

THE OPINIONS OF PRE-PRIMARY EDUCATION TEACHERS ON THE ADVANTAGES AND DISADVANTAGES OF HETEROGENEOUS AGE GROUPS

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Abstract

The research focuses on the issue of mixed-aged children in nursery schools. The aim of the research was to find out the opinions of the nursery school teachers on the advantages and disadvantages of a heterogeneous age groups based on their practical experiences. In order to find out the opinions of the respondents, a questionnaire was constructed and used. Based on the results, it can be said that 243 respondents consider an advantage to be the better social and emotional development of children, regardless of whether the respondent prefers to work in a homogeneous or heterogeneous age group. However, they did not agree with the disadvantages of heterogeneous age groups. The respondents teaching homogeneous age groups have generally identified far more disadvantages, and the greatest disadvantage being that children in a heterogeneous age group have worse conditions for cognitive development and do not have the opportunity to compete with each other. It has also been confirmed that those respondents with more years of work experience prefer a more heterogeneous age composition of groups than respondents with fewer years of work experience.

Keywords: *mixed-age groups, nursery school, nursery school teacher, pre-primary education.*

Introduction

The pre-school age is crucial to the development of every person's personality. In this period, the so-called window of opportunities is open for the acquisition of different abilities; the foundations for the development of intelligence and psychomotor skills are built and a social relationship with other people is emerging. It is important that all aspects of a child's personality develop in a balanced way, so that an emphasis is not only on the cognitive aspect, at the expense of the socio-emotional and psychomotor aspects. For this reason, an important role

in the development of the child's personality is also played by the environment of the nursery school and the organisation of the education, in terms of the homogeneity of the groups.

Theoretical Starting Point of the Studied Issue

Peter Gray, an American psychologist, who studied the self-education of hunter-gatherer children in primitive tribes from an anthropological point of view, concluded that child education is more effective when children are in mixed-age groups. The researcher recommended that mixed-age groups were also applied in the current education system (Gray, 2008). Concerning the issue of age-homogeneity, the researcher stated: *"One of the most bizarre and, from my point of view, the most harmful aspects of our treatment of children, is our interest in segregating children into separate age groups. We do it not only in school, but also in extra-curricular environments, thus depriving children of a valuable component of their natural means of self-education"* (Gray, 2013, p. 58).

In this research, the concept of a *heterogeneous age group (HeG)* designates nursery school group (class) with children of different ages from 3 to 7 years old, and the concept of a *homogeneous age group (HoG)* designates group with children of the same age category, e.g. 3-4 years old, 5-6 years old, etc.

The division of children into a HeG in school classes has its origins in the reform education of the 20th century (Montessori, 2004; Kovalik & Olsen, 1993; Petersen & Walberg, 1979). The emergence of many alternative schools was a response to traditional education, in an attempt to create educational institutions, which would provide a better quality of education. The emerging alternative schools have been distinguished from classical ones by several features, for example, goals, content, didactic methods and formats, including the formation of heterogeneous age groups.

From classical alternative schools, M. Montessori (2004) can be mentioned, where the children's relationships are not marked by rivalry and competition; on the contrary, in a HeG, they strengthen mutual relationships through free cooperation. The older children spontaneously share their knowledge and skills with the younger ones; the younger children find help and support in the older ones if needed. Their coherence is also supported. The advantage is that older children, who want to help or explain something to the younger ones, have to structure their knowledge and try to communicate with them in a more understandable manner, thereby expanding their own comprehension of skills, while strengthening self-confidence (Montessori, 1972).

Another classic alternative school is the Jenaplan School, which is characterised by a family atmosphere; it prepares the children a naturally stimulating environment, so that they would be able to develop freely (Petersen, 1979). Children are divided into the so-called tribal groups combining two or three years, thus creating natural groups on the basis of voluntary and free grouping.

Although many of the classical alternative schools do not explicitly insist on creating a HeG, nonetheless their principles provide the right conditions. E.g. Waldorf School, Dalton Plan or Freinet Pedagogy (1993) emphasised collaboration in groups; they prefer to create social positive relationships and mutual help, more than competitiveness (Clanfield & Sivell, 1990), which creates an opportunity for a HeG.

