



REPRESENTATION OF MOVEMENT-BASED INTEGRATED LEARNING IN DIFFERENT PHYSICAL ENVIRONMENTS OF AN EARLY EDUCATION INSTITUTION

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Abstract/Izvleček The aim of this paper is to determine the differences in the representation of children's integrated learning in an institutional context between standard children's integrated learning and movement-based integrated learning. The research encompasses two early-aged children's groups attending city kindergartens. The content analysis method was used; activities were photographed and filmed with video cameras. Movement-based integrated learning has a significant influence on the quality of the educational process.

Predstavitev na gibanju temelječega integriranega učenja v različnih fizičnih okoljih predšolskih institucij Namen prispevka je ugotoviti razlike v predstavljanju integriranega učenja otrok v institucionalnem okolju med standardnim integriranim učenjem otrok in na gibanju temelječem integriranem učenju. Raziskava vključuje dve skupini mlajših otrok, ki obiskujejo mestna vrtca. Uporabljena je bila metoda analize vsebine; dejavnosti so bile fotografirane in posnete z videokamerami. Na gibanju temelječe integrirano učenje ima pomemben vpliv na kakovost vzgojnega procesa.

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Introduction

In accordance with the new early and preschool education paradigm (Rinaldi, 2006; Pavlović Breneselović, 2015; Johansson & White, 2011; Maleš, 2011; Miljak, 2015, etc.), and the consequently changed image of children and childhood in the scientific-research discourse (Clark 2013; Corsaro, 2005; Mayall, 2010, etc.), a turn has happened in the study of individual children and their needs towards a recognition of the importance of the structure of interaction among children, adults and the physical environment. For these reasons, the central issue of early education quality, discussed by many authors, including Dahlberg, G., Moss, P., & Pence, A. (2007), is not the level of children's achievements, but the quality of the experience in which children are engaged. Moreover, research in the area of early and preschool education (Dahlberg, g., Moss, P., 2006), regarding such a holistic, wide, social, cultural and ethical view of early education institutions, indicates the necessity of perceiving children holistically, in terms of interaction, complexly and dynamically, as live, pulsing human units, a perspective which is indisputably influenced by taking into account Bronfenbrenner's ecological model of child development (Hayes, O' Toole and Halpenny, 2017). He indicated the intrinsic feature that defines the ecological approach to human development: a focus on dynamic relations between the organism and its environment, where both the person and the environment are found in conjunction and activity, meaning that one should deal with "the process in a context" (Hayes, O' Toole and Halpenny, 2017), i.e. the changes in the micro- and macro-systems surrounding children and people in their close environment. This constitutes a changed viewpoint on the importance of the sociocultural context in development and education, based on the interpretive approach to observing and understanding children's behaviour, for which it is necessary to make long-lasting, careful observation, description and interpretation in various situations and times, and in various specific social and cultural conditions (Edwards et al., 1998; Dahlberg et al., 2007; Bruner, 2000; Giudicci & Rinaldi, 2002; Miljak, 2007). In such a theoretical framework, children's learning is woven into the whole context of everyday life in kindergarten and is a result of their activity (doing) and collaboration with others. The quality of children's learning can be achieved only by considering the wholeness of the conditions in which they live every day; therefore, learning is not divided according to content areas or fields. It is thus inappropriate to give early-aged children's learning a time limit or limited activities (content) planned by the

preschool teacher. In Reggio pedagogy, teaching is determined as the creation of learning conditions, while learning is defined as the study of the environment where the child lives, and with regard to this, planning of learning is defined in terms of preparation and organisation of the space, materials, situations and learning opportunities (never in terms of the content and information that need to be acquired by the children) (Vujičić, 2010). Integrated learning is based on the creation of possibilities for children to explore their assumptions and satisfy their curiosity by interacting with the physical and social environment, collaborating with peers and adults who can expand their learning. That is why integrated learning is directed toward “perceiving the whole picture” in learning, not to “the acquisition of fragmented knowledge (Mac Naughton, 2003). Integrated learning supposes the interpenetration of playing and learning, while every situation is respected as a learning situation. It always enables playing, observation, experimenting, research and trying out, while including actions, excursions, life-practical activities, numerous ways of expressing ideas and assumptions (movement, sound, drawing, modelling, speech, etc.), as well as multiple learning sources (sensory experience, books, picture books, everyday-use items, artistic products, other people, and information and communication technology).

