ages 10-18: Can be self-controlled to flexibly switch between stimuli that require attention (like driving a bike/car) or non-attention (e.g., pedestrians-billboards, passing houses).	Ages 13-18: Develops skills to change focus and adapt to changing rules.
Ages 5-16: Can search for objects that have moved, remember where they are, and then develop skills to explore other places (e.g., play focus games or find the penny hidden under one of the three trophies)	7 years old: May be close to performing at adult levels in learning to ignore irrelevant stimuli (like a dot at the edge of the screen) and focusing on the central stimulus (like the picture in the middle of the screen).	Ages 10-12: Successfully adapts to changing rules even in more than one dimension (like shouting in the playground, not shouting at school, sometimes shouting at a theater rehearsal)
Ages 4-5: Realizes that appearance is not always the same as reality (e.g., a sponge that looks like a rock)	Ages 4-5: The ability to produce alternative solutions develops when the first attempt is not successful. Considers an arbitrary rule (can sort cards by shape rather than color)	
3 years old: Can remember two rules (e.g., reds will be placed here, blues will be placed there) and act according to the rules.		Ages 2-5: Shows success in rules that vary according to different activities (e.g., can take off shoes at home, wear them at school, wear boots when it rains)
9-10 months: Can execute simple goal-related tasks and two-step plans.	9-11 months: Looks like a toy on the other side of the window but can thwart the urge to reach straight for an inaccessible reward. The dominant response is delayed to explore the barrier around it.	9-11 months: When unable to reach an object directly, the ability to find various ways to retrieve the object develops.
7-9 months: Object permanence develops. Combines two activities sequentially (Can take off the cloth, hold the toy).	8-10 months: Begins to maintain focus despite being distracted by short delays in the task.	
	6 months: Begins to inhibit the dominant response (may not touch the thing instructed not to touch)	

Center on the Developing Child at Harvard University (2011)

Executive function skills develop gradually and each component builds on existing skills (Garon et al., 2008). Similarly, in Table 1, it is seen that working memory, preventive control, and cognitive flexibility, which are components of executive function skills, emerged during infancy and developed in a cumulative manner.

3.4   Executive Functions in Early Childhood

Executive functions are high-level cognitive skills that include behavior regulation and goal-directed activities of individuals (McCloskey et al., 2009). There are periods of high plasticity in which certain parts of the human brain, which is flexible by nature and can adapt to the environment, and their corresponding functions are sensitive to environmental influences (Zelazo et al., 2016). The prefrontal cortex is sensitive to environmental influences and its long-term development continues into adulthood. The rapid development of executive functions in early childhood shows the importance of experiences gained during this period and that this period of brain flexibility is the most critical time for intervention (Zelazo & Carlson, 2012).

Executive functions and behaviors begin to appear in infancy, but do not fully mature until young adulthood (Diamond & Lee, 2011). Executive functions at an early age predict executive function potential later in life (Eigsti et al., 2006; Friedman et al., 2007; Moffitt et al., 2011; Shoda et al., 1990). One of the most important and challenging tasks in early childhood is to acquire the early building blocks of executive function skills. The development of these skills in early childhood has a significant impact on healthy development in the later years of an individual's life (Center on the Developing Child at Harvard University, 2014). It is thought that adults should support the development of executive functions of children from an early age. Brain development is easily affected by the environment in the first years of life, especially in the 0-5 age range. When environments and interactions that support the development of executive function skills are created by adults, positive differences are observed in the actions and outcomes of young children at school, at home, and in their lives (Bryck & Fisher, 2012; Diamond & Lee, 2011; McCloskey et al., 2009; Wass et al., 2011).

A sample of executive functions (Dawson & Guare, 2009) and skills is presented in Table 2 with an explanation of how these skills are used by young children. Three components of executive function skills in early childhood are explained. Additional skills related to each component are also included. Here, it is considered important

that educators and adults realize that executive functions control behavior and that by understanding these functions they can help young children enhance these skills.

Table 2: Executive Function in Early Childhood

Executive Function	Executive Skills	Older Toddlers (ages 2-3)	Preschoolers (ages 3-5)
Cognitive Flexibility: Mental ability to switch between different concepts; thinking about more than one concept at the same time.	– Creativity. – Flexibility.	– Appropriately responds to differences in routines/structures with close adult support. – Engages in new activities.	– Adapts to changes in plans or routines with some alerts. – Begins to connect concepts that are not directly related, based on personal experience.
Inhibitory Control: The capacity to think before acting—the ability to resist the urge to say or do something.	– To wait. – To think first.	– May stop responding for a few seconds if watched closely by an adult. – Responds to "before, after" presentation of tasks when supported by an adult.	– Asks before taking anything. – Waits in line at group events.
Working Memory: Ability to retain information in memory while performing complex tasks. It includes the ability to draw on past learning or experience to apply to the situation at hand or project it into the future.	– Remember and use.	– Follows instructions given by an adult.	– Can follow the steps of a routine with a single command. – Can complete an easy task.

National Center for Pyramid Model Innovations (NCPMI) (2019)

Executive function skills are critical for school readiness and academic performance. School success, which develops from early childhood through these skills, affects academic performance in the following years (Diamond, 2013; McClelland et al., 2007; Morrison et al., 2010). As a result of various training given for a certain period, it was determined that children with good executive function skills learned more permanently and were able to retain more information in their memory than their peers with worse executive function skills (Benson et al., 2013). Executive function skills are seen by teachers as one of the most important determinants of success in the classroom (McClelland et al., 2007). These skills are essential for meeting the demands of the classroom environment and performing daily life tasks. In this way, children can be aware of the situations in which they need to sit, apply them, pay

attention, remember and obey the rules, and gain flexibility to adapt to new perspectives. In addition, as an indirect effect of executive function skills, children who come to the educational institution with these skills do not experience much difficulty with the learning process; they can love school and be more motivated (Zelazo et al., 2016).

Executive function skills have a significant impact on academic achievement, as well as on the development of social competence and social skills, and the reduction of destructive actions (Hughes & Ensor, 2011). Children with higher executive function skills exhibit less behavioral problems and have stronger emotion regulation (Cole et al., 1993; Jahromi & Stifter, 2008). In addition, in a longitudinal study in the literature, children with better inhibitory control in the 3-11 age range had better physical and mental health after 30 years and obeyed the laws more than children with lower inhibitory control (Moffit et al., 2011).

4   Discussion and Conclusions

Executive function skills develop significantly in early childhood. These skills have a significant impact on all areas of development, especially mental development. They do not lose their importance in the life of the individual during adulthood. Support of these skills in the early years leads to the strengthening of children's school readiness, academic performance, and social competencies for primary school. For this reason, it is thought that it is important for adults who interact with the child to know about the development process and support of executive function skills in early childhood. In particular, it is considered important that educators have information about executive function skills, implement strategies that support these skills in classroom environments, and regularly monitor behaviors. Parents, with whom children spends most of their time, should likewise be able to help children develop these skills by understanding executive functions skills. Researchers should develop measurement tools for executive function skills and perform further studies on the subject. Thus, important information resources will be obtained in practice and theoretical dimensions in the development of executive function skills in young children. There is a need to expand studies on this subject.

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A Study on Preschool Teachers' Thinking Supportive Behaviours

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Abstract Promoting thinking skills of children is one of the main goals of early childhood education. In this study, it was aimed to investigate the level of preschool teachers' thinking support behaviors according to their own perceptions and to examine whether their perception differs according to some variables such as their previous training in thinking skills and the type of school they work in. In the current study descriptive survey method was used. The study group consisted of 176 female teachers. They were selected randomly and working in public and private preschools in the western part of Turkiye. Data were collected through Thinking Supporting Teacher Behaviors Scale-Preschool Teacher Form. As the initial step in the data analysis, descriptive statistics were calculated then since the data showed normal distribution according to normality analysis independent sample t-test was performed. According to the results of the study, it was determined that preschool teachers highly supported their students' thinking skills according to their own perceptions and the teachers' thinking supportive behaviours varied significantly depending on the variables of previous training on thinking skills' and the type of school where they work.

1   Introduction

21st Century Skills are widely accepted to describe the future competencies requires from individuals and referred to as skills of future. These skills are vitally important for preschool children as well as for all individuals. Developing thinking skills is one of the main keys for raising individuals with the skills of the future.

Promoting effective thinking in young children is one of the main goals of early childhood education (Costello, 2012). Researchers' definitions of thinking and thinking skills may differ, but the common point is that they focus on mental activity, logic, and use of knowledge. According to Mcguiness (2000), thinking skills include acquiring, organizing, analyzing knowledge and reasoning by elimination, problem solving, determining cause and effect relationships, evaluating options, observing the process, making decisions, and applying them to one's own life. The period between the birth of a child and the age of 6 is considered the most critical period for the cognitive development of children (Aisyah, 2019). For this reason, it can be said that it is vitally important to start activities for the development of thinking skills at an early age (Birbili, 2013). Child-centered, inquiry-based and dialogic learning comes to the fore in developing systematic, analytical, creative and critical thinking in children and enabling them to be involved in the learning process (Priyanti and Warmansyah, 2021).

Curiosity, questioning, open-mindedness and enjoyment of thinking should be instilled in children in early childhood (Ritchhart and Perkins, 2008). It is emphasized that enabling children to speak in various situations and contexts is important in developing their thinking skills (Fisher, 1996; Godwin and Perkins 1998). In addition, it is recommended to introduce children to philosophy at an early age and to develop their questioning skills. In this context, in early childhood education, process-oriented questions should be asked, answers should be questioned and justified, and concepts and principles should be transferred (Costello, 2012). In accordance with these statements, Taggart et al. (2005) point out that while organizing teaching and learning process, preschool teachers should include games that encourage students to solve problems and inquiry, and challenges that will stimulate children's creative, reflective and analytical thinking skills.

For the development of thinking in early childhood, first of all, the concept of thinking should be included in curricula in the context of skills and habits (Krogh and Morehouse, 2020). 21st century skills and especially the development of thinking skills should be chosen as one of the focal points in curriculum development studies. Thinking skills that are envisaged to be acquired in the context of 21st century skills in early childhood were listed by Scott (2017). According to his study, children should be taught a wide variety of problem-solving techniques and should be encouraged to use various types of reasoning such as induction and deduction. In addition, they should be enabled to analyze evidence, arguments, claims and beliefs effectively. Children should be able to synthesize and make connections between information and arguments. They also should be able to solve problems in both traditional and innovative ways. Indubitably, teachers have the most important role in this whole process.

In order for children to acquire these skills at an early age, teachers should support their thinking processes through in-class and out-of-class activities. Ensuring that children speak in various contexts during those activities is vital in terms of improving their thinking skills. Parents of children generally perceive academic progress as acquiring knowledge in books. At this point, teachers should both act in a way that supports the thinking skills of children and involve their families in that process (Costello, 2012). Early Childhood Curriculum should be developed to guide teachers on issues such as supporting children's thinking skills and ensuring family participation. Walsh Murphy and Dunbar (2007) also emphasize the importance of developing game-based, practical, challenging, and flexible curriculum for the development of children's thinking skills.

When the level of preschool education in Turkey is examined, it is seen that creativity was emphasized in the curricula developed until 2006, yet "creative thinking" was not directly focused on as a skill, and other thinking skills were not included in the curricula. One of the most important reforms in Turkish Education System was carried out in the 2005-2006 academic year. Since then, all curricula in Turkiye have been revised in accordance with constructivism, starting from the level of early childhood and elementary education.

In Turkiye, thinking skills were emphasized for the first time in preschool curriculum in 2006. The preschool curriculum, which is still being implemented in Turkiye, was developed in 2013 and the activity plans in this program emphasize thinking skills in

the field of cognitive and social development. As Posner (1995) states, the reflections of formal programs in practice can be different. As it is known, the implementers of curricula are teachers. Lieber et al. (2009) points out that teacher characteristics are more effective than physical conditions or the structure of the curriculum in the good implementation of the curriculum. Ornstein and Hunkins (2009) also state that teachers will more accurately determine the learning characteristics, needs, interests of students, and teaching strategies, methods and materials that can be effective for them. Thus, teachers can make curriculum adaptation (Hewitt, 2006).

At this point, the professional skills of teachers come to the fore, and from the point of view of preschool education, the extent to which teachers support their thinking skills in the education program emerges as an important issue. Teachers' thinking supportive behaviors can vary such as practice engaging and exciting activities for children, adopting dialogic teaching using clear language in the classroom, creating an interactive, flexible and creative learning environment, encouraging questions, problems and possible solutions to talk and work collaboratively, problem solving and reflection activities. While thinking is invisible, teachers can make thinking more visible in their classrooms through documenting children's works. The use of documentation in the context of early childhood education is interpreted as a tool for recall and reflection. In contemporary preschools, teachers are constantly documenting work, providing a space to make children's thoughts visible. The use of documentation in the context of early childhood education is interpreted as a tool for recall and reflection (Rinaldi, 2006). It can be said that thinking becomes visible when children are aware of their own thoughts and when teachers plan to progress by using evidence of children's thinking.

In this study, it is aimed to determine the level of preschool teachers' thinking support behaviors according to their own perceptions and to examine whether their perception differs according to some variables. The behaviors to support thinking, which are considered depending on the dimensions of the measurement tool used in this study, were examined as "Openness", "Reflecting through Documentation", "Providing Free/Flexible Learning Environments" and "Questioning". In this context, research questions of the current study were;

According to the preschool teachers' own perceptions;

1. At what level do they show thinking support behaviors?

2. Do preschool teachers' thinking support behaviors show a significant difference according to their previous training in thinking skills and the type of school they work in?

2   Method

In line with the purpose of the study, descriptive survey method was used. The study group was all female teachers that were randomly selected working in public and private preschools in the western part of Turkiye (N=176). In this study, " Thinking Supporting Teacher Behaviors Scale (TSTBS)-Preschool Teacher Form" which was developed by Kaymak and Alkın Şahin (2022) administered as a data collection tool. 5-point Likert type scale consisted of 19 items and four subscales: "Openness", "Reflection Through Documentation", "Providing Free/Flexible Learning Environments" and "Questioning". The Cronbach's Alpha value for the whole scale was .77 and it was varied between .69 and .76. The data were analyzed through statistical analysis program. Since the data showed normal distribution according to Kolmogorov Simirnow test and normality analysis [z=1,063; p=0,224], independent sample t-test was performed.

3   Findings

For the first question of the study, descriptive statistics of the level of thinking support behaviors according to the participants' own perceptions are presented in Table 1.

Table 1: Descriptive statistics for TSTBS

Subscales of TSTBS	n	K	min	max	$\overline{\text{X}}$	S
Openness	176	7	21	35	30.42	2.12
Reflection Through Documentation	176	6	17	30	25.34	2.81
Providing Free/ Flexible Learning Environments	176	3	9	15	13.71	2.03
Questioning	176	3	10	15	13.66	1.89
TSTBS Total	176	19	69	95	83.13	6.88

As it can be seen in the Table 1, the number of the items of subscales are 7, 6, 3 and 3 respectively. When the mean scores of the total and sub-scales of the TSTBS were converted to from 1 to 5, the mean score for the total of the scale was $\overline{\text{X}}$ =4.37. According to this result, the participants think that they support their students'

thinking behaviors at a high level. Similar results were obtained for the subscales (Openness $\bar{X}$ =4.34; Reflection through Documentation $\bar{X}$=4.22, Presenting Free/Flexible Learning Environments dimension is $\bar{X}$=4.57, Asking Question $\bar{X}$=4.55).

TSTBS scores of the participants were analysed with independent sample t-test, according to their previous training in thinking skills and the type of school they work in and the results were presented in Table 2.

Table 2: Examination of TSTBS scores by previous training and the type of school where they work

			n	$\bar{X}$	s	t
Openness	**Previous Training**	Yes	72	31.04	.48	.94
		No	104	29.90	.59	
	Type of School	Public	101	28.22	1.12	2.56*
		Private	75	32.03	.94	
Reflection Through Documentation	**Previous Training**	Yes	72	26.37	.87	.97
		No	104	25.88	.92	
	Type of School	Public	101	25.74	1.79	3.11**
		Private	75	27.26	2.01	
Providing Flexible Learning Environments	**Previous Training**	Yes	72	14.20	2.12	1.02
		No	104	12.07	2.43	
	Type of School	Public	101	11.16	2.84	3.04*
		Private	75	13.94	2.99	
Questioning	**Previous Training**	Yes	72	14.09	2.33	3.76**
		No	104	11.28	2.78	
	Type of School	Public	101	12.17	1.99	3.18*
		Private	75	14.14	2.04	
TSTBS Total	**Previous Training**	Yes	72	85.07	5.98	4.05**
		No	104	79.13	6.02	
	Type of School	Public	101	77.29	5.32	4.21**
		Private	75	87.37	4.97	
*p<.05, **p<.01						

According to Table 2, in openness subscale, it was determined that the mean scores of the participants who had previously received in-service training on thinking skills ($\bar{X}$ =31.04) were higher than the other participants' scores ($\bar{X}$=29.90) but this difference did not show a statistically significant. The mean scores of the participants working in a private school ($\bar{X}$=32.03) were statistically different from the mean scores of the participants working in a public school ($\bar{X}$=28.22). A similar situation was observed in Reflection Through Documentation subscale. While the mean scores did not show a statistically significant difference according to whether the

participants had received in-service training before (t=.97), a significant difference was observed in favor of the participants working in private schools (t=3.11). As can be seen in Table 2 no statistically significant difference was observed between the mean scores of the participants who received ($\overline{X}$=14.20) and did not receive in-service training ($\overline{X}$=12.07) in Providing Flexible Learning Environments subscale while there was a significant difference between the mean scores of the praticipants who work in public school ($\overline{X}$= 11.16) and private schools ($\overline{X}$=13.94). In Questioning subscale, the mean scores differed significantly according to both whether the participants received in-service training or not and the type of school they worked at. These differences were in favor of participants who had previously received in-service training on thinking skills ($\overline{X}$=14.09) and worked in private schools ($\overline{X}$=14.14). When the mean scores obtained from the whole scale are compared, it can be seen that the thinking skills support behaviors of the participants who received inservice training ($\overline{X}$= 85.07) and worked in private schools ($\overline{X}$=87.37) were significantly higher than the other participants ($\overline{X}$= 79.13; $\overline{X}$= 77.29).

4   Conclusion and Discussion

In this study, it was determined that preschool teachers highly supported their students' thinking skills according to their own perceptions. This finding is promising in terms of raising individuals with the skills required by the 21st century. Alkın Şahin (2022), Soydan and Dereli (2014) revealed similar findings in their studies which they examined the level of support of preschool teachers' thinking skills of their students. According to Akbıyık and Ay's (2014) study preschool teachers' attitudes towards thinking education are positive, which is also consistent with the findings of the current study. Baumfield (2006), on the other hand, determined that teachers consider themselves inadequate in teaching thinking. This difference may be due to the fact that the research was conducted in different country or that it was conducted at an earlier date than the current study. There are also studies conducted in Turkiye with different findings than the current study. For example, in the study conducted by Akbıyık and Kalkan-Ay (2014), it was determined that pre-school teachers did not see themselves as sufficient in teaching thinking skills and they needed to develop themselves. Akbaba and Kaya (2005) also determined that preschool teachers do not give the necessary importance to thinking skills. However, these studies were also conducted at a date earlier than the current

study and qualitative research method was used. In other words, the characteristics of the samples of the studies may have caused this difference. At this point, it may be recommended to examine the thinking skills support behaviors of preschool teachers with a mixed method model, and to determine the current situation and possible needs in future studies.

It was determined that both the total scores and the sub-scale scores of teachers' thinking supportive behaviors differed significantly in favor of teachers working in private schools. This finding may be due to the better physical and financial conditions of private schools and the more flexible application of curricula. Furthermore, the competition between private schools may have resulted in teachers' efforts to improve themselves. Moreover, the socioeconomic characteristics of families who can send their children to private schools may increase their expectations and demands from private schools. In support of this finding, Alkın and Şahin (2022) also determined that preschool teachers working in private schools are more interested in thinking education and their attitudes towards thinking education are more positive than teachers in public schools.

It is known that programs such as Regio Emilia, High Scope, Think! are effective in helping teachers learn the ways of teaching thinking skills through Questioning, Reflection Through Documentation and other activities (Aubrey et al., 2012; Hansen, 2012). Emer (2007) also determined that teachers who received in-service training on thinking skills showed a positive increase in behaviors that support children's thinking skills. In this context, it can be recommended to ensure the implementation of professional development programs aimed at gaining thinking skills, especially in public schools. As a matter of fact, Aubrey et al. (2012) draws attention to the importance of such specific programs, and O'Reilly et. al (2022) and Ayvacı (2010) emphasize that different pedagogical approach programs contribute to the development of thinking skills at an early age.

Planning of studies examining different variables that may be effective in supporting the thinking skills of preschool teachers can contribute to the literature. In addition, studies should be planned to improve the teachers and their opportunities in public schools. The issue can be examined in depth with qualitative studies aimed at examining the difficulties and needs of teachers working in public schools. This study was carried out with the participation of a group of preschool teachers in

Turkiye. Comparative research can contribute to wider and better understanding of teacher's thinking support behaviors and the knowledge in the relevant literature.

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ATTITUDES OF STUDENTS, FUTURE EDUCATORS TOWARDS CREATIVITY IN RELATION TO THE DEVELOPMENT OF ALGORITHMIC THINKING SKILLS

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Abstract The greatest contribution of the educator in the child's life is the way he/she encourages the child in various areas of development, including creativity. Depending on the educator's self-assessment, this can have an impact on children's creative abilities, but in much more open-ended scenarios, it can also have an impact on the development of algorithmic thinking skills in children. By participating in the Algolittle project, we focused on the beginning of the professional lives of future educators, in their final year of study, to show them that encourage and development of algorithmic thinking in children from an early age contributes to the development of all other domains. The scope of the research in this paper includes the self-assessments of students, future educators toward creativity related to the development of algorithmic thinking skills, although the project itself covers a much broader area.

1   Introduction

The use of technology in all sectors, particularly in education, requires teachers with certain digital competencies in order to use the teaching technology and make the learning process more interesting to students. For contemporary teachers they are substantial, including educators in early childhood education institutions, as teamwork and professional learning communities in educational institutions provide a venue for research, information sharing, teamwork, connection of different findings, and application of knowledge and skills for and among children and adults. Self-assesment help students judge their own abilities and performance, and become self-regulated learners. Creativity is considered desirable in education, especially within teachers at all levels of education. In early childhood education in Croatia, it is one of the fondation values and it represents all-time skill. There is also one skill considered to be important for present and for the future, skill that helps decompose problems in smaller, solveble steps, algotithmic thinking skills. In this paper, we are presenting correlations in self-assesments of creativity and algorithmic thinking among undergraduate students of Early and Childhood Education (ECE) at University of Rijeka, as integral part of Erasmus+ project "Algorithmic thinking skills through learning through play for the programming literacy of future generations"- Algolittle.

2   Creativity

By engaging children in learning through group work, problem-based learning can create a stimulating environment for preschoolers to develop their inquiry creativity. But in a further step, one can examine creativity in these processes. Creative thinkers are active learners who are able to find and solve problems, recognize patterns, find and use information in other ways, challenge, make decisions, and search for new ideas (Healy, 2004). First of all, creativity is important in the Croatian preschool system, it is one of the six values included in the National Curriculum for Early and Preschool Education (MZO, 2014). The greatest contribution of creativity is understanding and promoting the benefits of divergent opinions.

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The basic values of the National Curriculum for Early and Preschool Education derive from the commitment of the Croatian educational policy to the complete personal development of the child, to the preservation and development of the national, spiritual, material and natural heritage of the Republic of Croatia, to European coexistence and to the creation of a society of knowledge and values that enable progress and sustainable development. Creativity as a core value represents the basis for the child's development into an initiative and innovative person, capable of recognizing, initiating and shaping various creative activities and finding original approaches to solving different problems. This value relies on the acceptance of the child's natural creativity, which should be encouraged, stimulated and developed in various ways during the educational process in order to express and create. The kindergarten provides a variety of opportunities for the child to express and creatively process his or her own ideas, perceptions and experiences. Play as a teaching method not only stimulates the brain to think creatively, but also provides young children with countless opportunities to learn through constructivism (Wojciehowski & Ernst 2018). Creative thinking is necessary to develop, improve, communicate, and implement ideas as well as be open to new perspectives, express originality, understand the limitations of the real world, and see failure as a new opportunity (Greenhill, 2015). These are the basic skills on which young children learn and which should be developed from early childhood. To respond to today's challenges, educators should also be creative in developing activities that encourage children to solve problems with creative ideas. In designing the educational process, the development of the child's divergent thinking is especially valued in all types of activities, learning areas, and communication. Different cognitive-symbolic expressions of the child are understood as a tool for a better understanding of the child and as an integral part of the whole educational process in kindergarten (MZO, 2014, p.10).

3   Algorithmic thinking

Algorithmic thinking is a way of solving problems using a series of steps that lead to the goal of solving the problem. It defines an approach that can be used to develop problem-solving skills. The term algorithmic thinking was first used in the 2006 article "Computational Thinking" by Jeannette M. Wing. The author interprets that algorithmic thinking "involves solving problems, designing systems, and

understanding human behavior, relying on concepts that are fundamental to computers" (Wing, 2006, p. 33).

According to Shelton (2016), the development of algorithmic thinking in young children does not necessarily require the use of a computer, but can also be achieved with "unplugged" methods. These non-computer methods are not an alternative to computer-based problem-solving methods, but are used as an additional activity in understanding and solving problems. Educators/teachers take on the role of guiding the child in the problem-solving process to help them find a solution, as Vujičić, Jančec & Mezak (2021) describe with more details connected to algorithmic thinking. Algorithmic thinking is closely related to problems and their solutions. Each new problem expects a solution, which can be achieved by decomposing the problem and finding a logical sequence of steps to solve it.

Learning through play or Play Based Learning as a learning strategy is very useful for young children, since play are the main source of children's interest in preschool. Fun and active participation in play effectively contribute to preschoolers' learning process, but in all of this, it is important to encourage creativity and not leave it out. Resnick (2017) describes the concept of creative thinking as a new way of solving problems, especially problems related to daily life. Creative thinking understood in this way relies entirely on algorithmic thinking because it offers a different perspective on the problem-solving process.

All of these insights were incorporated into the curriculum of the elective course designed as part of the Algolittle project (Jančec and Vujičić, 2021) for the study of Early and Preschool Education. The goal of the subject curriculum was to enhance the knowledge and skills of students in their final year of undergraduate study in early and preschool education so that they could connect them to the algorithmic thinking skills they would use in their approach to teaching children trough play-based learning.

4   Methodology

The piloting process of the Algolittle course at the Faculty of Teacher Education, University of Rijeka was carried out from February 28th 2022 to June 10th 2022 in the third year of the study of Early and Preschool Education (full-time study).

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Classes were organised according to the "flipped classroom" model. Students used a hybrid learning model with interactive materials and additional learning materials prepared by the professor and provided on a learning platform. Students had some additional tasks in the form of designing activity plans to integrate algorithmic thinking into different ECE development areas.

4.1 Measuring instruments and a sample of respondents

Thirty-two students of the last year of study of early and preschool education participated in the survey. All students were female. The age of the students ranged from 20 to 24. Most of them, i.e. 20 (60.6%), were 21 years old, two were 20, eight were 22 and three students were 24 years old.

Data were collected using an online pre- and post-education questionnaire to analyse differences in students' attitudes and acquired knowledge. Informed consent was obtained from students for data collection, analysis, and reporting. The questionnaire consisted of a total of 6 parts:

- Computational thinking - Problem Solving;
- Creativity;
- Teamwork;
- Algolittle questionnaire;
- Motivation to teach;
- Engagement versus disaffection with learning.

For the purposes of this article, questionnaire was used to determine students' self-assesment in creativity in relation to algorithmic thinking skills. These parts are Creativity and Algolittle questionnaire.

To measure creativity, the validated Short Scale of Creative Self - SSCS instrument (Karwowski, 2011) was used, which can be considered as two scales: measuring creative self-efficacy and creative personal identity or as a single scale with 11 items assessing personal creativity. For the purpose of this paper, the Creative Self-Concept scale was evaluated as single scale by averaging all 11 items:

(1) I think I am a creative person.

(2) My creativity is important for who I am.

(3) I know I can efficiently solve even complicated problems.

(4) I trust my creative abilities.

(5) My imagination and ingenuity distinguishes me from my friends.

(6) Many times I have proved that I can cope with difficult situations.

(7) Being a creative person is important to me.

(8) I am sure I can deal with problems requiring creative thinking.

(9) I am good at proposing original solutions to problems.

(10) Creativity is an important part of myself.

(11) Ingenuity is a characteristic that is important to me.