From the modern alternative schools, the model of Integrated Thematic Teaching, according to Kovalik (Kovalik & Olsen, 1993) can be referred, which promoted teaching in a HeG (Gejdoš & Graham, 2016). Among its basic principles, the open school included, learning from one another, cooperation and communication, so instead of the traditional child divisions by age, was preferred to create a HeG. A HeG is typical for cooperative teaching, in which children of different abilities, sexes, ethnic backgrounds and social groups worked together (Johnson & Johnson, 2018), according to the options of the school and their age.

From other alternative concepts supporting free play and a HeG, one can mention free schools, for example, the model of anti-authoritarian education by Neill (1995). In 1921, he founded a school that up until the present day operates on the same principles. It is attended by hundreds of learners of different nationalities, aged 5-18. Sudbury Valley schools around the world are working on similar principles (Greenberg, 1992).

At present, the trend of pre-primary education is to create an inclusive environment (Chepel, Aubakirova, & Kulevtsova, 2016), where any diversity, whether in terms of nationality, race, language, social environment or disability, is not only accepted, but even welcomed. A HeG can be especially of benefit to the effective work of an inclusive school.

A heterogeneous age class allows the child a wider range of social connections. Every child, when he is three or four years old, tries out the role of a freshman during the attendance of a nursery school and lets the older children advise and guide him. Later, when he reaches 5 or 6 years, he has the opportunity to experience the role of a younger child's guide, protector and supporter. The child also has the opportunity to observe more behavioural patterns than in a HoG.

The creation of a HeG also has its disadvantages, especially in a classical education movement, where it is necessary to pay attention to the fulfilment of the prescribed content and performance standards. Teachers have a more demanding preparation and organisation of teaching.

Researched Issue

The researched issue started out from verified hypotheses that the respondents - nursery school teachers who taught in homogeneous age groups - would still choose to teach a homogeneous age group. Likewise, teachers who taught in heterogeneous age groups, would rather choose to teach in a homogeneous age group (Hul'ová, Rochovská, & Klein, 2018). The respondents' opinions are, therefore, very different from those of most experts, so the topic of age homogeneity groups in nursery schools can be considered current. The opinions of experts on the importance and benefits of heterogeneous age groups in nursery schools are consistent with another validated hypothesis in the aforementioned research. The respondents teaching heterogeneous age groups see more benefits of such divisions compared to the respondents teaching homogeneous age groups. Also, in this research, it was found that younger respondents preferred homogeneous age groups more than the older ones. The age of the teachers is generally related to the number of years of their teaching experience. Older teachers with more years of experience have more work experience and can more appreciate the benefits of bringing children into heterogeneous age groups (Hul'ová, Rochovská, & Klein, 2018).

For these reasons, the research questions were: 1. Whether there is a statistically significant difference among the respondents favouring a HeG and the respondents favouring a HoG in the opinions related to benefits of a HeG "children have better conditions for social development" and "children have better conditions for emotional development"; 2. Whether there is a statistically significant difference among the respondents favouring a HeG and the respondents favouring a HoG in the opinions related to disadvantages of a HeG "children have worse conditions for cognitive development" and "children do not have the possibility to compete with each other"; 3. Whether there is a statistically significant difference between the respondents with a higher number of years of work experience and those with a fewer number of years of work experience in terms of preference for a HeG.

The Aim and Hypotheses of the Research

The main aim of the research was to find out the opinions of the nursery school teachers on the advantages and disadvantages of a HeG. From the main aim of the research, partial goals came about:

1. To find out what advantages the teachers see from teaching in a HeG.
2. To find out what disadvantages the teachers see from teaching in a HeG.
3. Compare the advantages and disadvantages of a HeG, in the opinions of those teachers who prefer a HoG.
4. Compare the advantages and disadvantages of a HeG, in the opinions of those teachers who prefer a HeG.
5. Compare HeG preferences among the teachers, according to their years of work experience.

