

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.

Keywords:

integrated learning,
motor
development,
movement,
early and
preschool
education
institution,
teaching

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 advocates, 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

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-constructivistically 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 sensible 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

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

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.

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.

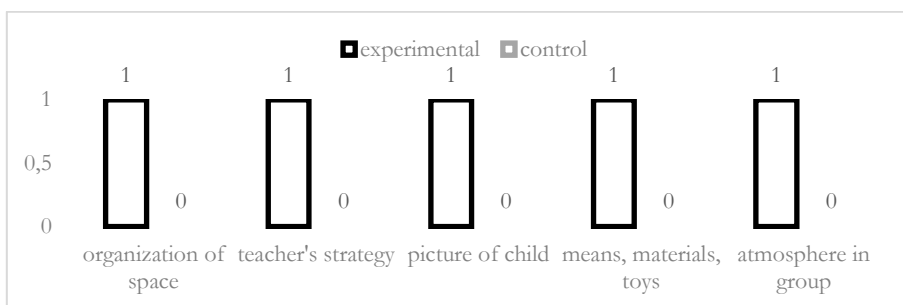


Figure 1: Presence of integrated learning starting points in kindergarten spaces.

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.

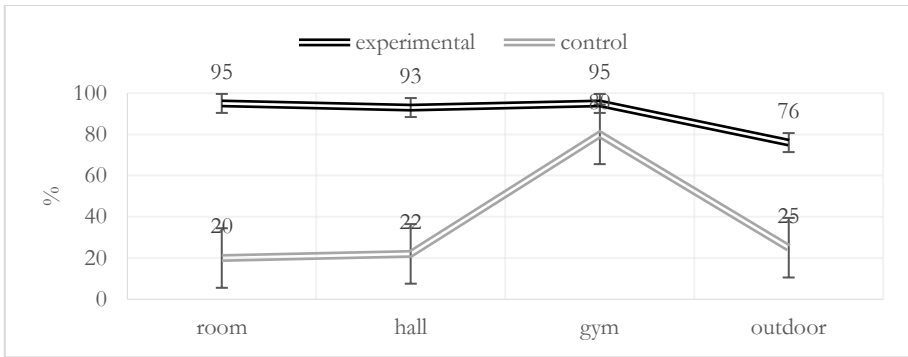


Figure 2: Presence of motor knowledge in the domain of mastering space during activities.
Source: own.

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.

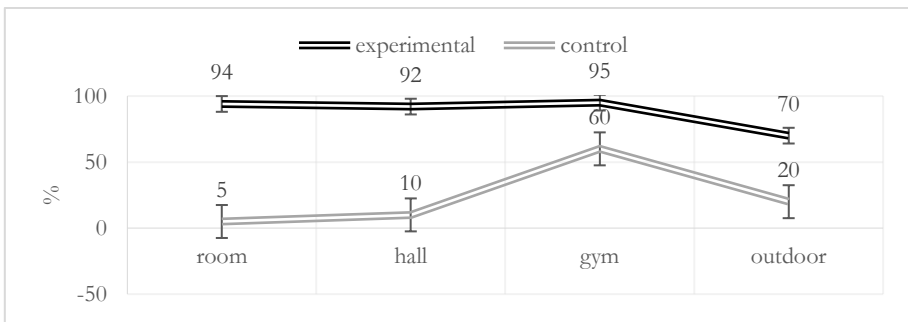


Figure 3: Presence of motor knowledge in the domain of mastering obstacles during activities.
Source: own.

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.

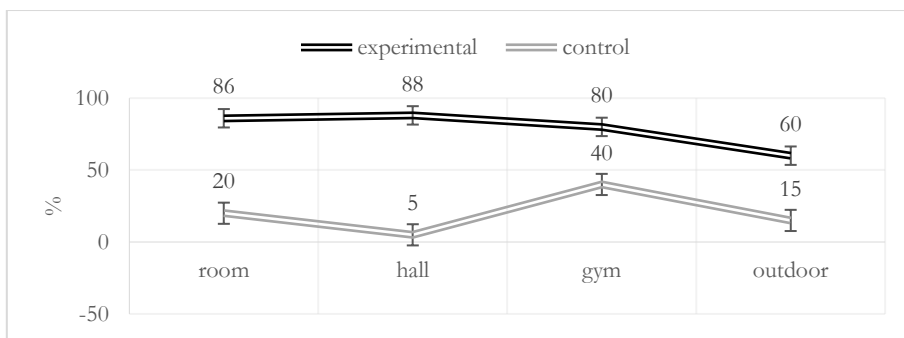


Figure 4: Presence of motor knowledge in the domain of mastering resistance during activities.

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.

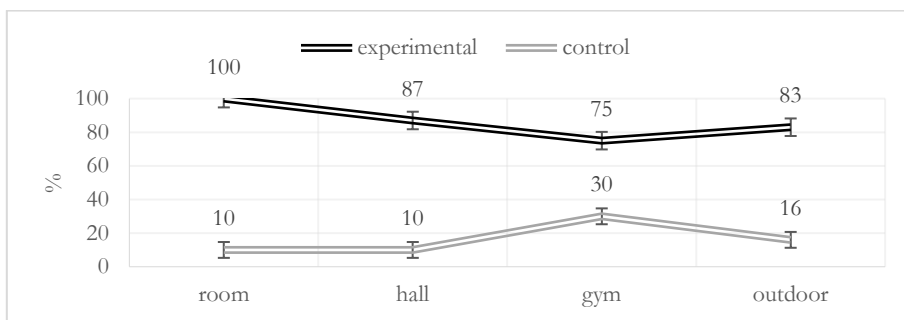


Figure 5: Presence of motor knowledge in the domain of mastering the handling of objects during activities.