All items were offered with 5 responses on a Likert-type scale (1- Definitely not, 2- Somewhat not, 3- Neither yes or no, 4- Somewhat yes, 5- Definitely yes). The instrument had very good reliability, as the Cronbach's alpha value was 0,88.

To help students assess their knowledge of algorithmic thinking skills for the needs of the project, the Algolittle project partners developed a measurement tool in the form of a questionnaire containing 10 items:

(1) I can explain algorithmic thinking and its features.

(2) I know the types and characteristics of algorithmic thinking.

(3) I can give examples of algorithmic thinking in daily life.

(4) I can explain the benefits of algorithmic thinking skills in early childhood.

(5) I can develop appropriate methods and strategies to teach algorithmic thinking skills.

(6) I know what coding tools are used to develop algorithmic thinking skills in early childhood education.

(7) I know how to benefit from algorithmic thinking in different learning areas of early childhood education.

(8) I can create algorithmic thinking activities in different learning areas of early childhood education.

(9) I believe that developing algorithmic thinking skills is important for teacher candidates.

(10) I have knowledge about play-based learning.

This questionnaire also offered 5 responses on a Likert-type scale to assess knowledge by 10 statements includes (1- no knowledge, 2 – sufficient knowledge, 3 – good knowledge, 4 – very good knowledge, 5 – excellent knowledge). The instrument had excellent reliability, as the Cronbach's alpha value in final questionnaire was 0,93.

4.2   Results and discussion

SPSS Statistics was used for data analysis. First, reliability was calculated separately for each scale, followed by descriptive statistics for individual scales and correlations between scales.

Table 1: Descripive stastistic of Short Scale of Creative Self – SSCS

	N	M	SD
I think I am a creative person.	32	4,03	0,74
My creativity is important for who I am.	32	4,38	0,61
I know I can efficiently solve even complicated problems.	32	4,25	0,57
I trust my creative abilities.	32	4,09	0,73
My imagination and ingenuity distinguishes me from my friends.	32	3,47	1,08
Many times I have proved that I can cope with difficult situations.	32	4,34	0,65
Being a creative person is important to me.	32	4,28	0,81
I am sure I can deal with problems requiring creative thinking.	32	4,19	0,59
I am good at proposing original solutions to problems.	32	3,84	0,81
Creativity is an important part of myself.	32	4,06	0,88
Ingenuity is a characteristic that is important to me.	32	4,34	0,65

The overall average result of the students' self-assessment of creativity considering all statements is 4.12. The lowest average value of 3.47 was recorded for the fifth question (*My imagination and ingenuity distinguishes me from my friends*), while the highest value of 4.38 was recorded for the second question (*My creativity is important for who I am*).

The results of the students' self-assessment on knowledge of algorithmic thinking skills after the eduction show very high scores for all questions of the questionnaire. The only average response value below 4 was recorded for the sixth question (*I know what coding tools are used to develop algorithmic thinking skills in early childhood education*), which is understandable since coding was the least represented in education. The

average overall student self-assessment result for knowledge of algorithmic thinking after education is 4.33, which we are very pleased with.

Table 2: Descripive stastistic of Algolittle questionnaire

	N	M	SD
I can explain algorithmic thinking and its features.	32	4,19	0,64
I know the types and characteristics of algorithmic thinking.	32	4,25	0,67
I can give examples of algorithmic thinking in daily life.	32	4,56	0,56
I can explain the benefits of algorithmic thinking skills in early childhood.	32	4,28	0,68
I can develop appropriate methods and strategies to teach algorithmic thinking skills.	32	4,09	0,69
I know what coding tools are used to develop algorithmic thinking skills in early childhood education.	32	3,84	0,85
I know how to benefit from algorithmic thinking in different learning areas of early childhood education.	32	4,41	0,61
I can create algorithmic thinking activities in different learning areas of early childhood education.	32	4,44	0,62
I believe that developing algorithmic thinking skills is important for teacher candidates.	32	4,59	0,61
I have knowledge about play-based learning.	32	4,69	0,54

To further determine the relationship between algorithmic thinking skills and creativity, we analyzed the correlations of the individual items in these questionnaires.

Table 5 showes the results of the correlations between the individual items of the Creative Self Questionnaire and the Algorithmic Thinking Questionnaire. All items of the Algorithmic Thinking questionnaire have at least one statistically significant correlation with one of the items of the Creative Self questionnaire and the correlations are predominantly positive.

The highest correlation is seen in statement five *I can develop appropriate methods and strategies to teach algorithmic thinking skills*, with statement *Ingenuity is a characteristic that is important to me* (r=,500, p<0,01), and positively but low in statistical significance correlated with statements *I know I can efficiently solve even complicated problems* (r=,350, p<0,05), *I am sure I can deal with problems requiring creative thinking* (r=,351, p<0,05) and *Creativity is an important part of myself* (r=,363, p<0,05).

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The first item *I can explain algorithmic thinking and its features* shows a strong correlation with *Creativity is an important part of myself* (r=,492, p<0,01) and positive but low in statistical significance with *Ingenuity is a characteristic that is important to me* (r=,378, p<0,05) and *I am sure I can deal with problems requiring creative thinking* (r=,412, p<0,05).

Table 4: Correlations between estimated Creativity and Algorithmic thinking skills

Creative Self - SSCS / Algorithmic thinking skills	I can explain algorithmic thinking and its features.	I know the types and characteristics of algorithmic thinking.	I can give examples of algorithmic thinking in daily life.	I can explain the benefits of algorithmic thinking skills in early childhood.	I can develop appropriate methods and strategies to teach algorithmic thinking skills.	I know what coding tools are used to develop algorithmic thinking skills in ECE.	I know how to benefit from algorithmic thinking in different learning areas of ECE.	I can create algorithmic thinking activities in different learning areas of ECE.	I believe that developing algorithmic thinking skills is important for teacher candidates.	I have knowledge about play-based learning.
I think I am a creative person.	,258	,308	,111	,237	,310	,266	,326	,321	,100	,188
My creativity is important for who I am.	,308	,236	,023	,204	,298	,180	,355	,321	,075	,173
I know I can efficiently solve even complicated problems.	,220	,169	,151	,229	,350*	,017	,346	,321	,208	,159
I trust my creative abilities.	,234	,343	,102	,332	,301	,284	,342	,333	,159	,241
My imagination and ingenuity distinguish me from my friends.	-,084	-,167	-,023	-,097	-,061	,012	-,005	,021	-,044	,038
Many times, I have proved that I can cope with difficult situations.	-,081	,092	-,016	,138	,213	,275	,043	,015	,038	,225
Being a creative person is important to me.	,266	,103	,136	,202	,239	,160	,151	,196	,042	,209
I am sure I can deal with problems requiring creative thinking.	,412*	,446*	,253	,424*	,351*	,189	,316	,297	,305	,394*
I am good at proposing original solutions to problems.	,182	,253	,058	,199	,317	,293	,132	,141	,063	,182
Creativity is an important part of myself.	,492**	,520**	,252	,400*	,363*	,448**	,430*	,483**	,168	,249
Ingenuity is a characteristic that is important to me.	,378*	,386*	,421*	,427*	,500**	,392*	,364*	,414*	,359*	,502**

Item *I know the types and characteristics of algorithmic thinking* shows the same positive statisticals significant correlations with the same items of Creative Self questionnaire. Strong correlation is seen with item *Creativity is an important part of myself* (r=,520, p<0,01) and positive but low in statistical significanceone with other two statemens *Ingenuity is a characteristic that is important to me* (r=,386, p<0,05) and *I am sure I can deal with problems requiring creative thinking* (r=,446, p<0,05).

Item *I can explain the benefits of algorithmic thinking skills in early childhood* has positive but low in statistical significance correlations with items *I am sure I can deal with problems requiring creative thinking* (r=,424, p<0,05), *Creativity is an important part of myself* (r=,400, p<0,05) and *Ingenuity is a characteristic that is important to me* (r=,427, p<0,05).

Seventh statement *I know how to benefit from algorithmic thinking in different learning areas of ECE* has positive but low in statistical significance correlation *Creativity is an important part of myself* (r=,430, p<0,05) and *Ingenuity is a characteristic that is important to me* (r=,364, p<0,05).

I know what coding tools are used to develop algorithmic thinking skills in ECE is strongly statistical significant correlated with *Creativity is an important part of myself* and with *Ingenuity is a characteristic that is important to me* (r=,448, p<0,01) and positivly but low in statistical significance correlated with *Ingenuity is a characteristic that is important to me* (r=,392, p<0,05).

I can create algorithmic thinking activities in different learning areas of ECE is also statistical significant correlated with *Creativity is an important part of myself* and *Ingenuity is a characteristic that is important to me* (r=,483, p<0,01) and low in statistical significance but still positivly correlated with *Ingenuity is a characteristic that is important to me* (r=,414, p<0,05).

Item *Ingenuity is a characteristic that is important to me* is low in statistical significance but positive correlated with *I can give examples of algorithmic thinking in daily life* (r=,421, p<0,05) and *I believe that developing algorithmic thinking skills is important for teacher candidates* (r=,359, p<0,05).

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There is one more item which shows statistical significance, it is low but in positive correlation, *I have knowledge about play-based learning* with next two items:

I am sure I can deal with problems requiring creative thinking (r=,394, p<0,05) and with *Ingenuity is a characteristic that is important to me* (r=,502, p<0,01).

Finally, *I have knowledge about play-based learning* has strong connection with *Ingenuity is a characteristic that is important to me* (r=,502, p<0,01) and positive but low in statistical significance with *I am sure I can deal with problems requiring creative thinking* (r=,394, p<0,05)

5 Conclusion

Future educators develop many skills and competences during their studies with the aim of a holistic approach to the education of preschool children. In their future work, they should use various methods and strategies to successfully guide children through research and cognitive, language and communication, and socio-emotional development, as well as to promote the development of practical life and motor skills and creativity. Algorithmic thinking skills, that we tried to develop in the Algolittle project through the design of an elective course and apply in our work with our students, can be integrated in all of these activities. With this research, we wanted to find out how our students experienced this, what their attitudes were after their education, and to what extent they saw the correlation between creativity and algorithmic thinking.

According to their responses, there is a strong correlation between algorithmic thinking and creativity, 24 statistically significant correlation. All items in the Algorithmic thinking questionnaire are correlated with at least one item in the SSCS creative self questionnaire. In the SSCS questionnaire, the last item, *Ingenuity is a characteristic that is important to me* is particularly noteworthy, showing a statistically significant correlation with all ten items of the Algorithmic thinking questionnaire. Items *Creativity is an important part of myself* and *I am sure I can deal with problems requiring creative thinking* of the SSCS questionnaire are also significantly related to more than half of the statements in the Algorithmic thinking questionnaire.

Several conclusions can be drawn from the research findings: our students, future educators, are aware of the importance of a holistic approach to teaching preschool children and point to the connection between creativity and algorithmic thinking skills in problem solving. They consider themselves creative and believe that developing algorithmic thinking skills is important for them. Their professional development should include topics on developing these skills for both themselves and the children they will teach.

Further research could explore the possibilities of developing a lifelong learning program and supporting educators in practice who would improve their work by developing the competencies mentioned above.

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TEACHING SOCIAL SCIENCES IN ECE: EXPLORING CORRELATIONS WITH CREATIVITY AND ALGORITHMIC THINKING

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Abstract Teaching social sciences in early childhood education context is demanding and little research has been done related to competences that support the high-quality teaching in social studies. The purpose of this study is to examine specific concepts to better understand possible implications of these concepts in teaching social sciences in early childhood education. Future teachers, students of preschool education (N=31), reported the highest mean values for teamwork, following social sciences teaching skills, creative self-assessment, and algorithmic thinking teaching skills. Students feel most competent in teaching life skills and slightly less competent in teaching social studies, presumably of its complexity. The analysis of correlations between all four concepts revealed that students who report higher creativity, report higher teamwork skills and higher algorithmic thinking teaching skills. The results are important for supporting the students in creativity during their undergraduate study and in learning how to teach social sciences in early childhood education.

1   Introduction

1.1   Why is teaching of social sciences in ECE important

Teaching in ECE (early childhood education) should be in an open and playful classroom setting, designed to be child-centred and nurturing (Madrid and Dunn-Kenney, 2010), especially when teachers prepare activities related with social sciences, because the themes can be sometimes abstract, difficult to understand or complex (Wallace, 2017). We understand the teaching of social sciences as the part of kindergarten curriculum concerned with the study of social relationships and the functioning of society (Odihambo, Nelson and Chrisman, 2016; Wallace, 2017). The knowledge and skills learned through social sciences prepare children to become informed and engaged citizens of their country and the world (Ingleby and Oliver, 2010). Social sciences in ECE, is a field designed to meet the educational needs of society. It emerged at the beginning of the 20th century as a holistic approach to citizenship education using the techniques of social science, raising questions, gathering data, analysing, discussing etc. (Mindes, 2005).

Including social sciences in the educational curriculum of the early childhood years provides an opportunity for ECE teachers to support children as they are developing a sense of self and an awareness of their family and community (Seefeldt, Castle and Falconer, 2014). Preschool programs in Slovenia have a formal social studies curriculum and many everyday preschool experiences provide a foundation for learning social studies (Curriculum for Kindergartens, 1999).

Teaching of social sciences in ECE is important, as each child is a member of society and depends on the functioning of the society in which he or she lives, so it is necessary to introduce children to the basic knowledge of society, its mechanisms, characteristics, services and systems from the pre-school period onwards (Seefeldt et al., 2014). At the same time, children are becoming aware that there are other members of these communities who make contributions to their own well-being and that of the other community members. ECE teachers can lead them in studies of topics within their community, including businesses, community services, jobs and responsibilities of adults, history, geography, economy, social and emotional skills, values, health education, thorough daily routine, introducing to social environment, visiting various institutions, learning about occupations, health, traffic, media etc.

Teaching and learning of social sciences enable children to develop the intellectual habits of investigation and inquiry as they learn how to transform their curiosity into questions and then represent what they have learned using developing skills in language, fine arts, and play (Licardo, 2017). By incorporating social sciences in the early years, teachers are establishing the foundation for a democracy. They help preschool children to develop group participation skills, such as social negotiation and problem solving, communicating about one's needs, and making decisions as a group. Experiences in social studies provide a foundation for the skills needed to become an active, aware and productive citizen (Mindes, 2005).

1.2   The process of teaching and learning social sciences in ECE

Teaching social sciences in ECE should include systematic approach to solve open-ended problems, development of communication skills, social and emotional skills, multicultural understanding, collaboration skills and teamwork.

It is important that instructional design in ECE implement step by step approach where children recognize basic steps, fine-tune them and interconnect them into basic cognitive concepts in learning social sciences. Learning of social sciences is dependent on meaning-making. Meaning is related to cognitive concepts made or constructed by the individual child, that is acting in a social environment and using available resources (Kress, 2010). Learning is also social process whereby knowledge in constructed during social communication and sign-making activities (Selander, 2008, Kress and van Leeuwen, 2001, van Leeuwen, 2005). Significant to teaching and learning are institutional settings, learning resources, instructional designs and teachers' creativity during those processes.

For teaching social sciences in ECE various methods and strategies can be used, which all implies that ECE teachers should be creative when preparing an instructional design. For example, if ECE teachers apply experiential learning, it is necessary that teacher enables children to observe, experience, manipulate with objects and processes, to offer the children multiple resources for learning, to discuss with the children about their prior knowledge and to lead them to be able to connect prior knowledge to new knowledge, while learn through experience. All this cannot be done without teachers' creativity (Budihal et al., 2020). If ECE teachers apply problem-based learning, focus should be on how to develop cognitive skills, critical

thinking, argumentation, creative thinking, innovation and intuition. Problems should be meaningful, real, with possible multiple answers and solutions and teachers should be able to lead the children to find or propose meaningful problems for exploring and learning (Zhang et al., 2011). Again, teachers need creativity and besides, they also need to be able to recognize and define specific steps to lead the problem-based learning process. The role of the teacher in problem-based learning is to facilitate children's knowledge construction through analysing and solving problems. Teachers' creativity and step by step guidance can support that problem solving process or experience learning process leads to learning. Experience itself does not necessarily lead to learning. It is not uncommon that teachers use fun activities that successfully entertain children, but do not lead to learning (Gelman and Brenneman, 2004). Possible misconception of teaching social sciences is also teacher-centred instructional strategies over more active and child-centred strategies, and instead of improving critical thinking they are just teaching facts (Lucey et al., 2014). Such mis-educative experiences can constrain children to learn and develop (Dewey, 1935).

1.3   Why is algorithmic thinking and creativity important in teaching social sciences in ECE

Algorithmic thinking is derived from the idea of an algorithm, which is the process of figuring out a series of actions to execute in order to solve a problem and get the intended result (Katai, 2014). Algorithmic thinking definitions are still in the evolving process and can't be generalizable yet (Berland and Wilensky, 2015). In ECE we understand that algorithmic thinking includes logical thinking, evaluation, decomposition, abstraction, generalization to analyze the problem, process or phenomenon. It is important that ECE teachers can recognize algorithms in everyday learning processes and to be able to implement algorithmic thinking in learning situations (Gencel et al., 2021). For example, when children learn how to wash their hands or teeth, we can teach them simple algorithms related to step-by-step actions in those basic skills. It is crucial that teacher can recognize and define the sequence of steps (algorithms) and to present them to children in a playful, creative way and support them to master the specific skill. Another example could be that teacher creates a board game with traffic rules and children apply one of the possible coding tools, e. g. robots like Cubetto, MTiny or BeeBot, to move the robot with coding and complete specific tasks given by the teacher or by the children. In

such learning process children analyse which steps are important to complete the task, they learn to decompose complex steps into smaller ones, evaluate if they reached the desired goal and learn about traffic signs and other rules they need to consider in this specific traffic situation in a playful way.

Creativity in teaching ECE is also of very important, because it enables teacher to create learning environment, create learning tools, visual material, play and to innovate learning experience in everyday practice. By definition (Runco and Jaeger, 2021), creativity includes innovation and effectiveness, we may also add a possibility to applicate the creation in educational process with the purpose to achieve learning goals. Teachers therefore should be creative in the ways they conceive and carry out their role and, in the ways, they develop learning opportunities, and relationships with the children and other stakeholders in the learning process. In the last few decades creativity is perceived central to education, to be applied to education to respond to key challenges in a way it has never been before (Craft, 2005). Some authors (Seltzer and Bentley, 1999) argue that we live in the creative age where we should shift the focus away from what we should know and onto what we should be able to do with our knowledge. The "know how" is the central to developing creative ability of the teacher.

Teaching social sciences in ECE is a complex task and little research has been done related to competences that support the high-quality teaching in social studies in ECE context (Lucey et al., 2014). The purpose of this study is to examine the above-mentioned perceived concepts and skills of future ECE teachers (students of preschool education), to better understand the correlations and possible implications of these concepts in professional development in teaching social sciences in ECE.

2   Method

2.1   Participants and procedure

Participants in the study were 31 students of second year study full time program Preschool Education at University of Maribor, Faculty of Education, who were participating in the seminar on algorithmic thinking in social sciences during the winter semester 2021/22 on 6 lectures and sessions with total number of 18 hours of the seminar. The seminar was conducted during the Erasmus+ project Algolittle

(Algolittle, 2022), where students were learning how to teach social sciences with algorithmic thinking skills and play-based learning. Majority (n = 28; 90,3%) of the students were 21 years old, two of them were 22 and one was 23 years old, most (n = 30) of them were females, one student was male. Their average grade was 8,37 (SD = 0,55), 12 students of 31 (38,7%) were students of first generation, which means that they were the first members of their extended family, who were studying at the university. Informed consent was obtained from the students regarding the collection, analysis and publication of the data and results of the research study.

We collected the data in the beginning and at the end of the seminar. It this research we present part of the analysis which includes only the data collected at the end of the seminar with special focus on correlations between social sciences teaching skills and other concepts (e. g. algorithmic teaching skills, creativity and teamwork).

2.2   The instruments

In this study we used four instruments, two of them were made for the purpose of this study and two were validated instruments from other authors.

To measure social sciences teaching skills we created short instrument for students' self-assessment. We used 3 self-assessment questions related to teaching of social sciences in ECE (Assess your knowledge and skills for preparation of guided activities that include algorithmic thinking for a) life skills, b) health education and c) social studies in ECE). Five item scale was used (1- nonsufficient, 2 – sufficient, 3 – good, 4 – very good, 5 – excellent). We computed the three questions in one variable Teaching social sciences skills. The instrument shows good reliability, Cronbach alpha value is 0,92.

To measure algorithmic thinking skills in teaching we made the instrument for the purpose of this study. The instrument was created by the team of experts in the project Erasmus+ Algolittle. The questionnaire includes 9 variables related to teaching knowledge and skills of algorithmic thinking on five-item scale (1- no knowledge, 2 – sufficient knowledge, 3 – good knowledge, 4 – very good knowledge, 5 – excellent knowledge). For example, I can explain algorithmic thinking and its features, I can give examples of algorithmic thinking in daily life, I can develop appropriate methods and strategies to teach algorithmic thinking skills, I know what

coding tools are used to develop algorithmic thinking skills in early childhood education. The instrument shows good reliability, Cronbach alpha value is 0,88.

To measure creativity, we used validated instrument the Short Scale of Creative Self – SSCS (Karwowski, 2011), which measures creative self-efficacy and creative personal identity. The SSCS is composed of 11 items, of which 6 measure creative self-efficacy and 5 measure creative personal identity. Creative self-efficacy is composed of the following variables (3) I know I can efficiently solve even complicated problems, (4) I trust my creative abilities, (5) My imagination and ingenuity distinguishes me from my friends, (6) Many times I have proved that I can cope with difficult situations, (8) I am sure I can deal with problems requiring creative thinking, (9) I am good at proposing original solutions to problems. Creative personal identity is composed of the variables (1) I think I am a creative person, (2) My creativity is important for who I am, (7) Being a creative person is important to me, (10) Creativity is an important part of myself, (11) Ingenuity is a characteristic that is important to me. It is a self-assessment instrument measured on 5-point Likert scale with values 1 – definitely not, 2 – somewhat not, 3 – neither yes or no, 4 – somewhat yes and 5 – definitely yes. The internal consistency of both scales is high: α CSE = .81, α CPI = .90. In validation research both scales had bee characterized by high reliablity and validity (Karwowski, 2012). A two factor structure of the instrument was confirmed by confirmatory factor analysis and exploratory structural equation modelling (Karwowski, 2011a, 2012; Karwowski et al., 2013). We calculated a creative self-concept score by averaging all 11 items, as suggested by author of the instrument (Karwowski, 2011).

To measure teamwork, validated instrument Teamwork scale for youth was used (Lower et al., 2015). It is a self-assessment scale developed to assess a youths' perceived ability to collaborate and work with others to achieve a common goal in the group or team context (Anderson-Butcher et al., 2014). Items 1 and 2 reflect attitudes toward teamwork, Items 3–10 reflect teamwork behaviours. Items are assessed on a 5-point Likert-type scale ranging from 1 (not at all true) to 5 (really true). These items possess a degree of content validity, given the nature of teamwork, which involves group engagement, communication, and working as a team. Confirmatory factor analyses examined the factor structure and measurement invariance of the scale across time. Teamwork Scale for Youth demonstrate acceptable factorial validity and measurement invariance across time. Additionally,

strong reliability and concurrent and predictive validity of the scale are established (Lower et al., 2015).

2.3   Analysis

We analysed the data in SPSS, using descriptive statistics for sum scales (min, max, mean and standard deviation, frequencies) and inferential statistics for correlations between scales and individual variables. We also calculated the reliability value with Cronbach alpha coefficient for each scale.

3   Results

3.1   Descriptive statistics

Table 1: Descriptive statistics for sum scales

Scales	N	Min	Max	M	SD
Social science teaching skills	31	3,00	5,00	4,20	0,63
Creative self	31	2,73	5,00	3,99	0,55
Teamwork	31	3,40	5,00	4,41	0,49
Algorithmic thinking teaching skills	31	3,00	5,00	3,91	0,48

Results for sum scales indicate that after the seminar students report the highest mean values for teamwork, following social sciences teaching skills, creative self-assessment and algorithmic thinking teaching skills. We can observe that the mean values for all scales are quite high and the minimum and maximum values proof that all measured values are above the 2,5 which is considered as middle value. Additionally, we checked for frequency distribution and mean values for each item for social sciences teaching skills, because the purpose of the seminar was to improve those skills of the students.

Table 2: Descriptive statistics for teaching social science skills

Variables	N	scale	f	f %	M	SD
Teaching life skills	30	good	3	10,0	4,26	0,63
		very good	16	53,3		
		excellent	11	36,7		
Teaching health education skills	30	good	4	13,3	4,20	0,66
		very good	16	53,3		
		excellent	10	33,3		
Teaching social studies skills	30	good	6	20,0	4,13	0,73
		very good	14	46,7		
		excellent	10	33,3		

3.2 Correlations

Table 3: Correlations between measures and CA coefficients

	1	2	3	4
1 Social science teaching skills	(,91)			
2 Creative self	,25	(,88)		
3 Teamwork	,21	,52**	(,90)	
4 Algorithmic thinking teaching skills	,20	,39*	,10	(,88)

*p<.05, **p<.01

The results in the table show statistically significant strong positive correlation between teamwork and creative self-concept (r = .52, p = 0.003) and moderate positive correlation between teamwork and algorithmic thinking teaching skills (r = .39, p = 0,04), which indicates that those students who are creative might show good teamwork and might have more potential to develop algorithmic thinking teaching skills. Correlations between social science teaching skills and measured variables are positive, weak, and not significant.

Cronbach alpha values show good reliability on all included measures (<.70).

We wanted to know more about the positive significant correlations, so we did further analysis of correlations between individual items of the teamwork, creativity and algorithmic thinking teaching skills.

The results of correlations between individual variables od Creative self and Algorithmic thinking teaching skills show mostly positive correlations. The most significant correlations occur in variables of Creative self-efficacy and practical knowledge and skills in algorithmic thinking teaching.

Strong positive correlations are between My imagination and ingenuity distinguish me from my friends and I can create algorithmic thinking activities in different learning areas of ECE (r = ,57; p = 0,001) and Many times I have proved that I can cope with difficult situations and I can develop appropriate methods and strategies to teach algorithmic thinking skills (r = ,54; p = 0,002), I know what coding tools are used to develop algorithmic thinking skills in early childhood education (r = ,57; p = 0,001). Moderate positive correlations are between Many times, I have proved that I can cope with difficult situations and I can explain algorithmic thinking and

its features (r = ,37; p = 0,039), I know how to benefit from algorithmic thinking in different learning areas of early childhood education (r = ,47; p = 0,008), I can create algorithmic thinking activities in different learning areas of early childhood education (r = ,49; p = 0,012).

Table 4: Correlations between individual variables of Creative self and Algorithmic thinking teaching skills

Algorithmic thinking teaching skills Creative self	I can explain algorithmic thinking and its features.	I know the types and characteristics of algorithmic thinking.	I can give examples of algorithmic thinking in daily life.	I can explain the benefits of algorithmic thinking skills in early childhood.	I can develop appropriate methods and strategies to teach algorithmic thinking skills.	I know what coding tools are used to develop algorithmic thinking skills in early childhood education.	I know how to benefit from algorithmic thinking in different learning areas of early childhood education.	I can create algorithmic thinking activities in different learning areas of early childhood education.	I believe that developing algorithmic thinking skills is important for teacher candidates.
I think I am a creative person.	0,01	-0,17	0,09	-0,02	0,01	0,07	0,16	0,07	-0,21
My creativity is important for who I am.	0,00	-0,31	0,12	0,08	0,09	0,17	0,24	0,20	-0,33
I know I can efficiently solve even complicated problems.	0,27	0,20	0,20	0,28	0,31	0,29	0,15	0,07	0,12
I trust my creative abilities.	0,28	0,08	0,21	0,12	0,16	0,06	0,19	0,13	-0,34
My imagination and ingenuity distinguish me from my friends.	,37*	0,02	0,34	0,17	0,32	0,20	0,31	,57**	0,19
Many times, I have proved that I can cope with difficult situations.	,49**	0,24	0,28	0,28	,54**	,57**	,47**	,49*	0,23
Being a creative person is important to me.	0,19	-0,22	0,21	0,13	0,16	0,24	,40*	0,34	-0,07

Algorithmic thinking teaching skills / Creative self	I can explain algorithmic thinking and its features.	I know the types and characteristics of algorithmic thinking.	I can give examples of algorithmic thinking in daily life.	I can explain the benefits of algorithmic thinking skills in early childhood.	I can develop appropriate methods and strategies to teach algorithmic thinking skills.	I know what coding tools are used to develop algorithmic thinking skills in early childhood education.	I know how to benefit from algorithmic thinking in different learning areas of early childhood education.	I can create algorithmic thinking activities in different learning areas of early childhood education.	I believe that developing algorithmic thinking skills is important for teacher candidates.
I am sure I can deal with problems requiring creative thinking.	,39*	0,26	0,21	0,30	,38*	0,30	0,25	,36*	0,03
I am good at proposing original solutions to problems.	0,30	0,20	0,01	-0,02	-0,01	0,15	-0,01	0,26	0,17
Creativity is an important part of myself.	0,10	-0,03	0,12	0,16	0,12	0,07	0,27	0,19	-0,32
Ingenuity is a characteristic that is important to me.	,37*	0,27	,51**	,37*	,51**	,50**	,60**	0,27	0,08

*p<.05, **p<.01

Another item of creative self-efficacy which indicates moderate positive correlations with algorithmic thinking teaching skills is I am sure I can deal with problems requiring creative thinking, which correlates with I can explain algorithmic thinking and its features (r = ,39; p = 0,029), I can develop appropriate methods and strategies to teach algorithmic thinking skills (r = ,38; p = 0,034) and I can create algorithmic thinking activities in different learning areas of early childhood education (r = ,36; p = 0,045).