Based on the research aim and on the basis of a research with similar problematics (Hul'ová, Rochovská, & Klein, 2018), the hypotheses were formulated:

1. Among the respondents favouring a HeG and the respondents favouring a HoG, there is a statistically significant difference in the number of marked benefits of a HeG, with the respondents favouring a HeG considering "children have better conditions for social development" and "children have better conditions for emotional development".
2. Among the respondents favouring a HeG and the respondents favouring a HoG, there is a statistically significant difference in the number of marked benefits of a HeG, with the respondents favouring a HoG considering "children have worse conditions for cognitive development" and "children do not have the possibility to compete with each other".
3. Between the respondents with a higher number of years of work experience and those with a fewer number of years of work experience, there is a statistically significant difference in terms of a HeG, in favour of those respondents with more years of work experience.

Research Methodology

General Background

This research was carried out between November 2017 and December 2018. It was part of the larger project entitled "*Advantages and disadvantages of heterogeneous age groups from the perspective of nursery school teachers*". Some findings from this project, regarding teachers' preference of age-homogeneous or heterogeneous classes have already been published (Hul'ová, Rochovská, & Klein, 2018). In this larger research project, a questionnaire, a semi-structured interview and a direct unstructured observation were used as research methods to find out the opinions of the respondents about the issue. In the non-structured interview, the respondents freely expressed their opinion about the issue. The researchers also conducted an observation of the educational activities at four nursery schools, which divide children into HoG and HeG.

Instruments and Procedures

A questionnaire was used to find out the opinions of the respondents. The questionnaire contained 8 questions; 5 questions were evaluated for the purposes of this research. These were items featuring the choice of response with different options offered, while the respondents had the option to give another answer for each item.

The respondents indicated whether they are teaching in a class with a HoG or a HeG, and whether they would choose to teach in a HoG or a HeG, if it was within their power. In the other two items, they have chosen from several options, the advantages and disadvantages that they see in HeG teaching. The advantages and disadvantages were formulated on the basis of the theoretical starting points of the given issue (Evangelou, 1989; Gray, 2008; Greenberg, 1992; Salcedo, 2018). They are listed in the legends of Figures 1 and 2. In addition, the respondents could also mention other advantages and disadvantages that they did not find in the options offered. At the end, the respondents reported the number of years of their teaching work experience.

The questionnaire was designed by researchers for the purposes of this research, so its expertise and pilot testing were necessary. Five experts in the area of pre-school education have commented on each item in order to assess its constructive and content validity. Each item was assessed on a scale of 5 (relevant) - 0 (irrelevant). The result was expressed as a percentage. (90%).

Due to the smaller scale of the research tool, it is necessary to realise its lower reliability, however, the benefit is the good homogeneity of the research tool, because it measures one attribute, and the items are close to each other due to their content (all are related to age group homogeneity within a nursery school).

A constructed questionnaire was pilot tested on a sample of 20 kindergarten teachers. After filling out the questionnaire, they were commenting on whether the instructions concerning the answering of the question could be well understood, whether the questions were linguistically correct, easy to understand and logically organised, whether some questions were redundant and whether the questionnaire was sufficiently motivating for nursery school teachers. Based on the answers by the respondents in the pilot testing, serious adjustments were not required. Subsequently, a pre-survey was carried out with the aim to eliminate minor mistakes, which have been overlooked in the pilot testing, as well as to test the statistical processing of the results.

The questionnaires were administered personally, electronically and online through social groups.

Sample Selection

The respondents took part in the research on a voluntary basis, which they have confirmed in the informed consent at the beginning of the questionnaire (Hul'ová & Šukolová, 2016). The research sample was assured by the selection available. 234 nursery school teachers were involved in the research. Of these, 95 teach in HoG classes and 139 teach in HeG classes. In terms of the years of work experience, the research sample shows the characteristics listed in Tables 1 and 2 with the majority of respondents having around 5 or around 30 years of work experience. In terms of the preference of a HoG and a HeG, the research sample shows the characteristics listed in Table 3.

Table 1. The length of the teaching practice of the respondents (%).

Work experience (years)	up to 5	6-10	11-15	16-20	21-25	26-30	31-35	above 36
% resp.	28.21	10.26	9.40	2.56	8.55	12.82	17.09	11.11

Table 2. The length of the teaching practice of the respondents (Descriptive statistics).

<i>Work experience (years)</i>	<i>M</i>	<i>SD</i>	\tilde{x}	x_{min}	x_{max}
	18.72	13.59	19.5	0	42

Table 3. The preference of homogeneous and heterogeneous age groups among the respondents.

