

EXPERIENCE IN PRESCHOOL SCIENCE TEACHING IN SERBIA AND GERMANY DURING PANDEMIC

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Abstract

During the pandemic of COVID-19, preschool teachers had to adapt to the novel teaching challenges of online communication with children and parents. In this study, the effect of pandemic to the preschool science teaching was evaluated from the perspective of preschool teachers in Serbia and Germany. The research was conducted from May to August 2021 and included 90 examinees. For the purpose of this survey, a questionnaire with 19 open- and closed-ended questions was constructed. The results showed that in the organization of educational practice in distant science activities there was no significant difference in kindergartens in Serbia and Germany. German preschool teachers had more positive perception of their digital competencies compared to their colleagues from Serbia. The comparative analysis of parent engagement, as intermediaries in the realization of educational tasks, showed that in both countries the parents were equally willing to cooperate, but the tasks were more regularly completed with German parents. It was concluded that, although there were certain differences, preschool teachers in both countries shared similar experiences from the times of pandemic.

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Key words

Preschool education, preschool science teaching, online activities, COVID-19 pandemic

Introduction

Modern kindergarten has the task to provide a supportive and stimulative social and physical environment for diverse and adequately created activities for children to create knowledge, skills and abilities according to their interests and developmental potentials. The main goals of preschool education are: the support to a comprehensive development and wellbeing of children; providing incentive environment for the development of personal capacities; enrichment of experiences and building knowledge of self, others and world; educational function of the family; lifelong learning and involvement in society; development of child's potentials as a prerequisite for the prosperous society. Early education should enable children to play, to be creative and constructive, to communicate and cooperate with their peers and adults in the kindergarten and in the community. The most important pedagogical role of preschool institution is to capacitate children to be independent as well as collaborative and to prepare them for successful life in the society (Years of Ascent, 2018).

With the onset of COVID-19 pandemic in 2020, the fulfillment of the goals and functions of preschool education has been substantially challenged, primarily the ones related to socialization of children. The transition of educational practice from kindergartens to online communication required the improvement of preschool teachers' digital competences in a very short time.

Due to the inability of personal interaction between teachers and children, this period was challenging in many aspects:

- difficulties in the engagement of children;
- lack of interaction among children;
- inability to express affection and care;
- encouragement of self-respect, self-confidence and independency of children;
- appreciation of child's perspective;
- inclusion of children of different origin, socio-economic status, ability status;
- formative assessment of the child's progress.

By contrast, due to active and daily involvement of parents in online communication with the teachers, the educational aspects such as cooperation with the parents and planning activities based on childrens' developmental skills, needs and interests was additionally developed (Miškeljin, 2021; Vandekerckhove et al, 2013). This crisis period, aside from pandemic-related issues, brought something positive – solidarity and mutual cooperation, strengthening of preschool teams and teamwork and, as most important, close and reinforced cooperation with the key player in the education of children - the family.

In the state of Hessen, Germany, the early childhood educational work is based on Hessen's Education Plan for Children aged 0 to 10 (BEP, Bildungs- und Erziehungsplan für Kinder von 0 bis 10 Jahren). This education plan is a novel educational concept defined as a process created not only by experts and teachers, but also by children, their parents and other adults who are actively involved. Since its beginnings in 2005, this education plan develops as a co-constructional process and it is the basis of the whole education system. Comparing to the current preschool curriculum framework in Serbia titled "Years of Ascent" (2018), it is evident that these education programmes are very similar and both support integrative learning. In integrative learning, connections between concepts and experiences are made, leading to problem solving in learning situations. Integrative learning through project-based approach brings together three dimensions of child's learning: well-being, participation in action and relationships. Every life situation is learning opportunity, where children are engaged in multiple ways (play, observation, imagination, engagement, experimenting and practical activities), learning from many resources, and one theme is perceived from different angles. This enables easier adoption of concepts and incorporates previous knowledge and experiences (Pavlović-Breneselović, 2010). In Hessen Education Plan for Children aged 0 to 10 it is emphasized that its educational goals are strengthening children's basic skills such as taking responsibility, the ability to cooperate, creativity and dealing with individual differences and cultural

diversity. In both frameworks the accents are on childrens' active learning, researching and discovering, their age-appropriate participation in educational process, as well as the educational partnership developed with the parents and local community.