Table 5: Correlations between individual variables of Creative self and Teamwork

Creative self \ Teamwor	I think that teamwork is important.	People who work in teams can learn more than if they work by themselves.	I feel confident in my ability to work in a team.	I know how to give my team members feedback that will not hurt their feelings.	I ask others for feedback.	I make an effort to include other members of my group.	I value the contributions of my team members.	I treat my team members as equal members of the team.	I am good at communicating with my team members.	I feel confident in my ability to be a leader.
I think I am a creative person.	,46**	,39*	,39*	,12	,40*	,31	,13	,25	,16	,16
My creativity is important for who I am.	,53**	,44*	,27	-,01	,38*	,35	,22	,36*	,14	,08
I know I can efficiently solve even complicated problems.	,07	-,10	-,09	,08	,23	,49**	,30	,34	-,03	,08
I trust my creative abilities.	,54**	,50**	,47**	,17	,32	,37*	,15	,42*	,20	,29
My imagination and ingenuity distinguish me from my friends.	,24	,33	,53**	,28	,13	,20	,15	,29	,15	,39*
Many times, I have proved that I can cope with difficult situations.	-,26	-,16	-,16	-,18	,02	,22	,19	,17	-,23	,16
Being a creative person is important to me.	,37*	,35	,19	,08	,19	,45*	,31	,41*	,12	,11
I am sure I can deal with problems requiring creative thinking.	,22	,31	,21	,11	,41*	,52**	,38*	,54**	0,10	0,15

Teamwork / Creative self	I think that teamwork is important.	People who work in teams can learn more than if they work by themselves.	I feel confident in my ability to work in a team.	I know how to give my team members feedback that will not hurt their feelings.	I ask others for feedback.	I make an effort to include other members of my group.	I value the contributions of my team members.	I treat my team members as equal members of the team.	I am good at communicating with my team members.	I feel confident in my ability to be a leader.
I am good at proposing original solutions to problems.	,34	,25	,34	,34	,21	,36*	,32	,50**	,28	,45*
Creativity is an important part of myself.	,56**	,50**	,48**	,37*	,45*	,52**	,32	,54**	,29	,26
Ingenuity is a characteristic that is important to me.	,33	,37*	,31	,21	,37*	,53**	,18	,40*	,18	,17

The strongest positive correlations for Creative personal identity are between variable Ingenuity is a characteristic that is important to me and I can explain algorithmic thinking and its features (r = ,37; p = 0,043), I can give examples of algorithmic thinking in daily life (r = ,51; p = 0,004), I can explain the benefits of algorithmic thinking skills in early childhood (r = ,37; p = 0,040), I can give examples of algorithmic thinking in daily life (r = ,51; p = 0,004), I can explain the benefits of algorithmic thinking skills in early childhood (r = ,37; p = 0,034), I can develop appropriate methods and strategies to teach algorithmic thinking skills (r = ,51; p = 0,004), I know what coding tools are used to develop algorithmic thinking skills in early childhood education (r = ,50; p = 0,004) and the strongest positive correlation, I know how to benefit from algorithmic thinking in different learning areas of early childhood education (r = ,60; p = 0,000).

The results in the table show that variables of Creative personal identity more often significantly correlate with Teamwork than variables of Creative self-efficacy. In both cases correlations are positive and mostly moderate and, in some cases, strong.

Variable for Creative personal identity I Think I am a creative person moderately correlates with almost half of the variables of Teamwork: I think that teamwork is important (r = ,46; p = 0,009), People who work in teams can learn more than if they work by themselves (r = ,39; p = 0,033), I feel confident in my ability to work in a team (r = ,39; p = 0,030), I ask others for feedback (r = ,40; p = 0,027).

Similarly, variable My creativity is important to who I am, show strong positive correlation with: I think that teamwork is important (r = ,53; p = 0,002) and moderate positive correlation with People who work in teams can learn more than if they work by themselves (r = ,44; p = 0,014), I ask others for feedback (r = ,38; p = 0,034), I treat my team members as equal members of the team (r = ,36; p = 0,049).

Next variable for Creative personal identity, Being a creative person is important to me, shows moderate positive correlations with I think that teamwork is important (r = ,37; p = 0,040), I make an effort to include other members of my group (r = ,45; p = 0,011), I treat my team members as equal members of the team (r = ,41; p = 0,021).

Two last variables for Creative personal identity show strong and moderate positive correlations with majority of variables of Teamwork. Variable Creativity is an important part of myself correlates with I think that teamwork is important (r = ,56; p = 0,001), People who work in teams can learn more than if they work by themselves (r = ,50; p = 0,004), I feel confident in my ability to work in a team (r = ,48; p = 0,007), I know how to give my team members feedback that will not hurt their feelings (r = ,37; p = 0,041), I ask others for feedback (r = ,45; p = 0,011), I make an effort to include other members of my group (r = ,52; p = 0,003), I treat my team members as equal members of the team (r = ,54; p = 0,002). Variable Ingenuity is a characteristic that is important to me correlates with I think that teamwork is important (r = ,33; p = 0,055), People who work in teams can learn more than if they work by themselves (r = ,37; p = 0,042), I ask others for feedback (r = ,37; p = 0,040), I make an effort to include other members of my group (r = ,53; p = 0,002), I treat my team members as equal members of the team (r = ,40; p = 0,024).

Variables for Creative self-efficacy also indicate moderate and strong positive correlations with Teamwork variables. Variable I know I can efficiently solve even complicated problems moderately correlates with I make an effort to include other members of my group ($r = ,49$; $p = 0,005$).

Variable with the most significant correlations with Teamwork of creative self-efficacy variables is I trust my creative abilities. This variable correlates with I think that teamwork is important ($r = ,54$; $p = 0,002$), People who work in teams can learn more than if they work by themselves ($r = ,50$; $p = 0,004$), I feel confident in my ability to work in a team ($r = ,47$; $p = 0,008$), I make an effort to include other members of my group ($r = ,37$; $p = 0,041$), I treat my team members as equal members of the team ($r = ,42$; $p = 0,018$).

Variable My imagination and ingenuity distinguish me from my friends correlates with I feel confident in my ability to work in a team ($r = ,53$; $p = 0,002$) and I feel confident in my ability to be a leader ($r = ,39$; $p = 0,032$).

Variable I am sure I can deal with problems requiring creative thinking significantly correlates with I ask others for feedback ($r = ,41$; $p = 0,023$), I make an effort to include other members of my group ($r = ,52$; $p = 0,003$), I value the contributions of my team members ($r = ,38$; $p = 0,034$), I treat my team members as equal members of the team ($r = ,54$; $p = 0,002$).

Variable I am good at proposing original solutions to problems correlates with I make an effort to include other members of my group ($r = ,36$; $p = 0,048$), I treat my team members as equal members of the team ($r = ,50$; $p = 0,005$), I feel confident in my ability to be a leader ($r = ,45$; $p = 0,011$).

4   Discussion

In this research we examined the teaching of social sciences in the ECE context. The research is important because of the gap in understanding the high-quality teaching of social sciences and what competences of the teachers or future teachers (in our sample students of preschool education) are supportive in this context (Evans, 2021). By teaching social sciences in ECE, teachers develop many skills and competences of children, such as ability to investigate, teamwork, problem solving,

communication, social and emotional skills, multicultural understanding, cognitive skills in meaning-making of new concepts etc. For teaching social sciences many strategies and methods can be used and most of them include important skills like algorithmic thinking, creativity and teamwork which found the basis for teaching.

To better understand possible implications of algorithmic thinking, creativity and teamwork in professional development in teaching social sciences in ECE, we analysed the perceived skills of students after they finished seminar of algorithmic thinking in ECE, conducted during the Erasmus + project Algolittle (Algolittle, 2022). Students reported high mean levels on all analysed variables. The highest mean values are reported for teamwork, following social sciences teaching skills, creative self-assessment and algorithmic thinking teaching skills. In further analysis of skills in teaching social sciences students feel most competent in teaching life skills and slightly lower in teaching social studies. We presume it is because the themes of social sciences are more broad, complex, and it is not easy to explain or demonstrate these themes to children in ECE (Lucey et al., 2014; Evans, 2021). One reason is the complexity of specific themes, and second reason is that some themes are abstract, not concrete. Children in ECE might have challenges with understanding of abstract themes (e. g. what is mourning, death, honesty, prejudices or love) and teacher might have challenges to explain such abstract themes, while teaching life skills is very concrete and can be decomposed in simple tasks or steps. However, it is important to understand all sides in the pedagogical process and carefully plan the instructional design of the classroom activities which have learning objectives related to these themes (Lucey et al., 2014).

The analysis of correlations between all four concepts revealed that the strongest significant correlation occurred between teamwork and creative self-concept and moderate positive correlation between teamwork and algorithmic thinking teaching skills, which indicates that those students who are creative, might show good teamwork and might have more potential to develop algorithmic thinking teaching skills. To better understand observed significant correlations, we focused on creativity and analysed correlations between individual items of creativity vs. algorithmic thinking skills and creativity vs. teamwork. The most significant correlations occur in variables of Creative self-efficacy and practical knowledge and skills in algorithmic thinking teaching. Especially strong correlations are shown for students who report success in coping with problems or difficult situations and

algorithmic thinking skills. Besides, those who perceive themselves as ingenuine, report higher algorithmic skills. Regarding correlations between creativity and teamwork, results are more dispersed. Most of the items of creativity have four to five significant positive correlations with items for algorithmic thinking. The strongest correlations and with the highest number of items (7) which correlate with teamwork, is the notion that the creativity is important part of the teachers' skills. Which indicates that those future teachers who perceive themselves as creative are also good in teamwork.

From this research we can conclude that educational development for future teachers should involve themes and lessons that would support students in the development of creativity, especially creative self-efficacy, because this is one of the basic competences needed in their teaching of young children social sciences. The research also indicates that further research should be done in exploring possibilities how to support future teachers in high-quality teaching of social sciences in ECE context.

Acknowledgments

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The Correlation Between Integrated Learning and Movement in the Function of a Modern Approach to Teaching

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Abstract The aim of this research was to determine the correlation between movement and initial integrated learning during the educational process occurring in different areas of the kindergarten, i.e. to determine the correlation between integrated learning and the integral motor development of children during the realisation of everyday activities in early education institutions. The sample of participants comprised 56 children of the average chronological age of 3.3 years. The activities were filmed and processed using the content analysis method, percentages (%) of representation and Chi-squared test. The results indicate a significant positive correlation between initial integrated learning and children's integral motor development. Integrated learning is based on the child's movement, it is a modern and extremely successful approach to teaching which supports children's integral development. Children learn significantly faster, better and more efficiently if movement is included in the educational process.

1   Introduction

The contemporary curriculum has a number of characteristics, one of them being its integrative nature. There are different attitudes to the integrated curriculum, it has its advocators, as well as opponents. Those opposing such a method claim that in the context of integrated learning basic information can be lost. They believe it is better to structure the time for the realisation of the curriculum and direct it towards certain areas, so as not to omit important information. Those for the integrated curriculum advocate the unification of more different cognitive areas linked with the same topic which is interesting to children, but also valuable for their interest. According to the National Curriculum for Early Childhood and Preschool Education (2014, 41) "the curriculum for early childhood and preschool education should encompass all areas of children's development in their entirety in order to be adequate to the children's nature and their education. Therefore, activities are not structured according to separate methodologies, nor are they separated in terms of content and time, which implies working without the use of controlled teaching methods and the transfer of knowledge for the benefit of enabling purposeful children's activities and the achievement of a dynamic approach to learning."

The purpose of integrativeness is natural learning occurring in children which affects all aspects of their development, so its basic purpose is to offer children topics in the domain of their knowledge and experience, enabling them to research and interpret in learning activities and topics which are meaningful to them (Petrović-Soči, 2009). It is important to give children everything that can be turned into practical and concrete activities. However, to transform ideas or theories into practice is not an easy process, but one that flows between pure reproduction and artistic processes (Miljak, 2015). The aim of the integrated curriculum is to empower children's independence and autonomy in activities, which requires the creation of stimulating environments in which children have the freedom to research and create different physical, social and logical knowledge. According to their interests, needs and possibilities children are free to choose activities and partners to do them with, which means that they explore and learn in a reasonable and purposeful way (National Curriculum for Early Childhood and Preschool Education, 2014). It is important to mention that emphasis is not put on learning contents, but on the flexible, holistic conduction of the educational process where great value is given to the physical context of the institution, social interactions, the time dimension of the

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education process and to the stimulating environment of the institution, as well as to the individual pace and learning style of each child (Miljak, 2015). In other words, the curriculum is not a strict, unchangeable structure which has to be literally applied, but it can be flexibly directed toward the development of a quality environment in which children will have the chance to learn and live in a community with other children and adults.

The integrated curriculum is integrated, humanistic, developmental, as well as constructivistically and co-constructivistcally oriented (National Curriculum for Early Childhood and Preschool Education, 2014). Its integrated nature lies in the fact that during a child's process of learning it has to encompass all areas of its development. Petrović-Sočo (2009) claims that the essence of the integrated curriculum is not the transfer of knowledge, but the ability of children to, in contact with their environment, autonomously construct and co-construct knowledge.

Children will learn in a quality manner through integrated learning which represents the process of integrating the learning areas which affect all areas of children's development (Vujičić and Petrić, 2021). This is the main characteristic of a contemporary approach because it is characterised by the wholeness, not fragmentation of contents. Integrated learning represents the basic condition for children and studies about them, as well as for research, experimentation and testing of theories. The main starting point is that children learn thanks to their experience, i.e. that in the kindergarten environment situations similar to real life have to be created. Integrated learning is an extension of learning through games due to the use of various materials which enrich the process. The aim of integrated learning is for the child to learn with a purpose, so that the newly obtained knowledge is not applied in only one situation, but in various practical situations.

Vujičić and Petrić (2021) presented the characteristics of integrated learning, namely the holistic approach, physical environment, social environment, learning and play. These elements are the basics for the possibility of implementing the sole process. As the integrated curriculum depends on its infrastructure within the institutional context, so does integrated learning. The first starting point is the social and physical environment. The space, materials and time management are important for the activities and their implementation, while the socio-emotional atmosphere is determined by the relationships within the group and the institution. By creating an

adequate and supporting environment, adequate conditions for learning will be formed as well. The social and physical environment serve as the base for the sole integration of various areas characterised by the holistic approach. To integrate various types of knowledge, and to do it successfully, the starting point is the children's curiosity and interest. Intrinsically motivated children will achieve better results during play if they are interested in the contents (Lee-Cultura et al., 2022). This is done to stimulate self-control and research competencies.

The importance of movement for growth and development is mostly supported by the fact that children have certain abilities developed in the moment they were born, and these abilities enable them to survive outside their mother's womb. Those are the ability to breathe independently, to keep the body temperature stable, to suck and swallow, excrete unnecessary substances, etc. Biotic motor knowledge are such movement structures performed by children instinctively, for which adult instruction is not necessary, and their domains are: mastering space, obstacles, resistance and handling of objects (Petrić, 2019). The biotic motor knowledge of mastering space first acquired by children are rolling, crawling, walking and running. The group of motor knowledge for mastering obstacles includes drop jumps, depth jumps and hop jumps, climbing and crawling through. The group of motor knowledge for mastering resistance includes lifting, carrying, pushing, pulling and hanging. Handling objects comprises catching, passing, throwing and leading. They enable children to use their body in space in a senseful way. Although children start to perform biotic motor knowledge independently, their environment can influence the children's improvement in the acquisition of motor structures, or otherwise its stagnation. Therefore, it is important to make sure that children have a stimulating and safe environment to move through, but also allow for their motor development to occur uninterruptedly (Petrić, 2022).

Integrated learning through movement represents a new developmental approach to the education process (Vujičić and Petrić, 2021). Two notions are unified: integrated learning and movement. Integrated learning represents a modern approach to children, and through learning it links movement as a "follow-up" notion to integrated learning. The integrated curriculum emerges from the contemporary approach which starts from the theory about children being able and competent beings showing a potential for exploration. Through integrated learning children are able to achieve this potential. To explore, children have to move, manipulate and

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handle different objects. By trying and moving, children also learn. The integrated curriculum comprises the following activity areas: music, research-cognitive, kinesiological, creative and linguistic-communicational (Petrić, 2019). In each area children move using gross or fine motor skills. The point is that children do not necessarily have to perform proper movements, but to move, and by the sole construction of activities, a certain motor knowledge can be stimulated. In each activity children learn about a certain area, but through movement children comprehend. Numerous research studies have shown that children learn significantly faster, more comprehensibly and efficiently if the sole process includes movement, too (Vujičić and Petrić, 2021). Learning and moving are each child's basic needs, so they must not be separated, but unified.

A few recent research studies on the topic of integrated learning have been found. They discuss the positive effect different physical activities have on the cognitive aspect of a child's development. The research has been conducted in different countries (Denmark (2018), Indonesia (2021) and South Africa (2018), Croatia (2020) and Australia (2018)), using different research and data collection methods (qualitative, quantitative, sampling methods, etc), and they all obtained similar results in different parts of the world. The research conducted in Denmark and South Africa aimed to determine whether the integration of physical activity into linguistic and mathematical activities affected the success in mastering them, and whether children's physical activity improved their cognitive development. The research conducted in Indonesia aimed to determine the influence of various dance strategies and pedagogical competencies of early childhood educators on creating a positive atmosphere in the group which is important for the educational achievement and social development of children. The research conducted in Australia and Croatia showed that the spatial environment affected children's interest, their autonomy and the possibility to freely chose activities and materials, especially in outdoor free-time activities (Australia), or in the spatial-material environment which was arranged as a challenge to various forms of movement (Croatia). The spatial arrangement was emphasized also by Danish and South African research, while the common element to research conducted in Denmark, South Africa, Croatia and Australia is the influence of integrated learning with movement on various child-development aspects, especially the cognitive development. Along with the cognitive development, research has shown an improvement in children's social and affective skills, whose development is manifested in their interaction and collaboration during

activities. In line with that, the results of the research conducted in Indonesia showed that learning with movement, precisely learning a strategic dance, had a significant positive effect on the atmosphere within the group and on the development of the ability to independently regulate their emotions. The same research showed that high competencies owned by preschool teachers, besides having an effect on the positive atmosphere in the group and institution, influenced the stimulation of the social and emotional development of children, as well as the adaptation of their behaviour, all due to well-designated learning strategies.

Following upon what has been said, the aim of this research was to determine the correlation between movement and initial integrated learning during the educational process in different kindergarten spaces, i.e. to determine the correlation between integrated learning and integral children's motor development during the realisation of daily activities in early education institutions.

2   Methods

2.1   Participants

The research was conducted in two newly built kindergartens of the City of Rijeka. The sample of participants was formed by two mixed nursery groups of the average chronological age of 3.3 years. The experimental group had 29 children, whereas the control group had 27 children. A total of 56 boys and girls participated in the research, as well as their preschool teachers who completed the university graduate study Early and Preschool Education. The preschool teachers were competent to carry out the educational process, thus representing the contemporary understanding of children. The spatial arrangement for both groups was modern and of an adequate environment.

2.2   Research variables

The content analysis method was used to analyse video recordings of the direct educational process carried out with children based on which two groups of variables were formed. The first was directed to the starting points of integrated learning (spatial organisation, preschool teacher strategy, image of the child, aids, materials, toys, atmosphere in the group), while the second comprised variables of children's

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basic motor literacy (biotic motor knowledge) and their wholesome motor development (mastering space, resistance, obstacles and handling of objects).

Spatial organisation commonly comprises the division of activity centres, the correct use of desks and chairs as part of activity centres, the space fulfilling children's needs, interests and abilities and inciting them to (self) learn. It should be functional and aesthetically attractive, offer research activities, enable the construction and co-construction of knowledge, and be pleasant for the formation of social relationships, etc.

The preschool teacher strategy implies the way preschool teachers work, i.e. their participation in children's activities by the employment of educational strategies. The attitude of preschool teachers to children is observed – do they support autonomy and independence, use different media and documents, adapt activities and the environment to children, support team work, equal and democratic relationships among children, as well as among themselves and children, etc.

The image of children represents the segment which the institutional context should be based on. Children are seen as wholesome beings who constantly explore their environment. This depends on the sole construction of the space, the supply of materials, but also on the general understanding of children owned by the preschool teacher. Given adequate contents, children will learn independently and socialise. Through socialisation children learn cooperatively thus performing the co-construction of knowledge. Children are social beings who learn through interaction and communication with their environment.

Aids, materials and toys relate to their availability to children, especially the availability of natural materials which are adapted to children's developmental phases and stimulate research, as well as to the availability of different equipment.

The atmosphere in the group implies the socio-emotional atmosphere, team work among children, as well as among preschool teachers and children. The way preschool teachers construct the environment where children can express themselves freely, the structure of the context which stimulates children to act and learn, the atmosphere where adults can also participate, and the representation of

elements of the dynamic space where all the individuals respect each other and communicate.

Mastering space implies children's application of the following motor knowledge: crawling in different ways, walking along with music, forward roll, sideways roll, running on different surfaces, squats, jumping in place, rotation, descending a slope and walking on narrow surfaces.
Mastering obstacles represents the application of the following motor knowledge: children's crawling through, climbing, jumping over, jumping forward and drop jumping.

Mastering resistance implies the application of the following motor knowledge: lifting and carrying, pushing, hanging, pressing and pulling.
Mastering the handling of objects represents the application of the following motor knowledge: throwing, catching, passing, hitting, aiming and shooting.

2.3   Research protocol description

The research represents a qualitative approach for which the approval of the coordinator in charge for the conduction of the process in both kindergartens of the City of Rijeka was requested. Preschool teachers were informed about all the details of the research process, and actively participated in all its phases. Parents were also informed about all research activities and gave their consent for their child to participate in the research. The research was carried on two groups from different kindergartens, one being the experimental group, the other the control group. In the experimental group the starting point for integrated learning was stimulated more than in the control group.

The filming of the educational process in both groups lasted for four days, eight days in total. Each space of the kindergarten was filmed for one day, while the recordings were then edited to 15 minutes per day (for each space inside the kindergarten). Both groups had elements of contemporary spatial arrangement.

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2.4   Statistical data processing

The collected data were processed by the programme STATISTIKA 12.5 (StatSoft, Inc., Tulsa, OK, USA) and presented in the form of charts and tables. The video recordings were processed using the method of content analysis. The percentages (%) of representation for all research variables were calculated. The Chi-squared test was used to determine the difference between the experimental and control group in total (absolute) values. The statistical significance was tested on the level $p < 0.05\%$.

3   Results

Chart 1 shows that in the experimental group all starting points of integrated learning are present, whereas neither of the starting points of integrated learning was explicitly present during the education process in the control group.
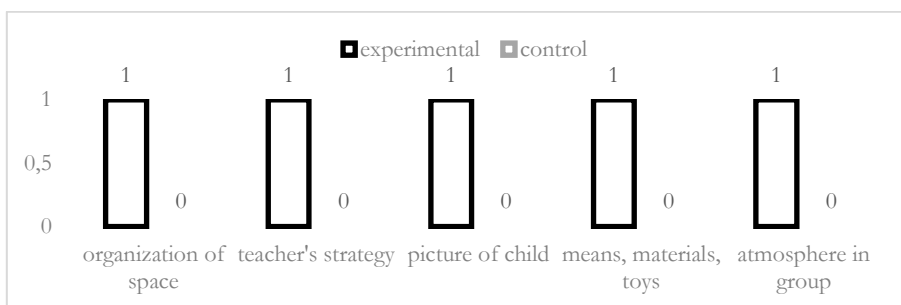
Figure 1: Presence of integrated learning starting points in kindergarten spaces.
Source: own.

Chart 2 shows the presence of children's motor knowledge belonging to the domain of mastering space. In the experimental group their average presence in children in all kindergarten spaces amounts to 90%, while in the control group it is 37%. The gym is especially emphasized in the control group with 80%, but it is still 15% less than in the experimental group.
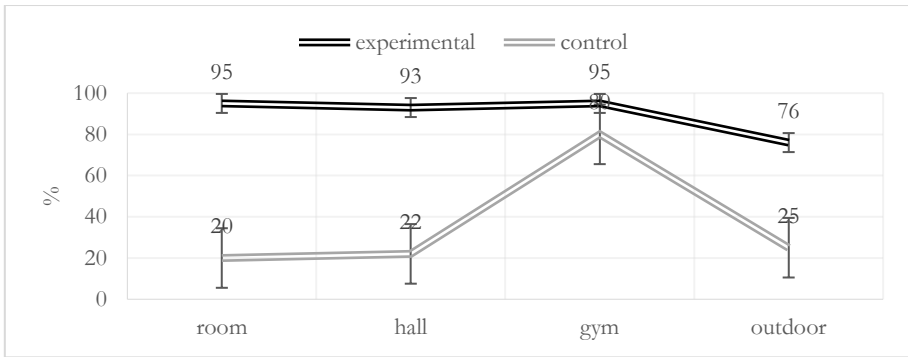
Figure 2: Presence of motor knowledge in the domain of mastering space during activities.
Source: own.

Chart 3 shows the presence of children's motor knowledge belonging to the domain of mastering obstacles. In the experimental group their average presence in all spaces of the kindergarten is almost 88%, whereas in the control group it only amounts to 23.7%. The gym is especially emphasized in the control group with 60%, but it is still 35% less than in the experimental group.

Figure 3: Presence of motor knowledge in the domain of mastering obstacles during activities.
Source: own.

Chart 4 shows the presence of children's motor knowledge belonging to the domain of mastering resistance. In the experimental group their average presence in all spaces of the kindergarten is almost 80%, whereas in the control group it only amounts to 20%. The gym is again emphasized in the control group with 40%, which is 40% less than in the experimental group.

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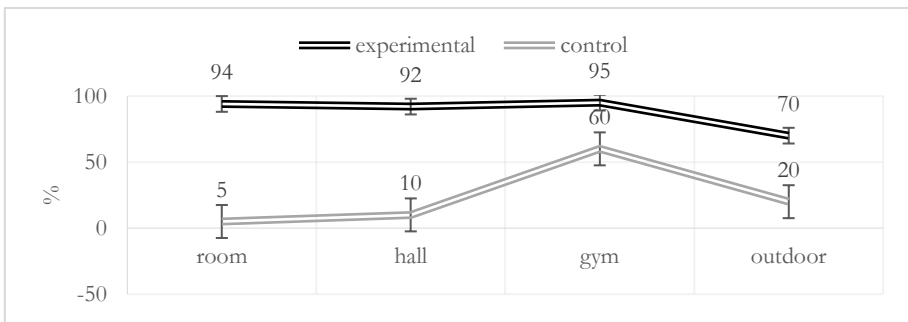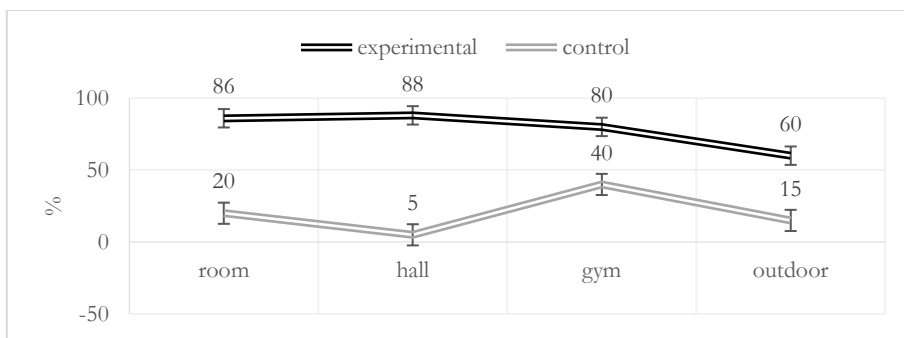**Figure 4: Presence of motor knowledge in the domain of mastering resistance during activities.**

Source: own.