<i>Work experience (number of years)</i>	<i>Teach HoG</i>	<i>Teach HeG</i>	<i>Total</i>
Prefer HoG	93	80	173
Prefer HeG	0	57	57
Pther answers	2	2	4
Total	95	139	234

Legend: Teach HoG - respondents teaching in a class with a homogeneous age composition of children; Teach HeG - respondents teaching in a class with a heterogeneous age composition of children; Prefer HoG - respondents preferring teaching in classes with a homogeneous age composition of children; Prefer HeG - respondents preferring teaching in classes with a heterogeneous age composition of children.

Data Analysis

The respondents' answers to the selected questions were analysed. For a statistical verification of the hypotheses, Pearson's chi-squared test was used, as it is a comparison of the two groups within the nominal variable.

Research Results

The Benefits of Teaching in Heterogeneous Age Groups

In Figure 1, the answers of the respondents, concerning the marked benefits of a HeG in nursery school classes, are presented.

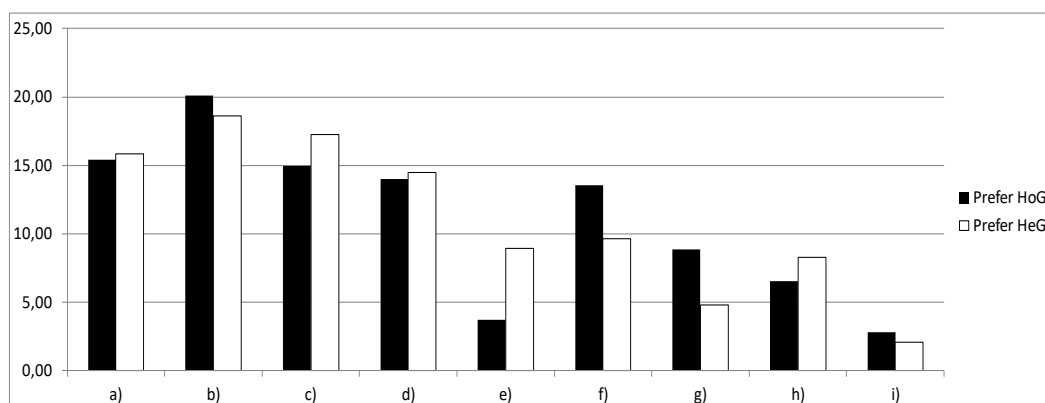


Figure 1. Benefits of heterogeneous age classes in nursery schools [in %].

Legend: Prefer HoG - respondents preferring teaching in classes with a homogeneous age composition of children [in %]; Prefer HeG - respondents preferring teaching in classes with a heterogeneous age composition of children [in %]; a) the class more resembles a family environment; b) children have better conditions for social development; c) children have better conditions for emotional development; d) children have better conditions for cognitive development; e) deregulation of competition between children; f) the teacher can compare the progress made by the child over a longer period of time; g) the child will develop a deeper relationship with the teacher; h) a longer and better cooperation with the parents of the child; i) other.

Figure 1 shows that teachers preferring teaching in the HoG classes, most commonly referred as a benefit the fact that children have better conditions for social development (b), that the classroom more resembles a family environment (a) and that children have better conditions for emotional development (c). Teachers who prefer teaching in classes with a HeG of children most often referred to the same benefits, but in a different order - children have better conditions for social development (b), children have better conditions for emotional development (c) and the class more resembles a family environment (a).

From the other benefits, the respondents mentioned, for example, that the younger children learn from the older ones through observation and imitation; the children learn faster from the older children without the intervention of a teacher and there is the possibility to place siblings in one class.

In Table 4, the benefits of a HeG from the point of view of the respondents, broken down by the preferences of the advantages *b* and *c* are presented.

Table 4. Benefits of heterogeneous age groups from the point of view of the respondents.

	Observed frequency			Expected frequency	
	Prefer HoG	Prefer HeG		Prefer HoG	Prefer HeG
Benefits b and c	150	104	Benefits b and c	151.41	102.59
Other benefits	278	186	Other benefits	276.59	187.41

The respondents favouring a HeG and the respondents favouring a HoG agreed in their opinions that in a HeG the children have better conditions for social and emotional development. The hypothesis H_1 was rejected (Table 6).

