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The relation between reflection and the quality of a preschool teacher's education performance

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Abstract

Many developed countries have been concentrating lately on the quality of preschool education. Generally, what is considered one of the most important aspects of quality preschool education is quality teaching performance, which has been focused on in many research studies. Research also investigates the level of reflection in preschool teachers, especially in relation to their professional development. However, none of the research studies have, so far, focused on observing the relationship between the two phenomena. We carried out a multiple case study to investigate the relationship between the quality of reflection and the quality of teachers' performance. Eight pre-primary teachers were video-recorded in their work, and subsequently, in-depth interviews were conducted. During the interviews, we used stimulated recall over selected video sequences, focusing specifically on selected aims of education. The findings indicate that teachers with a higher quality of reflection reached higher quality in the selected areas of teachers' performance. The results also showed that the teachers with a university degree reached higher quality performance. The findings can contribute to the discussion on the professional development support of preschool teachers and can initiate a discussion on the need to examine the university preparation programmes for these teachers.

Keywords: Qualification, Quality, Reflection, Education performance, Preschool teachers

Introduction

In recent years there has been a debate in the Czech Republic regarding initial pre-primary teacher education at the tertiary level. At the moment it is one of the few countries (EACEA 2014, p. 103) where preschool teachers are not expected to have a university degree despite the fact that many studies indicate that university graduate teachers bring higher quality into pre-primary education (Early et al. 2007; Kelley and Camilli 2007; Oberhuemer et al. 2010; Sylva et al. 2004). A specific feature of preschool education in the Czech Republic is that most children aged 3–6 are educated in public preschools, where approximately 80% of the teachers have just a secondary school education. The reform of school education at the turn of the century brought about the possibility of educating preschool teachers also at universities, which is why the percentage of

university educated preschool teachers has increased over the last 10 years, currently standing at approximately 20%.

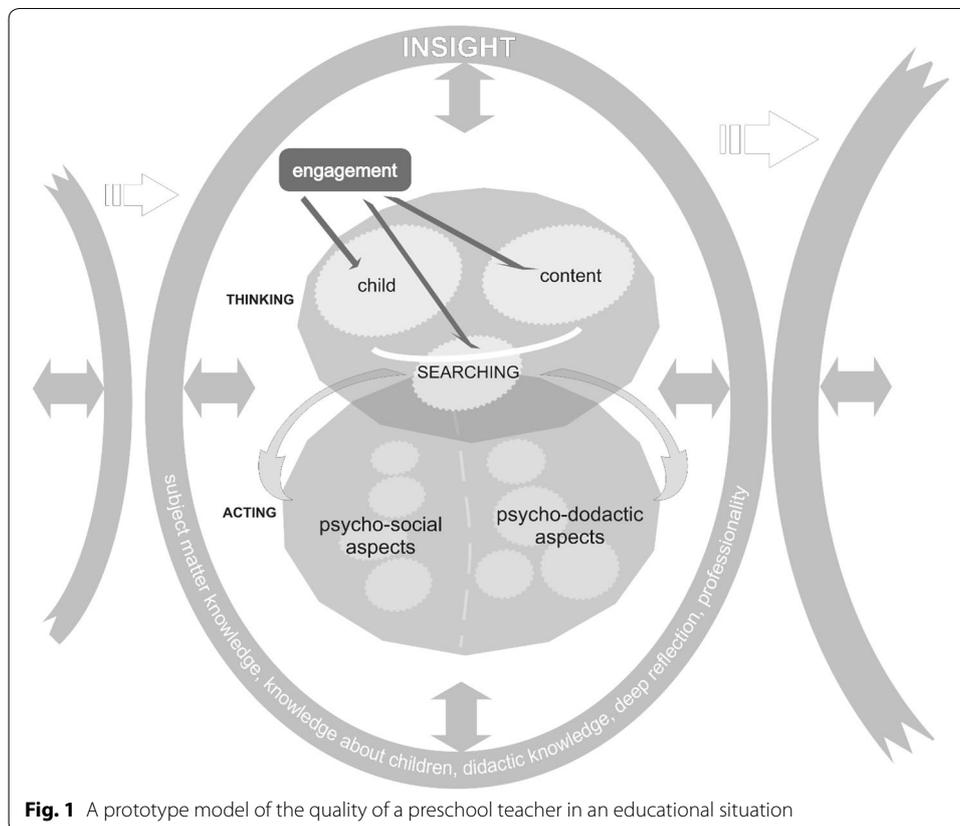
Most developed countries prepare teachers as a so-called reflective practitioner (Kasáčová 2005; Kosová et al. 2015; Schön 1987; Goodman 1984; Píšová 2005; Spilková et al. 2015; Wubbels and Korthagen 1990). However, there have been a number of very different concepts of reflection. Within the pedagogical context, reflection is referred to in connection with experiential (Kolb 1984; Korthagen et al. 2011), reflective (Gibbs 1988; Schön 1987), and professional or lifelong learning (Finlay 2008; Hatton and Smith 1995; La Boskey 1994; Shulman 1987). Marcos and Tillema (2006), and Marcos et al. (2011) carried out a meta-analysis of studies focused on reflection, and they pointed out that the majority of these studies are concerned with determining the level or type of reflection (e.g. Farrell 2004; Hatton and Smith 1995; Mezirow 1997; Zeichner and Liston 1996), or ways of thinking (Baxter 2004; King and Kitchener 1994). Very few of these studies provide information on the processes and techniques of reflection and its use in improving teaching.

This was the reason why we decided to examine the relationship between the quality of reflection and the quality of a teacher's performance. The quality of reflection was assessed on the basis of cognitive operations used by teachers in teaching, in accordance with Bloom's Taxonomy (Bloom 1956). The cognitive operations enabled us to observe the level of reflection—technical, practical, and critical (Day et al. 2007; Farrell 2004; Van Manen 1977). The technical level usually deals with the description of work, which is associated with the answer to the question "What is going on?" At the second practical level, evaluations of what is or is not correct are already emerging. At this level answers are sought to the questions "What is going on?" and "How is it happening?" At the critical level answers are already being given to what is happening and why. It is already an analysis of phenomena in connection with the social context or with scientific theories.