Chart 5 shows the presence of children's motor knowledge belonging to the domain of mastering the handling of objects. In the experimental group their average presence in all spaces of the kindergarten is almost 87%, whereas in the control group it only amounts to 16.5%. As in former domains, the gym is somewhat more emphasized in the control group with 30%, which is 45% less than in the experimental group.
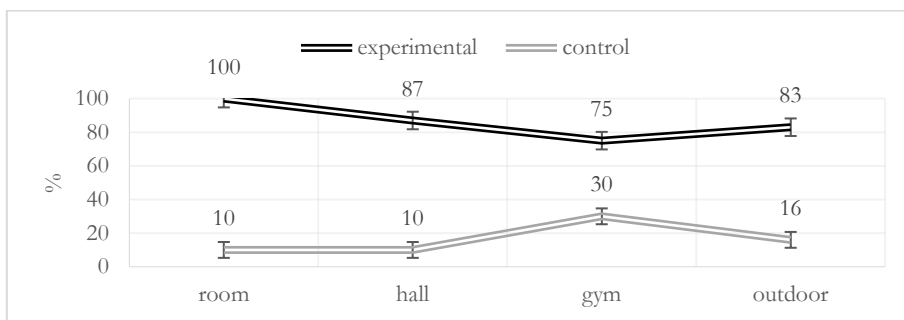
Figure 5: Presence of motor knowledge in the domain of mastering the handling of objects during activities.

Source: own.

Chart 6 presents the integral presence of children's motor knowledge, i.e. their average integral motor development. The experimental group used an approach by which they achieved 86% of the integral motor development, whereas the control group achieved somewhat less than 25%.
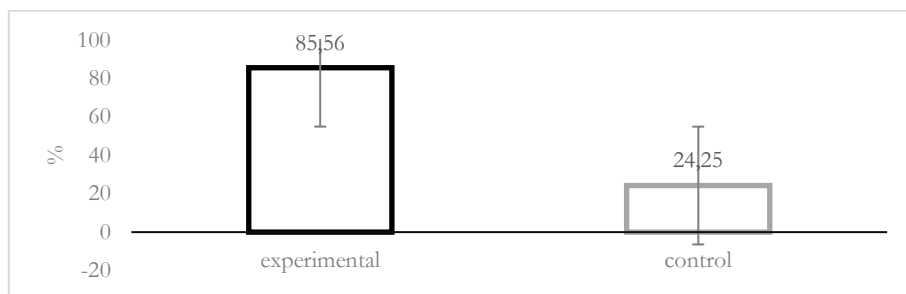
Figure 6: The overall presence of motor knowledge – the average integral motor development of children during activities.
Source: own.

The difference between the experimental and control group in the representation of the integral motor development amounts to more than 60%. Table 1 shows that this difference is statistically significantly ($p<0.001$) confirmed in favour of the experimental group of children.

Table 1: The results of the difference between the experimental and control group in the total presence of children's motor knowledge during activities

Chi - squared	df	p
17.075	3	0.001

Source: own

It can be said that in the experimental group, where the starting points of integrated learning are explicitly present, there is a significantly higher influence on the integral children's motor development. In other words, the results indicate a significant positive correlation between the integrated learning starting points and the children's integral motor development.

4   Discussion

The group of children with whom the approach of integrated learning through movement was underscored achieved a significantly higher presence of biotic motor knowledge and stimulated the development of basic motor literacy necessary for an optimal acquisition of specific motor contents. This understanding is in line with

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former research which have confirmed that kindergarten children who are part of a group where integrated learning is carried on achieve even to 100% better average results in all biotic motor knowledge domains than those children whose material and social environment is not organised in a way which stimulates integrated learning through movement (Petrić, Vujičić, Pejić, 2021). One of the reasons for such achieved results can be explained by the fact that children learn in an integrated way and form their experience through direct interaction with their environment within which they grow. It is not natural for children to separate educational areas. As a fact, they choose their activities and areas of interest themselves which significantly influences their motivation and participation. Children explore the world they live in with their whole being, and parents must recognise moments and incite their children to learn in a way which is for them meaningful.

Integrated learning needs a holistic approach to the organisation of the education process in order to connect different knowledge and direct attention solely to children thus trying to respect children's interests and needs for the creation of an environment which gives them freedom of choice and encourages them to take responsibility for their own behaviour (Vujičić and Petrić, 2021). Integrated learning implies the quality of the context in which learning occurs aiming at a better and more advanced learning process. Integrated learning occurs in a unified way, it is not narrowed down to subject areas, and each learning dimension has an impact on other dimensions, consequently on the integral development of children.

In the institutional context, besides the environment and the role of the preschool teacher, play, or children's activities in various contextual circumstances, is equally important. It is therefore important to emphasize the importance of playing and its developmental potential in the context of its occurrence as a key element of childhood. Playing is a natural and constructive way of interaction between children and adults, as well as children and the environment. During play children learn in an integrated way in the context of their everyday life. It is known that people do not learn in the same way and by employing the same methods, and thus the way each child learns is also different (Vujičić and Petrić, 2021). Children learn through play, actively, using language and movement, in order to transfer ideas. They use thoughts and emotions to understand themselves and others, and they also use written and oral tools in the formation of knowledge.

Results have shown that there is a statistically significant correlation between the presence of integrated learning starting points and the integral motor development of children during the realisation of activities in the education process. Recent research has increasingly indicated to the significant impact integrated learning through movement has on the integral motor development of the child (Vujičić and Petrić, 2021; Petrić, 2021; Petrić et al, 2020; Vujičić et al, 2020; Vujičić et al, 2020). Learning through movement is important for the sole well-being and health of children, so contemporary practitioners have the obligation to think more about this topic and change their own attitudes aiming at the improvement of the education institution quality. The results of the research carried out in South Africa, Australia and Denmark showed that integrating movement in working with children, besides influencing their cognitive development and the development of motor and social skills, also affects organisational changes in institutions and preschool teachers' self-questioning of their own practice. For instance, at the end of the research "STEM Practice in Early Years" preschool teachers have openly admitted that they could have done a better job if they had been more informed about the STEM area. STEM mostly relates to natural and information sciences which have not been so present in early and preschool education thus making most practitioners not ready for the challenges brought by such way of working with children. The implementation of movement in education necessitates a well-planned spatial and material environment and time management which changes the organisational environment of the institution. By changing the organisational environment, the quality of cooperation among preschool teacher also changes, as well as cooperation between preschool teachers and children, and thus collegiality in the institution is created as an element of the education institution culture.

The importance of children's integral motor development is especially manifested in the meaningful and rational use of one's own body in space. If children are deprived of only one biotic motor knowledge domain in the process of their development, their basic motor literacy will be significantly jeopardised (Petrić, 2022). This can be compared to learning the alphabet; if you do not know all the letters of the alphabet, you will not be able to write all the words and make sentences. A similar thing happens with biotic motor knowledge; if children do not perfect them, they will not be able to fully use their motor potential and transmit it to other areas of development.

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The children's need of learning is equal to their need for food and air. Since they were born, they were ready to learn, while the use of this predisposition depends on adults, as well as the conditions and environment we will offer them. That is why it is important for the environment in which children spend their time to be pedagogically ready and to offer to children a rich range of different stimuli which will satisfy their "hunger for learning" (Bowman et al., 2002, according to Miljak, 2009). The environment in the institution or the context of the institution was considered fixed in the past, almost unchangeable. However, with the new approach to education and the change of perspective of the child, transformations in the context of the institution also occurred.

In today's technological world, where the learning and teaching methods are modern, active learning, learning through movement, is often forgotten. We are witnessing generations who grow up in front of screens, live a sedentary life, a life that, with the course of time, brings along numerous obstacles to the normal and integral growth and development. The sedentary way of life causes numerous civilizational diseases (Jurko et al., 2015). The link between the mind and body has been forgotten, and rare are those who are aware that the mind and body cannot "grow" one without the other. It has also been forgotten that life begins and ends with movement. If we begin from ourselves and think about our own lives, we will see that the contemporary world holds even adults back, so it is not strange it influences our youngest, too.

It has been proven that the part of the brain that processes movement is the same as the one that processes learning, as well as that a damage of the cerebellum can be the cause of autism since it showed that autistic children have a smaller cerebellum and a smaller number of neurones in it. These conclusions were reached by Eric Courchsene of the California University. He connected the damages of the cerebellum with the damaged ability to quickly redirect attention from one task to another (Jensen, 2005). Different clinical, biological and pedagogical research have confirmed that activity is necessary for a proper functioning of the cerebellum and that it influences healthy growth and development. The research presented by Jensen (2005) in his book confirmed the correlation between the cerebellum and learning and rejected the earlier hypothesis that thinking and motion were two different notions.

When we speak about movement, it does not necessarily mean physical exercising. Likewise, when we speak about learning through movement, it does not mean that movement is exclusively a hard physical labour. Movement can be performed by painting with a paintbrush, drawing on the floor, playing with building blocks and many more. It is clear that physical exercising has a somewhat stronger influence on the development of neurons, and that children who take part in sport programmes and physical education programmes can develop a larger amount of neuron connections than those who did not take part in a similar programme. Exercising fills the brain with oxygen and feeds it with highly nutritious substances, so as to improve growth and make neuron connections better. Moreover, children who take part in everyday physical education show higher motor maturity, better educational achievement and attitude to school compared to peers who do not participate in everyday physical education. By exercising our body, we prepare our brain to respond to challenges fast due to the fast response of adrenalin and noradrenalin. "Exercising three times a week for twenty minutes has numerous benefits, and it has been shown that those who exercise at least for 75 minutes a week react faster, think and memorize better; moreover, exercising diminishes stress" (Jensen, 2005:105-106). Dizdarević, Krčmar and Martinić (2013) write about the situation of preschool children today and about the movement children engage with in kindergarten and the family. Children's motion usually comes down to walks in nature, bicycle riding or games in the park. More physically active children will endure higher efforts more easily, they will communicate with peers and adults more easily, they will cope and deal with tasks put before them better. Motion, i.e. movement, is the base for the human organism to work, while the contemporary world leads to the fact that children are increasingly limited in their moving around and blocked in their active ideas. Today's parents are constantly worried about children falling and getting hurt, so they replace games and activities with mobile phones, computer games, etc. All that prevents the normal motor and brain development. Preschool children are in constant movement, and it can be said that they are really tireless. Their daily movement represents play, a whole-day playing which has an excellent impact on the development of the anthropologic status of the child and is an important factor in their growth (Ibid.).

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5   Conclusion

The employment of integrated learning through movement at an early age does not only improve children's motor ability and health status, but leads to a better sensorimotor integration, has a stimulating effect on cognitive development, and encourages children for active participation. For this type of work with children to be successful, preschool teachers' professional competencies are necessary. They have to be ready and know how to have well-planned activities and integrate movement in working with the group. The spatial-material organisation of the environment in line with children's needs and interest is therefore very important. Preschool teachers who have high competencies will be able to introduce innovations which are possible to be implemented at the level of any education institution. One of the innovations is the integration of movement in the educational work, but this is only a step on the way toward quality changes which are determined as the common, long-term, research process aiming at establishing the problem and resolving it.

It was our aim to emphasize and indicate to the claim that institutional childhood is determined by the early and preschool education paradigm which points out the significance of new scientific knowledge about the possibilities of an early developmental period. These are the reasons behind the effort of linking together the starting points of integrated learning and movement functioning for the contemporary approach to early and preschool children.

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Exploring Early Childhood Teachers' Differentiation Practices in Teaching Mathematics with Learning Trajectories

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Abstract Teachers in preschools work with children with various ability levels; therefore, they should be ready to utilize differentiated instruction. However, they are not well equipped to meet the learning needs of children with individual differences when teaching mathematics. Research indicates that Learning Trajectories can help teachers when serving children with various learning needs. In this study, five preschool teachers participated in a Learning Trajectory based PD program for ten months to teach young children mathematics better. This research reports on the interviews of the teachers about their differentiation strategies. The content analysis of the interviews revealed that the teachers used the LT to accommodate their instruction to each child's level of understanding. They also utilized diverse ways of grouping children and they considered children's feelings. The results indicate that the LT can be a great tool in helping teachers differentiate their instructions along with sensitive and caring classroom culture.

1   Introduction

High quality educational standards in pre-school requires teachers to be prepared for supporting students with diverse educational needs (Garvis et al., 2022) because each child comes to school with a different background, including different genetic characteristics, interests, family effects and cultural backgrounds (National Association for the Education of Young Children, 2019). In addition, gaps among children may be higher if children are coming from families with diverse socio-economic backgrounds which strongly affects the development of the children (Kulic et al., 2019; Rindermann & Baumeister, 2015). Hart and Risley (1995) reports that when certain risk factors are present, it is possible to see differences between children's cognitive development as early as 18 months. Therefore, it is inevitably necessary for teachers to know how to differentiate teaching in preschool. However, that is not always the case, especially in mathematics.

Historically, mathematics has not been a popular subject in early childhood education; therefore, preschool teachers are not well equipped and struggle with teaching young children quality mathematics (Lindmeier et al., 2020; Sarama & DiBiase, 2004). Additionally, the situation becomes more complicated when teachers work with children who are gifted or have special needs to whom teaching requires certain adaptations. At this point, we believe that Learning Trajectories (LT) can guide teachers in the education of children with varying levels of developmental skills because the necessary conditions for implementing differentiated instruction can be easily provided by using the LT (Clements & Sarama, 2021).

According to Tomlinson (1999), who writes extensively about meeting individual learning needs, differentiated instruction requires teachers "to engage students in instruction through different learning modalities, by appealing to different interests, and by using varied rates of instruction along with varied degrees of complexity (p. 2)". This task should be challenging for teachers when teaching mathematics as they need to have a profound understanding of the content, pedagogy, and children's thinking in all areas of early mathematics (Carpenter et al., 1996; Gasteiger & Benz, 2018). Differentiated Instruction also entails developing and employing modifications in content, process, and product domains of curriculum (Tomlinson, 1999). However, literature addresses the inferior quality of teachers' modifications to support children with diverse needs (Kurth et al., 2012; Strogilos et al., 2018; Ware

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et al., 2011); thereby indicating the demand for new ways of supporting teachers in their efforts to differentiate instruction.

LT can be practical in that sense because teachers who learn about and implement LT understand the nature of the primary mathematics content better. Additionally, the nature of LT, where math skills are ordered from the most basic to the most complex is appropriate for facilitating learning for all children (Baroody et al., 2022; Sarama & Clements, 2009). It lubricates the process of defining students' level of content knowledge in all areas of mathematics and guides teachers to level up students' thinking (Sarama et al., 2022). Besides its use as an assessment tool, the LT also guides the curriculum and instruction (Confrey et al., 2014; Daro et al., 2011). In their research with in-service and pre-service elementary teachers, Wilson and his colleagues (2013) studied teachers' use of learning trajectories for rational numbers to develop their understanding of student thinking. The researchers found that using learning trajectories was effective in helping teachers form models of student thinking and shape their understanding of mathematics and student thinking (Wilson et al., 2013). Another research (Sarama et al., 2017) reported that early childhood teachers who used learning trajectories in teaching early mathematics improved their noticing of student thinking. That improvement in teacher noticing is likely to support teachers in designing learning contexts and activities more likely to facilitate children's mathematics learning. Since the LT includes skills from the most basic to the most complex, the teachers can quickly determine a baseline for each child. The teachers who monitor their students' progression via the LT would make instructional decisions easily for individual children (Sarama et al., 2017). Therefore, the LT naturally turns into a differentiated instruction tool. Teachers' expectations of children's potential are also likely to increase when they use the LT in teaching mathematics. Clements and Sarama conclude, "teaching with learning trajectories is the best way to address the needs of all children, especially those with special needs" (2021, p.348). Yet, we do not know much about how early childhood teachers using the LT for teaching mathematics differentiate their instruction. Also, literature suggests that there is little known about early childhood teachers' practices concerning modifications to differentiate their instructions(DeBaryshe et al., 2009; Purcell & Rosemary, 2008; Strogilos et al., 2018; Ware et al., 2011). Therefore, researchers call for new studies to learn more about the nature of the subject, especially small-scale studies investigating different methods of differentiation in early childhood classrooms (DeBaryshe et al., 2009). The current study will

contribute to the field by providing inside voice from the classrooms where the LT based mathematics program took place.

1.1   Research Questions

The following questions guided the present research:

- How did the teachers who participated in the LT-based PD program on teaching early mathematics implement differentiated instruction in their classrooms?
- What challenges did the teachers face while differentiating the instruction in their classrooms?

2   Methods

In this qualitative research, we worked with five early childhood teachers to explore the above questions.

2.1   Setting

The purpose of this research is to study a group of early childhood teachers' differentiation practices in teaching mathematics. Five teachers who participated in a Learning Trajectories Based (LT-Based) Professional Development (PD) program on teaching early mathematics instruction put what they learned at the PD into practice in their classrooms. While they were teaching mathematics aligned with the PD program principles, they found themselves to accommodate students with individual differences. The teachers needed to differentiate the content to adapt their instruction to diverse educational needs. In this paper, we report how they differentiated the mathematics instruction.

2.2   Teachers

Five female teachers working at a private kindergarten voluntarily participated in the current research and gave their informed consent in writing to take part in this project. Although all teachers were required to attend the LT-Based PD program, they all participated in the research section at their own will. Collected personal data

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was managed according to the related laws and regulations. All teachers received education in child development. As seen in Table 1, three of them own 4-year university degrees, one of them owns a 2-year university degree and one teacher holds a vocational school degree (equivalent of high school) in child development. The teaching experiences of the participants range from three to fifteen years (Table 1).

Table 1: Demographics of the participants with class age and size

Participant pseudonyms	Experience	Education	Class age; size
Teacher 1	10 years	4-year university	5 yrs. old; 15 children
Teacher 2	15 years	Vocational school	5 yrs. old; 16 children
Teacher 3	3 years	4-year university	4 yrs. old; 8 children
Teacher 4	4 years	2-year university	4 yrs. old; 9 children
Teacher 5	4 years	4-year university	3 yrs. old; 15 children

In addition to their formal education, the teachers attended a wide range of professional development programs and seminars; yet it was the first time they participated in a PD program on early mathematics instruction. Their mathematics and mathematics teaching knowledge were extremely limited. They received at most one or two mathematics-related courses at college level.

As seen in Table 1, the school serves children from different age groups. During the 10-month implementation of the PD program sixty-three children received early math instruction from five teachers. The children were from middle-class families in their region. Most of the parents were college-graduates working at white-collar jobs. In many cases, both parents were working during the days.

2.3 Professional Development (PD) Program

2.3.1 Overview

The authors of this research were invited by a private school located in a large metropolitan city of Türkiye to design and deliver a PD program on teaching mathematics to young children. While one of the teacher educators is an early childhood educator, the other is a mathematics educator. Both researchers have extensive previous experience in conducting PD programs on early mathematics

teaching. The PD efforts began at the beginning of September 2021 and lasted until the end of June 2022. Thus, altogether the present research reports about early childhood teachers' experiences in a 10-month PD program.

2.3.2   Purpose

The main purpose of the program was to enhance teachers' understanding and implementation of mathematics instruction for children between 3 - 6 years old. Among other frameworks (Confrey & Maloney, 2010; Simon & Tzur, 2009; Sztajn et al., 2012; Wickstrom & Langrall, 2020), The Learning and Teaching with Learning Trajectories (LT) approach for early mathematics (Clements & Sarama, 2017, 2021) guided the activities of the PD. The LT consists of three related components: a) a mathematical goal, b) a hypothetical developmental progression through which the child will move forward to reach the goal and c) a set of instructional activities that are supposed to help the child to move from one level of thinking to a more complex level (Sarama et al., 2016). Based on a rich body of research in mathematics education, developmental psychology, and cognitive psychology (Sarama & Clements, 2009), Clements and Sarama identified mathematical skills that children should acquire to reach the goal (2021). The skills are ordered from the most basic to the most complex and are observable and easy to assess.

2.3.3   Content

The entire program was devoted to teaching counting, subitizing, comparing numbers, adding, and subtracting, composing numbers to young children. Teacher educators introduced the content of each topic with the associated skills as outlined in the LT framework (Clements & Sarama, 2017). For each mathematics topic, a table with a list of the skills was handed out to teachers so that they could use the skills as an assessment and curriculum guide.

Teachers' approach to children was also critical in the PD program, where the aim was to support children's learning on the one hand and to reinforce their self-confidence on the other. LT-based list of skills guided teachers to find the appropriate level of activities where each child was challenged; yet they successfully solved the problem. This strategy was critical to feeding children's self-confidence, especially struggling children. The motto was "No child will leave the activity without

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any feeling of success." Therefore, teachers were encouraged to find ways to improve children's learning by offering challenging tasks and utilizing many ways to scaffold in case they need assistance.

2.3.4   Implementation

The teacher educators and teachers met weekly to discuss how to teach mathematics concepts and procedures. Each face-to-face meeting took about one-hour on Thursdays after the school day had ended. Between the face-to-face sessions the teachers could communicate with the teacher educators via phone and WhatsApp, a mobile instant messaging (MIM) tool. They asked their questions regarding the content of the PD program and mathematics concepts. Additionally, they shared videos and pictures of mathematics teaching episodes to receive feedback from the teacher educators. They received feedback on their videos via WhatsApp and at the face-to-face meetings.

At the weekly meetings, the teacher educators shared essential components of the mathematics topics. For example, they explained principles of counting (Brownell et al., 2014), perceptual and conceptual subitizing (Clements, 1999) and problem types for addition and subtraction (Fennema et al., 1996). The LT for the mathematics topics were introduced to the teachers at the meetings. The teacher educators reviewed the table with a list of skills associated with the relevant mathematics content (LT Table). They all carefully studied each of the skills so that they could effectively understand how to observe and teach the skills. The teacher educators and teachers offered relevant teaching ideas. The teachers were encouraged to use the skills table for the assessment of children and delivering the content. Additionally, videos of actual classrooms were viewed and discussed regularly. It was a big topic on the agenda of the weekly meetings to give feedback and discuss videos. Usually, one or two videos for each teacher were discussed at a meeting.

The school administrator attended all the weekly meetings in-person and took note of everything discussed during the meeting. She also visited the classrooms regularly to give feedback to the teachers and aided them if necessary. The school administrator was highly knowledgeable about the content of PD. The researchers, teacher educators, visited about three times a month. They engaged in conversations with the administrator regarding the classroom implementations. The researchers

were answering the administrator' questions about specific aspects of the implementation such as how to use mathematics manipulatives or how to lead successful mathematical talk with children. The teachers and administrator reported that the administrator was supporting the teachers regarding mathematics instruction via WhatsApp or individual interactions. As a result, the administrator acted as an on-site coach.

2.4   Data Sources

The teachers were individually interviewed twice by one of the teacher educators who has extensive experience in conducting research interviews. The first interview was conducted about in the middle of the PD program, January 10th, and the second interview was conducted at the end of the program, the last week of June. The teachers were also interviewed informally at the weekly meetings to ask about their reactions about the program and their experiences. The purpose of the interviews was to explore teachers' reflections on the implementation of the PD, their professional growth, and their classroom implementations, including differentiation practices. In this paper, we only focused on how they differentiate their instruction to reach students with diverse needs. In the interview protocols, we added questions which were solely specific to differentiation. We asked them the following questions regarding their differentiation practices:

- Were there any situations where the children had difficulties during the implementation phase?
- What do you do for slow learners?
- How did you assess whether children learned or not?

2.5   Data Analysis

This research was carried out by using qualitative content analysis. Content analyzing process includes the coding, categorizing, and naming the data (Miles & Huberman, 1994; Sharan B. Merriam, 1994). Interviews were transcribed and read by all researchers several times. Most relevant and significant expressions for the aim of the study are identified and occurred as codes. Categories are decided by grouping all codes in accordance with their similarities and differences. Five categories emerged and were named as following: Planning instruction appropriate for the

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child's level, grouping-pairing, individual work with the child, considering the child's feelings and using LT as a differentiation tool. For reliability issues, after reading the data, researchers discussed occurring codes and reached a consensus on themes and sub-themes.

3   Results

In this section, the findings obtained from the data collected through interviews with 5 teachers participating in the research are included. Differentiation practices used by early childhood teachers in teaching mathematics are grouped into five main themes: Planning instruction appropriate for the child's level, grouping-pairing, individual work with the child, considering the child's feelings, and using LT as a differentiation tool. While explaining the themes, the sub-themes identified for each theme and the opinions of the teachers were included.

3.1   Planning appropriate instruction for the child's level

The first theme emerging from the data was teachers' concern for providing appropriate level of instruction when teaching mathematics. Three sub-themes occurred related to this theme: Adjusting implementation, slowing the process down, and progressing after the child reaches the previous level on LT.

Teachers increased or decreased the cognitive demand of activities according to child's level of ability. For instance, Teacher 1 mentioned that she used larger numbers in mathematics games and more challenging questions when she was working with a gifted child.

Similarly, another teacher, Teacher 2, commented,

"My table was small for the activity with cards up to a hundred, but the gifted girl was ready to count to three-digit numbers. (...) Activities up to a hundred really seems so easy to some children."

Teacher 2 prepared extra counting cards for the gifted child, who could count to three-digit numbers, so that the child would extend her counting skills. As expected, the teachers also had children who were behind their classmates. Teacher 4 talked

about how she tried to meet the needs of a group of students with diverse levels of learning.

She commented,

"…I asked questions with larger numbers when I work with children who are above the class average. For example, when I noticed that two of my students had higher learning capacities, I challenged them in mathematics. Yet, I ask questions with slightly smaller numbers when I work with others, considering their level. So, they do not feel bad about themselves."

In addition to making the activity easier, teachers also slowed their teaching process down for children whose learning speed requires a slower course.

It was also found that the primary tool that teachers used for differentiation was the LT. They followed the activities within the scope of LT considering the children's individual needs. Their use of the LT is a direct reflection of what they learned in the PD. All teachers stated that when they worked with a child who had difficulty reaching a specific outcome, they returned to the previous level in the LT framework. They practiced making him master the necessary skills he had difficulty with. After reaching the previous level, the child's participation in activities that moved him forward was ensured.

After assessing children based on their correct responses, the teachers determined children's level on the learning trajectories for counting. They were expected to base the instruction on the assessment results. The teachers reviewed the learning trajectories to have a general idea about the children's overall level. Following the general overview, they determined whether there were striking differences among individual children. The teachers were encouraged to consider both the general class level and individual differences to better adjust the instruction. For instance, if a group of children shows counting skills up to 10, the teacher aimed at the counting skills beyond 10 to further student learning. Additionally, if a child were behind their peers, the teacher would be designing activities that require counting within ten. Furthermore, the teachers were expected to increase the demand of the activities for children who are ahead of their peers.

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3.2   Grouping-pairing

Some teachers said they used grouping and pairing methods sometimes for differentiation. They shared that they paid attention to the children's thinking level while grouping them in activities requiring small group work.
Teacher 4 commented,

"… to establish a balanced learning atmosphere, I mix up children by their levels of reaching mathematical goals. (...) Children can look at each other and learn something from each other because it really helps."

Teacher 4 and other teachers included children ahead and behind the general class level as much as possible in the same group. They encouraged the children to learn from each other by supporting their interactions. While doing this, they aim to ensure that the children behind the class do not sit together and that their learning motivation does not decrease by feeling unsuccessful.

Teacher 2 commented,

"I group children in a way that children do not feel bad for not being competent enough. Because when children who are behind others always come together, their emotional mood goes down, unfortunately."

Teacher 2 also stated that after grouping and pairing students to support peer learning, she gave instructions encouraging children to interact, give each other clues and help each other to make the learning climate more welcoming and natural.

Another teacher, Teacher 1, stated that she especially grouped the children far ahead of the general class level in particular activities. She explained that children could easily follow each other's actions and learn from each other during the activities. Also, it was practical to bring together children who perform exceptionally well to prevent others from feeling incompetent.

3.3   Individual work with the child

Working individually was often necessary when teachers worked with diverse groups. For instance, it was not always possible to evaluate whether the child with individual needs had achieved the relevant goal when working with a large group.

Teacher 3 explained,

" I cannot understand whether he/she understood any concept when working as a large group. In large groups, children who are behind their peers have the potential of being invisible."

As emphasized by Teacher 3, children needed to be evaluated individually. Teacher 3 further explained that, in large groups, they could copy each other's answers. Teacher 1's comments added more on the subject that it was necessary to work one-on-one with children in need to prevent them from moving to the next level without fully comprehending.