Disadvantages of Teaching in Heterogeneous Age Groups

In Figure 2, the answers of the respondents concerning the identified disadvantages of a HeG in the classes of nursery schools are presented.

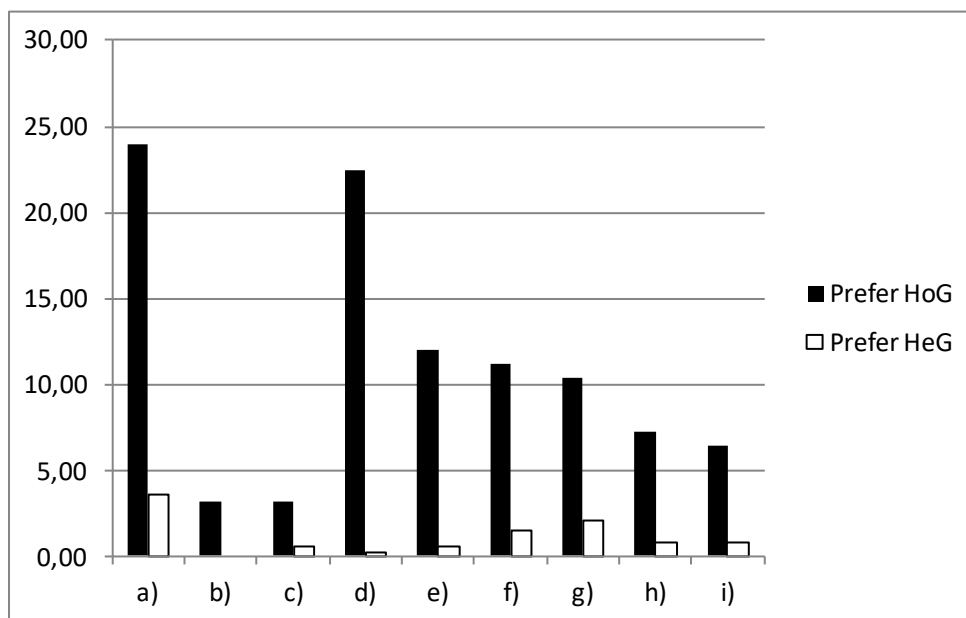


Figure 2. The disadvantages of heterogeneous age classes in nursery schools [in %].

Legend: Prefer HoG - respondents preferring teaching in classes with a homogeneous age composition of children [in %]; Prefer HeG - respondents preferring teaching in classes with a heterogeneous age composition of children [in %]; a) the child is in contact with a smaller number of children of the same age; b) the children have worse conditions for social development; c) the children have worse conditions for emotional development; d) the children have worse conditions for cognitive development; e) the children do not have the opportunity to compete with each other; f) the child is assessed by only one teacher for several years; g) the child is in contact with only one/two teachers over several years; h) the parents of the child are in contact with only one/two teachers over several years; i) other.

Figure 2 shows that teachers preferring a HoG most often referred as a disadvantage the fact that a child is in contact with a lower number of children of the same age (a), the children have worse conditions for cognitive development (d) and the children do not have an opportunity to compete with each other. Respondents favouring a HeG have identified far fewer disadvantages. They indicated in particular the disadvantage that the child is in contact with a smaller number of children of the same age (a) and the child is in contact with only one/two teachers over several years (g).

Other disadvantages reported by the respondents were, for example, more difficulty securing spatial conditions; more demanding teacher preparation; the copying of older children in a negative sense; disturbing the activity of the older children by the younger ones and a marginalisation of the younger children to the detriment of the older ones.

Table 5 shows the disadvantages of a HeG from the perspective of the respondents, broken down according to the disadvantages of *d* and *e*.

Table 5. Disadvantages of heterogeneous age groups from the perspective of the respondents.

	Observed frequency			Expected frequency	
	Prefer HoG	Prefer HeG		Prefer HoG	Prefer HeG
Disadvantages of <i>d</i> and <i>e</i>	86	6	Disadvantages of <i>d</i> and <i>e</i>	70.12	21.88
Other disadvantages	164	72	Other disadvantages	179.88	56.12

There was a statistically significant difference between the respondents. Respondents favouring a HeG have identified less disadvantages of *d* and *e* than the respondents favouring a HoG. The H_2 hypothesis was accepted (Table 6).

