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# Project-Based Learning in Early Childhood Education in Serbia: First Experiences of Preschool Teachers

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**Abstract:** The aim of the research was to examine the attitude of preschool teachers towards the implementation of project-based learning within the system of preschool education in the Republic of Serbia, with a special emphasis on the identification of its advantages and disadvantages. The research sample comprised 410 preschool teachers from 9 cities in Serbia. The findings showed that preschool teachers have a moderately positive attitude towards the benefits of the project-based learning for children and preschool teachers ( $M=4$ ). The respondents also agree with all the statements from the questionnaire which relate to the difficulties in implementation of the project-based learning approach. A statistically significant difference among preschool teachers in relation to the academic level and length of work experience, occurred only in case of one item, which is related to the lack of didactic materials ( $p=0,008$ ;  $p=0,02$ ).

*Keywords:* project-based learning approach, preschool age, preschool teacher.

## Introduction

Educational trends have been constantly changing and developing primarily in accordance with the results of new researches and information on children's development. One of these trends refers to designing a preschool curriculum which is based on the idea that children learn through practical, significant experiences which are focused on their interests. Accordingly, in the Republic of Serbia, since 2019, the implementation of the New Basics of the Preschool Curriculum, called "Years of Ascent" has started. The new curriculum has started to be implemented in a successive manner as of September 1, 2019, with the intention to make its implementation mandatory as of 2023, for all preschool institutions (*Years of Ascent: The Basics of the Preschool Education Curriculum, 2019*). The concept of the Basics of Curriculum "Years of Ascent" is based on the integrated approach to learning through which, by means of relations and actions, the welfare of a child is supported. In the implementation of the integrated approach, according to which various learning situations in authentic preschool contexts pervaded by contents from different fields, the project-based learning has a significant role. Project-based learning is a form of learning based on constructivist approach according to which children construct new knowledge by upgrading the existing knowledge and experience through social interactions. In relation to this, four fundamental pillars essential for project-based learning can be identified from the corpus of constructivist elements and guidelines: a) basically, construction of knowledge begins with the leading investigative question; b) children's investigation is based on decisions and choices, with the support of their teacher (preschool teacher); v) collaborative work and communication are dominant; g) projects should be authentic – aimed at real life problem solving (Ristanović, Stojanović and Živković, 2018; Lev, Klark and Starki, 2022; Shah and Kumar, 2019).

The main value of project-based learning reflects in the fact that it enables children to investigate and engage in personally meaningful situations, in which they relate their previous and new experiences in a creative way. Instead of guiding children to find the fastest and most successful solution, the aim of the project is to enable them to search for the authentic solution through personally meaningful investigative

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activities. In this process, the preschool teacher provides support to children and facilitates the learning process itself (Evtimov and Petrović, 2021).

In the project-based learning approach, children learn through collaboration with their peers and adults, contribute and influence their own learning as active and competent participants and they learn through taking part in the local community and experiencing themselves as valuable community members. In this approach, children make choices while investigating, enjoy the investigation, take the initiative and experience learning as a meaningful, creative, relevant process, building trust in their own investigative abilities and developing strategies how to investigate something, accept other children, the preschool teacher and other adults as their co-participants and co-investigators, participating together with the adults in the joint investigation, getting positive feedback related to their personal and cultural diversity from the local community members (Krnjaja and Pavlović Brenešević, 2022; Lev, Klark and Starki, 2022). The project-based approach enables creation of the atmosphere in which the children's needs, wishes and emotions are respected, children feel comfortable and productively take part in the learning process. Positive emotions such as curiosity, enthusiasm and joy promote the learning process and make it more successful (Stojanović, Cirkovic-Miladinovic and Milovanovic, 2021).

Review of the literature dealing with the project-based learning approach shows that it can be applied to all educational levels (Katz and Chard, 2000; Rinaldi, 2006; Petrović and Hoti, 2020) and that it contributes to long-term academic and social development of children, that children learn through project-based activities memorize content longer and have deeper understanding of what they learn (Beneke and Ostrosky, 2015; Harris-Helm and Katz, 2011). It has been established that this approach provides a set of cognitively appropriate activities which set to motion a new curriculum and discussion about the learning and teaching process. Since the focus is on the learning process, planning and creation of activities have not been anticipated. Project can promote and reflect cohesion of the curriculum and its integration through school subjects and/or developmental domains (Marshall, 2017; Vengopal, 2016).

Other studies also present benefits of the project-based learning approach. Research results showed that the project-based learning has a positive influence on children's social skills, problem solving, investigation and interaction and that it promotes collaboration among children (Beneke and Ostrosky, 2015; Farida and Rasyid, 2018; Sumarni, Putri and Andika, 2022).