Remote teaching and learning in early childhood education lasted for 13 weeks in Serbia, while in Germany the kindergartens were closed for seven weeks. All participants in education process together were overcoming challenges, problems, difficulties and celebrated successes.

This comparative study investigated the perspective of preschool teachers in Serbia and Germany about the teaching practices in extraordinary epidemiological conditions and about the impact of pandemic on education process and children's development in Serbia and Germany.

Theoretical Background

The impact of the world pandemic caused by SARS-COV2 virus on the education processes has been brought into focus as especially challenging for the teachers, therefore it is the subject of numerous scientific studies in the field of education worldwide. The phenomenological study in Turkey (Yildirim, 2021) focused on the ways of implementation of educational task, kinds of activities performed during pandemic, and also challenges and measures to be taken to sustain preschool educational process. The results of the study point to the numerous adverse effects to preschool education, as well as an array of challenges which the teachers and parents encountered during remote teaching (Yildirim, 2021).

In many studies the effects of pandemic on education were investigated (Burgess & Sievertsen 2020; Viner et al. 2020), however, very few of them investigated the ways of implementation the educational process during the pandemic. Most researchers agree that the cooperation between preschool teachers and parents was essential for a sustainable early childhood education (Dereli & Türk-Kurtça, 2022; Luo et al., 2022). This is consistent with previous studies emphasizing the importance of family (Steed & Leech, 2021) and participation of parents in children's education (Duran, 2021; Dereli & Türk-Kurtça, 2022; Yıldırım, 2021). The key role during pandemic was played by parents, which complemented teachers and thus supported the educational process by involvement in children's activities in remote learning (Nikolopoulou, 2022). The fact that parents provided the necessary support during online learning points to the parents as crucial stakeholders of distance preschool education (Lau & Lee, 2020; Andersson Søre et al., 2022).

Many studies, where the ways of communication of preschool teachers with parents were investigated, found that distance learning was performed by means of phone and social networks - *Facebook*, *Instagram*, *WhatsApp* and *Skype* (Yıldırım, 2021; Nikolopoulou, 2022; Duran, 2021), *Zoom*, *Viber*, e-mail, while the parents which didn't have the access to these services were supplied with printed material (Dayal and Tiko, 2020).

Some teachers stated that distance teaching and learning during lockdown resulted in increased parents' engagement in their children's education and thus upgraded the child-parent interactions. The biggest challenges during work online were the problems with internet connection and some parents

unwilling to cooperate (Nikolopoulou, 2022), which might be justifiable due to their full-time daily jobs or caring for multiple children or siblings with special needs (Lee et al., 2021).

Virtual learning format was more or less successfully implemented during pandemic, despite the limitations of resources and lack of teachers' experience and training for digital technologies. It is necessary that preschool teachers have digital competencies (Yıldırım, 2021), while policy makers are expected to redefine the frameworks for sustainable early childhood education.

Although none of the studies focused exclusively on the science teaching during pandemic, the common conclusion is that the problems in preschool education during pandemic were the same or similar in different parts of the world.

Methodology and Methods

The new preschool curriculum framework in the Republic of Serbia "Years of Ascent" (2018) focuses on the holistic development and wellbeing of children through integrative learning in an inspirational environment and on building meaningful relationships with peers and adults through play and other activities. The sudden onset of pandemic and consecutive lockdown has set up a challenge for education professionals in Serbia and worldwide how to accomplish these goals and tasks.

The subject of this research was the experiences and reflections of preschool teachers in Serbia and Germany in science teaching during the COVID-19 pandemic. Following the government measures and guidelines, early childhood professionals were obliged to carry out educational process in the times of epidemiologic crisis. The aim of this research was to compare the educational practices, experiences and reflections of preschool teachers in Serbia and Germany while teaching science contents during the pandemic. The two countries differ in many aspects, so the presumption was that there were differences in the organization and realization of the educational process in preschool institutions in Serbia and Germany during the COVID-19 pandemic.

Procedure

For the purpose of this survey, the questionnaire and the attitude scale were constructed. The survey was anonymous and comprised of 19 open-ended and close-ended questions. The questions referred to the experiences and reflections of participants' educational work during lockdown and to the challenges they encountered during pandemic.

Data were collected in a period from May to August 2021 in Serbia and Germany.