Another reason for working individually was the child's need for individual instruction since he/she could not learn in groups. All but one teacher stated that they conduct individual studies with children with individual needs to provide mathematics instruction appropriate for children's individual needs. They mentioned using different strategies, including staying at the proper level of LT until the child learns, giving extra time, repeating, making the child sit near the teacher, and doing individual work to check whether the child has learned.

Teacher 1 stated that she spared time for a child she knew needed more time during the activities. Although the rest of the class started to work on the next goal, they continued to work on the last goal with the child. Teacher 1 did not expect the child to move to the next level if she decided that was unnecessary. Another teacher, Teacher 4, stated that she did extra individual work for the children who were behind the average class level regarding the learning goals. She repeated the same activity for children in similar situations many times.

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Teacher 2 used another strategy; she commented,

"I take them (children behind the general class level) near me. Starting with individual work with smaller numbers. I'm taking it down, slowing it down."

As data shows, the participant teachers worked with children with special needs individually when they evaluated those children's level of mathematical understanding. Also, they offered individual instruction when those children could not follow the instruction in groups.

3.4   Considering the child's feelings

Throughout the interviews, all teachers consistently emphasized the importance of considering children's feelings while planning mathematics instruction appropriate for individual children. They rationalized their differentiated educational activities with the need to improve children's moods or to prevent them from feeling bad. They reiterated that children cognitively behind their peers should feel accepted, successful, and confident in their classrooms.

For instance, Teacher 4 commented,

"At the end of the activity, I want them to have good feelings. Each child should say, "I can do it!"

Another teacher, Teacher 2 stated that it was important not to force children to do things beyond their ability; instead, teachers should focus on what they could do. Otherwise, she said, they were likely to feel bad and insufficient; these children need encouragement.

Teacher 2 explained further and gave an example:

"... while one of my children was doing subtraction, I said, 'you are doing very well!' He got enthusiastic and said, 'I'm very good at subtraction!' He was so excited and said, 'I'm already very good at subtraction' all day."

She stated that this encouraging and motivating approach improved the child's attitude towards mathematics and self-confidence. The teachers used the above strategies to comfort them, make them feel accepted, and support their

development. Yet, they sometimes needed professional help. Then, teachers referred them to psychological counseling services in their school.

Teacher 1 gave an example,

"One of my students is shy and fearful of numbers. First, I wanted to relieve that fear and anxiety. I talked about him to the school counselor. Is he having trouble understanding or paying attention? There is a fine line there. The counselor is an expert on this subject, of course."

Teacher 1, as stated, received support from experts and focused specifically on the child's development process.

3.5   Using LT as a differentiation tool

As interviews were analyzed, the findings suggested that the teachers actively used the LT Table as a differentiation tool. First, they determined each child's stage by conducting individual interviews. What each child could do was marked with "+" and what they could not do with "-". Based on these assessments, teachers made plans to improve the skills in which children got "-".

After describing her way of using LT Table, Teacher 4 said,

"For example, I don't try to teach place value concepts, including ones and tens, to a child who cannot count."

Utilizing the LT Table enabled teachers to assess students based on factual data and determine the general class level and the levels of individual children on the same document. The teachers reported that they noticed the children who needed individual support better.

Teacher 1 commented,

"LT checklist tool clearly reveals whether a child needs individual support and our starting point."

Similarly, Teacher 4 said,

"LT is our map; it is our road map."

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When we asked how often and how they used this tool, teachers said they reviewed it every week, at varying intervals for each child, and evaluated the students they thought progressed and turned the "-" into "+". Teachers emphasized the importance of not interrupting children's play using LT Table.

In this regard, Teacher 1 said,

"Not interrupting the child's play but attending to the child's play is not a waste of time, it is a necessity." Teachers stated that they prepared game-based mathematics activities with appropriate materials to improve the skills that the child acquired "-". The children were very enthusiastic about participating in the related activities.

Teacher 2 stated that children consider assessment as playing one-on-one games with the teacher and added,

"The games and stations we set up on the table (for assessment) are interesting. The children feel special, and they say, 'When will you pick me up?'"

Therefore, the data showed that the teachers' use of games and plays as a part of their assessment with LT Table improved the tool's efficiency.

4   Discussion and Conclusion

Research results show that teachers make many modifications, especially in the context of process and content. Some strategies teachers employed were organizing small group and individual activities, pairing students with varying levels of understanding, increasing and decreasing the difficulty levels of activities, giving extra time, repeating, using different materials, and slowing down. These modifications were similar to the ones utilized by the teachers who participated in other studies (Deunk et al., 2018; Strogilos et al., 2018). In addition, two issues stood out in this study. The first is that teachers actively used LT as a differentiation tool. In a similar study conducted before, Debaryshe and colleagues (2009) reported that the participating teachers did not assess student progress as often as required, and they perceived this process as "too much of a burden" (DeBaryshe et al., 2009). On the contrary, the current study participants did assessment activities regularly. Indeed, the participating teachers were not told how often they would evaluate; they

were only asked to follow the children with the LT Table. They decided how often they would use it. Possible explanations for this result may be as follows: The study was conducted with a small group where the role of personal relationships might have motivated teachers. The two researchers held regular face-to-face meetings each week and gave individual feedback to the teachers. They reviewed the teachers' work and shared the points they liked or needed to be corrected. Group dynamics might have motivated the teachers. Another explanation might be the practical nature of the LT Table. During the training sessions, the researchers observed that the LT Table allowed the teachers to see the children's progress and, thus, the result of the education they gave more quickly. Also, reporting new progress made them proud at the weekly meetings, resulting in regular assessment sessions. Further research on teachers' motivation for differentiation processes will illuminate the issue better.

The second issue was that teachers were concerned about children's emotional well-being. During the interviews, they often mentioned the significance of interacting with children in a caring manner when they were teaching mathematics. Their concern for children's feelings may result from the PD program's emphasis on supporting children's self-confidence. The findings showed that the teachers adapted the program's motto of "No child will leave the activity without any feeling of success." as a criterion while planning and implementing their activities.

The teachers' conscious efforts to create a classroom atmosphere conducive to learning for each child should have supported children's relationship with the teacher, the environment, and the subject. In this context, children who see that they have succeeded in mathematics will develop a positive perception of mathematics and have increased motivation to learn. Studies are needed to investigate this point further.

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IDENTIFYING CHALLENGES AND OPPORTUNITIES FOR THE FUTURE OF MONTESSORI MUSIC EDUCATION

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Abstract The Montessori approach places great emphasis on the holistic development of preschool children, to which music education can also make a significant contribution. However, it appears that Montessori kindergartens have difficulty ensuring that music has an equal role in the educational process. This exploratory study, which is a part of larger research on the role of music in Montessori kindergartens in Slovenia and abroad, aimed to further our understanding of music education in Slovenian Montessori kindergartens to recognize the challenges and opportunities for the future of Montessori music education in Slovenia. Slovenian Montessori early childhood education (ECE) teachers, teaching assistants, and principals who also work in the ECE group ($N = 40$) were surveyed about the current use of music in their kindergartens using a questionnaire developed by the researcher. The findings suggest that while there are many good practices for teaching music in Montessori kindergartens, there is room for improvement and further development in the field of music in Montessori kindergartens.

1 Introduction

The public at large is becoming increasingly aware of the benefits of music education and the necessity of cultivating innovative thinking for the development of a progressive society. However, from a pedagogical standpoint, music is often not given enough attention and is not considered equivalent to other fields. The latter is especially relevant to the Montessori approach, which, despite its emphasis on the importance of holistic education of children, struggles with ensuring that music has an equal role in the educational process.

1.1 Montessori approach

The Montessori approach positions the child at the centre of the educational process. It is founded on systematic observation of children, focusing on their developmental needs and characteristics, enabling them to meet their natural development in a prepared environment (Montessori, 2008). According to Montessori (2006), children from birth to approximately age six have a unique, innate capacity, during which period they are open to forming their identity through exposure to the environment. Montessori (2007) believed that a child would exhibit a strong desire to repeat certain activities for no apparent reason until these repetitions lead to a newly acquired skill during so-called sensitive periods when the child absorbs only one feature of his environment and is not receptive to others. In Montessori kindergartens, early childhood education (ECE) teachers make a special effort to tailor lessons and activities to each child's unique needs and sensitive periods.

The Montessori approach sees teachers as facilitators or guides in the educational process. Setting up a conducive classroom environment ensures the children have access to resources that will aid in every facet of their development (Montessori, 2006). Children's learning is scaffolded through the design of Montessori materials and activities, allowing them to learn independently (Isaacs, 2018). Montessori believed that children's levels of interest and focus are important indicators of their ability to learn; therefore, in Montessori kindergartens, teachers regularly observe the children and use those notes as planning tools (Lillard, 1972). In Montessori kindergartens, the learning materials represent curricular content (Isaacs, 2018). The everyday routine in Montessori kindergartens is organised into work and activity

cycles to structure learning, which helps the children follow their natural rhythms while encouraging them to learn on their own and take charge of their actions (Montessori, 2007). As a means of supporting the growth of healthy interpersonal relationships, children in Montessori kindergartens are typically organised into vertical heterogeneous groups of three years (one to three and three to six) (Isaacs, 2018).

When properly implemented, the Montessori approach has been shown to promote children's social and academic skills as much as, if not more than, traditional pedagogical approaches (Lillard & Else-Quest, 2006), especially in mathematics and science (Dohrmann et al., 2007).

The first documented implementation of the Montessori approach in Slovenia dates back to 2002, when the Ursuline in Ljubljana opened the country's first private Montessori kindergarten, and to 2004 when the institute started formally implementing a Montessori program (Kordeš Demšar, 2006). The first Slovenian teacher training took place in 2006 in collaboration with the German Montessori organisation Montessori Verband Aachen (Kordeš Demšar, 2006). In 2008, Slovenian Montessori Association (n. d.) was formed to preserve and promote Montessori pedagogy in Slovenia, to accredit institutions that adhere to Montessori pedagogical principles, and to bring together Slovenian Montessori teachers through the organisation of various conferences and workshops. In 2022, there are 17 Montessori-accredited kindergartens in Slovenia, 10 non-accredited Montessori kindergartens, and a few more public kindergartens where the elements of the Montessori approach are implemented in certain groups (Montessori Association, n. d.). Based on the data published by the Slovenian Ministry of Education, Science and Sport (n. d.), we estimate that roughly 80 Montessori ECE teachers are currently actively working in Montessori kindergartens.

Despite the widespread interest in Montessori pedagogy, there is a severe lack of scientific literature on the topic in Slovenia. A minimal number of academic pieces have been written about Montessori pedagogy, either outlining its core principles (Kordeš Demšar, 2007) or relating them to subject-area instruction (Bučar, 2004; Kavkler, 1997; Župan, 2018).

1.2   Music education in Montessori approach

Given that Maria Montessori did not have a background in music education, the advancement of Montessori preschool music education is due to her collaboration with music educators such as Maccheroni (1966) and Braun Barnett (1973). In Montessori's view, musical development is analogous to linguistic development; by encountering music in their environment daily, they get the opportunity to develop the skills of listening, reading, and performing music. For this reason, the Montessori approach to music education centres on providing children with meaningful musical experiences before introducing them to musical literacy. The advantage of music instruction in Montessori kindergartens is that it is tailored to the characteristics and needs of children and allows them to participate in individual musical activities based on their interests when they are in the sensitive period for musical development and thus most receptive, positively affecting their motivation (Polk Lillard, 2011).

There is a lack of literature on the role of music in Montessori kindergartens. Rajan (2017) analysed the views of American Montessori school principals on the importance of musical instruction in early childhood education. The results showed that although principals of Montessori schools and kindergartens believe music can be used to promote learning or build multicultural understanding, the possibilities for carrying out musical activities are very limited due to low school budgets and/or time constraints. Essential to the field as a whole is the work of Dansereau and Wyman (2020), who note that many Montessori kindergartens are dominated by didactic materials aimed primarily at developing the child's visual sense. They present the results of action research designed to eliminate the perceived inadequacy of musical education in the Montessori approach by developing and implementing a part of the curriculum that is more consistent with the Montessori philosophy. Together, these studies provide important insights into the current state of music education in Montessori kindergartens and indicate the need for further research on the strengths and challenges that the field of music education in the Montessori approach faces.

1.3   Present study

Numerous studies highlight the benefits of music instruction for children (Collins, 2014; Hallam, 2010; Petress, 2005), particularly in the early years (Alvarez & Cardany, 2011; Trainor & Hannon, 2013; Trehub, 2016; Young, 2016), and show that exposure to music can serve as a means of promoting development in other learning areas (Gill & Rickard, 2012; Mehr et al., 2013; Wolff, 2004). Despite the importance of music in early childhood education and the great interest of researchers and the general public in the Montessori approach, very little attention has been paid to the role of music in Montessori kindergartens.

The main goal of this study was to examine the role of music education in Montessori settings, with a focus on kindergartens in Slovenia, to further our understanding of music education within the Montessori philosophy and practice. Montessori ECE teachers possess the greatest first-hand understanding of the musical environment in which children are learning and experiencing music in the sense of the Montessori philosophy; therefore, this study examines their perceptions and opinions on how music is implemented into the educational process in Montessori kindergartens.

Since music education is not the Montessori approach's primary focus but is seen as a piece of the mosaic for the holistic development of children, we were interested in whether Montessori ECE teachers perceive music education as a part of the curriculum of their institution. These findings can give us an insight into the presence or absence of music education in Montessori settings. Furthermore, this information is especially crucial since a lack of musical instruction in Montessori kindergartens may indicate an inadequate understanding of the Montessori philosophy or inadequate training among the management and the teachers.

According to Rajan's (2017) study in the USA, a substantial proportion of Montessori institutions employ music specialist's, who are most often responsible for teaching music at their institution and who may or may not have expertise in Montessori methodology. We were interested in whether these findings are somehow related to the environmental and cultural context in which the kindergartens are located. Therefore, one of the objectives of our study was to find out who is responsible for teaching music in Slovenian Montessori kindergartens.

These findings will shed light on whether music is integrated into the everyday educational process within the classroom or is taught more as a separate subject.

As mentioned in the literature review, the theoretical works of Maria Montessori give music far less attention compared to other subjects. The Montessori approach is a general pedagogical concept with broad ideas about how the educational process should occur. More concrete guidelines for teaching music can be found in other approaches to music education, like the Edgar Willems approach, Orff Schulwerk, Suzuki, Kodaly, and Dalcroze. Orff Schulwerk is an approach to music education developed by Carl Orff and Gunild Keetman, that emphasises physical experience with rhythm, beat, metre and tempo using specially designed instruments (Collins, 2013). The Suzuki approach emphasises repetition and adaptation of external stimuli to teach children as young as four to play musical instruments (Collins, 2013). The Kodaly approach is a pedagogical system for Hungarian schools, combining elements of folk music, national culture, and contemporary music (Collins, 2013). Furthermore, the Dalcroze combines basic musical elements such as rhythm, melody, and harmony with body movement to provide a multidimensional approach to music learning (Collins, 2013).

We were curious whether Montessori ECE teachers integrate principles of other approaches to music education into their musical instruction in Montessori kindergartens. Furthermore, we aimed to understand which other approaches to music education are most often integrated into music instruction in Montessori kindergartens, as this may indicate which approaches to teaching music are most congruent with the Montessori philosophy.

Since there are various contexts in which musical education might take place, we were interested in finding out whether Montessori kindergartens provide any supplemental musical instruction in the form of extra-curricular activities. We aimed to determine whether these activities are offered at no cost or require payment to participate. This could provide insight into whether children from various socioeconomic backgrounds have equal access to extracurricular musical activities in Montessori kindergartens.

This study also aimed to determine the specifics of musical education in Slovenian Montessori kindergartens more precisely. Since the guidelines for preschool music education emphasise the importance of equal representation of all musical genres, we wanted to find out how often Montessori ECE teachers listen to different genres of music with their students during music lessons. Since young children were found to be more receptive to various musical genres than older individuals (Brittin, 2000; Siebenaler, 1999; Todd & Mishra, 2013), it is crucial that preschool children are exposed to diverse music during their preschool years. In order to find out how music is taught in Montessori kindergartens, one of this study's goals was to investigate how often Montessori ECE teachers use different methods and forms of teaching and learning during music activities. We assumed that children have many opportunities to work individually with didactic materials, as this is a well-known feature of educational work in Montessori kindergartens. Since the Montessori method is widely recognized for its emphasis on encouraging the growth of analytical thinking, it stands to reason that Montessori ECE teachers would also gravitate toward methods that support this goal.

The findings of this study should make an important contribution to the field of Montessori education as well as the field of early childhood music education. Based on our understanding of the current state of practice in Montessori early music education, we will be able to recognize the challenges and opportunities for the future of Montessori music education in Slovenia.

2   Method

Since the role of music in Montessori early childhood education in Slovenia has not yet been thoroughly studied, we used an exploratory research design to answer our research questions. Exploratory research is defined as the investigation of a problem that has not been clearly defined (Stebbins, 2001). Exploratory research does not produce definitive results; rather, it identifies themes, new areas of interest, and research topics for future investigation.

2.1   Participants

A random sample of 40 ECE teachers from Montessori kindergartens in Slovenia was used.

Of the participants, 38 ($f\% = 95$) were female and 2 were male ($f\% = 5$). The average age of the participants was 36.08 years, with the youngest participant being 23 years old and the oldest being 54 years old. Regarding job position, 19 ($f\% = 45$) of them were ECE teachers, 18 ($f\% = 47.5$) ECE teaching assistants, and 3 ($f\%= 7.5$) principals who also worked in the ECE group. Regarding the degree of their education, 2 ($f\% = 5$) of the participants have obtained secondary professional education, 6 ($f\% = 15$) of them secondary general education (gymnasium), 1 ($f\% = 2.5$) of them junior college, 9 ($f\% = 22.5$) of them higher vocational college, 3 ($f\% = 7.5$) of them bachelor's degree, 17 ($f\% = 42.5$) of them master's degree, and 2 ($f\% = 5$) of them a PhD or postgraduate specialist degree. Regarding the field of their education, only 13 ($f = 32.5$) of them have obtained their education in educational sciences and teacher education.

2.2   Survey instrument

To study the role of music in Slovenian Montessori kindergartens, we developed a survey questionnaire for Montessori ECE teachers. The survey, which had 34 closed-ended questions, was completed electronically by the participants. Only one section of the study's data and one analysis's findings (concerning the formal circumstances of the implementation of music activities) are reported in this paper. The data was collected in 2020 as part of a doctoral thesis that aimed to study music's current role in Montessori kindergartens in Slovenia and abroad.

2.3   Procedures

The collection was completed using the e-version of the instrument in collaboration with the Slovenian Montessori Association, which forwarded the questionnaires to all Montessori ECE teacher members in Slovenia. The data was gathered anonymously. In the results sections, we present descriptive statistics related to the context in which music is implemented in Montessori kindergartens in Slovenia. To analyse the differences between the frequencies of use of particular teaching and learning forms, methods, and the frequency of listening to different genres by Slovenian Montessori ECE teachers when teaching music to preschool children, the Friedman test of two-way analysis of variance by ranks was used.

3   Results

Slovenian Montessori ECE teachers outlined which art disciplines are part of the curriculum of their kindergarten. The results are presented in Table 1.

Table 1: Art disciplines that are part of the Montessori kindergarten curriculum

	f	f %
Film	2	5.0
Music	34	85.0
Theatre	17	42.5
Visual arts	35	87.5
Literary arts	17	42.5
Dance	27	67.5

Most ECE teachers state that music (*f*% = 85.0) and visual arts (*f*% = 87.5) are part of the kindergarten curriculum where they work. Less than half of the ECE teachers report that their institution's curriculum includes theatre (*f*% = 42.5), literary arts (*f*% = 42.5), or film (*f*% = 5.0). Surprisingly, among the Montessori ECE teachers in Slovenia, there is still a relatively high percentage (*f*% = 15) of those who believe that music is not a part of their Montessori preschool curriculum.

Table 2 displays the extracurricular activities offered in the Montessori kindergartens where surveyed ECE teachers work.

Table 2: Extracurricular activities that are in Montessori kindergartens offered free of charge

	Free of charge		At a charge	
	f	*f*%	*f*	*f*%
Edgar Willems music lessons	22	55.0	13	32.5
Preschool music school	0	0	4	10.0
Other music-related activities	10	25.0	5	12.5
Preschool dance lessons	10	25.0	17	42.5
Choir	4	12.7	1	2.5
No extracurricular activities	11	27.5	13	32.5

Table 2 shows that in most Montessori kindergartens in Slovenia, children are offered some kind of music-related extracurricular activity, either free of charge or for a fee. More than two-thirds of the kindergartens where the surveyed ECE teachers work offer free musical enrichment programs. However, over one-fourth of the ECE teachers report that their kindergartens do not offer extracurricular

activities. The results lead us to conclude that Edgar Willems music lessons are the most commonly offered free-of-charge music-related extracurricular activity, and preschool dance lessons are the most commonly offered music-related extracurricular activity offered at a charge in Montessori kindergartens in Slovenia.

Table 3 shows the position of the staff member who, according to the Montessori ECE teachers, is responsible for teaching music in their institution.

Table 3: Position of the employee who is responsible for teaching music in Slovenian Montessori kindergartens

	f	*f%*
Head teacher	27	67.5
Assistant	13	32.5
Music specialist	24	60.0

Most surveyed ECE teachers believe that the head teacher is responsible for teaching music in their kindergarten (*f%* = 67.5), followed by the music specialist (*f%* = 60.0). Less than a third of the surveyed teachers believe that the teacher's assistant is also responsible for teaching music in their kindergarten (*f%* = 32.5). There is cause for concern over the significant proportion of kindergarten educators who declare that music education is not the responsibility of the head teacher, music specialist, or assistant. This information suggests that no one is responsible for teaching music in certain Montessori kindergartens. Consequently, this may indicate that some Montessori kindergartens do not place enough emphasis on music education.

Table 4 shows the information the ECE teachers surveyed provided on whether they integrate elements from other approaches to music instruction into their music lessons.

Nearly half of Montessori ECE teachers integrate elements of other pedagogical concepts into their music instruction. The most commonly used pedagogical approach for integration is Edgar Willems' approach. These findings may indicate that many Montessori ECE teachers believe that the Montessori approach to music does not provide sufficient resources for effective music instruction for preschool children and thus need to integrate elements of other approaches.

Table 4: Integration of the elements of other approaches to teaching music into their music instruction

		f		*f%*
Yes		**17**		**44.7**
	Edgar Willems	17		100.0
	Suzuki	1		5.8
	Orff Schulwerk	1		5.8
	Dalcroze	1		5.8
	Kodaly	1		5.8
	Music together	1		5.8
No		8		21.1
I do not know		13		34.2

Figure 1 shows how frequently Montessori ECE teachers listen to various musical genres with their children.
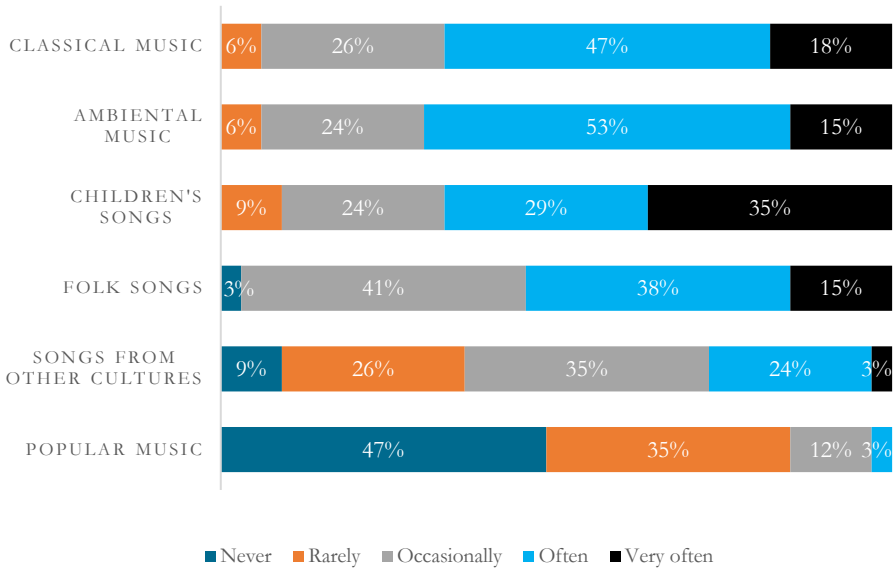
Figure 1: Frequency of listening to different musical genres with children

Montessori ECE teachers reported listening to children's music more often than other genres ($M = 3.94$) and far less frequently to popular music ($M = 1.94$) with their pupils. Almost half of the surveyed ECE teachers ($f\% = 47$) never listen to popular music.

A Friedman test was conducted to determine whether there were significant differences in the frequency of listening among the genres. Table 2 presents the results of the Friedman test.

Table 5: Friedman test

Variable	Mean Rank	χ^2	df	p
Classical music	4.17			
Ambiental music with sounds of nature	4.17			
Children's songs	4.65	89.069	5	.000
Folk music	4.08			
Songs of other cultures	2.61			
Popular music	1.33			

The results of the Friedman test were statistically significant based on an alpha value of .05 ($\chi^2(5) = 89.069$, $p < .001$), indicating statistically significant differences between the mean ranks of the variables. Pairwise comparisons with adjusted p-values showed that there were significant differences between the frequencies of listening to popular music compared to all other musical genres except to songs of other cultures ($p < .001$) and between the frequencies of listening to songs of other cultures compared to all other musical genres except popular music ($p \leq .021$). For each comparison, ECE teachers are less likely to listen to popular music and songs of other cultures with their pupils.

Figure 2 shows how frequently Montessori ECE teachers use different forms of teaching and learning (individual learning, working in pairs, working in groups, and frontal instruction) when teaching music to preschool children.
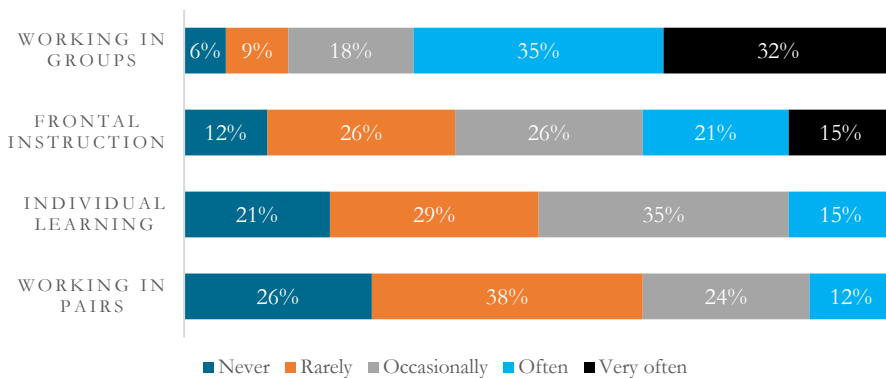
Figure 2: Frequency of use of different teaching and learning forms

Most Montessori ECE teachers ($M = 3.79$, $SD = 1.175$) claim that working in groups is the teaching and learning form they use most often with their students, whereas the fewest prefer working in pairs ($M = 2.21$, $SD = .978$). Almost a third of the ECE teachers very often work in groups (32.0%). Surveyed ECE teachers use the individual form of work ($M = 2.44$, $SD = .991$) more frequently than working in pairs ($M = 2.52$, $SD = .978$) when teaching music.

A Friedman test was run to determine if there were significant differences in frequency of use among different teaching and learning forms used by Montessori teachers. Table 2 presents the results of the Friedman test.

Table 6: Friedman test

Variable	Mean Rank	χ^2	df	p
Group work	3.32			
Frontal instruction	2.54	29.453	3	.000
Individual learning	2.21			
Work in pairs	1.93			

The results of the Friedman test were statistically significant based on an alpha value of .05 ($\chi^2(3) = 29.453$, $p < .001$), indicating statistically significant differences between the mean ranks of the following variables: individual learning, work in pairs, group work and frontal instruction. Pairwise comparisons with adjusted p-values showed that there were significant differences between the frequencies of use of pair work compared to group work ($p < .001$) and between individual work and group work ($p = .002$). For each comparison, ECE teachers are more likely to prefer using group work.

