HIGHER ORDER THINKING TASK AND QUESTION APPLICATION IN THE WORLD COGNITION LESSONS IN PRIMARY FORMS

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Abstract

Recently, one has become concerned about the quality of natural science and social education basics of the primary school students. Particular attention is devoted to the higher-order thinking ability education. In the qualitative research, it was analysed what higher order thinking questions and tasks primary school teachers apply in the world cognition lessons. Research data were gathered using a lesson observation method. The gathered data were analysed making a technical picture. Research results showed that primary school teachers proportionally applied lower and higher-order thinking questions and tasks.
Keywords: *world cognition lessons, higher order thinking abilities, primary education*.

Introduction

Today's school should orient itself to students' education for future and to educate critically thinking, creative citizens, able to analyse, interpret, make conclusions. Natural science education in primary school is not only important but also a problematic one, because it comprises various components – ecological, environmental, harmonious development, healthy living and other (Lamanauskas, 2008). Social and natural science literacy learning combining various components and using a real-life context requires from the students to use thinking abilities (Avargil, Herscovitz, & Dori, 2012).

For the lower order thinking abilities scientists tend to attach knowing, knowledge repetition, perception and application (Anderson & Krathwohl, 2001; Thomas & Thorne, 2009; Brookhart, 2010). In other words, this is what does not require a particular thinking activity, more mechanical remembrance and knowledge application. Describing higher order thinking abilities, the researchers (Anderson & Krathwohl, 2001; Thomas & Thorne, 2009) discern such thinking, which they refer to in the activity: analysing, comparison, evaluation, conclusion making, creation, assumption making, new solution searching, information application in the new context. The scientist Brookhart (2010) distributes higher thinking abilities into three categories: *transference; critical thinking; problem solution*.

Teachers apply various types of tasks and questions in the lessons as a means to improve and measure students' understanding, also to assure that a certain subject

teaching process takes place (Kerry, 2002). Kerry (2002) pointed out that question types used in a classroom perform an important role in the teaching learning process, because it makes an influence on students' achievements and on the level of participation in the education process. It is important that the teachers apply appropriate questions in the classroom, because students can propose a proper and a thought of answer, if the asked questions are well prepared (Brookhart, 2010).

The scientists (Peen & Arshad, 2014; Jiang, 2014; Shafeei, Hassan, Ismail, & Aziz, 2017) having researched higher order thinking task and question involvement into education process notice that teachers usually apply lower order thinking questions, which are short, one or two word answer, but not higher order thinking questions, which are open and the answer to them is based on the students' opinion. Shafeei, Hassan, Ismail, Aziz (2017) research revealed that teachers agree that higher order thinking tasks are necessary, because they help to develop students' critical thinking, however in the education process more often they apply lower order thinking tasks and questions. This is because teachers lack knowledge about higher order thinking task and question preparation and application in the lessons. Therefore, the authors recommend that teachers were provided with a proper teaching about higher order thinking, that they could successfully develop students' higher-order thinking abilities in their classes. The other research, which was conducted by Peen, Arshad (2014) results revealed that teachers tend to get one student's answer to every question without giving an opportunity for the other students to answer the same question. The researchers make a conclusion that teachers do not expect from the other students an answer to the same question and this apparently does not encourage students' active participation in the lesson. Researchers notice that applying such a questioning way, students seem to finally stop participating in the lesson.

Planning the content of the lesson, teachers should make sure that the prepared tasks will definitely require from students certain knowledge and thinking abilities. It is important that individual tasks and activities include the foreseen teaching content and altogether basically form a common field of the desired knowledge and thinking abilities (Brookhart, 2010). For the content, thinking ability and evaluation balance planning, the scientist Brookhart (2010) suggests using *technical picture* – a certain tool, necessary to guarantee that the task and question collection reflect the width and depth of knowledge and abilities, foreseen in the teaching goals. This is a plan, which helps to hold content knowledge and thinking ability balance, based on task and question collection.