Early childhood is the period in which movement (physical activity) represents happiness and a challenge to children, and in which they soon acquire new and different motor actions, which they store as motor skills records (Petrić, Kostadin, Peić, 2018). The rapid acquisition of new and various content and forms enables their nervous systems to become susceptible to sole learning (Alić et al., 2016). Integrated programmes of physical exercise in educational institutions have proven to be very successful for increasing in the level of children’s physical activity (Domika, Armano, Petrić, 2018). If children move insufficiently, their natural instinct for movement decreases, which in time leads to consequences for their overall motor skills, and is difficult to compensate in adulthood (Pihač, 2011). The acquisition of motor skills gives children the possibility to adapt and develop, as well as to behave actively in the world surrounding them. One of the aims of education is to achieve balanced development of a child by connecting emotions, motor activities and thinking processes, while a lack of experience and of opportunities to participate in motor activity can slow down both the motor and intellectual development of a child (Sindik & Šerbinek Kotur, 2014). When the interaction of brain and body is carefully considered, it becomes clear how important movement

is for learning and the manifestation of life itself: movement awakens and activates many mental abilities, connects and establishes new information and experience in the neural network, and is important for all actions by which knowledge and understanding are represented and expressed (Hannaford, 2007). Physical activity is linked to effects on knowledge, such as improved brain activity and improved brain development (for instance, better neural connections and improved blood circulation and oxygenation), cognitive functioning (for instance, cognitive attention, control and memory), and children's academic success (Mavilidi et al., 2017). To develop the potential for all these benefits to be achieved, the physical experience of learning science through whole body movement should start in early and preschool education, recognised as the place of holistic development (motor, social, emotional, and cognitive) and holistic learning (Mavilidi et al., 2017). Each movement is a sensorimotor occurrence linked to the intimate understanding of the physical world, a world from which each new act of learning is derived (Hannaford, 2007).

If the integrated learning approach based on movement proves successful, the basis for a new teaching theory will be established, one that could make an extremely significant contribution to the child's holistic development. Therefore, the aim of this paper is to determine the differences between children's standard integrated learning and movement-based integrated learning.

Methods

Sample of participants

The research comprised two mixed nursery groups of children from kindergartens in the City of Rijeka. The experimental group had 18 children attending the full-day programme of Kindergarten A. The control group consisted of 16 children from Kindergarten B (Table 1). Both kindergartens have been newly built; they are architecturally modern, with large, spacious indoor and outdoor surfaces. The preschool teacher for the experimental group has a university degree and the status of mentor, with 11 years of work experience in early and preschool education and is continually participating in professional learning and development programmes.

The control group preschool teacher has also completed university education, has eight years of work experience in early and preschool education and participates in professional learning and development programmes. Both preschool teachers are members of learning communities in their working teams. It can be concluded that they have the competences for organising the educational process based on early-aged children’s integrated learning.

Table 1: Description of participants.

Groups	Girls	Boys	Total	Ages
Experimental	8	10	18	3.4
Control	8	7	16	3.2

Sample of variables

In the first step, the content analysis method was used to obtain better insight into the comprehension of activities organised on the premises of Kindergarten A and Kindergarten B: the children’s living room, hall, gym and outdoor (external) physical environment. Next, in the second step, the same activities were analysed according to the following constituents (adapted from Petrović-Sočo, 2009), which are considered important for understanding the contemporary approach to educational work in an early and preschool education institution:

- physical environment organisation – in activity centres, the tables and chairs form part of the activity centres, possibility of children’s choice, satisfying the need for (self)learning, open spaces, different spaces (re)assigned for children’s activities, availability of various stimuli: children organise, adapt and change the space according to their own needs and interests
- preschool teacher and application of educational strategies – creating the conditions for children’s (self)learning, observation, listening and documenting the children’s learning process, study of the ways children learn, democratic relationship with children, encouraging cooperative/common learning by doing research, questioning, discovering and experimenting
- image of the child – understanding children as social beings open to learning; the child is an individual and rich in potential – they create their knowledge alone or in cooperation with others, level of trust in the child

- atmosphere in the educational group – putting children in the position of knowledge creators, the level of children’s engagement in activities, (pro)activity, self-initiative and self-organisation, children assuming responsibility; passing from one to another activity – free, flexible and individual; preschool teacher and children’s dialogue – their communication, participation of preschool teachers in children’s activities.

