

**Collaborative learning in  
Lithuanian schools:  
Findings from a nationwide  
teacher survey**

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## **Introduction**

It has been my pleasure during August and September 2016 to work with Justina Naujokaitiene, a visiting researcher in our Centre for Technology Enhanced Learning. Justina is a PhD student in the Department of Education at the Vytautas Magnus University, Lithuania. She holds Bachelor's and Master's degrees in psychology, and her research interests focus on organisational change and behaviour, learning at work, and information technology (IT)-based and technology-enhanced learning.

Justina has been gathering evidence about collaborative learning in schools in Lithuania, and we have been working on ways to present some of these data as a working paper. In this working paper, the focus is on how teachers and learners are involved in collaborative learning activities. Initially, an overview of the topic is offered, providing views from the literature of how collaborative learning can be defined, a discussion of different collaborative practices in lessons, how technologies are used in collaborative learning lessons, and roles of individuals and groups in collaborative learning. After a section about the school education system in Lithuania, the sections that follow offer perspectives from a survey that has gathered evidence from across Lithuania. The results offer evidence about collaborative learning practices of teachers nationwide, and explore when collaborative learning is used within lessons and projects, in which schools, by which teachers, and educational practices adopted within lessons and projects.

The study presented in this working paper draws out some important new evidence about forms of collaborative learning, and ways that interactive whiteboards are related to practices within collaborative learning lessons.

We would like to express our thanks to the many teachers who completed the questionnaire, and offered us valuable details about their practices. Without that evidence, this paper would not have been possible.

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## 1. EXECUTIVE SUMMARY

The main focus in this research is on teachers in Lithuania, and their experiences about engaging with collaborative learning enhanced with different information and communication technologies (ICT). This collaborative learning study, which takes account of the uses of technologies among teachers, is the first of its type in Lithuania. This state-of-the-art research gives an opportunity to see how collaborative learning is happening in practice from teachers' perspectives.

Collaborative learning combines constructionism with social learning — sometimes referred to as “social constructivism” (Vygotsky, 1978; Wertsch, 1985; Laurillard, 2009). Collaboration is one of the elements that is concerned with learning together, and can encourage individual cognitive processes. While learning, pupils take responsibility and make decisions on how they will work together, and make their contribution to the development and improvement of knowledge.

Collaborative learning can be used while working with students of different age groups, in various subjects; it can be long-term (over several lessons) or short-term (in 1-2 lessons) activities. Typically collaborative learning shifts away from teacher-centred or lecture-centred approaches, but principles of traditional learning do not disappear entirely as they play their part in other learning activities. Studies show that collaborative learning can lead to deeper level learning, critical thinking, shared understanding, and long-term retention of the learned material. Technologies can play a part in the change of the roles in the teaching-learning process, and support collaborative learning (Mercier and Higgins, 2015).

The early 1990s was the start of the development of the current system of education in the Republic of Lithuania, and it is still undergoing change. When talking with Lithuanian teachers, it is obvious that collaborative learning has been a success in Lithuania, as teachers are using collaborative learning in lessons practically and develop different methods of active learning.

In this research, 411 respondents participated, 374 of them were women (91%) and 37 men (9%), which is a fairly good reflection of the entire population of Lithuania teachers. The average of their age was 48.7 years, and their average pedagogical work experience was 24.6

years (the minimum – 1 year, the maximum – 46 years). The majority of them were support teachers (at quite senior levels in schools), and the minority were early stage career teachers. The majority of the respondents worked in long gymnasiums (with pupils aged from 6 to 19 years) and middle schools (pupils aged from 11 to 16 years), with only 5 teachers working in primary (pupils aged from 6 to 11 years) and 9 in secondary (pupils aged from 6 to 19 years) schools. Eighty per cent worked in schools in cities and only 27 teachers worked in small villages. The smallest school had only 15 pupils and the biggest had 1,500 pupils. The smallest class where teachers worked had 6 pupils and the biggest had 36 pupils.

From the research results, it was interesting to find that those teachers who use short-term collaboration activities do not also use long-term collaborative activities. Furthermore, teachers using interactive whiteboards tend to use collaborative learning for short-term (1-2 lessons) activities, whereas teachers using other technologies tend to use collaborative learning for long-term (several weeks) activities or to give collaborative tasks for students as their homework.