A teacher's performance and the professionalism of a preschool teacher

Since the end of the twentieth century, the quality of preschool education—or rather the quality of the educational processes—has been dealt with globally in the context of both the economic and the social implications for the child and society as a whole (Barnett 2008; Heckman 2011; Sammons et al. 2007; Sylva et al. 2004; Yoshikawa et al. 2013). A plethora of studies attempted to identify the signs of quality and efficiency in teachers. High-quality criteria for preschool teachers include, e.g. the knowledge of the curriculum (Sommer et al. 2010), the ability to create a multidisciplinary learning environment (Pramling and Pramling Samuelsson 2011), to integrate play and learning (Pramling Samuelsson and Carlsson 2008; Johansson and Pramling Samuelsson 2009), and to carry out partner and supporting interaction with children (Howes et al. 2003), but also among teachers (Elliott 2006; Sheridan et al. 2009). Generally, there is an effort to characterize the typology of professionalism of ECEC (Katz 1987; Oberhuemer et al. 2010; Saracho and Spodek 2007).

In the following text, a prototype view on teacher quality proposed by Sternberg and Horvath (1995) was the scientific standpoint for monitoring the quality of preschool teachers. It should be stated that it is not an empirically based model that characterizes teacher quality through a set of criteria attributes (in terms of Aristotelian logic),



which is why the authors talk about a view or perspective. The prototype view is based upon the idea of *family resemblance*. The authors of the prototype model assume that “the higher the similarity, the higher the subjective probability that the object falls into the category” (Sternberg and Horvath 1995, p. 10). The essence of the model is diversity in the skills of expert teachers, i.e. that various teachers can be called experts as each teacher can demonstrate a different level of quality or representativeness within a set of categories, among which there are no “clear” boundaries. The categories include (1) *knowledge*; (2) *efficiency*, and (3) *insight* (see Fig. 1). In other words, two expert teachers may resemble each other only a little even though each of them might resemble the prototype closely.

Even though there are not many studies that would verify the prototype view, a team of authors in the Czech Republic researching the expertise of foreign language teachers came to the same findings (Pířová et al. 2013). We therefore also decided to build on the prototype view. The evaluation tool *Framework of Preschool Teacher Professional Qualities*¹ (Syslová and Chaloupková 2015) was deployed to characterize quality and its key elements in the preschool teacher.

¹ Framework for the professional qualities of preschool teachers (Syslová and Chaloupková 2015) is a Czech evaluation tool intended for evaluating as well as self-evaluating the work of a teacher. Its core is made up of professional activities, in which the professional competences of a teacher are visible, and these are expressed as a set of knowledge, skills, attitudes, values, and personal qualities. Educational situations are expressed in the tool as criteria for quality in eight areas, i.e. planning of the educational situation, learning environment, learning processes, assessing the educational progress in children, reflection on education, school development, and cooperation with colleagues, cooperation with parents as well as the wider public and the professional development of a teacher.

The graphically depicted model of preschool teacher quality (Fig. 1), as well as the model of a foreign language teacher's expertise, is based on the perception of educational situations as interactions that are continually linked to each other like a chain. Every situation which takes place in a preschool facility, be it an interaction with a child in spontaneous play or an interaction in didactically aimed activities, is always determined by the professional insight of the teacher, which is based on the teacher's professional knowledge, more specifically the teacher's *knowledge of the field, knowledge of the children, didactic knowledge, professionalism, and deep reflection*.

The efficiency of a teacher's work and their expert/quality performance are determined by their ability to learn continuously through reflection on their experience. Reflection enables teachers to automate well-taught practices and, with less cognitive load, increases the efficiency of planning, implementation, as well as evaluation of educational processes. "Reflective teachers are teachers who use new problems as opportunities to expand their knowledge and competences" (Sternberg and Horvath 1995, p. 13).

Methodology

The research aimed to find out if teachers with higher reflective skills demonstrate higher quality in their teaching performance in the selected areas. The first phase of the research focused on investigating the quality of the teaching performance in selected areas. The selected areas were the psycho-didactic aspects and the psycho-social aspects of teaching. In order to better target the research, we chose the following research questions:

- What aims of education are formed by teachers in short-term projects?
- What quality is demonstrated in the individual performances of teachers in the selected psycho-didactic and psycho-social aspects?

The second phase of the research focused on researching the quality of reflection of preschool teachers. The following research questions specify partial research aims:

- What cognitive operations can be identified in the reflection of the teachers?
- What levels of reflection (Farrell 2004) are achieved by individual teachers?
- In the third step we compared the results of both the studies for individual teachers, and we formulated the following research questions:
 - Is there a relationship between the quality in the selected aspects of the teaching performance and the level of reflective skills?
 - Are there differences between the teachers educated at secondary schools and the university graduates?

The research sample included eight teachers. Originally, we sent the offer of cooperation to all the preschool facilities in the Czech Republic (approximately 4500). The reason for the final narrow choice was the need to obtain the consent of the teacher, the head teacher, as well as the parents from the preschool facility regarding the video recording, which proved to be rather complicated. Half of the respondents had completed only their secondary school education (hereafter Anna, Barbora, Dana, and Ema),

Table 1 Research sample

Teacher	Qualification	Years of teaching	Number of classrooms in the preschool facility	Number of children in the classroom
T1 Anna	Secondary education	3	3	23
T2 Barbora	Secondary education	5	3	17
T3 Dana	Secondary education	5	3	22
T4 Ema	Secondary education	5	3	23
T5 Hana	University education	4	3	24
T6 Jana	University education	5	3	23
T7 Lenka	University education	1	3	24
T8 Michaela	University education	3	3	22

and the other half had a bachelor's degree (hereafter Hana, Jana, Lenka, and Michaela). The teachers are introduced in greater detail in Table 1. During the video recording, all the teachers worked with the children themselves, with no others being involved. Some of them, namely Anna, Dana, Hana, Jana, and Lenka, reported previous experience with video recording either in their preschool facility or during their studies at university.

During the school year 2013/2014, eight video recordings were taken. As a rule, the recording lasted for approximately 100 min. In methodological discussions, it is often pointed out that the recorded lessons may not fully correspond to the way in which education is conducted under normal conditions, i.e. without the presence of a camera. We tried to monitor the problem of representativeness of the recorded lessons by means of a questionnaire filled in by the teachers after the end of the recorded session. The responses showed that the majority of the teachers described the course of the morning programme as typical or rather typical; they also described the behaviour of the children as typical in 88% of the sessions.

The obtained data were evaluated from the point of view of the extent to which the selected criteria of the quality of teaching performance were fulfilled in the areas of:

- *Psycho-didactic aspects*, i.e. the teacher: (1) presents the educational content as a problem (does not transmit ready information); (2) creates opportunities for thinking, for confronting various opinions and ideas; (3) connects learning with real-life situations; (4) formulates the educational aim, and
- *Psycho-social aspects*, i.e. the teacher: (5) asks open questions to support the development of higher levels of thinking; (6) gives children the opportunity to express their own experience, opinions, and ideas; (7) supports the efforts of each child and encourages them; (8) calls for and appreciates mutual help among children.