Participants

Participants were chosen by a purposive sampling method. The sample consisted of 54 preschool teachers from five towns in Serbia (Novi Sad, Novi Bečej, Kikinda, Bečej and Koceljeva) and 36 preschool teachers from the towns of Köln and Dreieich in Germany.

Methods

This study applied the method of qualitative content analysis of official national measures and guidelines and pedagogical documentation, as well as a descriptive method for the analysis of the experiences and attitudes of the participants.

Results and Discussion

Analysis of the years of service (Table 1.) revealed that the participants in Serbia had longer average work experience comparing to the ones in Germany.

Table 1. Distribution of participants according to years of service as preschool teacher in Serbia and Germany

| Years of service | Percent of participants (%) | |
|------------------|-----------------------------|---------|
| | Serbia | Germany |
| <10 | 17 | 41 |
| 10-20 | 30 | 29 |
| 20-30 | 33 | 18 |
| >30 | 20 | 12 |

Data about the organization and implementation of educational process during pandemic were obtained through the questions about the ways of work, institutional support, available and used digital technologies, resources, teaching methods and strategies, as well as projects and themes realized (Tables 2. and 3.)

More than a half of preschool teachers in Serbia stated that they realized educational activity online and in kindergartens in equal duration during pandemic. One third of Serbian participants spent the most of pandemic days with children in kindergartens, while about 10% of them performed distance learning most of that period. By contrast, 44% of German preschool teachers performed mainly distance learning and about 40% stated that they worked with children online and in kindergartens in equal duration during pandemic. Only 17% of them were with children mostly in kindergartens (Table 2., question 1).

Over 80% of educators from Serbia were instructed with precise guidelines for their educational practice in pandemic conditions from their preschool or governmental institutions, contrary to German colleagues, where only 40% agreed with that statement (Table 2., question 2).

In Serbia only 5% of preschool teachers were completely dissatisfied with the working conditions during pandemics, while in Germany there were four times more dissatisfied teachers (Table 2., question 3). The sources of dissatisfaction in both countries were similar, except the stress, which was mentioned only by German teachers.

During lockdown, science teaching was mostly performed using video chat or video recordings as the dominant way of communication of teachers,

parents and children. Preschool teachers motivated children and sent them instructions for activities by means of video recordings, and parents and children documented their activities in the same digital format (Table 2., question 4), which is consistent with previous studies (Yıldırım, 2021; Dayal and Tiko, 2020).

Significant differences between Serbian teachers and their German colleagues were observed in digital technologies, platforms/apps used in science teaching (Table 2., questions 5 and 9). In Serbia, the majority of teachers used mobile phones and 40% of them used personal computer as well. By contrast, in Germany three quarters of teachers used personal computer, about 40% used mobile phone, and 20% used tablet too, a device which Serbian participants were not using in their work at all. The differences are more prominent in digital platforms and apps used for online education: almost all Serbian teachers used Viber, which was not used at all by their German colleagues. More than a half of German teachers used Zoom, half as much Teams and four times less Skype. The latter three platforms were rarely used by Serbian teachers.

Table 2. Questions and answers of preschool teachers from Serbia (S) and Germany (G) about organization and realization of educational process during pandemic – part I

| Question number | QUESTION | Country | ANSWER | | |
|-----------------|---|---------|----------------------------|---------------------------|---|
| 1. | In which way was science teaching performed during pandemic? | | a) mainly online | b) mainly in kindergarten | c) both, depending on epidemiological situation |
| | | S | 11% | 34% | 55% |
| | | G | 44% | 17% | 39% |
| 2. | You were instructed by your preschool or governmental institution with precise guidelines for | | a) I disagree | b) I partially agree | c) I agree |
| | | S | 2% | 17% | 81% |
| | | G | 22% | 39% | 39% |
| 3. | How satisfied were you with working | | a) completely dissatisfied | b) partially satisfied | c) completely satisfied |