Figure 2 shows how frequently Montessori ECE teachers use different teaching methods when teaching music to preschool children.
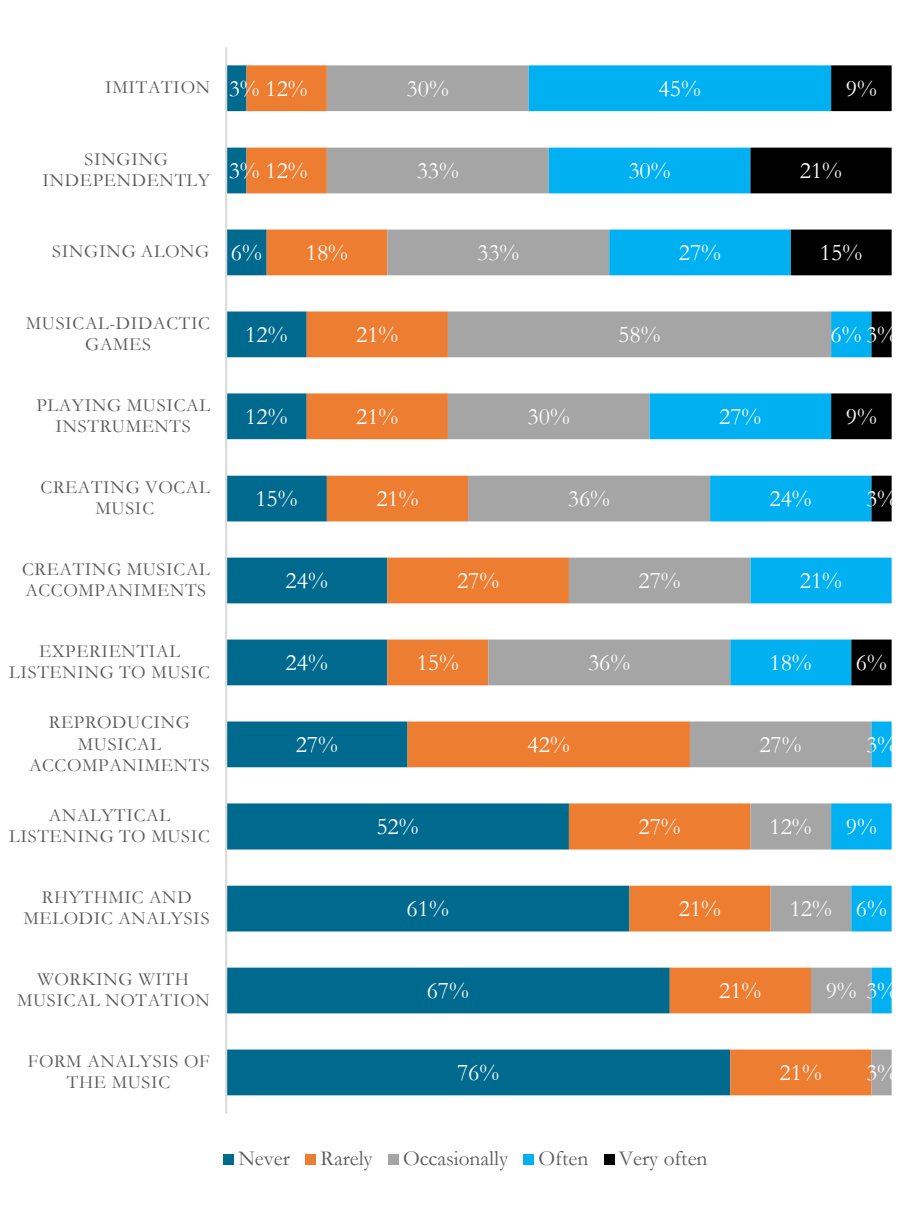
Figure 2: Frequency of use of different methods of teaching

A Friedman test was run to determine if there were significant differences in frequency of use among different methods of instruction used by Montessori ECE teachers. Table 2 presents the results of the Friedman test.

Table 7: Friedman test

Variable	Mean Rank	χ^2	df	p
Imitation	10.03	185.591	12	.000
Singing independently	10.27			
Singing along	9.56			
Playing musical instruments	8.92			
Experiential listening to music	8.00			
Creating vocal music	7.86			
Musical-didactic games	7.56			
Creating musical accompaniments	7.21			
Reproducing musical accompaniments	5.76			
Analytical listening to music	4.68			
Rhythmic and melodic analysis	4.30			
Working with musical notation	3.86			
Form analysis of the music	2.97			

The results of the Friedman test were statistically significant based on an alpha value of .05 ($\chi^2(12) = 185.591$, $p < .001$), indicating statistically significant differences between the mean ranks of the variables. We used pairwise comparisons with adjusted p-values. Slovenian Montessori ECE teachers use form analysis less frequently compared to all other teaching methods except for working with musical notation, rhythmic and melodic analysis, analytical listening and reproducing musical notation ($p \leq .001$). Furthermore, they less frequently use working with musical notation compared to all other teaching methods except for rhythmic and melodic analysis, analytical listening, reproducing musical notation and form analysis ($p \leq .037$). The use of rhythmic and melodic analysis is less likely to be utilised by ECE teachers compared to all other teaching methods except for reproducing musical accompaniments, analytical listening to music, and form analysis ($p \leq .016$). Among Slovenian Montessori ECE teachers, experiential listening is more frequently used than analytical listening. Compared to playing musical instruments, singing along, imitation, and singing independently, analytical listening is more frequently used by Montessori ECE teachers ($p \leq .001$).

4 Discussion

In reviewing the literature, little information was found about the context in which music education is implemented in Montessori kindergartens. Furthermore, there is no empirical data on music education in Montessori kindergartens in Slovenia.

This research aimed to answer several questions, the first of which was whether Montessori ECE teachers consider music and other art domains to be components of the Montessori curriculum. Although most Montessori ECE teachers consider music part of their institution's curriculum, the current study shows that there is still a share of Montessori ECE teachers in Slovenia who hold the opposite view. These results are compatible with those of Dansereau and Wayman (2019), who noted that music does not have an equal role as other domains in many Montessori classrooms in the USA. It is also interesting to compare this data with the study by Rajan (2017), who reports that, in the USA, almost all Montessori ECE teachers agree or strongly agree that music is as important as other academic subjects, that having music education in school programs is important, and that music education is a necessary part of the Montessori curriculum. Although the percentage of ECE teachers in Slovenia who do not consider music a part of the curriculum is relatively small, the fact that such attitudes exist at all is concerning, and the reasons for this should be investigated further in the future.

Another important finding of our study is that more than two-thirds of the kindergartens offer free musical enrichment activities, with Edgar Willems' music lessons being the most commonly offered free-of-charge extracurricular activity. These findings appear to align with the current situation in Slovenia, where the Edgar Willems approach to music teaching is the most popular approach for teaching music that is being incorporated into the various levels of the educational system (Jovanovič & Crvenica, 2020). The latter makes sense, considering the overlap between Maria Montessori's teaching methods and those advocated by Edgar Willems and the fact that Willems frequently cited Montessori in his works (Frega, 1995). Our findings suggest that in Slovenia, Montessori preschools seem more likely to charge extra for dance classes than any other music-related activity.

Our research also shows that most Montessori ECE teachers state it is the head teacher's responsibility to teach music to preschool children. However, they are closely followed by those who state that teaching music is the responsibility of a music specialist. This data suggests that many kindergartens continue to delegate music education to a general music teacher who is not necessarily familiar with Montessori methodologies and can only teach music as a separate subject rather than an integral component of the daily curriculum. Latter contrasts Maria Montessori's theoretical writings, arguing that the classroom teacher's role is to provide children

with opportunities to participate in musical activities (Isaacs, 2018). This situation could be the result of Montessori ECE teachers' insecurities and a possible lack of musical expertise. Although music specialists teach music in many Slovenian kindergartens, there are far fewer such kindergartens compared to the United States, where, according to Rajan (2017), nearly all Montessori institutions employ a music specialist.

Another aim of this study was to understand whether Montessori ECE teachers integrate principles of other approaches to music education into their musical instruction in Montessori kindergartens and which of them are most often integrated into the music instruction. The results of this study show that almost half of the surveyed ECE teachers integrate elements of other approaches to teaching music into their music instruction in Montessori kindergartens. The most widely used approach to music education by Montessori ECE teachers is Edgar Willems' approach. These findings may suggest that many Montessori ECE teachers believe that the Montessori approach to music does not provide sufficient resources to teach music effectively to preschool children. These results also confirm that Montessori ECE teachers consider the Edgar Willems approach most compatible with Montessori pedagogy.

The following research question in this study sought to determine how often Montessori ECE teachers play recordings of different musical genres when instructing music. We found that when teaching music to children, Montessori ECE teachers predominantly listen to children's music and rarely listen to popular music. It is interesting to note that among the surveyed ECE teachers, almost half never listen to popular music when instructing children. The analysis of the differences between the frequency of listening to different genres showed that popular music and music of other cultures are statistically the least frequently used by Montessori ECE teachers when teaching music. When teaching music, all musical genres must be given equal attention, as expressing an interest in a particular genre of music might be correlated with listening to that genre of music regularly (Denac, 2008). Given that children are more likely to hear popular music at home, the lower representation of this genre in kindergartens does not seem problematic.

According to our findings, we also note that there are differences between Montessori ECE teachers in the frequency of use of particular forms of teaching and learning when instructing music. Most ECE teachers report using group work most frequently, while only a small percentage favour having students work in pairs. As individual work is a well-known feature of educational work in Montessori kindergartens (Brehony, 2000), it is somewhat surprising that Montessori ECE teachers do not use individual forms of learning and teaching to a greater extent when teaching music. Possible explanations for this observation include a lack of music-related didactic materials that would equip ECE teachers to facilitate children's engagement in such activities.

Finally, this research aimed to examine the frequency with which Montessori music educators employ various pedagogical methods when teaching music. The analysis revealed substantial variation in the frequencies of use between particular methods of musical instruction among the Montessori ECE teachers. The less preferred methods when teaching music among the Slovenian Montessori ECE teachers are form analysis, working with musical notation, rhythmic and melodic analysis, and analytical listening. One of the main drawbacks to the widespread adoption of such approaches might be that they call for a higher level of musical expertise on the part of the instructor; as a result, many Montessori ECE teachers could have opted instead to focus on approaches that are more manageable for those without a background in music. Another possible explanation for this could be that Montessori ECE teachers hold the view that in kindergarten, it is preferable to employ teaching methods that emphasise the growth of basic musical skills rather than those heavily tied to analytical thinking. The finding also supports the interpretation that Montessori ECE teachers more often use the method of experiential listening to music compared to analytical listening when teaching music. Since one of the main goals of preschool music education is cultivating a positive attitude towards music and experiencing music as actively as possible (Denac, 2008), this seems like a sensible choice.

5   Conclusions

Since early childhood music education is an essential component of preschool children's holistic development in Montessori kindergartens, our primary objective in conducting this research was to make a meaningful contribution to the advancement of Montessori music education in Slovenia and beyond.

Overall, this study strengthens the idea that there is a need to further develop the field of music in Montessori kindergartens. The results of this study point to several challenges in the field of music education in Montessori kindergartens that need to be discussed and resolved in the future through collaboration between scholars and ECE teachers. Multiple pieces of evidence from our study suggest that Montessori ECE teachers appear to be unaware of current scientific findings in the field of early music education as it relates to the Montessori approach. Another challenge for Montessori early music education's future is that some ECE teachers do not consider music and other art domains to be a part of their institution's curriculum, which may indicate that they do not consider music as significant as other domains.

On the other hand, with this study, we also identified many good practices that occur in teaching music in Montessori kindergartens. It is encouraging that Montessori educators listen to different genres of music when teaching music to children and are aware of the issue of overemphasizing popular music in early childhood settings. In addition to the required curriculum, many Montessori kindergartens also provide extracurricular music classes for the children, which is encouraging, especially if these activities do not require additional payment. We think it is good that many Montessori kindergartens can also offer music-related extracurricular activities to children outside the central pedagogical concept. We also consider it beneficial that Montessori ECE teachers supplement their teaching with resources outside the Montessori approach when they assess that the Montessori approach does not offer them enough guidance in the area of music education. Given the many shared principles between the Montessori approach and Edgar Willems' approach to music education, combining the two seems like a reasonable choice. We applaud that Montessori educators incorporate multiple methods and forms of teaching and learning into their music instruction, even if they are not all used equally often.

When discussing the limitations of our research, it should be noted that the data we obtained about the current position of music education in Montessori kindergartens is based on the subjective opinions and attitudes of the ECE teachers who work there, so objectivity could not be ensured. The scope of this study was also limited in terms of the sample size. Even though there are only a limited number of Montessori kindergartens in Slovenia and, consequently, only a limited number of Montessori ECE teachers working in them, a larger sample could ensure an even better generalisation of findings.

The findings from this study make several contributions to the current literature. Our research is one of the few empirical studies in the field of music in Montessori kindergartens, both in Slovenia and beyond. Our study's findings can be used as a reference by future researchers in this field. They will provide Montessori educators with new perspectives on the advantages and challenges of Montessori early music education and offer implications for the practice. We believe precise knowledge about the specifics of musical education in Montessori kindergartens will contribute to the further development of this domain.

In addition, this study's findings have several important implications for future practice. First, we would like to point out that it is necessary to pay more attention to this area through theoretical and empirical studies. More research is needed to examine the planning, implementation, and evaluation of music education in Montessori kindergartens. Research has to support and encourage the development of new didactic materials compatible with the Montessori approach to help fill this gap in this field. Montessori ECE teachers should be offered more education and professional development opportunities in the field of Montessori methodology and in specific subject areas, particularly music. They should be given the opportunity to participate in a variety of different workshops, teacher trainings, and seminars designed to help them develop their musical expertise and gain insight into the best practices for teaching music in Montessori preschools. They could also benefit from the availability of Montessori music instruction guides and other materials, which are, apart from a few Montessori music didactic materials, currently non-existent in Slovenia.

The Montessori method provides a solid foundation as we strive to provide preschool children with the best possible musical education. Despite the obstacles that exist in the field of early childhood music education in Montessori kindergartens, there is reason for optimism about its future.

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PRE-SCHOOL TEACHERS' VIEWS ON DISTANCE EDUCATION AS A PART OF TEACHING IN THE FUTURE

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Abstract The pandemic COVID - 19 affected education, while modern education is still relevant along with educational technologies. Education was delivered through distance learning as face-to-face teaching was not possible during the pandemic. The aim of this paper is to analyse the views of pre-school teachers about distance education as part of teaching in the future. For this purpose, a phenomenological study is conducted using semi-structured interview forms to obtain qualitative data. 10 preschool teachers working in a government preschool in İzmir city, Karabağlar district, participated in this research. All the interviewed preschool teachers participated in the distance learning programme. For data analysis, the content analysis method was used and interpretation through direct quotations is used in different parts of this article. Direct quotes are used to support the findings. The results of this analysis show that distance education has a primarily positive impact on the use of educational technologies and professional development. Although teachers initially believed that distance education was inadequate, they later concluded that it offered them the opportunity to improve. Proposals for distance education were developed based on this research.

1   Introduction

Considering modern education approach, student-centered education took the place of sage-on-a-stage approach. Through this new approach, the focus became to convey knowledge, skills, and qualifications that needs to be internalized by the students according to students' individual differences, interests, abilities, individual learning methods, and pace. Teacher plays a role in guiding and supervision (Alpar et al., 2007).Teacher should present the structure of the learning process flexible, various, and prosperous; They need to fulfill the process of education in traditional schools and classrooms, as well as they should make it possible education for students in every part of life by arranging and controlling. The changes in acquiring and accessibility to knowledge caused the changes in educational qualifications. Changes such as, accessing knowledge fast, productivity and efficiency, student groups' number, quality, and expectations has affected modern education approach. These factors that affects education approach support developing educational technology. In today's world technological developments offer new opportunities and vary settings and methods for learners and instructors (Alkan, 1990;).

Educational technology has entered our lives in order to troubleshoot the issues and needs together with modern education approach. Instructor and technology have become two significant elements for the learner. Educational technologies are used in mass education and individual education; textbooks, computer, internet, television, video recordings are among educational technology products (Alpar et al., 2007).

Developments in educational technologies accelerated on account of COVID-19 pandemic. COVID-19 has caused problems in health, economy, psychology, education all around the world. COVID-19 pandemic forced traditional education system into a fast change (Saltürk & Güngör, 2020).

COVID-19 virus caused schools to be closed around the world. Education of 1.6 billion students, approximately 90% of the world's student population of all education levels, were interrupted. (Akın & Aslan, 2021). The change started when all around the world schools started to close at the beginning of the pandemic. Face-to-face education gave its place to alternative solutions because of the ambiguity

about going back to normal life (Saltürk & Güngör, 2020). How to convey knowledge, skills, and teaching has become more important.

After the first case which was seen on 11 March 2020 in Turkey, education in all grades were interrupted for a short while from 16th of March 2020 to 30th March 2020. Within the scope of open and distance education applications, it was decided that education would continue through three television channels and Education Information Network (EBA). A new decision was made on 29 April 2020 and the break was extended until 31st May 2020 because the course of pandemic had not changed. At first, higher education was interrupted on 12 March 2020. Later, it was decided that 2019-2020 education year should continue through open and distance education from 23 March 2020 to at the end of spring term (Can, 2020).

Although there were some attempts to produce different alternatives, distance education became one of the most preferred solutions to face-to-face education around the world. This situation caught Turkey off guard like all the other countries in the world. However, Turkey quickly started distance education applications (Altıntaş, 2021). UNESCO announced that it would support countries in order to reduce the negative effects of closed schools and to ensure the continuity of education through distance education and also it announced that it would support the countries to take special cautions against disadvantaged groups (Can, 2020). In addition to health measures, world countries decided to switch to distance education in order to prevent students falling down within the bounds of possibility. Online education was not the last resort, instead it became the only resort for the whole world. (Telli et al., 2020).

Before the pandemic, distance education was used as a part of lifelong learning. The term "distance education" firstly appeared in Wisconsin University's catalogue in 1892 and in 1906 it was used in an article by William Light who was the director of the university (Horzum et al., 2013). In the year of 1833, it came to light when a Swedish newspaper announced that it would give a written lecture though a letter and firstly in England distance education started when Isaac Pitman began teaching with letters in 1840 (Horzum et al.). Since 2000s distance education's reach has expanded and became widespread.

In Turkiye, Ankara University made distance education happen when it first started to teach the bankers through letters in 1965 (Horzum et al., 2013).

From past to present the concept of distance education developed thanks to developments in technology and implementation methods. Instead of distance education term open education, internet-based learning e-learning, virtual learning and computer-based learning terms started to be used (Gökbulut, 2021; 163). In distance education through asynchronous and synchronous teaching teacher and the student can be in different places. In today's world distance education can be changed and differentiated according to the needs of the instructors and learners. There are myriad of definitions of distance education in literature.

All the things considered distance education is defined as a teaching method based on active usage of information technologies to teach lessons and make it easier to learn since learners and instructors are in different times and locations (Özdoğan & Berkant, 2020). According to another definition, distance education is defined as a teaching method in which learners and instructors are independent, far away, and separate from each other for the most of the learning-teaching process and documents and materials that are used are mostly appropriate for the content of the lesson (Özdoğan, Berkant, 2020). Distance education is a learning or teaching model, in which instructor and learner interact with each other using communication technologies independent of time and place (Kurnaz et al., 2020; Rai & Basnet, 2021). It is understood from the two definitions, the most crucial point in distance education is that source and recipient are in different locations and active usage of information technologies (Özdoğan & Berkant, 2020).

Even though there are some different definitions, the main goal is to bring together learners and instructors in different places, to eliminate the drawbacks which cause the education to not occur, to offer an education system that can adapt to science and technology and can benefit the learner without being affected by time and palace (Kaçan & Gelen, 2020).

After compulsory distance education started in Turkiye, during COVID-19 pandemic teachers started to send homework, worksheets, and activities through applications such as Telegram, WhatsApp.

Since 23 March 2020 Ministry of Education (MEB, 2020a) made the lessons possible through EBA (Education Information Network) and TRT television channel. Teachers used applications that supply online platforms from the basic education level to the higher education level in their education processes.

Ministry of Education announced that it would start compensation lessons via Education Information Network and TRT (television channel) by changing weekly course schedules. Over 20 million student and one million teachers switched to distance education in Turkey. In this process, we tried to enable the durability of education with distance education, which we were caught off guard and did not have sufficient and necessary information. Although it was limited, free internet service was provided by the Ministry of Education for pupils who want to access EBA (internet network) (Özdoğan & Berkant, 2020). Furthermore, online/live lessons took the place of them when all these implementations were not enough to proceed the education efficiently.

Online/live lessons became compulsory for each teacher with the start of 2020-2021 education period. In accordance with the weekly course schedule, every teacher started online lessons through EBA or applications like Zoom. However, being unprepared for online lessons brought some problems (Yüksel, 2021).

Even though face-to-face education started again in 2022-2023 education year, distance education became one of the irreplaceable tools in education. It continued to be used commonly for the education of individuals at all levels of education, pupils, teachers, administrators, and parents.

In this circumstance, the aim of this research is to analyze the thoughts of teachers regarding distance education in Turkey, to find out the challenges experienced by teachers in the process, to evaluate the effects of distance education on teaching profession in the light of the effects of the pandemic process and technological developments. Thus, the paper aims to make suggestions to improve the potencies in distance education.

The main problem of this work is identified as 'What are the views and thoughts of preschool teachers about distance education?'

The subproblems of this research can be listed as following questions:

1. What are the situations of preschool teachers when it comes to distance education?
2. What are the problems of preschool teachers encountered during distance education?
3. What are the thoughts of preschool teachers about the teaching process during distance education?
4. What are the suggestions of preschool teachers on effective and productive conduct of the distance education process?

2   Method

2.1   Research Model

The research was carried out with the phenomenology pattern, which is one of the qualitative research methods. Phenomenology is a method that zeroes in on evaluating personal experience. The aim of phenomenological studies is to uncover a more general understanding of the phenomenon or situation by studying the personal experiences of the participants regarding a phenomenon or situation (The phenomenology design was used while focusing on the phenomenon which we do not have through and detailed information. Phenomenology primarily tries to describe the world experienced by individuals and to explain the quintessence of experiences to explore the common meanings underlying the phenomenon (Ünal & Bulunuz, 2020). In this paper, the phenomenology method was selected in order to try to comprehend deeply the experiences of preschool teachers in distance education. Accordingly, themes and codes were formed and content analysis was carried out.

2.2   Participants

Appropriate sampling method was used in this research. The participants consist of 10 preschool teachers who work at a state preschool in the town of İzmir's Karabağlar district.

Information regarding the descriptive features of the participants is presented in Table 1.

Table 1: Information regarding the descriptive features of the participants

Gender	Frequency
Female	10
Age	
25 to 30	2
31 to 41	5
41 to 50	3
Years of service	
6 to 10 Years	3
11 to 15 Years	5
16 to 20 Years	2
Type of school that worked	
State School	10
Status of participating in in-service training on distance education	
Yes	1
No	9
Have an internet connection at home	
Yes	9
No	1
Possession of a personal computer	
Yes	9
No	1

When Table 1 is considered, there are 10 female participants while there are no male participants. The age range of the participants changes from 25 to 60. Participants with 6 to 10 years of service are 3, participants with 11 to 15 years are 5, and participants with 16 to 20 years are 2 people. Ten of the participants work in state schools. While only 1 person received in-service training on distance education, 9 people did not receive it on this topic. Besides, while 9 participants have personal computers, 1 participant does not have a personal computer. All 10 participants have internet connection at their house.

2.3   Data Collection

Data is generally obtained through interviews in phenomenological research (Yıldırım,Şimşek, 2013). In this research, data is obtained through semi-structured interview forms. The interview form is created by the researcher. Expert opinion in the field of pedagogy was considered. As a pilot experiment, the form prepared before the study was sent to two preschool teachers and in this way applicability of

the form was tested. At the end of the pilot experiment, the form was finalized by making corrections and additions to materials.

Interview form consists of 5 parts. In the first part, the participants were asked for information about their descriptive features. In the second part, questions about the difficulties encountered by preschool teachers in distance education process are covered. In the third part, the question about preschool teachers' thoughts on teaching during distance education is asked. In the fourth part, the question about preschool teachers' views on teaching profession while they gave distance education is asked. In the fifth part, the question about the suggestions of preschool teachers regarding effective and productive conduct of distance education process is asked. The interview form is attached to the paper.

In order to collect the data of the research, the interview form was prepared and delivered by hand to the preschool teachers, and they were required to write the answers themselves. The data were obtained through answering the questions by the preschool teachers who volunteered to participate in the research. Data were collected in April 2021.

2.4   Data Analysis

Quotations were taken from the answers given by the participants by using the content analysis method in the analysis of the data. Before the analysis, the answers given to the interview form were photocopied and each form was named (such as K1, K2, K3…) and the answers given were grouped under the question headings. Themes were formed according to the research questions. Next, the answers given by the participants were grouped according to their similarities and differences. The analysis was completed through generating codes from the answers given by the participants.

2.5   Validity and Reliability

Preschool teachers (2) and field experts (1) examined the questions in the interview form and determined that the form had content validity. 2 researchers worked together and came to an agreement in the content analysis. Direct quotations are used, the process is explained in detail. All interview data is preserved.

2.6   Limitations

This research was carried out with 10 preschool teachers working in preschool in town of Izmir Karabaglar district, Turkiye. The research is a qualitative research based on the views of preschool teachers on distance education.

3   Findings

The findings obtained from the questions asked to the preschool teachers were analyzed in 4 parts based on the problems of the research.

Prior Knowledge of Preschool Teachers About Distance Education

Preschool teachers were asked whether they knew what distance education is before the COVID-19 pandemic, and if they had prior knowledge on the topic. Moreover, they were asked to write examples of distance education they were aware of. Teachers gave one or more examples to the question. The answers given by the teachers were coded and presented in Table 2.

Table 2: Prior knowledge of preschool teachers about distance education

Main Theme	Answers	Codes
Information about distance education	I have prior knowledge about distance education (3) I do not have prior knowledge about distance education (7)	Letter (1) Online(2)

When Table 2 is considered, it is seen that 7 of the preschool teachers do not have any prior knowledge about distance education, and 3 teachers have prior knowledge about distance education. When teachers who had prior knowledge about distance education were asked to write examples of distance education, it was spotted that teachers gave Letter (1), Online (2) examples.

The Problems Preschool Teachers Experienced During Distance Education

Initially, within the framework of the research, it was asked whether the preschool teachers did distance education or not. Ten of the teachers said that they do preschool activities through distance education. Moreover, it was asked whether the

preschool teachers had problems in the distance education process or not. The codes were formed through theming the answers given by the teachers and presented in Table 3.

Table 3: The problems preschool teachers experienced during distance education

Main Theme	Answers	Codes
Problems with computers and Wi-Fi connections	I had problems (10)	Wi-Fi connection (6) Slow Wi-Fi connection (4) Not knowing the applications (4) Overcrowded application systems (5)
Problems with students	I had problems (10)	Students cannot access internet/computer (4) Low attendance (5) Students have low motivation and reluctance (5) Students have short attention spans (4) Students have to use the internet/computer under adult supervision (3)

When Table 3 is considered, it is seen that preschool teachers have problems with Wi-Fi connection (6), high Wi-Fi density (5), not knowing how to use distance education applications (4). Teacher K1 said, "During the lectures, I had connection problems because of high intensity. We could not properly connect to EBA most of the time," Teacher K3 stated, "I had problems with voice transmission because of Wi-Fi connection. Also, I have never used programs such as Zoom before. I understood the programs by experiencing them, which took some time." K10 teacher told, "I had stress during the comprehending phase of "EBA/Zoom" because it was a program, we did not know anything about. I had difficulty connecting most of the time because of the high-density connection during lecture hours." Teacher K6 said, "I had problems with the internet, there was a high-density. I had constant disconnections during the lecture." They gave these answers.

The problems of preschool teachers with students in the distance education process; students' inability to access the internet/computer (4), low participation in lessons (6), students have low motivation/reluctance (5), short attention spans of students (4), students having to use the internet/computer under adult supervision (3). Teachers stated these problems. Teacher K2 told, "It was very challenging to keep the students in front of the screen. They had connection problems. It took some time to learn class definitions and live class participation in EBA. I had difficulty in guiding some of my students from a distance." Teacher K3 said "I had to teach lessons in the evenings because pupils' parents were working, especially children

with short attention spans had problems focusing on that time. When I thought the lesson during the daytime, the participation was very low." Teacher K4 told "Children could not attend the lessons because they could not use the computer themselves and the families went to work. Generally, they were with their grandparents, and they could not help the children technologically. Teacher K8 stated "When we consider the attention span of the age group, I observed that the students were bored in front of the screen. While children's participation was higher at first, participation and desire diminished day by day." Teacher K9 "Since I had a lot of parents working, I had to arrange the hours of the lesson during evening hours for computer use. In those hours students were reluctant to attend the class." They expressed their problems.