In addition to the perceived benefits of a project-based approach to learning, some researchers (Holen, 2000; McPhee, 2002) have identified problems for students working with this model. They also indicate that issues associated with group work including dynamics, personality conflicts and conformity have limited the effectiveness of some groups in problem solving. Dahlgren and Dahlgren (2002) found out that this approach prevented some students' ability to deal with the problem itself, which led to the conclusion that taking part in the project-based learning approach does not have to be a positive experience for all students. Eden (2000) had a similar experience, since the findings showed that some students were actually anxious, instead of being engaged and excited, due to the open and flexible nature of the project-based learning approach. However, as any approach, the project-based approach shall probably bring about some problems and frustrations, along with the benefits for its participants (Edwards, and Hammer, 2007).

Considering advantages as well as the difficulties in implementation of the project-based learning approach, this paper deals with surveying preschool teacher's opinion on their first experiences in the implementation of the New Basics of the Curriculum and Project-based Learning Approach, as an integral part of the Curriculum.

## Materials and Methods

### Research aim

The research aim is to explore previous experience and attitudes of preschool teachers in reference to the implementation of the project-based learning approach, with a special emphasis on the benefits and difficulties in the process of implementation of this model.

### Sample

The research was conducted in preschool institutions in 9 towns in central Serbia: Arandelovac, Brus, Čuprija, Jagodina, Kragujevac, Kovin, Petrovac na Mlavi, Zaječar, Beograd. The research sample consisted of 410 preschool teachers in total. The respondents, preschool teachers, differ in terms of the level of their academic education (two-year Higher school for vocational studies for preschool teachers, three-year College of vocational studies for preschool teachers, four-year bachelor academic studies

and master academic studies), and according to the length of their working experience. Considering the successive implementation of the New Basics of Preschool Curriculum in preschool institutions, preschool teachers have different experiences in the implementation of the project-based learning approach.

### Instruments

For the purpose of this research, a Questionnaire was created and used for collection of data on the opinion of preschool teachers about the implementation of the project-based learning approach. The Questionnaire consists of 16 questions of different types: close-ended and open-ended questions and two five-point Likert-type scale questions (Strongly disagree, Disagree, Undecided, Agree, Strongly agree) regarding the statements provided.

Cronbach's Alpha reliability coefficient measuring internal consistency on this scale is 0.912, thus we can come to a conclusion that the internal consistency of the scale is satisfactory and that the scale has satisfactory reliability.

### Procedure

The data regarding experience and opinion of preschool teachers about the project-based learning approach was collected in the period October-December 2022. Preschool teachers were given the Questionnaire and provided with the explanation regarding the research aims and they were asked to answer the Questionnaire questions.

### Analysis Procedures

Data processing included descriptive statistics methods (frequency, mean value), as well as analytical statistics methods for the statistical evaluation of statistically significant difference.

## Results and Discussion

In order to establish the preschool teachers' attitude towards the advantages of the project-based learning approach that children benefit from, firstly, on the basis of their grades in certain category, an average grade was calculated (Table 1).

**Table 1.**  
*Advantages of project-based learning children benefit from*

	N		Median	Std. Deviation	Percentiles		
	Valid	Mean			25	50	75
Learns through collaboration with peers.	410	4.34	4.00	.759	4.00	4.00	5.00
Contributes to and influences own learning as an active and competent participant.	410	4.26	4.00	.742	4.00	4.00	5.00
Learns through participation in the local community, and experiences him/herself as a valuable member of the local community.	410	3.98	4.00	.984	3.00	4.00	5.00
Makes choices while investigating in relation to the form of participation and expression.	410	3.99	4.00	.862	4.00	4.00	5.00
Enjoys the investigation, has initiative and experiences learning as a meaningful, creative process.	410	4.20	4.00	.811	4.00	4.00	5.00
Strengthens his/her own self-esteem	410	4.28	4.00	.753	4.00	4.00	5.00
Accepts other children, preschool teachers and other adults as co-participants.	410	4.34	4.00	.739	4.00	4.00	5.00
Gets positive feedback on accepting personal and cultural diversity from the local community members.	410	3.97	4.00	.960	3.75	4.00	5.00

Based on the results obtained, we can see that in all benefits categories of the project-based learning approach, preschool teachers said that they have a moderately positive attitude, since the Median value is  $Md=4$  for all items, i.e. majority of preschool teachers said that they "mostly agree" with the provided statements. Such attitudes of preschool teachers were expected, since the benefits regarding advantages of the project-based learning approach have already been a common knowledge. Results of many studies confirm the benefits stated in this questionnaire (Evtimov and Petrović, 2021; Farida and Rasyid, 2018; Lev, Klark and Starki, 2022; Vengopal, 2016). A difference of opinion of preschool teachers in relation to academic education and work experience length (calculated using the Kruskal-Wallis test) was not found, since the p values for all items were  $p>0,05$ .