| | | | | | |
|---|---|---|--|----------------------|----------------------|
| | conditions in your kindergarten during pandemic? If you are dissatisfied, define the reason. | S | 5% | 54% | 41% |
| | | S | „The irregular attendance of children in kindergarten“ „Wearing masks“ „The difficulties in contact with children and parents “ | | |
| | | G | 22% | 67% | 11% |
| | | G | „The limitations“ „The division in groups“ „The ban on children interaction“ „The stress“ | | |
| 4 | How was science teaching performed during lockdown and work from home? Please describe in short and give examples of the projects or some activities. | S | „According to established plans, we sent different tasks for activities to the parents in Viber groups once weekly and we got feedback from them in the same way. The activities were chosen to be interesting, age-appropriate for the children to accomplish independently and at no cost for the material. We tried to choose activities which support comprehensive development as much as possible. We made video recordings of stories, poems, etc. and sent it to the parents.“ „Adequate contents selected by the teachers were shared in a Facebook group to the parents, as well as verbal instructions which were passed to children, and feedback information was sent the same way.“ | | |
| | | G | „Teachers prepared short video recordings for the children “ „Video recordings from the internet“ „Personal research“ „Family video in home atmosphere“ | | |
| 5 | Which digital device did you use? | | a) mobile phone | b) personal computer | c) tablet |
| | | S | 89% | 39% | 0 |
| | | G | 39% | 75% | 19% |
| 6 | Which platform or app did you use in online science teaching? | | a) Viber | b) Zoom | c) Skype d) Teams |
| | | S | 96% | 7% | 6% 2% |
| | | G | 0 | 61% | 14% 28% |
| 7 | Which teaching methods and forms did you | S | Methods: verbal, descriptive, demonstrative, oral presentation, illustrations, video and audio recordings, textual tasks, rarely practical and inquiry-based activities | | |

| | | | | | | |
|-----|--|----------|--|----------------------|----------------------------|------------------------|
| | chose when giving instructions to children and parents in online science projects? | | Forms of work: individual and group work with family members | | | |
| | | G | Methods: verbal, illustrations, video and audio recordings, textual tasks | | | |
| 8. | You used the following resources in finding ideas and material for science teaching: | | a) Internet | b) Colleagues | c) Professional literature | d) Personal experience |
| | | S | 68% | 13% | 57% | 69% |
| | | G | 64% | 0 | 100% | 28% |
| 9. | Online science teaching is more challenging than in kindergarten. | | a) I disagree | b) I partially agree | c) I agree | |
| | | S | 4% | 46% | 50% | |
| | | G | 0 | 44% | 56% | |
| 10. | How often did you send the science related tasks to the parents? | | a) daily | b) 2-3 times a week | c) once a week | |
| | | S | 11% | 35% | 54% | |
| | | G | 0 | 12% | 88% | |

Verbal, textual and illustrative-demonstrative teaching methods are applied in both countries, with the emphasis on the usage of video and audio recordings. Only teachers from Serbia stated that they used individual as well as group work with children and the family members (Table 2., question 7).

As for the resources for finding ideas and material for science teaching, internet, previous personal experience and professional literature respectively were the most prevalent among the teachers from Serbia, while German teachers used predominantly professional literature, than internet. They relied much less on their personal experience, and none of them consulted colleagues for the ideas and material (Table 2., question 8).

Preschool teachers from both countries agreed that online science teaching was more challenging than working on the same subjects in the kindergarten (Table 2., question 9).

In Germany, the majority of teachers sent the tasks to parents and children once a week, while in Serbia the tasks were sent once a week or 2-3 times a week, and four teachers even sent their tasks daily (Table 2., question 10).

Feedback information on activities with children at home parents sent to teachers in various forms (Table 3., question 11). The photographs or verbal communication through Viber, Skype and Zoom apps were the predominant modes of feedback from parents, while video recordings and written answers (e-mails of messages) were used less frequently in both countries. The lower overall percentage in answers among preschool teachers in Germany indicates that they thought that they should choose only one answer (the most dominant way of sending feedback by parents), while Serbian teachers circled all the ways of communication with parents, regardless of the predominance. The significant number of parents in Serbia occasionally gave no feedback (57% teachers experienced that), which was also observed in some previous studies (Yıldırım, 2021). By contrast, in Germany none of the participants had such experience, meaning that the parents in Germany considered the realization of tasks with children and sending the results obligatory.

For the pedagogical documentation (Table 3., question 12), the Serbian teachers had default report forms that were filled out and sent by e-mail to the educational guidance counselors weekly, with the documentation of instructions and assignments for children and feedback from parents attached. For preschool teachers in Germany, the only documentation of their educational work consisted of the correspondence with the parents.