The measurement protocol and research description

The study forms part of the project “Establishment of the system for monitoring children’s physical activity by modern technology in early and preschool institutions” financed by the University of Rijeka, reference number uniri-drustv-18-268. Preschool teachers participated in all phases, especially in the creation and shaping of the integrated curriculum, which encompasses all areas of children’s development into one unit and organisation of the educational process in which children freely choose their activities according to interests, needs and opportunities, and explore and learn in a way that is meaningful and purposeful. The children’s parents were informed about the project and gave written consent for their children’s participation. The study was conducted in June 2019. Each of the educational groups had to be visited four times. We offer our thanks to Kindergarten A and Kindergarten B, as well as to the experimental group preschool teacher and the control group preschool teacher who readily and openly agreed to participate in this research. The control group preschool teacher conducts the integrated approach in planning the educational work with early-aged children, where the children’s learning represents an integrated process that is not to be divided by content or area, but starts from authentic children’s activities where both individually and in cooperation with other children, they explore, learn by doing and actively build their knowledge in line with the National Curriculum for Early Childhood and Preschool Education of the Republic of Croatia (2015). The experimental group continually conducts the integrated approach in planning the educational work in line with the fundamental principles of the official national document issued in 2015 but emphasizing movement. Motor activity is highly represented in all the children’s activities (art, research, music, mime, drama and scene playing, desk-manipulative, pre-reading and pre-mathematics etc.). Stimuli that include movement are ensured in each activity centre because these motivate children to perform motor tasks that enable them to play, learn and explore through movement.

The preschool teacher prepares stimuli which enable movement, while simultaneously encouraging the construction and co-construction of knowledge and the development of skills.

Data processing

The observation and content analysis methods were used. The activities of integrated learning and movement-based integrated learning were photographed and filmed with a video camera. To make the research as objective as possible, a “critical friend” took part in the analysis and discussion of the video footage. The activities conducted in the living room, gym, hall and outdoor space of the kindergartens were separately observed during the direct educational work and by a subsequent check-up of the footage and photographs, which functioned as pedagogic documentation and data collection. Documentation made it possible for the preschool teachers to gain deeper insight into and understanding of their personal practice, to understand the type of “image of the child” they have and the type of implicit pedagogy they implement in their work, while achieving a better understanding of children and their potential, along with an insight into the children’s self-concept..

Results

According to the constituents described in the methods by the analysis of video footage and the attached photographs, what follows is the description of the results for the experimental and control groups. The control group living room is organised around activity centres where children can to choose an activity and can freely move around the room, choosing what they want to engage with. Tables and chairs are part of the activity centres. The preschool teacher gathers the children around – and following the children’s suggestion, organises the activity of riddle solving, during which the children are sitting at or standing around the table. On the preschool teacher’s initiative, they organise a forest animal race in one part of the room. Children participate in preparing the activity, while the preschool teacher gives instructions. The preschool teacher calls those children who are to participate in the activity, while other children stand still and wait. He reacts to children’s individual needs: a boy makes plasticine letters and shows them to the preschool teacher, who asks him to name the letters and encourages him to say words that start with this

letter. The children have at their disposal didactic aids, craft materials and toys, finished materials to play with and toys of various kinds. The atmosphere in the group is pleasant and quiet. The children are mostly gathered around the preschool teacher, who continually talks to them, asks questions, gives answers to children's questions and invites children to participate in ongoing activities (Photograph 1). These children are invited by the preschool teacher, who initiates some activities, and when the activities are initiated by the children, he participates and takes the role of leader.