In order to ensure an adequate degree of objectivity (or reliability), the system of categories was verified by two researchers on 10% of the research sample. The inter-rater agreement was 87%. (For more details, see the Syslová 2017). The video recordings were analysed in the Videograph programme (Rimmele 2002).

The quality of the performance of the individual teachers was subsequently captured on a four-point scale (1–4). Individual points represent the level of quality in each category. One point means that the desired performance did not occur or only rarely. Two points were awarded for performance that showed minimal quality.

Three points stood for a standard performance. Four points belonged to above-standard performance in the monitored category, provided it was a typical performance of the teacher, i.e. used in the recorded session.

In the second phase of the research, we used semi-structured interviews, which were connected with stimulated recall over selected sequences of the video recordings.

The interview took place within approximately a week of the video being recorded, and the teachers were able to watch it. This text presents the analysis of the part of the interview that deals with the reflection on the video recording. The complete interview included, in addition to the part analysed here, also items (questions) concerning the support for teacher professional development in the preschool facility, and the routine and accompaniment of novice teachers.

As regards the part of the interview analysed in this text, our respondents' reflection was initiated through the following questions: "When watching the video recording, what did you feel and what did you learn about yourself?", or "Was there anything you would do differently?" After responding, the teacher was asked to watch a video-recorded sequence comprising controlled activities and to answer the question: "What was the aim of the activity?" The discussion stimulated through the video recording was relatively less controlled, and the teachers were given sufficient space to freely formulate their views in their answers.

The interviews were recorded on a dictaphone and then transcribed. They were analysed in the Atlas.ti programme. For coding the transcripts, we used the system of categories proposed by Pířová (2005, p. 145). The categories are based on cognitive operations (Bloom 1956), identified in teachers' reflection. The categories include *description*, *analysis*, *evaluation*, *proposing alternative solutions*, *generalization*, and *metacognition*. Again, the system was verified by two researchers on 10% of the transcripts; they showed direct agreements over 80% (for more details see the Syslová 2017).

In the third step, a holistic reading of the transcripts was carried out, and the agreements and discrepancies within each interview of each teacher were captured and compared with the real performance in the video recording. The notes subsequently served to assess the quality of reflection of individual teachers.

This was followed by axial coding, in which we created hypotheses about the relationships among the individual subcategories and categories. We tried to verify these not only within each individual interview (and look for the typology of reflection in individual teachers), but we also looked for a relationship between reflection and the quality of teaching performance ascertained in the analysis of the video recordings.

Results of the research on the quality of education in the selected areas

We present the results of the research first (a) from the perspective of selected aspects of teacher performance and (b) from the perspective of the professional performance characteristics of the individual teachers.

Selected aspects of teacher performance

In the prototype model of the quality of a preschool teacher, two aspects of a teacher’s actions in educational situations—the *psycho-didactic* and the *psycho-social* ones (see Fig. 1)—were determined. Table 2 summarizes the quality of the individual aspects of the performance of the monitored preschool teachers assessed on a four-point scale. For each item, the minimum and maximum observed values and the usual rates of central tendency are shown: mean value, modus, average, and standard deviation.

The table shows that the teachers reached the highest level of quality in *linking the selected topics with reality* (3). Moreover, the highly rated categories included *problem teaching* (1) and supporting *thinking* (5) in children. The lowest values were found in the category of *organizing the activities* and supporting children to be able to *express their opinions and ideas* in accordance with the constructivist approaches.

The **psycho-didactic aspects** were represented by categories of *problem teaching* (1), *opportunities to express opinions* (2), *linking learning with reality*, and (3) *formulating the aims* (4).

Problem teaching

The content of the education was expressed by most of the teachers as a *problem to be solved*. Problem learning was usually enabled by the character of the educational activities which were frequently carried out as group activities (Anna, Dana, Hana, Lenka, and Michaela), where there were 2–5 children. In addition to these group activities, teacher 6 (Jana) also organized cooperative activities where the children had to work together to achieve the desired result of the activity.

Opportunities for expressing opinions

The teacher also created opportunities for children to express their opinions. Another organizational form of fulfilling this requirement was the community circle organized by Hana: the children there shared their opinions and feelings about their morning activities. An example of verbal support for sharing among children was the frequent encouragement by Lenka: *Kristyna, did you tell the boys anything? Kristy, if you do not*

Table 2 Summary of the results of the analysis of selected aspects of teacher performance

Aspects of pedagogical performance	Psycho-didactic aspects				Psycho-social aspects			
	1. Problem teaching	2. Expressing opinions	3. Connecting with reality	4. Formulating aims	5. Supporting thinking	6. Children's opinions	7. Supporting effort	8. Mutual help
Minimum	1	1	2	1	2	1	1	1
Maximum	4	4	4	4	4	4	4	4
Mean value	1	1	4	1	3	2	3	2,5
Modus	3	1	4	3	3	2	3	3
Average	2.75	2	3.375	2.375	2.75	2.125	2.75	2.375
Standard deviation	1.165	1.195	0.744	1.061	0.707	0.991	1.035	1.061

like something, what do you need to say? Or: What will you do with the peg? How will you solve it? Or: What if you offer it to your friends—to see if they might have an idea?

Linking learning with real life

The content of the class curriculum in the individual visited preschool facilities was usually based on the events currently happening, e.g. *Christmas* (December), *Olympic Games* (February), *Birds in the spring* (March)—for teachers Barbora, Dana, and Ema. The choice of the content thus corresponded with the recommendations of the *Framework Educational Programme for Preschool Education*² to make use of “situations, which provide the child with comprehensible practical samples of life, so that the child learns skills and knowledge at the moment they need it, and thus better understands their meaning”, i.e. situational learning (RVP PV, 2016, p. 8). Other topics were, for example, *Family* (Anna), *My body* (Lenka), *Animals* (Hana and Michaela), *Books* (Lenka), where we failed to identify why they were included in the given period. For the topics *Family*, *My body*, and *Books*, the activities were based on the children’s experience and were realized through experiential learning.³ The majority of the teachers linked learning to *real-life situations*. The topic of Christmas corresponded with the time of Advent, and the children had the opportunity to observe the Christmas atmosphere both in the media and in the shopping centres. However, this topic, along with the topics of *Animals* and *Birds in spring*, did not draw on the children’s direct experience.