Preschool teachers in Serbia monitored the progress of children's projects over time through the video recordings and photographs and there was often doubt whether children completed tasks independently or with the help of the adults. Some Serbian teachers stated that they had difficulties in pedagogical documentation as the only feedback of children's achievements was from the parents. On the other hand, a part of German teachers didn't document children's progress, and the rest of them used children's portfolios (Table 3., question 13).

Significant differences among Serbian and German participants were observed in teachers' satisfaction with children's development (Table 3., question 14). The majority of teachers in Serbia were partially satisfied with children's development, stating that the children's progress depended of the level of parents' engagement and that its assessment was nonrealistic, because the parents have often completed the tasks instead of their children. In Serbia, as well as in Germany, there were not many unsatisfied teachers, and the ones who did, specified the lack of equipment and the impossibility of individualized educational approach as the reason. Contrary to the Serbian participants, the majority of German teachers expressed their satisfaction, which was explained by the fact that the parents had time to interact with their children during lockdown.

The themes, tasks, activities and projects completed during lockdown (Table 3., question 15) were matching or similar in German and Serbian kindergartens.

Asides from a small number of preschool teachers who didn't experience any difficulties during lockdown and the ones who didn't answer the question, the following difficulties were highlighted by the majority of examinees (Table 3., question 16): teacher's insufficient digital competencies, disinterest of

parents, disrespect of teachers' privacy and spare time by parents, difficulties in motivating children on-line and impossibility of conducting project in respect to children's interests. The teachers from Germany stated that the most challenging was monitoring and helping children during task completion as well as the lack of direct social interaction among teachers and children. Similar experiences were observed in some previous studies (Jalongo, 2021; Yildirim, 2021).

Table 3. Questions and answers of preschool teachers from Serbia (S) and Germany (G) about organization and realization of educational process during pandemic – part II

| n | QUESTION | Country | ANSWER | | | | |
|---------|--|---------|--|---------------------|--|---------------------|----------------|
| | | | a) photographs | b) video recordings | c) verbal communication via viber, zoom, skype | d) textual messages | e) no feedback |
| 1 1. | In which way did you get feedback on the completion of tasks related to science teaching from the parents during lockdown? | S | 98% | 61% | 81% | 43% | 57% |
| | | G | 39% | 25% | 39% | 22% | 0 |
| 1 2. | How did you document your work in science teaching practice during pandemic? Please describe. | S | „We made weekly plans of activities, and at the end of the week, we evaluated it and wrote reports. The default tables and report forms were filled with data and sent to the educational guidance counselors by e-mail.” „All the activities were documented by supplementary material (written material and photographs). “ | | | | |
| | | G | „Correspondence with the parents“ | | | | |

| 1 3. | How did you assess children's progress related to science learning during lockdown? | <p>S</p> <p>„By means of periodical comparison of video recordings of children“ „It was difficult to give realistic assessment of children's development in such circumstances.“ „By means of feedback from the parents, i.e. through their comments“ „Progress in fine motor skills was evident in photographic recordings of completed tasks.“ „We couldn't be sure if the children completed the task on their own or someone else did it for them“ „Poorly, because we didn't have direct contact with children, but with parents only“</p> | | | | | | | | | | | | |
|---------|---|--|----------------|--------------|------------------------|----------------|---|-----|-----|----|---|-----|-----|-----|
| | | <p>G</p> <p>„By means of portfolio “ (3) „By no means“ (1)</p> | | | | | | | | | | | | |
| 1 4. | How satisfied were you with children's development related to science learning during pandemic? | <table border="1"> <thead> <tr> <th></th> <th>a) satisfied</th> <th>b) partially satisfied</th> <th>c) unsatisfied</th> </tr> </thead> <tbody> <tr> <td>S</td> <td>11%</td> <td>83%</td> <td>6%</td> </tr> <tr> <td>G</td> <td>78%</td> <td>11%</td> <td>11%</td> </tr> </tbody> </table> | | a) satisfied | b) partially satisfied | c) unsatisfied | S | 11% | 83% | 6% | G | 78% | 11% | 11% |
| | a) satisfied | b) partially satisfied | c) unsatisfied | | | | | | | | | | | |
| S | 11% | 83% | 6% | | | | | | | | | | | |
| G | 78% | 11% | 11% | | | | | | | | | | | |
| 1 5. | Which themes/projects did you complete on-line during pandemic? Name some of them. *NA: S – 31%; G – 52% | <p>S</p> <p>Hygiene and corona, Animals, Children's birthdays, Traditional holidays (Easter), Toys made of recycled material, Changes in nature, My garden, Traffic, Spring, Occupations, Insects, Experiments with water, What do I see through my window, My yard, ...</p> <p>G</p> <p>Hygiene and corona, Animals, Children's birthdays, Traditional holidays (Easter), Toys made of recycled material, Changes in nature.</p> | | | | | | | | | | | | |
| 1 6. | What were the difficulties in your teaching practice related to science teaching during lockdown? Give some examples. *NA: S – 40%; G – 63% | <p>S</p> <p>„Mastering digital tools usage and communicating children and parents by means of digital tools“ „All day long engagement and receiving messages of completed tasks by parents inappropriately late at night.“ „How to make the task interesting, fun and to spark the imagination, curiosity and the need to discover the new dimensions of life. How to instruct parents to motivate children for the realization of tasks“ „Inability to perceive children's interests as a</p> | | | | | | | | | | | | |