The most popular software among teachers to support collaborative learning is: web browsers (e.g. Internet Explorer, Chrome, Mozilla); presentation programs (e.g. Microsoft PowerPoint); or interactive programs and lessons. The most popular technologies are interactive whiteboards and projectors. Research results do not explain why the third technology - sound recording systems - is used by teachers; further research is needed to answer the question of what the purpose is of the sound recording system.

Teachers who use interactive whiteboards tend to choose a different balance of educational activities and different kinds of evaluation and reflection than those who use other technologies. The results suggest that interactive whiteboards are used in activities when pupils need to research, find information, present and discuss it.

To take the research further, it would be interesting to look at teachers' practices close up, by creating collaborative learning lessons together with teachers.

## 2. DEFINITIONS OF COLLABORATIVE LEARNING

Collaborative learning combines constructionism with social learning — sometimes referred to as “social constructivism” (Vygotsky, 1978; Wertsch, 1985; Laurillard, 2009). Learning through the perspective of social-constructivism can be described through a number of different cognitive processes involved. According to social constructivist theory, individual knowledge structures direct human attention, action and learning. In constructivist theory, the term *equilibration* describes a process in which a person looks for logical consistency of knowledge structures and contexts. Constructivists argue that people learn when they set goals. We reflect on, conceptualise, make links, test and improve existing capabilities and skills. While learning, we share common consensus domains; together we learn and teach (Papert, 1997). Collaboration is one of the elements that is concerned with learning together, and can encourage individual cognitive processes therefore.

In terms of a deeper focus on learning rather than considering generalised cognitive potential, Papert’s (1997) approach allows us to understand how ideas are formed and become expressed through the media, actualising certain contexts, through individual reflection. This includes gaining perceptions of universal topics and through individual discussions about favourite representations, or artefacts. Papert (1997) states that expressing the self’s inner feelings and ideas is the key to learning. A self-directed learning cycle is an iterative process in which learners are discovering the right tools and mediation that best supports exploration of the most relevant issues (also discussed by Luckin, 2010). According to Papert (1997), knowledge is created in contexts and shaped in the way we use them, while, according to Vygotsky (1978), cognitive development cannot happen without social relations. The biggest mistake of psychology was to separate thinking from affects (according to Vygotsky, 1978). Vygotsky (1978) states that social contacts are influenced not only by cognitive factors, but also by instinctive and emotional elements that give meaning to discover something new, encourage motivation, raise self-esteem and give the opportunity to feel and understand another. *Collaborative learning*, arising from both Piaget and Vygotsky combines the social and construction elements of the learning process (Laurillard, 2009).

In different research literature, collaborative learning can be described and is embedded in different terms, such as: *cooperative learning*, *collaborative learning*, *collective learning*,

*learning communities, peer teaching, and peer learning or team learning.* The meaning of these descriptions can be understood differently, but they all have a link with collaborative learning. Resta and Laffière (2007) state that collaborative learning is a complex concept, but not a clearly defined one. There is no universally adopted meaning of the terms *collaborative* and *cooperative* learning or agreement on precisely what their differences or commonalities are (Resta and Laffière, 2007). As there is a wide variety of collaborative learning definitions in the scientific literature, some authors do not try to define what collaborative learning is (Dillenbourg, 1999), and present broader understandings of this phenomenon. This approach is chosen because the same word *collaborative* is often used in different situations and does not represent its meaning in the same way. In the broadest way, collaboration can be defined as “involving two or more people working together for a special purpose” (Cambridge Dictionary, 2016). Roschelle and Teasley (1995) define collaboration as a coordinated, synchronous activity that is the result of continued attempts to construct and maintain a shared conception of a problem. Unfortunately, this definition does not include the situation Dillenbourg (1999) states, where he says that the adjective “collaborative” concerns four aspects of learning:

- A situation can be characterised as more or less collaborative when peers are more or less at the same level and can perform the same actions, have a common goal and work together.
- The interactions that do take place between the group members can be interactivity, synchronicity and “negotiability”.
- Some learning mechanisms are more intrinsically collaborative, and learning mechanisms as collaboration must be similar to those triggered in individual learning processes: induction, cognitive load, (self)-explanation, conflict. Processes that may occur in collaborative situations are: internalisation, appropriation and mutual modelling.
- There are effects of collaborative learning (which means that there are potential ways of how to measure them).