Formulating the aims

The highest level of quality in the category of *aims* was achieved by Lenka, as she was the only one who operated not only with partial educational aims, but also with evaluation indicators,⁴ according to which she assessed the achievement of partial aims in the preschool facility: *This week we focused on learning about the human body. We chose the competence or SUK (see footnote 3) which dealt primarily with knowledge of the human body, and then about the senses. But we really started by getting to know the human body from the basics, i.e. skeleton, muscles. However, because we were just starting, the children created a skeleton based on a book. I gave them sticks (from ice lolly sticks) and dark paper—so that it was easy to see. I prepared books on the human body, encyclopedias, and they tried to create a human body. However, it is true that I had it like that on Monday, and on Tuesday I gave them the opportunity to try to create it themselves.* The opposite extreme could be seen with Ema, who did not work with any of the target categories and whose intentions were to focus only on activities, i.e. what she would be doing with the children. The video recording shows that all the activities that the teacher prepared for the children were organized for the whole class without any choice (those who did not want to participate could just watch), and none of the key competencies were developed. It can be said that Ema did not purposefully plan the children’s development, nor

² State curriculum obligatory for all preschool facilities.

³ Experiential learning is described in detail in Curriculum Supporting Health in Preschool Facilities (Havlíková et al. 2006, p. 200).

⁴ SUK is an abbreviation of associated indicators used by preschool facilities in the Programme supporting health in preschool facilities to evaluate the results of education.

was she able to even to find out later what skills were being developed in the children through the activities.

The area of **the psycho-social aspects** consisted of categories of *supporting the child's thinking* (5), *finding out the opinions of children* (6), *supporting the child's efforts and appreciating them* (7), and *encouraging mutual help among children* (8). In the area of the psycho-social aspects, the highest quality performances of the teachers included *supporting the child's effort and appreciating it* and *supporting the child's thinking*. The weakest area within the psycho-social aspects was *the children sharing their opinions*.

Supporting the child's thinking

Children's thinking was supported by the teachers through cooperative activities (Jana), but also through problem teaching/learning (Anna, Dana, Hana, Lenka, and Michaela). Teachers' statements supported the thinking of the children either with the intent to hear the correct response (e.g. *How many starlings would fit in here?*—Dana; *What is it?*—Ema; *Where could he be living?*—Hana), or as an incentive for more elaborate responses using higher cognitive operations (e.g. *How will you solve it?*—Barbora; *What do you think?*—Hana, Jana).

Finding out the children's opinions

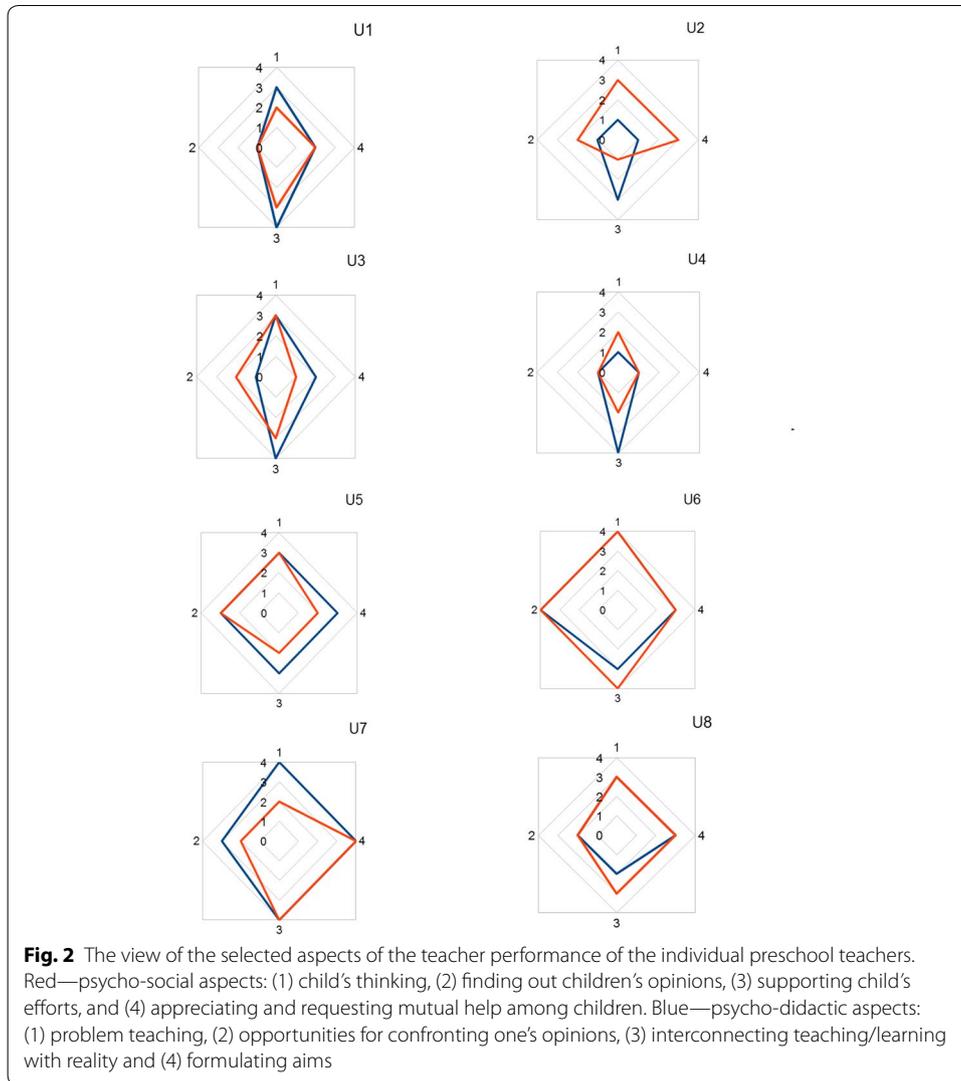
The most efficient teachers in this category were Hana and Jana. The latter encouraged the children to express their own opinions and experience in the discussion circle encouraging them to self-evaluate with questions like: *What did you manage to do? Are you satisfied? What do you think?* Hana encouraged sharing in the community circle with the following question: *Which activity did you like?*