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|-------------|--|----------|--|---|---|--|---|---|
| | | | necessary part of running of project. “ „Disinterest of some parents. “ „Lack of personal contact with the children“ „There was nothing difficult“ | | | | | |
| | | G | „The children didn’t have social interaction with the teachers and other children“ „Monitoring and assistance while children completed the tasks were difficult“. | | | | | |
| 1 7. | Which public health measures did make the realization of themes/projects related to science content difficult and in what way? | S | Wearing face masks, lack of facial expression, lack of physical contacts, extreme hygienic measures, inability of cooperation with wider social community and visits, ban on the presence of parents in kindergartens, ban on musical or physical activities in the gym, lack of various didactic materials necessary for the project approach | | | | | |
| | | G | Wearing face masks, difficult non-verbal communication, distance, accentuated activities related to public health measures, lack of cooperation with local community, ban on the organization of outings and the presence of parents in kindergartens, difficulties in the realization of project activities. | | | | | |
| 1 8. | Which challenges did you face during realization of themes/projects related to science content in the times of pandemic? (please encircle one or more answers) | | a) insufficient number of children in the realization of theme/project | b) Public health measures which disabled group work | c) Inability to leave kindergarten and connect to the local community | d) Ban on organization of outings and visits | e) Ban on kindergarten events ,birthday parties, etc. | f) Offer: Inability to express closeness, hugs and kisses |
| | | S | 28% | 44% | 76% | 33% | 28% | 28% |
| | | G | 17% | 28% | 33% | 39% | 28% | 25% |
| 1 9. | Was there any positive impression which you will remember from the period of | S | „Parents’ delight when they realized that children can participate in home activities jointly with them. “ „We got to know parents and children better” „Beautiful photographs of children in flower gardens which they created together with their parents” | | | | | |

| | | |
|--|---|---|
| | <p>lockdown? Please describe shortly.</p> <p>*NA: S – 18%; G – 25%</p> | <p>„Great dedication of the parents and children in work from home, creativity and nice examples of completed tasks“ „The recordings of children“ „Detailed reports of various activities. “ „The children liked that they had the opportunity to be the reporters, to record and take the photos” „The parents’ satisfaction when sending feedback about realized activities“ „At the end by means of video recordings, the children recited poems about teacher, which they found with their parents and memorized“ „Some parents became aware of the importance of preschool teacher and his importance in children’s development and the burden of his profession” „There wasn’t any positive impression! “</p> <p>G</p> <p>„The photographs of the children“ „Lots of understanding “ „The collage created by the parents with the expressions of gratitude” „Zoom calls without face masks“ „There was nothing positive, live word is live word!”</p> |
|--|---|---|

*NA – no answer; in all questions where NA wasn't specified, all 90 participants provided responses.

In the time of pandemic, when children attended kindergarten, identical mandatory public health measures and bans made science teaching difficult for preschool teachers in both countries (Table 3., question 17), and they were mostly related to keeping physical distance.

Teachers in Serbia and Germany faced the same challenges in science teaching in kindergartens in this period, as a result of similar recommendations and mandatory measures (Table 3., question 18). Among the majority of Serbian participants the most challenging was the inability to leave kindergarten and connect to the local community, followed by inability to work with children in groups.