Photograph 1: The control group – activities in the living room

The experimental group living room is also organised according to activity centres which are marked, while the space between activity centres is filled with stimuli inviting children to try various forms of movement (ramps, tunnels, paths, obstacles, etc.). Through the spatial organisation of the living room and the stimuli offered to children, the preschool teacher shows a high level of trust in children's abilities; he stimulates children to try various types of movements (jumping, crawling through, climbing, mastering resistance, manipulation of objects, etc.), encouraging each child to use his/her individual strategy with the materials (Photograph 2). The preschool teacher prepares aids by which he encourages research and problem solving (sticking different balls on a paper according to the colour of the elevated part), and integrates distinct developmental areas (aiming at a target with plastic balls from marked fields and noting down the result). Most of the materials are unstructured and multiform and can be used in different ways. Music of different rhythms is used to stimulate various types of movement by the children around the room. The atmosphere in the

group is one of “creative chaos”; the children are active and engaged at all times. They choose what they want to do and how they will use the offered stimuli. The preschool teacher is more in the background, observing the children, listening to them and participating if necessary.



Photograph 2: The experimental group – activities in the living room

The hall of the control group is intended for children’s games and includes apparatus and pole climbers. Children explore the climbers and play houses, they ride the plastic and sponge balance bikes, drive cars and push shopping trolleys. The stimuli offered to children include a chest, tins to hit, pins and a ball. Children occasionally run across the empty parts of the hall (Photograph 3). The preschool teacher observes what the children are doing, talks to them and explains to children how they can use the chest and the tins to hit. Children need the preschool teacher’s care and attention, and they call him to show him how they can aim, at which point the preschool teacher praises them. The atmosphere is peaceful and quiet; the children’s soft murmur can be heard.



Photograph 3: The control group – activities in the hall

The experimental group hall is rich in various stimuli: empty and full sandpits and materials to play with sand (buckets, shovels, funnels, tubes, etc.) distributed throughout the hall for the children to move as much as possible; chests and car tyres for walking and jumping; benches intertwined with elastic string where balloons are hung; pools with small and large balls; a basket without a hole hanging from the ceiling, mats, a wooden bridge, chairs and hoops (Photograph 4). The preschool teacher strategically arranges the aids and materials the length of the hall. He sets challenges for the children, who then seek solutions; for example, an empty sandpit, or a basket without a hole at the bottom. Children transfer sand from one sandpit to the other using a range of containers and negotiate obstacles found within the space. They drag benches under the basket, climb on these and, using their arms, empty the balls from the basket through the upper opening. The preschool teacher observes the children and does not give them instructions for the use of the stimuli but monitors how children use them. During the hall activities, children show great interest in playing with the sand and balls. In playing with sand, they are directed more toward individual learning, while in playing with the balls, they revealed “traps” together, tried how they would find the solution and made agreements about the realisation.



Photograph 4: The experimental group – activities in the hall

The control group enters an empty gym. The preschool teacher makes soap bubbles, which children catch around the room. Some children drive cars and jump on

bouncing balls. The preschool teacher shows the general preparatory exercises with the story of a bear (“The bear says...”), while the children stand around and follow the given exercises (Photograph 5). The preschool teacher suggests an obstacle course, carries in the props together with the children and prepares the exercises. He asks children to help him in preparing the course layout; children scream, wanting to help and running toward the preschool teacher, who then gives instructions about what to take and where to put the props. The preschool teacher invites children to stand in a queue and asks one child to demonstrate the exercises. A girl notices a shadow on the wall and shows it to the preschool teacher, who then supports the girl’s initiative and continues playing with the shadows, inviting all other children to join in. The preschool teacher starts the circle game Ringa Roses by gathering the children and inviting them to take part. He calls each child to take part, while before that children stand still and wait for the game to begin.



Photograph 5: The control group – activities in the gym

The gym for the experimental group is organised into motor centres that enable children to master space, obstacles, resistance and manipulation of objects (Neljak, 2009). Children choose the order in which they will use the objects and how. There is no waiting or standing in a queue; the children’s activities occur continually and according to children’s needs and interests (Photograph 6). Children adapt certain tasks according to their own discretion and change the appearance and function of the exercise location. The preschool teacher does not lead any activity. He is present in the gym and supports children in mastering more demanding tasks (he stays in their vicinity, offers a hand to children only if they ask him and fixes the elements). He monitors how a certain child masters an apparatus and changes the exercise

(making it more difficult or easier) depending of the children's abilities. The preschool teacher's high level of trust in the children's abilities can be seen, and those abilities, along with safe conditions, form challenging situations for the child. The children are extremely active during activities in the gym; they are constantly on the move, thus acquiring motor knowledge in many ways. In this dynamic and stimulating environment, one can hear them screaming and laughing while they communicate and interact with each other.