Supporting the child's efforts and praising them

In this category, we identified that the most frequently used phrase was *try it!* However, the phrase was not used by Ema and Jana. Ema used only general expressions of praise such as *superb* and *great*. Similarly, Anna also used these quite often. Further general expressions were used abundantly, e.g. *excellent* (Dana, Hana, Jana, Lenka, and Michaela), and Jana often used statements such as: *You will manage. I believe that you will succeed. Next time you will succeed. I want you to succeed.* Lenka often concretized the statement *try it*, e.g. *Try it in another way. Try to think. Try it once more.* She frequently encouraged the children by further statements: *Good idea. Wow, here there is a tall chimney emerging!* Jana and Lenka encouraged the children the most. Barbora, on the other hand, just once used the statement: *Try to make it.*

Requesting mutual help

Mutual help among the children was supported mainly by Lenka, e.g. *It is fine to advise. So, give him another piece of advice. Filip, have you negotiated with your friends if you can borrow the toys? And we could certainly give a piece of advice to Kiki.* She was the only one who praised the children when they helped another child, e.g. *Good, I like to hear that you have advised him, that it did not have to be me who came. You advised him really well.* She was the only one to go over to the children and say: *Can I share with somebody? Maybe offer it to the others?*



The view on the teacher performance of the individual teachers

The assessment of the teaching performance of the individual teachers is summarized in Fig. 2. We can see that individual teachers achieve different quality of their performance in the area of psycho-social aspects (red graph) as well as in the area of psycho-didactic aspects (blue graph).

Figure 2 shows the differences in fulfilling the criteria in both the researched areas (psycho-social and psycho-didactic) in the individual teachers. A higher level of fulfilment can be seen for teachers Hana, Jana, Lenka, and Michaela. A significant difference in the category fulfilment between the two areas can be seen with Barbora.

The comparison of teaching performance between individual teachers allowed us to set up the order (Table 3), which we used to compare the findings on reflective skills of teachers. The highest level of quality in the monitored aspects of teaching performance can be seen with Jana and the lowest with Ema.

Table 3 The comparison of the results of analysis of the selected criteria of teacher performance in the individual teachers

Teachers	Psycho-didactic aspects				Psycho-social aspects				Total	Order
	1	2	3	4	5	6	7	8		
T1 Anna	3	1	4	2	2	1	3	2	18	6
T2 Barbora	1	1	3	1	3	2	1	3	15	7
T3 Dana	3	1	4	2	3	2	3	1	19	5
T4 Ema	1	1	4	1	2	1	2	1	13	8
T5 Hana	3	3	3	3	3	3	2	2	22	3
T6 Jana	4	4	3	3	4	4	4	3	29	1
T7 Lenka	4	3	4	4	2	2	4	4	27	2
T8 Michaela	3	2	2	3	3	2	3	3	21	4

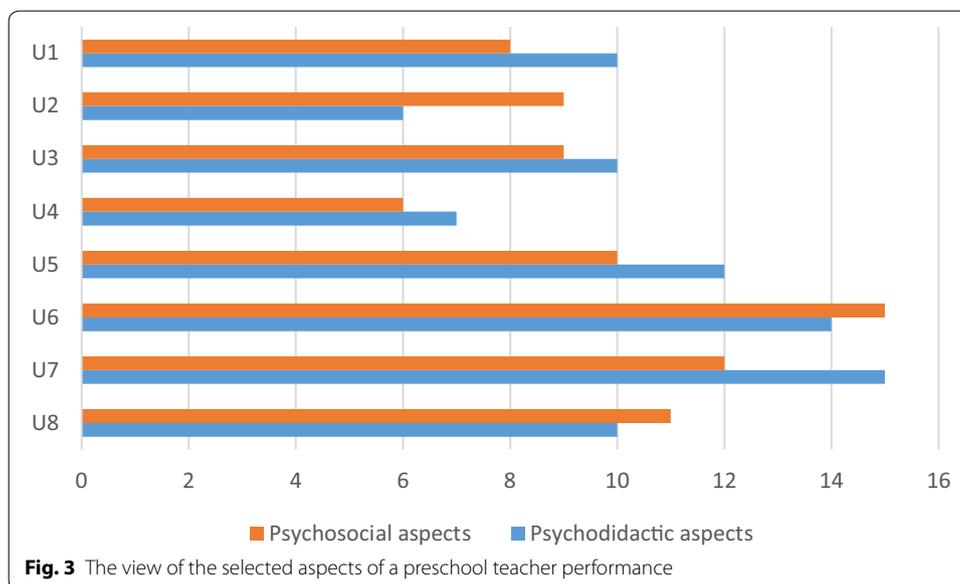


Fig. 3 The view of the selected aspects of a preschool teacher performance

We can use Fig. 3 for a better comparison of the teaching performance of individual teachers in both monitored areas (psycho-social and psycho-didactic) as it shows the summary of results of the fulfilment of the individual categories. In the psycho-social field, Jana showed the highest quality and Ema the lowest. In the psycho-didactic area, we observed the highest quality in Lenka and the lowest in Barbora.

The results of the research aimed at finding out the level of reflective skills

The following text intends to offer the reader insight into the thinking of preschool teachers as this was analysed from the point of view of cognitive operations according to Bloom’s taxonomy. These operations include *description, analysis, evaluation, proposing alternatives, generalization, and metacognition* (see Syslová 2017). By regular “looking back” at one’s own experience (initially with support), the teacher learns to think about his/her actions, to name and describe educational reality, to analyse his/her approaches, evaluate his/her intentions, their implementations as well as the

Table 4 The quality of reflection from the point of view of thought operations

Teacher	Description	Analysis	Evaluation	Alternatives	Generalization	Metacognition
T1 Anna	X		X			
T2 Barbora	X	X		X		
T3 Dana	X	X	X	X		
T4 Ema	X		X			
T5 Hana	X	X	X	X	X	
T6 Jana	X	X	X	X		X
T7 Lenka	X	X	X	X	X	X
T8 Michaela	X		X	X		

results of his/her activity. In this constantly repeating process, the teacher’s reflective skills develop to the level of metacognition, which we consider to be qualitatively the highest.

The results of our analysis are processed into Table 4 for better clarity.

If we look at the table in the vertical direction, we can see that only one teacher filled all the categories and two teachers reached the threshold of metacognition. Anna and Ema both operated only in the description and evaluation categories. Their evaluation typically shows the absence of an analysis phase and, when making assessments on the basis of the video recording they offered unconscious, intuitive evaluations of the educational situation.

From the horizontal point of view, it was positive that most of the teachers were able to propose more effective strategies for reaching the educational aim. However, we could not determine to what extent the teachers would use these strategies in their everyday practice, because the interviewer’s questions led them to a deeper insight into their actions and analysis of their approaches, and in some cases, the discovery of new connections was noticeable.