Table 6. Statistical processing of the research data.

Hypothesis	Chi-square criterion (χ^2)	Degrees of freedom (df)	Significance (p)	Acceptance/rejection
1	0.05	1	.823	Is rejected
2	21.013	1	.001	Is accepted
3	9.432	1	.002	Is accepted

Preferences of Homogeneous and Heterogeneous Age Groups in Terms of the Length of Teaching Work Experience

In Figure 3, the HoG and the HeG preference among the respondents are referred.

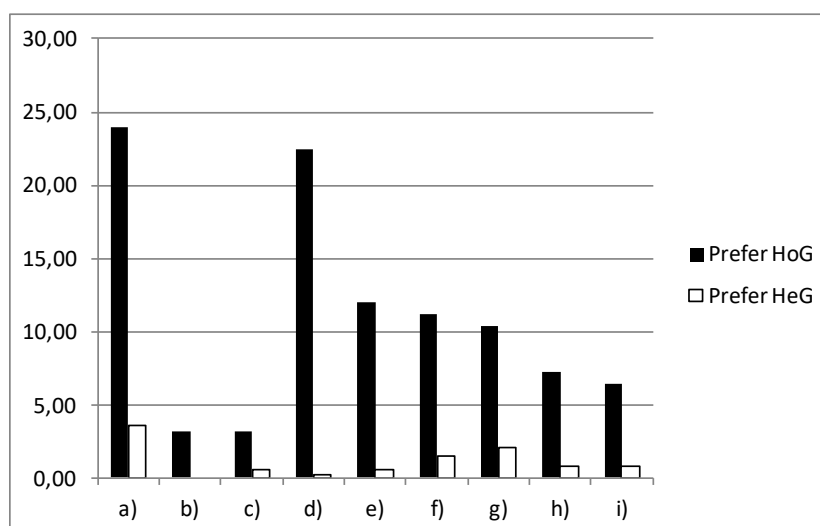


Figure 3. HeG and HoG preference among the respondents in terms of the number of years of teaching work experience.

Legend: Prefer HoG - respondents preferring teaching in classes with a homogeneous age composition of children [in %]; Prefer HeG - respondents preferring teaching in the classes with a heterogeneous age composition of children [in %].

It is clear from Figure 3 that those respondents with less than 5 years of work experience had a strong preference for a HoG. Among the respondents with over 21 years of work experience, there was a preference for a HeG.

Table 7 shows the observed and expected frequencies.

Table 7. HeG and HoG preference among the respondents in terms of the number of years of teaching work experience.

	Observed frequency			Expected frequency	
	Prefer HoG	Prefer HeG		Prefer HoG	Prefer HeG
Work experience up to 20 years	98	20	Work experience up to 20 years	87.74	30.26
Work experience over 21 years	76	40	Work experience over 21 years	86.26	29.74

There was a statistically significant difference between the variables. Respondents with more years of work experience preferred a HeG more than those with less years of work experience. The H_3 hypothesis was accepted (Table 6).

Discussion

The aim of the present research was to find out the opinions of the nursery school teachers on the advantages and disadvantages of HeG. This research provided more details about the teachers' opinions related to the advantages "children have better conditions for social development", "children have better conditions for emotional development", and disadvantages "children have worse conditions for cognitive development", and "children do not have the possibility to compete with each other".

The results of the research carried out among 243 nursery school teachers revealed that the respondents consider the benefits of a HeG to be the better social and emotional development of the children. Those respondents favouring either a HeG or a HoG in nursery schools both agreed with this opinion. Similarly, in the research study on age homogeneity in groups of nursery school classes (Hul'ová, Rochovská, & Klein, 2018), the group of respondents teaching a HeG found the best benefit to be the better social and emotional development of the children. These opinions were in line with the opinions of the experts quoted in the theoretical starting point of the issue, who emphasised the development of the personality of the child in the nursery school (not just the preference of the cognitive side) and the promotion of prosocial and collaborative behaviour. The age difference between the children allows them to experience more diverse contacts, more social roles, acquire more strategies, and gain more opportunities for natural imitation and the development of speech and communication.