The lower percentage of German participants who answered this question couldn't be well interpreted based on the available information.

A variety of interesting answers were obtained for the last question about eventual positive impressions from the lockdown period (Table 3., question 19). Similarly to previous open-ended questions, the preschool teachers from Serbia gave more detailed statements.

Except for a few negative answers and the ones that didn't answer, most of the teachers' comments were positive. Serbian teachers especially emphasized the parents' delight while completing tasks together with their children, nice examples of realized tasks (practical home activities, garden activities, role-playing), getting to know the teachers, children and parents more closely and raising parents' awareness of the important and demanding role of preschool teachers in their children's development. Two teachers noticed that the positive side was that during pandemic there was no additional engagement of teachers like attending meetings, team work, etc. Thus, through this survey they used the opportunity to express their dissatisfaction with the additional engagement that is required of them in addition to direct educational work with children. In their good impressions German teachers included a lot of understanding and gratitude shown by the parents, photos of the children and Zoom calls without face masks, which compensated physical separation.

Conclusion

The emergence of the COVID-19 pandemic and the introduction of mandatory public-health measures led to a different organization of educational work in kindergartens around the world. This paper provides an insight into the perspective of preschool teachers on the impact of the pandemic on the educational process and the development of children in Serbia and Germany during the pandemic.

This research had certain limitations. Namely, preschool teachers in Serbia were more willing to cooperate and answered open-ended questions more extensively, while educators in Germany were more cautious and unwilling for full participation. The possible explanation is that preschool teachers in Germany may be bound by a contract that does not allow disclosure of information about the institution where they are employed. This is reflected

in the ban on taking pictures of kindergarten rooms, and special care is taken to ensure that children are not photographed. This is also taken into account in Serbia, but when parents sign consent to photographing children, those photographs can be exploited only for the needs of the institution or for some other carefully defined purposes. It can be concluded that in this research this cautiousness and unwillingness of German participants to cooperate was the biggest limitation.

It is assumed that, considering educational goals and tasks in the field of science teaching, it was a challenge for teachers to organize online classes while respecting the principles of this educational field. According to the document Basics of Diversified Programs of Preschool Education, in Serbia, through project based learning various learning strategies have been integrated, such as inquiry based learning, learning through play, learning based on imagination, problem based learning, experiential learning and situational learning (Pavlović-Breneselović & Krnjaja, 2017). Likewise, in Germany, according to the BEP (Bildungs- und Erziehungsplan für Kinder von 0 bis 10 Jahren), the Education Plan for children aged 0-10, children are encouraged to actively learn, explore and discover, i.e. it is important that the child has access to discovery, experimentation and observation of the living and non-living world.

This study showed that during lockdown preschool teachers in Serbia and Germany carried out educational work related to science teaching in a similar way. Distance teaching was performed by sending verbal instructions or videos, and the teachers used a demonstrative and descriptive method adapted to individual work with children, with occasional group work within the family. The resources used were also very similar (internet, professional literature and previous experience). When it comes to the use of digital technologies, platforms and applications, there were significant differences between educators in the two countries.

Preschool teachers in Serbia mostly used mobile phones and the Viber application, and less frequently computers and the Zoom platform, while among German teachers, computers and the Zoom platform were most often used, and tablet computers and the Teams platform were used less frequently. Assignments were sent to parents and children in both countries usually once a week, and occasionally several times a week. On the other hand, there are significant differences in the way documentation is kept, because in Serbia it was in the form of weekly reports to the educational guidance counsellors, while in Germany it was the evidence of correspondence with parents. Except for minor differences related to satisfaction with children's progress during lockdown, where teachers in Germany were mostly satisfied, and in Serbia partially satisfied, there is no difference in the experiences of teachers in Serbia and in Germany. They shared common difficulties, challenges and problems they faced, positive impressions, partial satisfaction with working conditions, topics and content they realized. Therefore, we conclude that there are only some differences in the experiences of preschool teachers in the two countries in the implementation of educational work in the field of science teaching during the pandemic. It can be concluded that preschool

teachers have enough willpower and competence to adequately adapt to new circumstances in both Serbia and Germany.

This study will contribute the stakeholders in early childhood education to plan, build capacities and provide prerequisites for the implementation of preschool curricula in the times of crisis.

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