Sometimes, however, even the research questions did not lead to a deeper analysis or new proposals or strategies. For example, Ema described a conflict that had taken place during the video recording: *Fany, yes, he was misbehaving, he was running the car on the table and hurting other children, so I made him sit down at the table.* However, when asked to describe the feelings of the child by the researcher, the teacher reacted: *Well, he always cries ... I did not have time to deal with it because I had to pay attention to the children at the table ...* This example shows the level of action and looking back at the action without adequate analysis. Concurrently, the teacher’s direct work with children is a signal that individualization of education is not sufficiently supported.

The finding that some of the teachers used hierarchically higher cognitive operations without using the lower ones (e.g. Anna, Ema, and Michaela evaluated without prior analysis) made us think. This finding can be interpreted in several ways. One of them is the possibility that the teachers just did not verbalize some thought processes, i.e. they did not express them out loud. Another reason may be that previous levels of cognitive operations, especially the first of them (description), did not meet the required characteristics (Slavík and Slavík 2007). We assumed this to be the case when the statements of the higher thought operation (evaluation) were very subjective.

When reflecting upon the video recordings, we frequently encountered evaluative statements which had either positive or negative value. The positive evaluation statements by the teachers expressed their satisfaction with their own work (e.g. Ema: *Everything that I had planned was done successfully*), satisfaction with the behaviour of the children (e.g. Barbora: *All the children showed interest*; or Lenka: *I was pleasantly surprised due to the fact that I had thought there would be many negatives, that I would see that the children would behave differently behind my back. And I saw that the children were reacting normally, the way I think they do*), and contentment with their interaction with children (*the children reacted wonderfully to me—Jana; I used effective communication—Lenka; I entered the game as their game partner—Michaela*).

Hana, Jana, Lenka, and Michaela were aware of their strengths and their progress in the development of their professional skills. For example, Teacher 7 (Lenka) improved her communication by using “I statements” and giving feedback to children and changed the organization of education from whole-class activities to group activities. They used theoretical language and its terminology much more frequently such as pedagogical diagnostics, evaluation, effective communication, competence, etc. There were also words of dissatisfaction by Hana, Jana, Lenka, and Michaela related to their realization that the children were not developing skills in accordance with the target categories. For example, Hana: *So, when there is a problem, I try to solve the problem for the children. I do not give the children the opportunity to express themselves. I noticed one sequence where they were sort of playing with building blocks, they were putting them together, and there was a disagreement, and I had the tendency to go and settle it too fast.*

The interviews showed that higher levels of cognitive operations are used by teachers who had previous experience with focused reflection (e.g. in their pre-service teacher training, during their visits to preschool facilities) and were familiar with some reflective techniques (work with video recordings). Pišová (2005) came to the same conclusions in her research.

The results of the analysis of the semi-structured interviews revealed that the reflection demonstrated by Dana and Michaela was rather at the practical level, while the reflection of teachers Anna, Barbora, and Ema was at the lower technical level (Farrell 2004). Teachers Hana, Jana, and Lenka reached the critical level of reflection. In the case of Jana, we attributed the achievement of the highest level of reflection to her initial teacher education, as she mentioned that she had already used video recordings for self-reflection, while she was at university. In the case of Lenka, her high level of reflection was attributed partly to her initial teacher education, but also to her working environment. In the preschool facility where she works, reflection is promoted and teachers are consistently encouraged to improve the quality of their professional performance through observing and being observed (about the headmistress: *When she comes to observe, first she wants us to self-evaluate. How we saw ourselves. And only after that does she add her opinion, or what she liked, or what space for improvement she can see. But overall, in everything we are talking about she wants to know our opinions, our feelings.*)

Comparing the findings from both the phases of the research

At this stage of the research, we posed two research questions (a) whether there is a relationship between the quality of the selected aspects of teacher performance and the level of reflective skills, and (b) whether there are differences in teaching performance and the

level of reflection between the teachers who had completed only secondary education and the university graduates.

The following text is structured in accordance with the research questions. In the first step, we will introduce the results of the comparison of the relationship between the quality of the selected aspects of teacher performance and the level of the reflective skills. After this, we will compare the research results between the teachers who had completed only secondary education and university teacher education.

The relationship between the quality of selected aspects of teacher performance and the level of reflective skills

The nature of the in-depth study is typically associated with a smaller research sample. The same was the case in this study, which is why it is not possible to compare the results of research focused on the quality of teacher performance and the results of research focused on the quality of reflection quantitatively. Therefore, we compared the results only in the case of the teachers who fulfilled the examined categories of teacher performance to the highest and lowest extent, i.e. teachers Jana and Ema.

Teacher 6 (Jana)

Jana achieved the highest level of quality in both areas of teacher performance, although she did not score the most in the categories *linking teaching/learning with real life, aims, and children's mutual help*. Her teaching performance was characterized by a high level of support for children in expressing their opinions and experience. She was the only one out of the participating teachers who supported children in self-evaluation (*What have you learned? How did you resolve it? What did you succeed in?*). She preferred cooperative group activities and frequently asked children to negotiate together (*You have to tell each other*).

Asking open questions, cooperative forms of education and assigning tasks as problem-solving encouraged children to use a higher level of cognitive operations and led them to greater autonomy and mutual respect and consideration, as clearly shown in the video recording of the morning activities. The teacher used active listening and positive non-verbal communication. She expressed trust in children (*I trust that you will succeed*) and appreciated their performances. Her approach can be described as socio-constructivist.

When reflecting on the video recording, she was able to operationalize the more general aims of education (*The aim of the group activities was to introduce letters, and furthermore, there was cooperation among the children and they practised fine motor skills in the context of putting the letters together, and also speech production, as there they had to talk it through and also think up the words using a letter which they had chosen*).

Her self-reflection reached the critical level (Farrell 2004). As she states, she uses specific techniques of self-reflection, such as video recordings, which served to verify the effectiveness of the organization forms, e.g. *When I am thinking of a circle and we are all in the circle together, I have twenty-five children, then two children respond and the rest are staring at something. When they are in a smaller group then all of them have to communicate and when they have to choose their leader, for example, then they have to negotiate. So they develop the competences that are needed for that*. Video recordings also

help her track the development of her own communicative competence over time, e.g. *The first [video recording] is different, I have to say, and better, I consider it to be a success and also the communication there is much better. I think that I said "excellent" about a thousand times there, and not "you are succeeding". So I can see that in my communication there is a significant difference.*

She also uses reflection in action when it serves to quickly evaluate the situation and decide to choose a more appropriate alternative (*I had planned it in a way, let's say, together in a circle, and then I realised that in a smaller group it is better, so I left them in the smaller group. I realized that the other four groups would not care what words they came up with, and that the activity was much more important in the group than in the whole class.*)

Jana achieved the highest score in both of the areas (psycho-social and psycho-didactic) of teaching performance. Furthermore, her reflection proved to be at the highest level. The teacher demonstrated a high level of quality in both her teaching performance and in the reflective skills.