Preschool Teachers' Views on Teaching During Distance Education

Preschool teachers were asked questions about their views on the teaching during the distance education. The codes were formed by theming the answers. When Table 4 is considered, it is seen that the most used teaching methods by preschool teachers in the distance education process; return demonstration (10), and video (10). Teacher K1 said, "At the beginning of the process, I made activity assignments through EBA. Later, TRT Kindergarten channel went on the air. We played finger games via WhatsApp video calls. Teacher K2 stated "When I had connection problems and communicating with parents, I taught my lessons through WhatsApp. I made video calls. If we do not have a connection problem, I performed my live lessons via EBA. I taught my live lessons especially with question-answer, return demonstration and video sharing methods. I read stories with presentations. I played games together with videos. We filled our workbooks through their own web applications. I gave them worksheets to do with their families." Teacher K9 replied "I sent activities via EBA. Through communicating parents, I gave homework. I recorded videos and told how to do it. I sent practice samples from YouTube.

Preschool teachers use in the process of distance education; daily course plans (2), Documents (presentation, book etc.) (4), Web applications (z-book etc.) (2), EBA lesson content (7), videos (10) as teaching materials.

Table 4: Preschool Teachers' Views on Teaching During Distance Education

Main Theme	Subtheme	Answers	Codes
Method	Methods used in the lessons during distance education	There is answer (10)	Questions-Answers (1) Video (10) PowerPoint Presentation (1) Return Demonstration (10) Hands-on activities (2) Sending worksheet through EBA (10)
Material	Materials used in the lessons during distance education	There is answer (10)	Documents (presentation, book etc.) (4) EBA lesson content (7) Video (10) Paper, pencil (2) Daily course plan (2)
Lesson Duration	Lesson duration during distance education (minutes)	No answer (7)	1 to 30 minutes (2) 31 to 60 minutes (1)
Environment	Environment of distance education	No answer (7)	Comfortable (1) Safe (1) Optimal (1)
Applications used	Applications and platforms through distance education is carried out	There is answer (10)	WhatsApp (10) Online lesson (10) EBA (10)

When Table 4 is considered, it is seen that preschool teachers mostly complete 1 lesson between 1-30 minutes in the distance education process. They explained that it was not convenient for the attention span of the students to hold lessons for 2 hours consecutively. Teacher K1 "30 minutes was convenient for 1 lesson. Too many lesson hours caused boredom and distraction." Teacher K3 answered, 'It was very convenient for the lessons to take a maximum of 30 minutes and it was adequate for the children. Moreover, preschool teachers expressed that they thought their distance education from home and stated that this environment was comfortable (1), safe (1) and optimal (1). Teacher K5 replied, "Since it is too hard to keep students of this age group in front of the screen and perform activities, I have arranged an average of 20 minutes of activity. We thought lessons at home in a more comfortable environment. It made me feel safe during the epidemic."

Thoughts of Preschool Teachers on Teaching Profession in the Process of Distance Education

Preschool teachers' thoughts on the teaching profession during the extended education process were studied. Thus, themes were formed, and coding was done. The themes and codes formed are presented in Table 5.

Table 5: Thoughts of preschool teachers on teaching profession in the process of distance education

Main Theme	Answers	Codes
Usage of Educational Technologies	No answer (1)	Increase in technology usage (8) Starting to use online programs (8) Discovering different programs (4)
Concern	No answer (5)	Being unhappy (4) Feeling inadequate during distance education (5) Feeling of inefficiency (1) Fear (2) Feeling of emptiness (2)
Job satisfaction	No answer (1)	Feeling of inefficiency (2) Lack of face-to-face teaching (5) Inability to communicate with students (3)
Career development	No answer (1)	Opportunity to improve oneself (9)

When Table 5 is considered, it is seen that preschool teachers' distance education process have a positive effect on the usage of educational technologies. During distance education process of preschool teachers, they explained that the use of technology increased (8), starting to use online platforms when not regularly using them (8) and discovering different programs (4). Teacher K4 said, "It made new contributions to my profession. I had a limited relationship with technology, which increased after the distance education process in the pandemic. I used programs that I have never used before. We discovered the programs together with my friends and students." Teacher K7 "There were positive benefits such as the increase in the use of technology, more use of internet platforms and in the meantime learning new programs." Teacher K9 answered, "It has positively affected my use of computer programs that I was not aware before."

It is seen in Table 5 that inability to teach in the classroom environment causes anxiety in half of the preschool teachers and their job satisfaction is negatively affected. While the causes of anxiety are expressed as being unhappy (4), feeling

inadequate during distance education (5), fear (2), feeling of emptiness (2), feeling of inefficiency (1), preschool teachers whose job satisfaction is negatively affected; They stated the reasons as feeling of inefficiency (2), lack of face-to-face education (5), and inability to communicate with students (3). Furthermore, it was uncovered that 9 of the preschool teachers had a positive effect on their career development. Hence, they stated that they had the opportunity to develop themselves (9).

Teacher K1 said, "While I was encountered with practices that I had never encountered before regarding my profession the fact that teachers were presented as doing nothing all the time made me feel very uneasy and unhappy. When I was already anxious during this time, I sometimes felt unworthy professionally. Especially at first, I thought that I was not qualified for my students." Teacher K8 stated "I felt inadequate about the lack of information that may happen for students who are living in poverty and the inability to reach them. The process and all these developments were not familiar even for us. I watched videos on YouTube. I joined in-service trainings." Teacher K7 explained "The anxiety I experienced during the epidemic, the sayings on social media that showed the teacher as worthless and useless, and the inability to communicate enough with the students negatively affected me."

Suggestions of Preschool Teachers on Effective and Productive Conduct of Distance Education Process

Table 6: Suggestions of Preschool Teachers on Effective and Productive Conduct of Distance Education Process

Main Theme	Answers	Codes
Educational Technologies	No answer (1)	Providing computer and free Wi-Fi access to all students (6) Providing equal opportunity (3) Establishing standards (3)
Material	No answer (1)	Providing material/document support and diversity (8) Common distance education programs (1)
Education	No answer (3)	Providing guidance for parents (6) Arranging teacher trainings (1)

When Table 6 and suggestions of preschool teachers on effective and productive conduct of distance education process are considered, it is seen that the most prominent common opinions under the themes of educational technologies,

materials and education are; providing computer and free Wi-Fi access to all students (6), providing material/document support and diversity (8), and providing guidance to parents (6) Teacher K1explained "It seems to me that free internet access should be provided to students without internet access, and parents should be guided and participate in some way." Teacher K2 said, "For online fun games and activities, teachers need to be trained or do research to improve themselves somehow." Teacher K4 stated "First of all, the internet infrastructure must be solid. Parents should be made more knowledgeable and eager. It is a process that the family and the teacher should act together and carry out with a mutual discipline. Teacher K7 told "It is crucial to provide equal opportunity in education. In my opinion, in order to be effective and efficient, there should be certain standards at all levels. Like it was prepared in face-to-face education, it can be done by preparing a distance education program with an expert staff and distributing it to all students and teachers with the documents, computers, and tablet programs that will support this program, and providing free Wi-Fi access.

4   Conclusion and Discussion

In this research, the views of preschool teachers on the distance education process were tried to be explained. It is seen that distance education, which is a process that necessitates the adoption of different understandings from the methods used in classical classroom teaching and learning environments, is a more flexible model that leaves the responsibility to the individual and ensures personalized learning with it.

It is known that teachers who went through the distance education model one-to-one during the pandemic process cannot get the productivity and effectiveness of face-to-face education in the distance education process.

It was observed that most of the teachers did not have prior knowledge about the pandemic and distance education before the COVID -19 pandemic. The lack of distance education experiences of teachers and students before the COVID-19 pandemic, the inadequacy of the infrastructure and unawareness they encountered in connection with the technology they were exposed to deal with it in the process and it brought along many difficulties.

It is seen that teachers have the standpoint that it is challenging to teach preschool children with distance education. Furthermore, it was expressed by the teachers that they did not reach all students in the process and that there was no equality of opportunity. Başaran, Doğan, Karaoğlu & Şahin (2020), It has been determined that the negativities brought by distance education are the limited interaction, the inability of the students to participate in the lesson actively, the fact that distance education is not convenient for individual differences and there are problems about entering the lesson because of technical problems experienced. All teaching and learning individuals expressed that they had problems with technology access and lack of knowledge. It is stated that being unable to access internet is a very common problem in distance education (Serçemeli, Kurnaz, 2020).

It has been observed that preschool children also encounter with problems like needing for an adult for computer and internet access. The fact that the parents are at work and reluctant parents are other problems. Teachers expressed that they felt inadequate and worthless. The decrease in face-to-face communication and interaction is among the limitations of distance education (Altun Ekiz, 2020; Karakuş vd, 2020).

Teachers preferred EBA and Zoom programs during the distance education process, and they also tried to follow up and give feedback with WhatsApp. It is known that applications such as WhatsApp are used for purposes such as homework sharing, communication with parents, and announcements during face-to-face education process.

It has been observed that the rate of participation in in-service trainings for career development of teachers has increased and they have gained knowledge, skills and experience related to technology.

It has been observed that they prefer hands-on activities for online lessons, where they choose teaching methods such as return demonstration, video, question-answer during distance education. The short attention span of the children of this age group is among the factors that make the distance education process challenging.

With COVID-19 pandemic, it has become a significant necessity to continue the distance education method, which has been actively used in all education levels, in a qualified manner. If the problems and deficiencies regarding the distance education process are not resolved as soon as possible, the students who will be studying in the coming years may be equipped with inadequate, lack and incorrect information. It is crucial to take precautions regarding the distance education process immediately.

Based on the results of the research, some suggestions are made for the researchers:

- The participants of this research were pre-school teachers works at kindergartens. It is expected that research will be done on preschool teachers in kindergartens.
- With the transition to distance education, it is necessary to study how the education process in Turkey is affected at all grades and levels.
- It is crucial to examine how distance education activities affect all teaching and learning individuals positively or negatively.
- Various trainings on distance education, technology access and usage should be organized for teachers.

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What Can We Learn From Evaluation of Individual Education Plans for Children At Risk in Early Childhood Education?

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Abstract The purpose of the study is to evaluate the specifics and quality of individual education plans for children at risk, especially children with special education needs in ECE in Slovenia, although some specifics of individual education plans for other groups are also presented. The analysis of 39 IEPs in kindergartens at primary schools indicate that the professional assessment of the child's functioning is not written according to the domains of the Curriculum, that the number of goals in the IEPs is distinctly small, the role of the ECE teacher is not clearly defined, parents' participation is weak and IEP evaluations are all qualitative, with low measurability. Improvements are needed in terms of individualisation, better preparation of IEP, improvement of teachers' and parents' role and more quantitative evaluations.

1   Introduction

The inclusion has stimulated interest and the need to individualise education. Individualizing early childhood education for immigrant children, children with special needs, and other children at risk is one of the way to ensure that all children receive the best possible education and reach their full potential (Bondie, Dahnke and Zusho, 2019; Lindner and Schwab, 2020, Rakap, 2015; Vandenbroeck, 2007).

Early childhood education is important for children at risk because it can provide them with the skills they need to be successful in school and later in life, it helps children develop resilience and problem-solving skills, and it provides them with the structure and support they need in order to succeed (Heckman, 2011; Britto et al., 2017). Early childhood education can also support children at risk to develop their emotional skills, to interact appropriately with others, and to make good decisions (Anghel and Lupu, 2014; Kouider et al., 2014). Finally, early childhood education can help children from disadvantage groups to develop a sense of belonging and connectedness within their community, helping them to become productive members of society (Phillips et al., 2017; Ladd, 2017).

When individualized education is provided, it takes into account the child's cultural background, special educational needs, social background and other factors that may be impeding their progress. This allows the child to receive an education that is tailored to their specific needs and helps them to learn more effectively (Pretti-Frontzak and Bricker, 2000). Individualized education also helps to reduce the achievement gap between different groups of children, ensuring that all children have an equal opportunity to succeed. With the introduction of the individualised curriculum, the education sector has answered the question of how to work with children from disadvantage groups (Pretti-Frontzak and Bricker, 2004; Phillips et al. 2017).

Individualization in early childhood education is the practice of tailoring instruction and activities to the unique needs and interests of each child. This includes adapting the physical environment, materials, content, and teaching strategies to allow each child to learn and develop at their own pace (Sanches-Ferreira et al., 2013). It also involves providing activities and experiences that are meaningful to each individual child. Examples of individualized instruction in early childhood education include

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providing differentiated instruction, adaptation in learning and teaching, working in small groups, and providing opportunities child's optimal development (IEP, 2001).

The individualized education plan (IEP) is also a key component of the educational process for children with special needs in Slovenian kindergartens, as it is in many other nations. IEP for children with special needs in Slovenia are obligatory. In a formal sense, it refers to the document that is created after the National Education Institute issues its official certification of the child's placement in the proper educational program for children with special needs. Procedures for supporting children with special needs in all levels of education, from preschool to upper secondary, are governed by the Placement of Children with Special Needs Act (ZUOPP, 2007, 2011). The Placement of Children with Special Needs Act in Slovenia permits the official inclusion of children with special needs in regular education programs with additional expert professional support and educational process adaptation, which should assist these children in reaching the same standards of knowledge as their peers without special needs (Magajna et al., 2008; ZUOPP, 2011).

For immigrant children in early childhood education in Slovenia, IEP are suggested, but not obligatory. In order to adapt the educational process for immigrant children in ECE, it is necessary to form a professional team, and prepare an individual programme for the child, which can be used to monitor the child's progress (Smernice za vključevanje otrok priseljencev v vrtce in šole, 2012). Goals are set according to the expected progress of the child in each school year or semester. The goals in IEP for immigrant children can be related to child's empowerment in the field of communication skills in non-verbal and verbal interactions; in mother tongue and the teaching language; self-regulation and development of social skills; development of child's abilities in all areas (children's physical, motor, speech, cognitive, social, emotional, moral development); development of child's strengths; monitoring progress based on developmental milestones and individual characteristics of the child and gradual integration of the child and family into the local environment (Vključevanje priseljencev v slovenski vzgojno-izobraževalni sistem, 2017).

The annual IEP is a document developed by the professionals in the kindergarten or other educational institution (teacher, special education teacher, counsellor, principal) as well as other important IEP team participants, including the child and his or her caregivers, usually parents (ZUOPP, 2011). Each team member should reflect on the decisions taken by the IEP team on the child's education requirements and how they will be met as part of the process of developing the IEP. The IEP process involves cooperation between all parties in key steps, including the evaluation of the child, determining the child's needs, talking about standards or milestones, addressing social and emotional development and other crucial areas for the best possible development, and finally defining annual goals, accommodations, and supplemental aids for carrying out the IEP during the academic year (Opara, 2015; WDPI, 2010). IEP revisions, discussion of the child's progress toward goals in daily practice, and review at least once or twice a year are all part of the continuous IEP process (Bateman & Linden, 2006; Kavkler, 2011; Magajna et al., 2008; Pulec Lah, 2005).

However, research on the individualization of services for young children with special needs has acknowledged the significance of developing high-quality IEP goals and objectives, it has been found that these documents are often poorly written (Boavida et al. 2010; Pretti-Frontczak and Bricker 2000; Sanches-Ferreira et al. 2013). In Slovenian national evaluation study related to various additional professional support for children with special needs (Vršnik Perše et al., 2016; Licardo, Košir and Vršnik Perše, 2017) evaluation of IEP results reveal that in elementary school 32,2% of IEPs assessment of functional performance and academic achievement is too general or inadequate and needs some improvements. Conceptualization of students special needs is mainly constructed on academic weaknesses with poor understanding of disabilities and possible opportunities which might be used in education process (due to different disabilities) (Martin et al., 2004). Another citical issue in IEPs in collaboration with parents. Vršnik Perše et al. (2016) found that from IEP descriptions it is evident that some collaboration with parents during the IEP process exists; however, there is little evidence of active participation of parents in planning, implementing, and evaluating IEPs. Other authors also argue truly meaningful parent participation continues to be more exception that the rule (Heatherington et al., 2010; Spann et al., 2003). Further, assessment of quality indicators for goals, strategies, and methods indicated that some teachers and other professionals who write these goals still need general instruction about planning and

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writing them, because differences in quality of the goal descriptions are quite noticeable. In some cases, goals are written precisely, transparently, and reflective of measurement and scheduling, while in other cases goals are too general, impossible to evaluate, or even senseless (Vršnik Perše et al., 2016). In IEPs evaluations there is also evident that qualitative IEP evaluations prevail, which also indicates the lack of measurability (Boavida et al., 2014; Ruble et al., 2010, Sanches-Ferreira et al., 2013).

2 Method

2.1 The aim of the study

The aim of this research is to analyse the quality and characteristics of IEPs for children with special needs in ECE. More specifically, the aim is to find out whether the expert assessment of the child's functioning is written according to the activity areas of the Kindergarten Curriculum, how many people on average make up an expert team, what is the scope of the IEPs, what is the role of the educator in IEP, the extent to which the child's disabilities or deficits are recorded, how the objectives are defined, if IEPs include parental involvement, and how many IEPs include an evaluation.

2.2 Data collection

The research sample of document analysis consists of 39 IEPs in kindergartens at primary schools, which were obtained within the framework of the National Evaluation Study entitled Evaluation of different forms of additional professional support granted to children in accordance with the Act on Guidance for Children with Special Needs (Vršnik Perše et al., 2016) with the permission of the research leader, assoc. prof. dr. Tina Vršnik Perše. All IEPs belong to preschool children with special needs. All the children from whom we obtained IEPs were included in a programme for preschool children with adapted implementation and additional professional support.

2.3   The instrument

The instrument used was check-list made for the purpose of this study with scale 0 = no, 1 = yes in most of the variables. The check list included variables related to assessment of child functioning according to kindergarten curriculum learning domains, assessment of written adaptations in IEP according to child special needs, assessment of collaboration with parents in IEP, definition of child's special needs, assessment of written objectives, assessment of type and number of objectives, the length of the IEP by page and assessment of evaluation.

2.4   Analysis

The data obtained from the IEP analysis were processed using SPSS, analysed at the level of descriptive statistics.

3   Results

From the reviewed and analysed IEPs, we have found that in the creation of a child's IEP, the expert group is most often composed of the following persons: the headmaster of the kindergarten, the child's teacher and teacher asisstant, a special educator, a counsellor, a speech and language therapist, a psychologist, a sign language therapist, a physiotherapist, etc. In some cases, it is stated that a member of the expert group is also the child's assistant (in cases of children with visual impairments and autistic children). In all IEP cases where team members are listed, the parents are also listed as team members. The average number of the IEP expert group is four members.

Table 1: The assessment of child functioning according to kindergarten curriculum learning domains

	f	f %
No	33	84,62
Yes	6	15,38
Total	39	100,00

When analysing all 39 IEPs, we found that in most cases the professional assessment of the child's functioning is written in a descriptive form. The descriptive forms make it possible to identify the child's areas of strength and weakness and the

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difficulties he or she is facing. Expert assessments of a child's functioning vary according to the disorder the preschool child has. Only 15 % of IEP had and assessment of child functioning according to curriculum learning domains. If the assessment of the child's functioning is written according to the areas of the Kindergarten Curriculum, the teacher can more easily see from the IEP the child's deficit in each area and encourage the child's development in the activity areas. However, in the pre-school period, it is also important to have a global assessment of the child's functioning, from which the child's characteristics, strengths, weaknesses, abilities, skills, etc. can be seen. By assessing the child's functional areas, we are both assessing and identifying the individual's abilities. The assessment must be holistic, which means that we need to take into account the bio-physiological, psychological and social aspects of functioning. Assessment should not be finite because the child is always changing. We therefore suggest that it would be good for professionals to write in the IEP a global assessment of the child's functioning and a professional assessment of the child's functioning according to the domains of the Kindergarten Curriculum.

Table 2: The written adaptations in IEP according to child special needs

	f	f %
No	5	12,8
Yes	34	87,2
Total	39	100,0

The table shows that 34 (87.2%) IEPs have adaptations, and 5 (12.8%) IEPs have no records related to adaptations. The adaptations vary according to the child's special needs. In most of the IEPs analysed, the adaptations are divided into areas of adaptation: spatial adaptations, organisational adaptations, personnel adaptations, time adaptations, adaptations to the methods and forms of work, and adaptations to the implementation of the learning domains according to the Kindergarten Curriculum (1999). In some cases, the adaptations are followed by the provision of the equipment and facilities needed by the child. The result suggests that improvements are needed in this area in order to ensure that every IEP has written adaptations written, as this ensures that the child's educational work is individualised.

Table 3: The role of the teacher in IEP is defined

	f	f %
No	25	64,10
Yes	14	35,90
Total	39	100,00

From the table we can see that the role of the educator is defined in only 14 (35.90%) of the analysed IEPs. In the analysed IEPs that have the role of the educator, the most frequently stated role of the educator is to coordinate the work of the team, to convene team meetings, to lead the ongoing evaluation of the child, to cooperate with parents and other professionals, to participate in the elaboration of the IEP, to lead the ongoing evaluation of the child's progress, and to participate in the planning and implementation of the additional professional support. In 25 (64.10%) of the IEPs, the role of the educator is not defined.

The data suggest that educators still play an insufficient role in the creation and management of IEPs. Interestingly, a survey (Vršnik Perše et al., 2016) shows that the vast majority (94.6%) of teachers are invited to the expert team meetings. This figure is not entirely consistent with our analysis and may suggest that teachers are more formally present at meetings, as their role in the IEP is often not defined, as we found in our analysis.

In our opinion, ECE teachers are the persons who know the child best next to the parents. They are the ones who know the child's peculiarities, deficits, strengths and weaknesses best, as they also spend a lot of time with the child. The teacher is the person who, out of all the members of the team, knows the child's family environment best, apart from the parents. Teachers are an important source of information for the team or professionals, as they can view some situations more objectively than the child's parents. Therefore, we believe that teachers should play a greater role in the creation and management of the IEP, as is evident from the results in our sample.

Table 4: The collaboration with parents in IEP is defined

	f	f %
No	12	30,77
Yes	27	69,23
Total	39	100,00

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The results show that parents are involved in the preparation of 27 (69.23%) of the IEPs analysed. In the analysed IEPs where parental involvement is mentioned, the task, role and method of parental involvement are the most frequently mentioned. The role of parents is to cooperate with the kindergarten and the members of the expert group and to attend team meetings, which are usually planned in advance. Parents share their observations and provide important information about their child's progress with the team. Parents have the opportunity to communicate daily with the teacher when their child arrives at or leaves the kindergarten, during the afternoon talk time and at parent-teacher conferences. For the necessary meeting of the expert group, the expert group shall adapt to the parents' working hours. The professionals provide support to the parents in the following areas: informing them about the child's progress, highlighting the child's positive qualities, encouraging the parents to read a lot with the child, play with the child, involve the child in the home environment, advising them to involve the child in various activities, etc. (Curriculum Guidelines, 2003). 12 (30.77%) of the IEPs do not specify how the cooperation with parents will take place, which is concerning.

Table 5: The child disabilities, disorders of deficits are defined

	f	f %
No	4	10,26
Yes	35	89,74
Total	39	100,00

The results show that 35 (89.74%) of the IEPs record the child's disorders or deficits. In the IEPs where disabilities are mentioned, we can see that the most frequently mentioned disabilities are: mild/severe speech-language disorders, child with long-term illness, child with visual impairment, child with autistic disorder, mild/severe physical disability, child with mild hearing loss and mild/severe intellectual disability. In those cases where the disability is not defined (10,26%), there is a possibility that the type of disability has not yet been determined by professionals. Alternatively, it can be assumed that the person who prepared up the IEP did not include this information in the record, which can be interpreted as a professional error. However, we assume that the reason for the absence of a record is mainly due to the unclear diagnosis which might often be the case in ECE.

Table 6: The goals of IEP are defined

	f	f %
No	8	20,51
Yes	31	79,49
Total	39	100,00

When analysing the goals, we first investigated how many IEPs have written goals and how many IEPs have no goals. There are 8 (20.51%) IEPs that do not have a single objective or goal and 31 (79.49%) IEPs that have at least one type of objective. During the analysis, it was found that the most frequently written goals in the IEPs are general, operational and goals in selected areas of the Kindergarten Curriculum (1999).

Table 6: The types of goals in IEP

	f	f %
General goals	19	40,43
Concrete goals	5	10,64
Goals by curriculum learning domains	8	17,02
Classification of goals by Bloom taxonomy	15	31,91
Total	47	100,00

The table shows that among the 31 IEPs with goals, 19 (40.43%) have general goals, 5 (10.64%) have concrete/operational goals, 8 (17.02%) have goals by curriculum learning domains and 15 (31, 91%) of IEPs are those where the goals are written according to the Bloom's classification of learning goals, which include cognitive, emotional-motivational, psychomotor goals (Ivanuš Grmek and Javornik Krečič, 2011). From these results, we can conclude that operational or concrete goals should also be recorded in the IEPs, as they appear rarely.

Further analysis of the number of goals in each IEPs showed that 3 IEPs (7.69%) have 3 goals, 10 IEPs (25.64%) have 2 goals and 18 IEPs (46.15%) have only one objective. In 8 IEPs (20.51%), there are no goals. These results suggest that the number of goals in the IEP is distinctly small, given that the IEP is written to work with a child for at least half a year or for the whole school year. The analysis shows that the IEPs are very weak in terms of goals.

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Table 7: The length of the IEP by page

	f	f %
0 to 5 pages	11	28,21
6 to 10 pages	15	38,46
11 to 15 pages	10	25,64
16 to 20 pages	3	7,69
Total	39	100,00

Analysis show that 11 (28.21%) IEPs have 0 to 5 pages, 15 (38.76%) IEPs have 6 to 10 pages, 10 (25.64%) IEPs have 11 to 15 pages and only 3 (7.69%) IEPs have 16 to 20 pages. IEPs that are too large are not transparent and make it difficult to evaluate them, and IEPs that are only a few pages long are not of good quality because they do not contain all the necessary information and are not very efficient in support of the professionals who are working with the child.

Table 8: The evaluation of the IEP is defined

	f	f %
No	15	38,46
Yes, but not included	22	56,41
Yes (included in IEP)	2	5,13
Total	39	100,00

The results show that in 15 (38.46%) of the IEPs there is no evaluation, or no evaluation exists. In 22 (56.41%) IEPs it is mentioned that an evaluation exists but is not attached. Most of the IEPs state that an evaluation will take place, either at the end of the school year, written by a special educator or presented to parents. We found that only 2 (5.13%) of the IEPs had an evaluation included. The evaluations are summative, as they are written at the end of the school year and record all the achievements of the child during the school year.

We believe that evaluation is crucial and should be done for every IEP, and therefore we estimate that the 38% of IEPs without evaluation is too high to be satisfied with this result. This is particularly so because the sample of IEPs we analysed was not random but was sent from the kindergartens for analysis by the commissioning authority of the evaluation study, which is the Ministry of Education. We assume that the educators sent the IEPs that they considered to be good or the best among those available. In fact, much of the data we obtained from the analysis is worrying, as it points to weak areas of IEP in ECE, such as inadequate recording of goals,

weak participation of educators who do not have a clearly defined role, low parental involvement and weak evaluations.

4   Discussion

The research showed that the majority (89.7%) of children have defined disorders or deficits in the IEPs. We found that the majority of IEPs (87.2%) have written adaptations that the child needs. The professional team consists of 4 persons on average. These are most often a special educator, a speech and language therapist, a psychologist and a parent. This finding is promising as each professional assesses the child based on his/her experience and knowledge, which contributes to a better treatment of the child and may result in a better IEP.

We found that in most IEPs, the professional assessment of the child's functioning is not written according to the domains of the Curriculum, which is considered to be the basic professional document for the field of early childhood education. Most IEPs contain a global assessment of the child's functioning, which includes areas of strength and weakness, information about the child's family environment and the child's functioning in the community. We therefore recommend that professionals include a professional assessment of the child's functioning as a whole as well as a professional assessment of the child's functioning in accordance with the areas of the Kindergarten Curriculum in the IEP.

Regarding adaptations of pedagogical process and other adaptations written in the IEPs, the result indicate that improvements are needed in this area in order to ensure that every IEP has written adaptations, as this ensures that the child's educational work is individualised.

We also found that most IEPs have written goals, although there are very few specific goals in the IEP. It is concerning that 20.51% IEPs do not have a single objective or goal and 31 (79.49%) IEPs have at least one type of objective. These results suggest that the number of goals in the IEP is distinctly small, given that the IEP is written to work with a child for at least half a year or for the whole school year. The analysis shows that the IEPs are very weak in terms of goals.

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Experts most commonly use two types of goals, namely general goals and goals that are written according to the Bloom's classification of learning goals. We can conclude that operational or concrete goals should also be recorded in the IEPs, as they appear rarely.

It is a matter of concern that 64.1% of the IEPs do not include the role and tasks of the ECE teacher. Since they are able to evaluate some events more objectively than the child's parents, teachers are a valuable source of information for the IEP team. The outcomes in our sample support our belief that teachers should have a bigger srole in the development and implementation of the IEP.