The respondents also agreed that in a HeG, the child was with fewer children of the same age, which was a disadvantage for him. Therefore, when creating a HeG, it is appropriate, within the scope of the nursery school, to provide a balanced representation of a sufficient number of children from each age category. It is also possible to regularly include activities in which the group of children of the same age, especially the oldest age group, would cooperate in. On the other hand, as noted by P. Gray and J. Feldman (2004), it was generally well known that children of the same age had similar abilities to children of different ages, but this was not always true. In a HeG, a child who was ahead of, or was behind his or her peers in a certain area, could find equal partners among the older or younger children.

The group of respondents favouring a HoG marked significantly more often that disadvantages of a HeG were that the children had worse conditions for cognitive development. These opinions contradict the results of the research examining the relations between classroom age variability on children's vocabulary development for 2,743 children between the ages of two years, nine months, and six years, 11 months in Denmark. Findings indicated a significant nonlinear relationship between the range of child age within a classroom and children's vocabulary development, such that classrooms with a maximum age range of 24 months were associated with the greatest gains in vocabulary growth (Justice, Logan, Pustell, Bleses, & Højen, 2018).

The group of respondents favouring a HoG marked significantly more often that disadvantages of a HeG were that the children were not able to compete with each other. It is important to realise whether pre-primary education is perceived primarily as preparation for admission into primary school, where worse conditions for cognitive development are perceived only in a negative sense, or whether an emphasis is placed on the overall development of the personality of the child, where, alongside the cognitive aspect, the socio-emotional and psychomotoric side is also well developed. Concerning competition in pre-primary education, it is necessary to emphasise that it is more appropriate to create a collaborative environment for the child's social, emotional and cognitive development.

The research results also showed that the respondents with more years of work experience prefer a HeG more, when compared to the respondents with less years of work experience. Similarly, in a research on the age homogeneity of a group in nursery school classes (Hulová, Rochovská, & Klein, 2018), it was confirmed that younger respondents preferred homogeneous age groups more than the older ones did.

Respondents with long-term practical experience are likely to have a greater insight and are aware of the benefits that work in a HeG brings, despite the more demanding organisation of work and methodical preparation. In the similar research, R. Smith and E. Engeli (2015) detected a correlation between the teachers' attitude towards mixed-age teaching and the frequency of working with individualized learning sequences in the classroom.

On the basis of the above, it is possible to recommend that the issue of the age homogeneity of a group in the study programs of the pre-gradual preparation of nursery school teachers should be extended to a greater extent, at both a theoretical and a practical level.

Conclusions

The findings of this research have important implications for the nursery school teachers' pregradual education. It has been found that the nursery school teachers considered an advantage to be the better social and emotional development of children in heterogeneous age group. The respondents teaching homogeneous age groups considered the greatest disadvantage being that children in a heterogeneous age group have worse conditions for cognitive development and do not have the opportunity to compete with each other. It has been confirmed that those respondents with more years of work experience preferred a more heterogeneous age composition of groups than respondents with fewer years of work experience.

In the research, it is declared that it is necessary to take into account the recommendations of experts on the subject and in the context of the undergraduate training of nursery school teachers, to familiarise them with the advantages and disadvantages of heterogeneous age groups and to give them the opportunity to experience work in such groups. Teachers should be mindful of the overall development of the personality of a child and to not restrict pre-primary education to just preparation for entry into elementary school. The cognitive aspect of a child's personality should not be overstated at the expense of the socio-emotional and psychomotor aspect. On the other hand, it cannot be said for sure that this side develops worse

in a heterogeneous age group, because when older children explain something to the younger ones, they themselves strengthen and organise their knowledge. Heterogeneous age groups also allow nursery schools to break down competition among children and, on the contrary, support mutual help and cooperation.

The results of the research are that we should continue to study the issue and to extend the research also to the primary stage of elementary school, where the pro-social and cooperative behaviour of learners would be developed to the detriment of the competitiveness and mutual comparison of learners, whether with the norm or amongst each other.

Acknowledgements

The research is part of the project, GAPF CU No. 2/41/2018 “*Advantages and disadvantages of heterogeneous age groups from the perspective of nursery school teachers*”.

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Received: April 22, 2019

Accepted: June 16, 2019

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