Often broad definitions of collaborative learning that are used can be found: collaborative learning is a situation in which two or more people learn or attempt to learn something together (Gokhale, 1995; Dillenbourg, 1999). Dillenbourg (1999) states that this *collaborative learning* definition can be seen from different perspectives. It is not clear how many people are collaborating (a pair, small group, class or society), but also it is not clear what these

people are learning and, of course, whether the interaction is face-to-face or mediated via technologies. Van Boxtel, van der Linden, and Kanselaar (2000) also stress that collaborative learning may be a consequence of social interaction, which stimulates the elaboration of conceptual knowledge; hence, in a collaborative learning situation, students verbalise their understanding. Each approach to collaborative learning focuses on a different aspect of the learning process as being critically important; these approaches generate different conventional teaching methods, and, therefore, different uses of digital technologies and none denies the importance of the others (Laurillard, 2009). Gokhale (1995) states that the term *collaborative learning* refers to an instruction method in which students at various performance levels work together in small groups towards a common goal. The students are responsible for one another's learning as well as their own. However, Dillenbourg (1999) argues that collaborative learning is neither a mechanism (from a psychological point of view), nor a method (from a pedagogical point of view). Laurillard (2009) agrees that collaboration is not just social learning, not just discussion of theories, but also an opportunity for intrinsic feedback on the action of "explanation" or "argument" which itself requires reflection.

Dillenbourg (1999) states that *collaborative learning* describes a situation in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms, but there is no guarantee that the expected interactions will actually occur. He says the theory of collaborative learning concerns these four items: criteria for defining the situation (e.g. symmetry, division of labour), the interactions (e.g. symmetry, negotiability), processes (e.g. rounding, mutual modelling) and effects (Dillenbourg, 1999). The key to understanding collaborative learning is in the relation to those four items. Later, Kirschner (2001) indicated that *collaborative learning* has the following characteristics:

- Learning is active;
- The teacher is usually more a facilitator than an organiser of learning processes;
- Teaching and learning are shared experiences;
- Students participate in small-group activities;
- Students take responsibility for learning;
- Students reflect on their own assumptions and thought processes;
- Social and team skills are developed through group processes.

In the process of collaborative learning, understanding that students are responsible for their own and each other's learning, the important pursuit of the objective is for the students to help each other to understand and learn (Dooly, 2008). While learning, pupils take responsibility and make decisions on how they will work together, and make their contribution to the development and improvement of knowledge.

### 3. DIFFERENT COLLABORATIVE PRACTICES IN LESSONS

Collaborative learning represents a different view of how learning might be undertaken in the classroom. Laurillard (2009) presents a theoretical framework about collaborative learning that embraces a number of forms of learning and teaching, conventional and digital, mobile and classroom-based, formal and informal. As a result, collaborative learning can be used while working with students of different age groups, in various subjects; it can be long-term (over several lessons) or short-term (in 1-2 lessons) activities. Typically collaborative learning shifts away from teacher-centred or lecture-centred approaches, but principles of traditional learning do not disappear entirely as they play their part in other learning activities, such as discussions and active work with course material (Laal and Laal, 2012). Laal and Laal (2012) state that collaborative learning does not occur when students talk to each other (face-to-face or on a computer) in the time when they are doing the assignments, and it is also not happening in the discussion after they do the task. According to the authors, collaborative learning occurs when students in small groups help each other to learn. The teacher's role in a collaborative learning lesson is also different. Smith and MacGregor (1990) state that teachers in collaborative learning lessons tend to see themselves as "expert designers of intellectual experiences of students – as coaches' midwives of a more emergent learning process". Laurillard (2009) states that as the interactions proceed in the lesson, the learner should have opportunities to develop the practical application of the concept, theory, or idea in the context of discussion. Agreeing with this statement, Kaendler et al. (2014) suggest that it is very important for the teacher to plan student interaction, monitor it, and if needed, provide support for students. Johnson and Johnson (1999) present five aspects of successful teaching practice for collaborative learning: positive interdependence, individual accountability, direct interaction, social skills, and the evaluation of the process. Considering all five aspects, teachers should make sure that all group members will succeed (positive interdependence), each group member has responsibilities for his own learning and helps other members learn (individual accountability), all students can interact face-to-face or through technologies (direct interaction), learning gives opportunity to develop social skills (social skills), and that the group process is evaluated (evaluation of the process). Teachers often only evaluate the product or the cognitive results of students' teamwork (according to Ruys et al., 2011). However, reflecting on the way students collaborated and on how they can improve their learning process is at least equally important. In this respect, the teacher should summarise,