We also found that only 30.7% of the IEPs contain the signature of the parent, which is very low and indicates that parent's role in IEP is more formal and not in terms of active participants.

We found that only 2 (5.13%) of the IEPs had an evaluation included. Evaluation is crucial and should be done for every IEP, and therefore we estimate that the 38% of IEPs without evaluation is concerning. This is especially true considering that the sample of IEPs we examined wasn't chosen at random; rather, the kindergartens handed them for purpose of national evaluation study. We presume that the teachers sent the IEPs that they thought were the finest or the most effective ones that were offered. In fact, a large portion of the data we gathered from the research is alarming because it highlights IEP in ECE weak spots such poor goal recording, weak participation of educators without a clearly defined role, low parental involvement, and weak evaluations.

Although the results of the study cannot be generalised, we believe that improvements are needed in the field of early childhood education in terms of individualisation and IEP records. Teachers should be given a greater role in the creation of IEPs and also have their role stated in all IEPs, because teachers are a valuable source of information that can contribute to better IEPs, but at the same time there is a need for professional training of all persons involved in team work with a child with special needs in the planning, implementation and evaluation of IEPs, because there are shortcomings in various areas, and it seems that the IEP in Slovenian ECE system is still not a living document that really monitors the child

and his/her progress, but is mainly a formality to meet the requirements of the legislation.

Acknowledgments

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Parents' Perceptions on Early Childhood Independence in Self-care and Doing Chores

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Abstract The child's independence is the goal of educational action, as it is a quality that parents want their child to develop. Its development begins in early childhood, and parents play an important role. Consequently, in our paper we focused on parents' perceptions of their child's independence in self-care activities and doing chores. The research, in which 101 parents participated, was conducted with a questionnaire. The findings suggest that, while parents generally rate their children as highly independent, children are more independent in some activities than in others. In general, parents assessed children as more independent in self-care activities than in doing chores. Furthermore, we found that there are significant differences in parents' assessment of child's independence in dressing, bathing, and brushing the teeth between different age groups of children. Our paper contributes to understanding children's independence and provides insight into areas where children need adult support.

1   Introduction

In a postmodern society the only constant is change, which is why individuals are required to be creative, flexible, and original. Never before have individuals been subjected to so many rights and responsibilities imposed by society. Managing them leads individuals to become skilled in dealing with different patterns of behaviour, social roles in institutions and social spheres. All this contributes to visible changes in the way people live and think, in their identities and subjective structures, and in their attitudes and social relations. The turn from the domination of predefined identities to more plural and temporary lifestyles requires individuals to not only give an extra amount of effort but to prove themselves on a daily basis (Ule Nastran, 2000). This implies the need to empower individuals to take an active part in society, starting in early childhood. Hmelak and Lepičnik Vodopivec (2017) point out that the early childhood period is crucial for children's cognitive, social, emotional, linguistic, physical, and motor development (Chau, 2022).

During this period, the family plays an important role (Bezenšek, 2001), as it represents the social entity in which the child is educated, socialised, and thus shapes his or her personality (Mandic, 2012). Upbringing can be understood as the deliberate and conscious development of a child's abilities, with an emphasis on interaction and having an active role. By doing this the child becomes accustomed to having an active attitude in life. The aim of upbringing is to introduce values and encourage moral judgement and action. Upbringing is achieved through the content, the means by which the content is communicated, and the attitudes that are established in the process. It is crucial to emphasize that upbringing is influenced by the society in which it occurs. Closely linked to society is also socialisation, understood as the spontaneous process of internalising the values, rules, attitudes and patterns of behaviour that define a particular society. It is important to stress that values are socially determined, and therefore, in the context of upbringing, values are understood as debatable rather than absolutely valid and objective categorical entities (Peček Čuk & Lesar, 2011).

Consequently, the values that parents want to instil in their children may differ at both the societal and the individual level. Parents want to instil a different spectrum of values in their children, with independence and obedience seen as the two opposing poles. But values such as independence, hard work, responsibility, respect,

and good behaviour have been shown to be qualities that parents want to instil in their children, regardless of culture and social background (Xiao, 1999).

As a result, it is not surprising that children's independence as a goal of educational action often appears in theoretical debates, as Lesar and Smrtnik Vitulić (2013) also note. Independence is one of the most important qualities that we want a child to develop in the early childhood period (Ule, 2013), and it is therefore central to the early childhood's practice (Cameron, 2007). As more independent children have better self-confidence, self-esteem and motivation, independence can be seen as an imperative of modern education (Cerino, 2021), which justifies the relevance of the topic. Add to this the lack of research in this area and the focus of research on the development of independence in children with disabilities, and the need for further research is justified.

Our paper aims to address this gap by focusing on preschool children's independence from the parents' perspective, as the family environment plays an important role in the development of children's independence (Mandic, 2012; Rusmiati et al., 2019). In the theoretical part, we discuss the concept of independence, its development in preschool children and the factors closely related to its development. The empirical part presents parents' views on their children's independence skills, such as self-care skills and doing chores.

1.1   Independence of the child

In general, the term independence refers to various aspects of human functioning whereby an individual is not dependent on (the help of) others, either physically or mentally (Raeff, 2006). At the societal level, independence is described as freedom from external constraints and freedom to act and think (Cameron, 2007). It is important to add to this definition that, as Rose (1999) notes, since the individual is a member of society, independence to act and think only exists while at the same time being governed by a network of socially valid rules and norms. Although we are social creatures, it is important to develop a sense of ourselves as individuals, where independence plays an important role. As a result, independence can be criticised for promoting individualism. Yet, if we place independence in a social context, we can see the value of both thinking about ourselves and others and the importance of developing independence.

The development of independence, which starts in early childhood, is closely linked to the development of abilities, skills, and the acquisition of new knowledge (Giesinger, 2019). The process towards independence presupposes a child's own activity, which is very important for his/her development, self-esteem, and future life. It is an educationally triggered activity and depends on the environment, the family, parents, early childhood teachers, and teachers (Peček Čuk and Lesar, 2011).

The desire for independence first appears in children as early as the second year of life, thanks to their developing mental and motor skills. The period coincides with the emergence of stubbornness, which is thought to be an indicator of a child's tendency towards independence. This is also evidenced in Erikson's theory of psychosocial development, which places the development of independence as a central developmental task at the centre of the second phase (which occurs sometime between the ages of 2 and 3). This is a period that is designed for children to practice their own choice, will and autonomy (Santrock, 2018). As a result, children during this period need a lot of support and coaching to develop their independence (Nurani & Pratiwi, 2020).

There are two aspects of independence, both in early childhood and in later life, namely 1) independence in self-care (eating, dressing, hygiene, using toilet) and 2) independence in decision-making, whereby the child should be given opportunities to shape, make decisions and participate in various activities (Sears and Sears, 2004; Žnidaršič and Beguš, 2013).

1.1.1   Promoting children's independence through self-care skill training

Self-care is a frequently discussed topic in the literature when addressing preschool education, children with special needs, and various medical conditions that make it difficult for patients to care for themselves. It is defined as the practice of performing daily duties to prepare oneself for participation in activities (including dressing, eating, brushing teeth, etc.) (Cempron, 2021; Nurani & Pratiwi, 2020) or as the practice of undertaking tasks for oneself within a set time frame in the pursuit of preserving one's health and wellbeing (Ageborg et al., 2005). In the early childhood period, self-care skills mainly relate to the capacity to meet one's own basic needs without the assistance of an adult (Sezici & Akkaya, 2020).

Writing, cutting, gripping small items, and fastening clothing all require the use of fine motor skills, which entail eye-hand coordination and control of the little muscles in the body (Bhatia et al., 2015). The acquisition of motor skills is essential not only for a child's independence but also for their quality of life and social acceptance (Sezici & Akkaya, 2020). The lack of (fine) motor skills might prohibit children from performing basic self-care tasks like feeding, dressing and undressing and can have a negative impact on school performance (Feder & Majnemer, 2007). Furthermore, fine motor skills are a strong predictor of later academic achievement (Grissmer et al., 2010).

Self-care skills are in various cultural contexts viewed as a crucial component of early development and school preparation. Regardless of gender or preschool entrance age, age-appropriate self-care skills from two to three years old serve as a strong predictor of assertiveness and collaboration skills at the end of the preschool years (Zhu et al., 2021). They are a crucial element in a child's socialization process (Cempron, 2021). Furthermore, children with less developed self-care abilities may encounter many unfavourable circumstances and may struggle to build self-esteem (Bender, 1996). Teaching basic self-care skills is found to be associated with increased independence and parents' satisfaction (Boutain et al., 2020). It can play a crucial role in establishing a predictable framework for behaviour guidance and a comforting emotional climate in everyday family life (Fiese et al., 2006). Research shows that it can also positively impact child cooperation and positive parent-child interactions (Sytsma et al., 2001). Moreover, early childhood period has been identified as a critical time in the development of eating behaviours and food preferences (Powell et al., 2018) as well as eating disorders (Bryant-Waugh et al., 2010; Jacobi et al., 2004). To sum up, self-care skills can significantly influence the development of children in variety of domains.

1.1.2   Promoting children's independence by involving them in daily chores

Children's independence can also be encouraged by involving them in daily activities and chores, such as cleaning the house, preparing meals, shopping, and taking care of a pet. The advantages of doing domestic chores, however, appear to extend beyond managing daily life. Young children have a natural tendency to be helpers, and chores can serve as a natural method to foster this propensity (Rende, 2021).

Throughout the development, properly involving youth in household duties enhances their social, cognitive, and physical development (Rende, 2021). Tepper et al. (2022) believe that, as performing chores requires people to plan, self-regulate, transition between jobs, and remember instructions, it is possible that doing chores may also have a positive impact on executive functioning. In a longitudinal cohort study White et al. (2019) found a positive correlation between doing chores at the beginning of the elementary school and later development in self-competence, prosocial behaviours, and self-efficacy. Furthermore, age-appropriate chores have been shown to improve emotions of autonomy (Weisner, 2001) and are linked to enhanced prosocial behaviours and increased life satisfaction (White et al., 2019). Helping with washing and other chores, such as cleaning up toys, provides opportunities to engage toddlers and children in modest physical activity at home while reducing the present trend toward an abundance of pure sedentary behaviour (Rende, 2021). Moreover, the frequency of chores in kindergarten is positively correlated with a child's sense of social, intellectual, and life satisfaction abilities in the third grade, independent of sex, family income, and parent education (White et al., 2019). As children get older, working with family members on domestic activities can also predict advanced social abilities, such as an increased frequency of expanding on the ideas of others and the ability to contribute successfully to collective decision-making (Rende, 2021).

Together, these studies indicate that exposing preschool children to as many opportunities for developing their independence as possible is a good idea that can benefit them in many domains of their development.

1.2   Role of the adults in supporting the development of children's independence

Having discussed how engaging preschool children in self-care activities and chores can have a positive impact on their development, it is now necessary to emphasise the important role of adults in this process. The encouragement of preschool children to develop independence is a responsibility shared by all adults who interact with them. Parents and early childhood teachers play a particularly important role in the development of children's independence.

Early childhood teachers are essential in developing and enforcing routines of self-care activities and chores in group settings. As a result, it is not surprising that the time children spend in kindergarten has an impact on their motor and self-care abilities (Sezici & Akkaya, 2020). However, there seems to be a difficulty with how teachers in formal early childhood education find a balance between the child's independence and need for direction (Lindahl & Folkesson, 2012).

Although formal preschool education is crucial for developing motor skills and new behaviours, skills that contribute to child's independence can be further enhanced at home with individualized care and attention (Sezici & Akkaya, 2020). For instance, eating habits can also emerge via a child's interactions with their environment, some of which involve their parents or caregivers (Piazza et al., 2003). Research shows that children who eat with their families spend more time using forks and spoons appropriately and progress more quickly in learning how to take care of themselves (Oğuz & Derin, 2013). Moreover, when caregivers interact with toddlers in settings other than play, such as dressing, their language exchanges differed in terms of speech rate and lexical variety (Ageborg et al., 2005; Hoff, 2008). One of the variables that influences a child's independence is also the parenting style used by the parents (Margaretha et al., 2018). Research suggests that self-care skills might be learnt from an early age with the development of fundamental abilities including motor and linguistic skills and can be strongly impacted by caregivers' judgments of an infant's early self-care ability (Casper & Smith, 2004). Routines involving dressing, eating, and changing diapers account for 14% of the observed combined attention between parents and children. Joint attention has a socio-cultural function in providing children with pleasant reciprocal connections and shared meaning experiences with adults in addition to supporting the development of communication (Smith, 1999). These studies clearly indicate that parental everyday practices represent a contributory environmental factor in the development of child's independence.

The level of young children's self-care skills varies worldwide (Zhu et al., 2021), which may indicate that environmental factors can have a strong impact on the development of self-care skills. Because skills that are the foundation for future learning and academic success are developed in early life, sustained economic disadvantage during this time can have long-term impacts on subsequent school performance and later status attainment (Wagmiller Jr et al., 2006). The early

cognitive and behavioural development of children was discovered to have a curvilinear relationship with socioeconomic resources (Mollborn et al., 2014). Individual socioeconomic status, rather than national socioeconomic status, predicts how important parents find their children's independence (Park & Lau, 2016). Taken together, the socioeconomic status of the family can have a substantial impact on the amount of the support children have been given on their path towards independence.

1.3   Research problem

In present times, parents and teachers are expected to contribute as much as possible to the development of adaptable, resourceful, and competent individuals. Their contributions are especially vital because of the rapid pace at which modern civilization is undergoing transformations in every aspect of daily life. These changes and aspirations are altering the landscape and nature of the future of early childhood education. Independence represents an important piece in the mosaic of skills we advocate for when discussing learning and teaching for the future. This study aims to contribute to the establishment of high-quality early childhood education in which children's development in all areas, including independence, is enriched and supported.

The main goal of this study was to determine how parents assess their children's independence. If we can get a sense of how (in)dependent children are in various domains, we can learn more about how to assist them develop those skills.

Since the development of self-care skills is crucial not only for later academic achievement (Feder & Majnemer, 2007; Grissmer et al., 2010), but also for their quality of life and social acceptance (Sezici & Akkaya, 2020), we were curious to learn how parents evaluated their children's independence in using the toilet, dressing, cleaning, and brushing their teeth. These findings are significant because they give us insight into the current state of self-care skills development in preschool children.

Because using the toilet, dressing, cleaning, and brushing the teeth are diverse skills that require various levels of motor skill development, we wanted to determine whether there were any differences in parental assessment of children's

independence between the self-care skills indicated above. We believe this is important because, based on these findings, we will be able to inform both parents and teachers on which aspects of children's self-care skills development require the most attention.

In reviewing the literature, we established that involving preschool children in chores can benefit them in many domains of their development. One of the aims of the present study was also to find out how parents rated their children's independence in housekeeping, meal preparation, grocery shopping, and pet care. We wanted to examine if parental evaluations of their children's independence differed based on the type of chore. Possible disparities in the development of independence in specific chores will shed light on which chores children require additional assistance.

Given the fact that prior research suggests that a wide range of environmental factors may influence the level of the independence in preschool children, one of the primary objectives of our study was to identify which those factors are.

2 Research methodology

2.1 Sample

The survey was conducted on a convenience sample of parents, targeting only parents of children aged 4 to 6 who are enrolled in kindergarten. 101 parents participated in the research. A more detailed description of the sample is shown in Table 1.

Table 1: Sociodemographic structure of the sample of parents

Variable	Categories	N	%
Parents' gender	Male	2	2,0
	Female	99	98.0
Parents' age	M = 34.47, SD = 5.438		
Childs' gender	Boy	43	42.6
	Girl	58	57.4
Childs' age	4 years	33	32.7
	5 years	58	57.4
	6 years	10	9.9
Children with special needs	Yes	2	2.0
	No	99	98.0
	Total	101	100,0

2.2   Data collection and analysis

To obtain data, we created an online questionnaire. The link to the questionnaire was shared with parents through kindergartens. We were collecting data for three months, from June to August 2022. During this period, we were repeatedly inviting parents to participate in the research.

The data were processed and analysed using the SPSS software. Both, descriptive and inferential statistics were used to process data. Before further processing, the Shapiro-Wilk test was used, which showed that the variables deviate from the normal distribution, as a statistically significant difference $p < .05$ was shown everywhere. Consequently, we used non-parametric tests, such as Friedman, and Kruskal-Wallis H test.

2.3   Measuring instrument

For the purposes of the research, we adapted the Children Participation Questionnaire by Rosenberg et al. (2010). Two sets of items from the questionnaire were relevant for us, namely activities of daily living, which in our research are understood as self-care activities, and instrumental activities of daily living, which we understand as doing chores. Parents gave their answers on a scale from 1 to 6, where 1 meant "needs much assistance" and 6 "independent" – the answers related to their child's independence in self-care activities and doing chores.

3   Results

Parents rated children as most independent when it came to using cutlery when eating, followed by dressing, and using the toilet. Children were rated as less independent when bathing and least independent when brushing their teeth. We find that parents assess their children as considerably independent when it comes to self-care activities.

A Friedman test was run to determine if there were differences in parents' assessment of children's independence in different areas of self-care. Table 2 presents the results of the Friedman test.
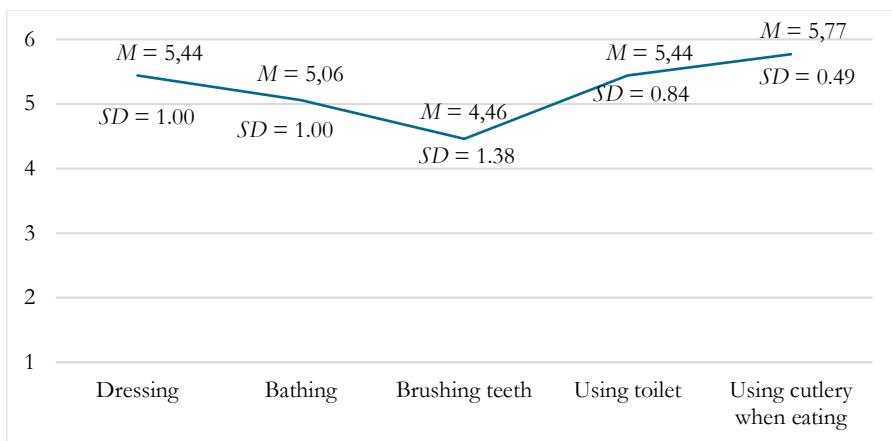
Figure 1: Parents' assessment of child's independence, expressed as the mean, in self-care activities

Table 2: Friedman test

Variable	Mean Rank	χ^2	df	p
Dressing	3.37	129.24	4	< .001
Bathing	2.61			
Brushing teeth	2.00			
Using toilet	3.27			
Using cutlery when eating	3.75			

The results of the Friedman test were statistically significant based on an alpha value of .05, $\chi^2(4) = 129.24$, $p < .001$, indicating statistically significant differences between the mean ranks of the following variables: dressing, bathing, brushing teeth, using the toilet, and using cutlery when eating. Pairwise comparisons with adjusted p-values showed that there were significant differences between parents' assessment of children's independence when brushing teeth compared to using the toilet, $p < .001$, when brushing teeth compared to dressing, $p < .001$, and when brushing teeth compared to using cutlery when eating, $p < .001$. For each comparison, children were less independent when brushing their teeth. There were also significant differences between parents' assessment of children's independence when bathing compared to using toilets, $p = .033$, when bathing compared to dressing, $p = .007$, and when bathing compared to using cutlery when eating, $p < .001$. In this case, for each comparison, children were identified as less independent when bathing.
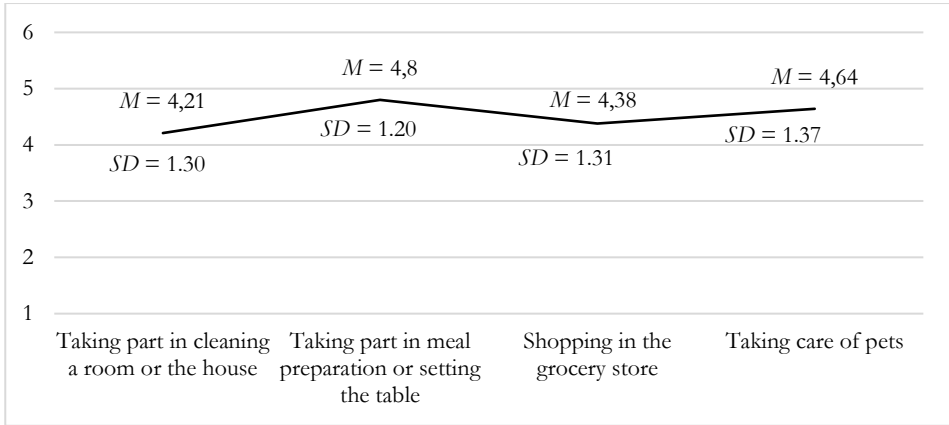
Figure 1: Parents' assessment of child's independence, expressed as the mean, in doing chores

Parents reported that children are most independent when it comes to taking part in meal preparation or setting the table, and when taking care of pets. Children are less independent when shopping at the grocery store and when taking part in cleaning a room or the house.

We were interested to find out if there were differences in parents' assessment of children's independence in different areas of doing chores mentioned above. The same procedure as for the self-care variables was applied. The results of the Friedman test were not significant based on an alpha value of .05, $\chi^2(3) = 6.73$, $p = .081$.

A Kruskal-Wallis H test was conducted to evaluate whether there were differences for children aged four, five, and six years in parents' assessment of their independence in all the self-care and doing chores variables mentioned above. Table 3 reports the variables for which Kruskal-Wallis H test showed statistically significant differences.

Table 3: Kruskal-Wallis H test

Variable	Age	Mean Rank	χ^2	df	p
Dressing	4 years	40.64	11.52	2	.003
	5 years	54.05			
	6 years	67.50			
Bathing	4 years	41.38	11.72	2	.003
	5 years	52.34			
	6 years	74.95			
Brushing teeth	4 years	38.26	10.61	2	.005
	5 years	55.91			
	6 years	64.60			

The results of the Kruskal-Wallis H test were statistically significant based on an alpha value of .05, $\chi^2(2) = 11.52$, $p = .003$, indicating that the mean rank of the parent's assessment of the child's independence in dressing was significantly different according to the age of the children. Pairwise comparisons with adjusted p-values showed that there were significant differences between parents' assessment of children's independence in dressing for 4-year-olds compared with 5-year-olds children, $p = .034$, and for 4-year-olds compared with 6-year-olds children, $p = .007$). When it comes to dressing, parents perceived older children as more competent for both comparisons.

Statistically significant results were also found for the variable bathing, $\chi^2(2) = 11.72$, $p = .003$. Pairwise comparisons showed that there were significant differences between parents' assessment of children's independence in bathing for 4-year-olds compared with 6-year-old children, $p = .002$, and 5-year-olds compared with 6-year-old children, $p = .05$. In both comparisons, older children were assessed as more independent.

The Kruskal-Wallis H test also showed statistically significant differences in the parent's assessment of the child's independence in brushing teeth, depending on the age of the child, $\chi^2(2) = 10.61$, $p = .005$. Pairwise comparisons showed that there were significant differences between parents' assessment of children's independence in brushing teeth for 4-year-olds compared with 5-year-old children, $p = .013$, and for 4-year-olds compared with 6-year-old children, $p = .031$. In these comparisons, parents also rated older children as more independent when brushing their teeth.

We should mention that we also used the gender of the children as an independent variable. However, parents' assessments of their child's independence in self-care and doing chores activities did not differ statistically significantly by gender, so we omit them from the detailed analysis.

4   Discussion

Our study, which evaluated parents' assessments of their children's level of independence, aimed to enhance empirical understanding about how self-reliant preschool children are and how adults may best promote their development of independence in various domains.

The current study found, that overall, parents' ratings of their children's independence were quite high, as seen by high mean scores across all measurements used. When evaluating the independence of children in different self-care activities, we discovered that, as anticipated, children are more independent in certain activities than in others. Compared to using the toilet, dressing, and using cutlery when eating, parents consider their children to be less independent when it comes to brushing their teeth and bathing. Furthermore, parents reported that, compared to bathing, their children encounter even more difficulties in brushing their teeth. These findings are consistent with the findings of other studies (Meland et al., 2016; Sezici & Akkaya, 2020) that suggest that pre-schoolers' levels of independence varies among specific activities. One possible explanation for this is that various self-care activities and chores demand different levels of motor development. On the other hand, parents have reported no difference in their children's levels of independence between the various types of chores. One possible explanation for this might be that parents appear to place more attention on teaching children self-care skills in the early years because they of their relatedness to developmental milestones and social expectations. Nevertheless, given these results, it's clear that additional investigation of this topic is required.

Interestingly, compared to the high values on the scales of parents' assessments of their children's independence in self-care activities, parents' ratings of their children's independence in doing chores were somewhat lower. Further research should be undertaken to investigate the explanation of this occurrence.

Since previous studies have suggested that numerous environmental factors may affect pre-schoolers' levels of independence, one of the main goals of our study was to examine the differences in the level of independence in self-care activities and in doing chores between groups of children with different characteristics. We found that there are significant differences in parents' assessment of their independence in dressing, bathing, and brushing the teeth between different age groups of children. As anticipated, parents perceive older children as more competent when it comes to some of the self-care activities (dressing, bathing, and brushing teeth). However, the observed difference in using the toilet and using the cutlery when eating between different aged children in this study was not significant. Furthermore, these differences were not found in any of the chores' subcategories. One possible explanation for these findings is that the majority of children in the age range that we included in our sample are already competent in the aforementioned self-care activities and chores.

Contrary to expectations, this study did not find significant difference between boys and girls in parents' assessments of their independence in self-care and doing chores. These results differ from previous studies which have suggested that girls tend to be more independent in self-care and doing chores (Meland et al. 2016), which might be connected to socialization into traditional gender patterns or biological differences between the genders (Schum et al., 2001). A possible explanation for these results may be that the gender disparities in 4- to 6-year-old preschool children are no longer as prominent as in younger children. However, with a small sample size, caution must be applied, as the findings might be biased.

5   Conclusion

The current study set out to examine parental perceptions of their children's level of independence between the ages of 4 and 6. The findings of this study suggest that, while parents generally rate their children as highly independent in self-care activities and doing chores, children are more independent in some activities than in others.

The current study, however, has certain limitations. One source of weakness, which could have affected results, is sampling (unrepresentative sample). This limits the study's ability to draw broader conclusions about pre-school children in general. Furthermore, the study's findings require consideration in the cultural and

environmental contexts in which young children reside. Another potential source of bias are parents' subjective evaluations of their children's independence. Therefore, more precise criteria for assessing children's independence should be incorporated into future studies on parental assessments to ensure objectivity.

Despite its limitations, the research presented here fills a significant gap in the literature since it is one of the few studies focusing on the independence of preschool children. The importance of our research is further underlined by the realization that independence is essential for children's continuous development in all aspects of their lives. Due to this substantial impact on children's future development and achievement in a variety of spheres of endeavour, we believe this topic should be examined in greater depth.

Our study has thrown up many questions in need of further investigation. More research is needed to determine the role that potential factors (such as socioeconomic status, parental education level, and parental style) have in determining pre-schoolers' level of independence. We suggest further research on how independence might be affected by the duration of the child's enrolment in kindergarten to determine the role of formal early childhood education in developing independence. Continued efforts are needed to raise awareness among parents and early childhood teachers about the importance of supporting independence skills. It is vital to provide concrete guidelines to parents on how they may contribute to the development of independence skills through simple routine activities. There must be constant work put in raising the understanding among the teachers that encouraging children's independence is equally important to their overall development and wellbeing as is academic achievement.

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TEACHING FOR THE FUTURE IN EARLY CHILDHOOD EDUCATION

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Abstract The monograph focuses on the teaching and learning of children in early childhood education. The international monograph includes contributions by authors from three countries, highlighting different perspectives on contemporary teaching and learning specific to ECE. The monograph is based on the collaboration of researchers from different universities in the Erasmus+ Algolittle project, who have explored important contemporary concepts of teaching in ECE, such as how to develop algorithmic thinking in preschool children, how to teach algorithmic thinking to ECE students, and the relevance of such cognitive skills for future knowledge. The monograph goes beyond the scope of the project by incorporating new scientific findings related to the implementation of various concepts in learning and teaching preschool children, such as executive functions, algorithmic thinking, creativity, problem-based thinking, integration of teaching from different domains, distance learning, specific pedagogical practices, thus presenting a wide range of topics relevant for the development of learning and teaching in early childhood education now and in the future.

Keywords:
early childhood education, teaching, learning, algorithmic thinking, cognition

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