Teacher 4 (Ema)

Ema reached the lowest level of quality in both areas of her teaching performance. Five criteria out of eight were scored by only one point, i.e. she showed very low quality in those aspects of her teaching performance.

A characteristic feature of her performance was whole-class teaching. The children spent most of the time in their morning activities in their preschool facility with the teacher. Also, the self-service activities linked with the organization of their morning snacks were teacher-controlled as illustrated in the communication of the teacher (*We will go to the toilet and wash our hands. Slowly and go to the queue. Is it clear?*). In her communication, instructions and requirements prevailed (*So, children, sit down*) with an absence of space for the children to express their own opinions or needs. The questions that the teacher posed were mostly directed towards finding out children's knowledge (*What is it? What do you call it? But mainly what?*). In the interactions with the children, general statements such as *great* and *superb* appeared abundantly.

Neither the organization of the learning/teaching processes nor the communication skills of the teacher invited the children to help each other, cooperate, or share opinions, nor did they encourage the use of higher levels of cognitive operations. Her approach may be described as prevalently transmissive.

The highest level of quality evaluated by four points was achieved by the teacher in the category of linking learning to real life. The topic in the recorded session was about the ongoing Olympic Games in Sochi. The interview revealed that she had chosen the topic not only for its topicality, but also on the basis of her knowledge of the children (*I was surprised that the children were watching the Olympic Games, and even at night! And how much they knew about it.*)

Emma's reflection remained at the technical, i.e. the lowest level, for which the description corresponding with the question of what is happening is typical. Although her reflection included evaluative statements, they were usually only intuitive opinions unsubstantiated by a quality analysis of the pedagogical phenomena.

Ema achieved the lowest scores in both areas (psycho-social and psycho-didactic) of her teaching performance. Also, her reflection oscillated at the lowest, i.e. technical level. She showed a very low level of quality in both her teaching performance and reflective skills.

Differences in the teaching performance and the level of reflection between the teachers who had completed only secondary education and the university graduates

The findings on the quality of teaching performance suggest that teachers Anna, Barbora, Dana, and Ema, who had completed only secondary education, show lower overall category fulfilment (see Table 2 and Fig. 2). Due to the small research sample, the findings cannot be generalized as the level of the individual teachers in the selected aspects (categories) differed significantly. Interestingly, in the category of linking teaching/learning with real life, three teachers who had completed only secondary education achieved the highest score. However, the four teachers who had completed only secondary education hardly ever demonstrated achievement in two categories, i.e. *the opinions of the children* and *confronting opinions among the children*. These teachers, in favouring whole-class organization and individual fulfilment of tasks, did not enable the children to share their opinions, negotiate, or argue regarding their decisions, etc.; moreover, the teachers' communication skills did not support the children in sharing their opinions, ideas, or needs.

More marked differences between the two groups of teachers were observed at the level of reflection (see Table 3). Half of the secondary school educated teachers oscillated at the technical level, and the second half at the practical level. Their reflection showed lower levels of cognitive operations when compared with the university graduates. As a rule, what was lacking were proposals of new options and strategies that could be used to educate children, and they also showed a certain quandary regarding how to interpret what they saw in the video recording.

In the case of the secondary school educated teachers, a significant phenomenon appeared on the surface, which we named *uncertainty*. For example, *Maybe something can be done in another way* (Anna); *I did not know how to react* (Barbora); *I do not know, but I think that I have a nice relationship with the children* (Dana); *I was searching for what is right* (Ema).

In both groups, the teachers showed an effort to explain why they could not fully meet the requirements of the contemporary preschool education linked with the personal development of a child. For example, *The right thing is to let children create on their own but I had an aim, ...* (Barbora); *We cannot do it because we have a lot of children ...* (Dana); *I know that a trend is a trend ...* (Hana); *I cannot do it in another way, the children cannot be alone ...* (Lenka).

Both groups, i.e. the teachers who had completed only secondary education and university graduates, related the criticism of their work to their professional skills, for example, the criticism of problem-solving (Lenka), or the criticism of prioritizing his/herself over the children (Hana: *I sometimes have quick reactions in the sense of advising the child, explaining, by which I do not enable them to discover, create or solve ...*) or the criticism of their communicative skills (Anna: *I speak properly*, Dana: *I keep using the same words*). The teachers who had completed only secondary education were more

concerned with themselves (*I see myself differently, I am static, nothing much...*). Anna was also critical of the children (*The children were very noisy*).

Suggestions for improvement that the teachers thought about were interesting. Usually, they were not based on the identified shortcomings. This finding was observed in both groups. Teachers Anna, Barbora, and Dana expressed their desire to motivate the children better, to lower their position, to be more positive, and to give the children feedback. Lenka wants to lower her position to be closer to the children (*it must be unpleasant for them*), Jana wants to describe more, and Michaela wants to broaden her theoretical knowledge in the field of educational diagnostics and evaluation.

Summary and discussion

The research focused on monitoring the quality of teaching of preschool teachers in the selected areas and monitoring the quality of their cognitive operations within their reflection. Its aim was to ascertain whether there is a relationship between these variables and whether there are differences between those who had completed only secondary education and university graduates.

The findings of the study may contribute to the international discussion on the quality of preschool education, since the study is closely linked to the criteria formulated by the Working Group on Early Childhood Education and Care under the auspices of the European Commission (2018, p. 8). The Working Group call for: “well-qualified staff whose initial and continuing training enables them to fulfil their professional ‘role’ and ‘supportive working conditions including professional leadership which creates opportunities for observation, reflection, planning, teamwork and cooperation with parents”.

Our study focused on the quality of teaching performance brought findings about the selected psycho-social and psycho-didactic aspects of a preschool teacher’s work. The nature of communication and the processes of content design influence the quality of the processes of educating preschool children. Children’s learning that takes place in a preschool classroom is determined by the quality of the performance of a teacher (e.g. Janík et al. 2013, p. 162; Píšová et al. 2013, p. 27). Therefore, these became the subject of our investigation.