The next objective of this research was to examine the opinion of preschool teachers about the advantages of project-based learning approach that preschool teachers can benefit from (Table 2).

**Table 2.**  
*Advantages of project-based learning approach that preschool teachers can benefit from*

	N		Mean	Median	Std. Deviation	Min	Max	Percentiles		
	Valid	Missing						25	50	75
A preschool teacher develops a quality relationship and creates a collaborative learning environment	410	0	4.12	4.00	.758	1	5	4.00	4.00	5.00
He/she enables relating the life of a child with the immediate life context	410	0	4.30	4.00	.719	1	5	4.00	4.00	5.00
When working with children, the focus is on developing a learning disposition, instead of individual knowledge and skills	410	0	4.17	4.00	.755	1	5	4.00	4.00	5.00
A preschool teacher documents the activities and learning in such way that they are transparent to the children, their parents, other preschool teachers and the community	410	0	4.35	4.00	.735	1	5	4.00	4.00	5.00
He/she develops a strong partnership with children, families, colleagues and wider community	410	0	4.46	5.00	.706	1	5	4.00	5.00	5.00
He/she cooperates with other institutions and professionals working with children and families	410	0	4.19	4.00	.813	1	5	4.00	4.00	5.00
He/she develops a learning culture through his/her own reflexive practice and research	410	0	4.28	4.00	.786	1	5	4.00	4.00	5.00

The results are identical as for the previous question. Majority of respondents has moderately positive attitude towards the benefits of the project-based learning approach for the preschool teachers. In case of one statement only, "A preschool teacher develops a strong partnership with children, families, colleagues and wider community", it was interesting to notice that the attitude of preschool teachers was extremely positive – "Strongly agree". This indicates that preschool teachers extremely value a good relationship and quality communication with all participants of the educational process in a preschool institution, thus this advantage of the project-based learning approach was highlighted as the most important one and it is considered to be the most significant advantage in their opinion. Various authors have been drawing our attention to this particular aspect of the project-based learning approach (Farida and Rasyid, 2019; Lev, Klark and Starki, 2022; Sumarni, Putri and Andika, 2022; Krnjaja and Pavlović Breneselović, 2022), thus pointing out that this approach enables a child to build and promote interaction, communication, cooperation and development of the feeling of care and empathy towards their friends. It is similar when it comes to the preschool teachers who have the opportunity, during the process of planning and implementing their projects, to cooperate with their colleagues, children's parents and members of the local community. Statistically significant differences among the respondents in relation to their level of education or work experience length were not found in this question either.

In this research, our intention was to examine, besides the advantages of the project-based learning approach, the difficulties and problems the preschool teachers encounter during the project implementation. The results have been presented in Table 3.

**Table 3.**  
*Problems and limitations of the project-based learning approach*

	Mean	Median	Std. Deviation	Min	Max	Percentiles		
						25	50	75
Insufficient knowledge on the project-based learning	3.24	4.00	1.216	1	5	2.00	4.00	4.00
Vague instructions for project planning and implementation	3.19	3.00	1.209	1	5	2.00	3.00	4.00
Insufficient materials for the project-based learning project implementation	3.93	4.00	1.078	1	5	4.00	4.00	5.00
Introduction of younger children in project planning and implementation	3.51	4.00	1.091	1	5	3.00	4.00	4.00
Difficulties related to monitoring and recording project results	3.42	4.00	1.121	1	5	2.00	4.00	4.00
Parents' lack of motivation to participate actively in planning and implementation of the project objectives	3.40	4.00	1.267	1	5	2.00	4.00	4.00
Difficulties related to cooperation with the local community	3.20	4.00	1.303	1	5	2.00	4.00	4.00

Majority of preschool teachers expressed a moderate attitude (“Agree”) in relation to the statements referring to difficulties such as: insufficient knowledge on the project-based learning approach, insufficient didactic materials for the project implementation, children’s age as one of the issues (especially in cases of project implementation involving younger children), having problems in the process of monitoring and recording project results, parents and members of the local community showing lack of motivation to participate actively in planning and implementation of the project activities. A special emphasis should be put on the fact that in case of the statement “Vague instructions for project planning and implementation”, preschool teachers had a neutral attitude  $Md=3$ , i.e. “Indecisive”. Such attitude can be explained by the fact that the implementation of the New Basics of the Curriculum and Project-based Learning Approach was conducted successively, thus not all respondents had the equal opportunity to spend the same amount of time on the implementation of the project-based learning approach in the immediate educational practice. Accordingly, they cannot assess to what extent the instructions they get are significant and clear. At this point, we should question the motivation of preschool teachers themselves for the implementation of the project-based learning approach. The results of the research conducted by [Deci and Rian \(2000\)](#), the motivation of those working in the field of education for the implementation of the project-based learning approach should actually be considered. They claim that educators often implement projects because they have been “forced” to do so and that most likely they will not take part in this process with joy and enthusiasm; they shall simply carry out orders in order to meet the project requirements. The aim of educational institutions, however, should be further development through the participants who actually implement the projects, i.e. preschool teachers ([Vojáčková, 2020](#)). Unfortunately, our research does not offer the opportunity to examine this important aspect of work, which is the motivation of preschool teachers to implement this learning model.