It is noticed that teachers developing students' higher-order thinking abilities encounter certain challenges. In order to understand social and natural science education peculiarities working in primary schools and higher order thinking ability expression during world cognition lessons, research aim was raised to analyse, what higher order thinking questions and tasks primary school teachers apply in the world cognition lessons, i.e. to ascertain what balance the teachers hold between the lower and the higher level tasks and questions; what thinking category tasks and questions usually teachers apply in the world cognition lessons; what higher order thinking tasks and questions prevail in different classes according to students' age. This research is a part of a carried out *qualitative case study* research according to Yin (2011).

Research Methodology

General Characteristics, Research Sample

The research was qualitative, carried out according to Yin (2011) *case study* methodology. It was carried out between October 2018 and March 2019. In the article, a general research part is presented.

The research was performed in one Kaunas primary school. It was chosen as *a case*, taking into consideration the fourth last year (2015, 2016, 2017, 2018) 2nd and 4th form students' National students' achievement assessment (PISA) results, which are openly announced in the school's internet cafe. According to the mentioned results, school students develop high higher- order thinking abilities.

In the article, the method of the presented part of the research is lesson observation. Four world cognition lessons in the 1-4 forms were observed and filmed, one in each form. Before filming all student parents' written agreements and primary school teachers' verbal agreements were obtained about the possibility to carry out observations and visual recordings in their classes. The lesson duration in form 1 – 35 min, in forms 2-4 – 45 min.

Research Procedure

During the observation all tasks and questions were fixed, which primary school teachers applied in the lessons. Research data were fixed in the task and question *technical picture* (see table 1), made according to Brookhart (2010) presented *technical picture* model. All the tasks and questions were recorded, analysed and discussed according to the indicated aspects in the research aims, i.e., it was stated what balance the teachers held between the lower and the higher order thinking questions and tasks; what thinking category tasks and questions teachers usually applied in the world cognition lessons; what higher order thinking tasks and questions dominated in different forms according to the students' age.

Table 1. Task and question *technical picture*.

Form	Lower order thinking abilities	Higher order thinking abilities		
	Knowledge, understanding, application	Transference	Critical thinking	Problem solution
I				
II				
III				
IV				

Research Results

In the first form the teacher raised a lot of questions, both of the lower and the higher thinking order. All the questions were very well thought of by the teacher, activated and motivated students for work. Frontal work dominated in the lesson, however constantly discussions were raised based on students' reasoning and argumentations. Knowledge, understanding and application questions were usually raised seeking to remember what the children knew on the discussed topic. Raising higher order thinking questions, the teacher referred to students' answers to lower order thinking questions, in this way deepening students' understanding and activating their critical thinking. Very often, in the first form the teacher asked students to compare the concepts, reason about similarities and differences, however, was short of students' argumentation to the spoken up reasonings. The teacher encouraged the students to discern similarities and differences, to group information, to single out the gist, to reason about the causes and consequences, to discern insignificant things. Two problematic situations were raised for the students, which they solved working in groups. The situations were not complicated but very lifelike and close to the students' environment. Working in the lesson, the students very often raised thinking questions themselves, answering to which thought critically; willingly referred to their experience, gave their examples on the discussed questions.

In the second form world cognition lesson, knowledge and understanding information was dominating about objects, phenomena and their features. There were given more lower order thinking questions and tasks than the higher thinking order ones. The students were mostly asked about direct information, which was given in the presentation, also, they were asked to tell what they knew about the discussed topic. This could be related to the fact that a new topic was discussed, new knowledge and understanding were obtained, therefore, the main attention was devoted to the new information uptake. In the lesson, various work forms were applied – frontal, work in groups, independent work, however, the tasks which the students performed, were mostly oriented to knowledge and understanding. First, the teacher asked the students about their experience, what they already knew, then about what was clearly presented in the slides, asked to compare the information or to reason. There could be not one right answer to the teacher's question. This encouraged students to actively participate in the lesson and to involve into activities. The students demonstrated information transference and critical thinking abilities when they needed to compare objects and to reason about them, referring to object features, to make conclusions, to explain how they understood the concepts, however, comparatively there were not many such questions. The students freely expressed their opinion, raised themselves thinking questions to the teacher and to their class students, participated in the discussions, which usually they initiated themselves. There was lack of their opinion expression and the heard information argumentation.