Photograph 6: The experimental group – activities in the gym

The yard for the control group is spacious, with many flat surfaces. There is different equipment for playing and exercising (Photograph 7). The stimulus offered to children for outdoor activities is a parachute, while several children play with balls. Most of the children are on the grass and gravel surfaces, where they explore, individually or in small groups, natural materials: sand, rocks, wood, sticks, etc. During the parachute activity, the preschool teacher gives instructions to the children (“...for this ball not to fall in, because then Tihana (the other preschool teacher, researchers’ remark) and I are the winners. Ok? So, I will throw it here in the middle, and you have to raise it and bring it down like that so that the ball does not fall in in the hole.”), and demonstrates. Both preschool teachers suggest that the children raise and lower the parachute quickly and strongly. Children who do not participate in the activity stand aside and observe and/or clap their hands. The preschool teacher invites them to participate, too. During the parachute game, the children are happy; they laugh and scream.



Photograph 7: The control group – outdoor activities

The yard of the experimental group is smaller and less equipped with exercise equipment and pole climbers than the yard of the control group. The only equipment is a small slide with a small house, a plastic tunnel-train and bicycles. The photographs of activities conducted in the yard show that the preschool teacher uses natural materials (sand and water), and various unstructured material to make the outdoor space more stimulating and attractive to children. Among the materials used, there are containers of different heights and depths, pools, sprinklers, plastic bottles and glasses, buckets, etc. (Photograph 8). There are also chairs and an elastic band, bicycles and a tunnel for climbing and crawling through – which did not attract any of the children. All of them participate in the water and sand activities. Assuming different positions, children explore the characteristics of water and sand: crouching, kneeling, lying down, standing on their toes to reach higher parts of the construction to test the flow; they run or walk fast in search of what they need (the preschool teacher arranged the material strategically for the children to move as much as possible, looking for and finding what they need). They carry the sand and water to different places, sprinkle and pour; they explore how the constructions work for the exploration of flow. What could be observed was constant communication and interaction among the children; they make agreements on who was going to do what (“First Jakov, then Lara, then me. Now, Jakov, I am going to fill it in (the sprinkler, researchers’ remark). Now me. Now Lara. Jakov gives it to me, I give it to Lara.”), or they find solutions (Mara: “You made me wet!”, Filip: “No, it will dry!”), and they often make declarations such as, “It’s so funny!”. The preschool teacher observes the children, documents (takes photographs) and remains alert to see if his inclusion is needed. He takes part in activities when children ask him to, usually to show him what they have observed, for instance, water sprinkling from a punctured bottle, or an empty plastic bottle floating on the water surface.



Photograph 8: The experimental group – outdoor activities

The results obtained from analysis of the video footage and photographs of the activities in the living room, hall, gym and outdoor space of the control and experimental groups show that there are significant differences in the spatial organisation and the spatial-material environment, the way the material and equipment for children's games and learning is used, the way preschool teachers apply educational strategies arising from their implicit pedagogy and their image of the child and children's activities, their (pro)activity, engagement and learning strategies, which to a great extent defined the atmosphere of each educational group.

Discussion

Results have shown that there is a significant difference between the educational group conducting children's integrated learning (the control group) and the educational group where the educational work is based on integrated learning with movement (the experimental group). Although both the control and experimental groups conduct the integrated approach in planning their educational work, the experimental group conducts the approach where all children's activities are linked to movement. This form of work enables children to satisfy their need for movement, but also to enjoy the learning process, which stimulates them to further construct and co-construct knowledge. Children link a certain purpose for a space and certain occurrences and actions therein to personal experience, depending on how comfortable they feel in it and to what extent the space is stimulating for taking action. This is one of the contemporary teaching challenges that can only be met by preschool teachers who enhance their competences, especially for creativity and innovation (Lepičnik-Vodopivec et al., 2020).