The best performance was achieved by both the groups (secondary and tertiary educated teachers) in the psycho-didactic area in the category of *linking content with real life* (No. 3) (see Fig. 2). We consider the finding to be very positive as it corresponds with the specifics of preschool children and their education.

Most teachers (except for Ema) digressed from whole-class activities and created opportunities to work in smaller groups. Teachers who had completed only secondary education found it particularly difficult to support their children in communication, sharing opinions, and confronting each other, which, however, is the core of the socio-constructivist approaches. In this aspect, the results for both the groups (teachers who had completed only secondary and those with tertiary education) differed the most (see Table 3). All the teachers who had completed only secondary education scored only one point in the category *confronting opinions* (No. 2). Although Anna, Barbora, and Dana offered activities during the monitored morning programme to individual children and groups (i.e. they departed from whole-class teaching), they were not able to activate their

children to cooperate and to develop their communicative, social, and problem-solving competences, etc.

The positives that are brought by the interaction among the children and by cooperative learning were confirmed by Shonkoff and Phillips (2000), in Litjens and Taguma (2010, p. 32) who claim that “interaction with peers and incentives for independent thinking and self-regulation have a positive impact on children’s IQ as well as their communicative competences”.

Great differences have also been noted in the ability of the teachers to formulate aims, i.e. to specify them towards the needs of the children and the chosen content of education. Among the university graduate teachers, we registered skills of anticipating classroom events and long-term planning (in broader contexts). Their planning, but also implementation of plans, was usually directed purposefully towards the development of the child’s personality. For those who had completed only secondary education, it was more characteristic to direct the content to the aims of preschool education.

Another situation could be observed in the psycho-social area. In the categories of this area, the level of quality of both the participating groups was more balanced (see Table 3). More obvious differences can be seen more for the individual teachers than across the groups (of the university graduates and those who had completed only secondary education).

The results indicate that university educated teachers achieved almost all aspects of higher quality in their teacher performance. Their better preparedness in the psychodidactic area seems to provide more self-confidence, thus freeing their mental capacity for greater focus on the preschool child, empathy, etc. The findings correspond to some other studies, which suggest that teachers with higher education are more responsive to children and have more positive interactions with them (e.g. Howes et al. 2003). They are also more capable of creating a rich stimulating environment, which leads to better educational results (e.g. Litjens and Taguma 2010).

The observed quality of reflection was assessed on the basis of a sequence of cognitive operations identified in the preschool teachers’ statements. We realize that it was difficult for the teachers to verbalize their thinking, and some of them encountered problems realizing their strengths and weaknesses (e.g. Barbora). A higher level of quality, the critical level of reflection, was recorded among university educated teachers.

They were able to argue their professional performances with respect to children’s performance with the support of the *Framework Educational Programme for Preschool Education*. Those who had completed only secondary education usually did not reach the level of proposing alternative solutions, and none of them reached the level of generalization or metacognition. Three of them oscillated only at the technical level, and only Dana reached a higher level, that of practical reflection.

Although it was a very small research sample, the results are consistent with other studies (Griffin 2003; Leijen et al. 2014; Syslová 2015), suggesting that educators working in preschool facilities think about their work mainly at the technical level, only 1% at the critical level (Pihlaja and Holst 2013, p. 188).

We compared the results of the individual teachers from the perspective of the prototype view on the quality of a preschool teacher’s work, and we demonstrated them on the profiles of Ema and Jana. These teachers were selected on the basis of their bipolar

results in the quality of their teacher performance. The results show that the teachers whose performance showed high quality also demonstrated a high level of reflective competence, whereas teachers with weak performance showed reflection at the lowest level.

The area of the relationship between teaching performance and the level of reflection is one of the less studied phenomena, which is why it is difficult to find any support for this claim in appropriate studies. There are, however, voices critical of such a claim. For example, Ripley (2010), building on the experience and data from the *Teach for America* programme, came to an opposite conclusion that rather than reflection, resilience seems to be the decisive factor for teacher professional development and thus for the quality of teaching performance. Her research differs in the selected procedures as well as its aims, which may be the reason for the differences in the conclusions.

Conclusion

This study with its focus and findings is consistent with the European Commission statement “that better educated staff are more likely to provide high-quality pedagogy and stimulating learning environments, which, in turn, foster children’s development leading to better learning outcomes” (European Commission 2014, p. 28). Our results suggest that teachers with higher education are more efficient in (a) planning their future activities, i.e. anticipating the events in the classroom, compared to the “lay” ad hoc solutions of situations based either on intuition or advice from others; (b) making conscious decisions about the approach to children and about educational methods, aimed at the development of the child’s personality for which the teacher takes responsibility; and (c) reflective skills, i.e. awareness, describing, explaining, evaluating, and practical experience with the use of professional language shared by the professional community (*lege artis*), in other words, sharing one’s understanding of and insight into one’s professional actions and their justification.

Our findings correspond to the results of the research on teacher expertise conducted in the same context, i.e. in the Czech Republic (Píšová et al. 2013, p. 40–44). They build on and support the prototype view of teacher quality in the sense that teachers’ beliefs about children, content, educational strategies, but also about themselves, are reflected in their behaviour. In other words, (university-)educated teachers demonstrate a high degree of congruence between the outcomes of professional insight, which includes deep reflection, and outcomes in the form of professional actions in educational situations.

Obviously, when reflection is limited to mere self-awareness and is not supported by deeper analysis, i.e. reflection based solely on subjective theories, we cannot expect any significant changes in a teacher’s actions, especially in more complex situations associated, e.g. with individualization of education.

This study has its limitations. It is a small-scale study with a modest research sample. The number of teachers is too low to allow for any general conclusions. Furthermore, the analysis of the video recording from only one morning session in a preschool facility may be limiting (or even slightly misleading in terms of typicality of actions).

Even though we are fully aware of certain limitations, we believe that our findings brought further information for the discussion on the quality of preschool education, and professionalism of preschool teachers, and thus contributed to the state of

knowledge in this field. Arguments in favour of university-based reflectively oriented pre-service education of future preschool teachers were formulated. Hopefully, our research may also help other researchers when aiming at the identification of the specifics of a teacher's performance at preschool level.

Authors' contributions

ZS designed the study, participated in discussing the results and revised the manuscript. Journal Board performed the assays and prepared the manuscript. ZS conducted the optimization and assay validation studies. All authors read and approved the final manuscript.

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