In the third form, balance was held between lower and higher-order thinking tasks. The teacher raised a lot of knowledge and understanding questions at the beginning of the lesson, when the students were asked to remember the previous lesson information, also, at the end of the lesson, when it was checked what the students learnt during the lesson. Analysing the new material, higher order thinking questions and tasks were applied,

activities were organised – work in pairs, in groups. Such tasks were given, performing which the students consulted each other, searched for arguments, supplemented each other. A lot attention was devoted to the new information finding, transferring their possessed knowledge to new situations. Students were constantly activated giving intriguing questions, hints. The teacher did not reveal new information but allotted such tasks having performed which the students found new knowledge themselves, checked it, comparing with what they already knew. Different groups tried to find out different things, compared different facts. Later, discussing the findings with the class students, shared information and deepened their and other students' understanding. Working frontally, the students joined at the same time different lesson and different topic knowledge, compared it with the analysed lesson material. The students were critically thinking about the information accuracy, preciseness, joined into one wholeness separate information details and on the basis of this made conclusions. At the end of the lesson, a common picture about vertebrates was put together from separate parts. The least in the lesson was allocated to tasks and questions for problem solving. Content information could be related more to the real-life context. Subject content was dominating in the lesson, though world cognition subject is very realistic itself, therefore it is not difficult to find links with the student's surrounding environment. Having related new material with the life context, more tasks and questions could appear for problem solution.

In the fourth form, from the beginning of the world cognition lesson, conditions were formed for the students' higher-order thinking ability development. Students created a thinking map on the lesson topic, in which firstly they marked what they already knew and further filled it in with the new information. The topic, which was discussed in the lesson was rather narrow, covering only one historical event, however, seeking to develop deeper students' understanding about that time events, a wider historical context was included, covering a few centuries till the discussed event. Consequent movement was noticed from knowledge and understanding to the higher-order thinking. Knowledge, understanding and application questions helped to purify and consolidate the information details, then it was critically thought about the same things – the events compared, reasoned about their beginning and ending, considered about different solutions and turnings. A lot attention was devoted to the discussed event narratives, which were presented with the help of information technologies. Information transference questions and tasks helped to join separate narrative facts into one common understanding. There were no questions and tasks oriented into problem solving abilities in the observed lesson, however, the mentioned abilities were developed in this class. This emerged when homework was discussed, which students would account in future. The discussed fourth form world cognition lesson topic was relevant, however, was very distant from this age children surrounding environment. No relationship was sought with today's life, questions and tasks were applied in the discussed period frames.

Conclusions

In the world cognition lessons in all classes, teachers hold the balance between lower and higher-order thinking questions and tasks. In the education process, it is consequently moved from the lower to the higher order of thinking. Knowledge and understanding are applied at the beginning of the lesson, when it is encouraged to

remember, what was learnt in the previous lessons, also at the end of the lesson, seeking to consolidate new information. Higher order thinking questions and tasks were usually applied discussing new material. In the observed 1-4 form lessons, all thinking categories emerged: transference, critical thinking, problem solution. Critical thinking tasks and questions were mostly noticed when it was asked to compare information, consider about its certainty and accuracy, to express one's opinion, to ground it with arguments, make conclusions. Quite often teachers applied tasks and questions, when it was necessary to transfer the possessed knowledge to new situations, to join different topic knowledge into one wholeness and to find new things. It was noticed the least of the questions and tasks oriented into problem solving. In the observed lessons, there happened to be one or two such type tasks usually assigned as homework tasks. However, the main difference emerged in the 1-4 forms according to the age groups, implementing the lesson content. In the first-second forms, the teaching content was very related to the real-life context, examples and links were sought with the student's surrounding environment. In the third-fourth forms, the teaching content was more constructive and concrete.

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