The spaces where the activities took place are presented separately in the results, with the intention of showing that children's need for movement and learning cannot and should not be narrowed to spending the whole day in one room. Therefore, in well organised institutionalised conditions, children should have the advantage of a wide range of movement, while different spots in the rooms should be filled with items that attract children's attention and stimulate the development of sensorimotor skills and pro-social relationships, giving them an abundance of new information (Petrović-Sočo, 2007). In the discussion, the spaces will also not be separated (the living room, hall, gym and outdoor spaces) because the results show that, according to the evaluation constituents, the same information is recorded in all the spaces. In the experimental group, the space is organised so that the activities taking place have high educational potential, where the richness and variety of the material awake the children's interest and initiate meaningful, purposeful processes linked to numerous opportunities for moving and learning. The spatial organisation constantly determines the children's behaviour, which can be observed in the quantity and quality of movement by children in the experimental group, and which differs from the control group where there is much less movement. Although there is much more room in the spaces used by the control group (empty parts of the space), these children move much less. On the other hand, the experimental group, along with the existing activity centres, has transitions from centres which have been designed as challenges for different types of movement. Malaguzzi (according to Petrović-Sočo, 2007) highlights that children's movement, along with independence and interaction, is one of the three basic requirements that a space must fulfil. Therefore, one of the basic questions is: how can one create a stimulating, developmentally adequate environment? There is no theory (or theories) to be learned and applied in practice, but the stimulating environment must be created jointly and built by doing and participating in the continual research of educational practice. By their educational strategies, preschool teachers give a significant contribution to the differences observed. The experimental group preschool teacher prepares aids and materials that the children choose themselves, enabling them to integrate different areas of knowledge. Going by the children's reactions and engagement, they find these activities interesting and challenging, and they are strongly motivated. Senge (2007) defines such learning as real learning, since it is connected and happens holistically (includes more than the "head" alone), and is directly connected to action, with an everyday life context, and together with other

children. Contrary to the control group preschool teacher who initiates children's activities and is the one mostly "heard and seen" on the video material, the experimental group preschool teacher creates the preconditions for children's activities, observes the children, tries to offer the best support for their development (participates indirectly). This experience leads to the conclusion that the quantity of preschool teachers' direct interventions does not imply a better relationship with the child. Miljak (2009) emphasizes that we adults teach children fragmentation from an early age, while children persistently teach us wholeness, integration of what they explore and experience; they teach us to connect with life situations, while we remain deaf and insensitive to their warnings. The same author claims that the activities parents choose for children are usually linked to certain areas; instead, they should offer them activities that integrate more areas, while such chosen activities are "deadly boring", and children try to get rid of them as fast as possible, respecting the preschool teacher's choice and decision. In his effort to protect children ("so that nothing bad happens to them"), the control group preschool teacher restrains children from free movement and research and prevents them from experiencing the world around them with their whole body. By these procedures, he sends feedback information to children about his opinion of them, his experience of them and the image of them he has: by unnecessarily helping children (for instance, to descend the pole climber), he implicitly sends the message that he considers them incapable, or by giving lots of advice ("take care, you are going to fall down like a ???," "not yet, stop, wait," "stand still," "come on, put that there" etc.), he shows that he does not trust them or he doubts their competence. The experimental group preschool teacher offers challenges to children, for instance, stimuli that invite children to climb, jump, crawl through, manipulate various objects, etc., giving them the equipment, but not ready solutions (to grab something that has been placed high on purpose, the child drags a bench or chair, alone or in cooperation with other children, and then climbs it). Such procedures allow children to take responsibility for their acts, to take care of themselves and their own safety, to share responsibility with others and learn in real-life situations. Such contemplation produces the image of a "rich child" who is competent and wants to face the world, a child whose learning is a cooperative and communicative activity, where the child creates knowledge and gives meaning to the world (Vujčić, 2017). Since children have innate curiosity and wonder, they do not need to be especially stimulated to explore the world; they already do that themselves, while preschool teachers have to show a

high level of confidence in children and their abilities, give them opportunities to do that, and under no circumstances restrain them.