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%.

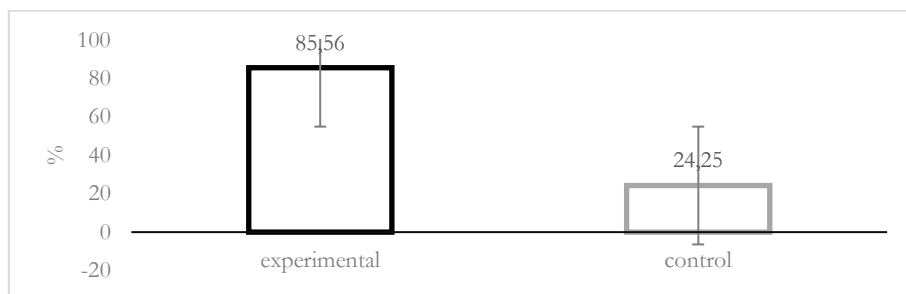


Figure 6: The overall presence of motor knowledge – the average integral motor development of children during activities.

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

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.

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.).

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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References

- Dizdarević, L., Krčmar, S., Martinić, M. (2013). *Kretanje i sport važni su za razvoj predškolske djece*, <http://www.roditelji.hr/uncategorized/kretanje-sport-vazni-su-za-razvojpredskolske-djece/>.
- Jensen, E. (2005). *Poučavanje s mozgom na umu*. Zagreb. Educa.

- Jurko, D., Čular, D., Badrić, M., Sporiš, G. (2015). *Osnove kineziologije*. Saša Krstulović, Alen Miletić (ur.). Sveučilište u Splitu, Sportska-knjiga, Gopal Zagreb.
- Lee-Cultura, S., Sharma, K. i Giannakos, M. (2022). Children's play and problem-solving in motion-based learning technologies using a multi-modal mixed methods approach. *International Journal of Child-Computer Interaction* 31. /doi.org/10.1016/j.ijcci.2021.100355.
- Campbell, C., Speldewinde, C., Howitt, C., MacDonald. (2018). *STEM Practice in the Early Years*. Australija: Deakin University, Victoria.
- Mavilidi, F. M., Okely, A., Chandler, P., Domzet, L. S. i Paas, F. (2018). Immediate and delayed effects of integrating physical activity into preschool children's learning of numeracy skills. *Danska: Journal of Experimental Child Psychology*.
- Miljak, A. (2009). *Življenje djece u vrtiću*. SM Naklada, Zagreb.
- Miljak, A. (2015). *Razvojni kurikulum ranog odgoja*. Priručnik za odgojitelje i stručni tim u vrtićima. Zagreb: Mali profesor.
- Nacionalni kurikulum ranog i predškolskog odgoja i obrazovanja (2014). Zagreb: MZOS
- Omidire, F.M., Ayob, S., Mampane, M. R. i Sefotho, M. M. (2018). Using structured movement educational activities to teach mathematics and language concepts to preschoolers. *South African Journal of Childhood Education*.
- Petrić, V. (2019). *Kineziološka metodika u ranom i predškolskom odgoju i obrazovanju*. Rijeka: Sveučilište u Rijeci, Učiteljski fakultet.
- Petrić, V. (2021). *Osnove kineziološke edukacije*. Rijeka: Sveučilište u Rijeci, Učiteljski fakultet.
- Petrić, V. (2022). *Kineziološke aktivnosti djece rane i predškolske dobi – postignuća kineziološke metodike*. Rijeka: Sveučilište u Rijeci, Učiteljski fakultet.
- Petrić, V., Vujičić, L. i Peić, M. (2020). *The correlation of different physical environments in early education institutions with the level of children's motor achievement development*. In 9th international scientific conference on kinesiology (Vol. 3, p. 419).
- Petrović-Sočo, B. (2009). *Meduovisnost kurikulumu ranoga odgoja i institucijskoga konteksta*. In Bouillet, D. i Matijević, M.(ed.). *Kurikulumi ranog odgoja i obveznog obrazovanja* (str.185-196).
- Vujičić, L., Peić, M. i Petrić, V. (2020). Representation of movement-based integrated learning in different physical environments of an early education institution. *Journal of Elementary Education*, 13(4), 453-474.
- Vujičić, L., Petrić, K. i Petrić, V. (2020). Utjecaj prostornog okruženja u predškolskim ustanovama na razinu tjelesne aktivnosti djece rane dobi. *Hrvatski sportskomedicinski vjesnik*, 35 (1- 2), 26-34.
- Vujičić, L., Petrić, V. (2021). *Integrirano učenje uz pokret u ustanovama ranog odgoja*. Rijeka: Sveučilište u Rijeci, Učiteljski fakultet.
- Yetti, E., Yufiarti, Syarah, S. E., Pramitasari, M., Suharti, Iasha, V. i Setiawan, B. (2021). *The Influence of Dance Instructional Strategy and Teacher's Pedagogy Competence on Classroom Climate*. Indonezija: Sveučilište Negeri Jakarta.