Considering the opinion of preschool teachers about the problems and difficulties during the implementation of the project-based learning approach, in relation to the educational level variable, in case of most statements, no statistically significant differences were noticed, except for one statement, which is “Insufficient materials for the implementation of the project-based learning approach”. Namely, the value  $p=0,044$ , measured using the Kruskal-Wallis test, showed a statistically significant difference, yet not showing clearly in comparison of which groups this statistically significant difference occurred, which led to conducting a subsequent Mann-Whitney Test (Table 4).

**Table 4.**  
*Mann-Whitney Test*

Ranks				
	Academic level	N	Mean Rank	Sum of Ranks
Insufficient materials for the project-based learning approach implementation	Higher school for preschool teacher education	163	113.37	18478.50
	Master studies, Preschool teacher course	78	136.96	10682.50
	Total	241		
Test Statistics <sup>a</sup>				
	Insufficient materials for the project-based learning project implementation			
Mann-Whitney U			5112.500	
Wilcoxon W			18478.500	
Z			-2.639	
Asymp. Sig. (2-tailed)			.008	
a. Grouping Variable: academic level				

The results show that there is a statistically significant difference between the preschool teachers with completed higher school for education of preschool teachers, on one hand, and those with completed master academic studies, on the other hand. We presume that this difference, in favour of preschool teachers with completed master academic studies, occurs due to the fact that those preschool teachers are better acquainted with the project-based learning approach, thus they realize that there is a need to have various didactic materials in educational groups, in order to implement the projects in a good quality manner.

A statistically significant difference occurred for the same item "Insufficient materials for project-based learning approach implementation" between the preschool teachers with different work experience. The Kruskal-Wallis test showed a statistically significant difference in the attitudes of preschool teachers with different levels of education,  $\chi^2=13.564$ , for  $df=4$  and  $p=0.09$ , whilst the value of the Mann-Whitney test was  $p=0.02$ , for the preschool teachers with up to 5 years of work experience, who think that insufficient materials do not represent a huge difficulty for the implementation of the projects, whilst the preschool teachers with the 20-30 years of work experience point out this as a serious difficulty in the implementation of project-based learning approach.

## Conclusion

Considering the fact that project-based learning approach within the New Basics of the preschool Curriculum started to be implemented in 2019, in preschool institutions of the Republic of Serbia, the aim of this research was to examine the opinion of preschool teachers about the implementation of the project-based learning approach, with the special emphasis on its advantages and disadvantages occurring in the process of its implementation. The results showed that preschool teachers understand the benefits children have from the project-based learning approach, since they expressed moderately positive attitudes ( $M=4$ ). Also, the respondents agreed that the project-based learning approach has positive effects on preschool teachers as well. When it comes to difficulties and problems occurring during the project implementation, preschool teachers evaluated that they do not have sufficient knowledge on the project-based learning approach, that there are problems of technical nature, such as insufficient materials, and finally, that they do not have adequate support provided by the parents and members of the local community. Preschool teachers with higher levels of education and preschool teachers with longer work experience, estimate that didactic materials are some of the more important prerequisites for the implementation of the project-based learning approach, since this item showed presence of statistically significant differences.

In spite of the research limitations (unspecified problems from the educational practice related to the implementation of the project-based learning approach, unspecified methods preschool teachers apply in planning and implementation of projects with children, appropriate sample, etc.), we consider the findings of this research relevant because they show how preschool teachers evaluate their first

experiences based on the project-based learning approach implementation.

Taking into account the significance and role of the project-based learning approach in working with preschool children, research results lead to a conclusion that it is necessary to continue working on improving the quality of project-based learning approach implementation, primarily on providing preschool teachers with adequate training and motivating them to implement this learning method. Hopefully, the above stated results shall have the capacity to initiate some new research studies.

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## Author Contributions

Conceptualization, B.S., D. R. and P.Ž.; data curation, B.S., and M.D.Ž.; methodology, B.S., P. Ž. and M.D.Ž.; resources, B. S. and M.D.Ž.; formal analysis, B. S. and D.R.; validation, P. Ž.; writing—original draft preparation, B.S. and D.R.; writing—review and editing, B. S. and P.Ž. All authors have read and agreed to the published version of the manuscript.

### Conflict of interests

The authors declare no conflict of interest.

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