The experimental group children have the full support of the preschool teacher for various types of movement, regardless of the time or spatial context; in this way, confidence in their readiness to face challenges and in their ability has been shown, which has a significant effect on the development of independence, self-consciousness, skilfulness, resoluteness and initiative. It is considered important to highlight the familiar fact, also evident in these research results, and that is the children's interest in playing with natural materials: water, sand, wood, grass, rocks, etc. The experimental group children were offered sand and water, and various tools and items of equipment to explore the natural materials in their activities. It was presupposed that the children's interest in research activities with water and sand would be high, which proved to be true; so, the materials for playing and research were offered at different locations for two reasons: to make children move and avoid unnecessary crowding at any one location. The control group children were not offered any natural material, but in their outdoor space the children found rocks, soil, a stick and grass, which they used in play and for individual (a boy who observes and explores grass) and group (boys dig a hole in the sand with rocks) research activities. The assumption was that the experimental group children would move less because of the available natural materials (sand and water) and various tools they could use to explore these materials' characteristics. However, even in such a context, the experimental group children moved twice as much as the control group children (there are quantitative indicators of this fact). It is natural for children to seek movement in all situations, and this is an integral part of integrated learning (Petrić, 2019). The experimental group children live in such a way, i.e. they live and learn by moving. The approach of the experimental group in planning and shaping the integrated curriculum includes children's integral development, while the educational process is organised so that each child, according to abilities, needs and interests, chooses activity content and, individually or in cooperation with others, learns by doing, thus actively building knowledge. A rich, polymorphic spatial-material arrangement that invites children to move and offers them a variety of challenges represents motivation for each child to perform motor tasks and learn through movement. It is more important to support the development of children's creative thinking than to strive to develop unique competences (Bašić, 2011).

Children bring their potential (resources) to their own education, and in the context of the opportunities on offer, they develop and differentiate them, which leads to the multiplicity of individual possibilities in children's ways of thinking and acting (Bašić, 2011). Children's activity does not mean to actively perform what adults expect from them, but the contrary. Children have their own theories, which need to be respected, and individual strategies of thinking; they seek solutions and learn. Knowing the individual potential of each child is the basis for further educational processes because there is no general, universal child nature, nor do all children need the same things for optimal growth. Each child's individuality should be considered, and one should be aware of the existence of differences among children, because not all children master motor knowledge at the same pace (often not even at a close pace), nor are there two identical performances (Petrić, 2019). Children in the same educational group will differ in their knowledge, abilities, interests, attitudes and other characteristics; therefore, it is important to insist on an individualised and flexible educational approach that allows the fulfilment of children's distinct needs and interests, and the recognition and affirmation of their identity, abilities and talent (Petrić, 2019).

Conclusion

The research results indicate significant differences between children attending educational groups in which integrated learning and movement-based integrated learning are conducted. Both groups, the experimental and the control, base their educational process on the integrated approach in planning the educational work, but in the experimental group, emphasis is placed children's activities linked to movement. Such an approach allows children to satisfy their need for movement, but also to enjoy the learning process, which then stimulates them to further construct and co-construct knowledge. Integrating learning with movement is a theory derived from practice. This theory reveals and creates new knowledge integrated into educational practice; by using these, new horizons and spaces to reveal and create new knowledge can be made. The approach to the common creation of theory and practice corresponds to the idea that educational theory is inseparable from practice, i.e. that "real" theory is generated from within practice (Miljak, 2007, 2009, 2015; Petrović-Sočo, 2009, 2011; Slunjski, 2012; Vujičić, 2016). Miljak (2015) advocates the construction theory, according to which the curriculum

is co-created by the joint construction of knowledge by all community members, and represents the formation and development of a new identity for all the individuals in a community and the community itself. Because spatial organisation determines children's behaviour, it was noted that the spatial equipment and richness of materials and aids for playing and learning affect the quality and quantity of children's movement, learning and exploring, irrespective of the place (equally for the living room, gym, hall or outdoor space). By their educational strategies, preschool teachers contribute significantly to the differences that were noted, and it can be concluded that the quantity of preschool teachers' direct interventions implies neither a better relationship with the child, nor better opportunities for learning. The theory derived from this research opens a new direction in the children's integrated learning approach and to the development of the educational process in early and preschool education in general. The results show a significant effect of movement-based integrated learning on the quality of the educational process; it is thus very important to direct attention to further studies of this theory.

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