evaluate, discuss, and reflect on the collaborative learning process together with the students (Gillies et al., 2008). Ruys et al. (2011) state that the pedagogical knowledge and related skills of teachers are described during different phases of a lesson with collaborative learning, more specifically the introduction, the processing and the consolidation or evaluation phase.

Focusing on the research into the effectiveness of collaborative learning, it can be categorised into several groups: research of individual and group effectiveness (Johnson and Johnson, 1986; Gokhale, 1995); improvement of cognitive skills (Bruner, 1985; Gokhale, 1995) and social skills (Gillies et al., 2008); and age group differences (Nunnery et al., 2013). Collaborative learning leads to deeper level learning, critical thinking, shared understanding, and long-term retention of the learned material (according to Johnson and Johnson, 1999; Garrison et al., 2001).

Johnson and Johnson (1986), in their research, showed that there are differences between cooperative teams and individual learners, as students involved in cooperative teams achieve more and tend to memorise information for longer periods of time than students who learn individually. Researching critical thinking, Gokhale (1995) states that critical thinking is promoted by the active exchange of ideas in the small group of students and also this exchange increases interest among group members. According to Gokhale (1995), a peer support system makes it possible for the learner to internalise both external knowledge and critical thinking skills and to convert them into tools for intellectual functioning. The results of the research are in agreement with the learning theories proposed by proponents of collaborative learning (Gokhale, 1995). Bruner (1985) claims that cooperative learning methods improve problem-solving strategies because students are confronted with different interpretations of the given situation. From this research study, it can be concluded that collaborative learning fosters the development of critical thinking through discussion, clarification of ideas, and evaluation of others' ideas. Collaborative learning offers students the opportunity to develop both cognitive skills, like analysing and problem-solving, and pro-social behaviour, like empathy and helping behaviour (Gillies et al., 2008). Nunnery et al. (2013) researched achievements in mathematics using collaborative learning, and compared two age groups (younger children in elementary and adolescent children in secondary settings). The results showed that there was a much stronger effect of collaborative learning on student achievements in the adolescent children's group than in the younger children's group.

Of course, there is a wide variety of research exploring the distinction between traditional learning and collaborative learning. Romero (2009) did a systematic review of 2,506 published and unpublished articles identified through a literature search on science outcomes. The results of this review indicated that cooperative learning improves student achievement in science.

#### 4. USING TECHNOLOGIES IN COLLABORATIVE LEARNING LESSONS

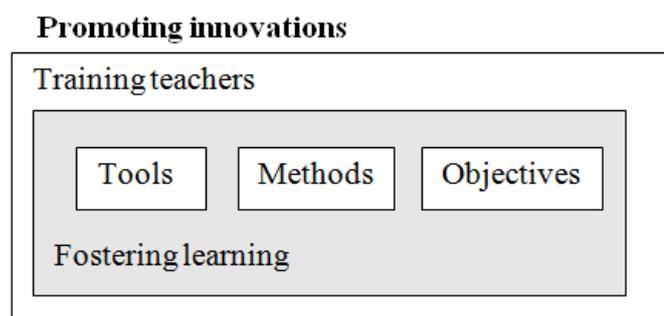
Compared to the impact it has had on other sectors of society, the appearance of information and communication technology (ICT) has not changed dramatically how teachers teach and how students learn in schools (Meredyth et al., 1999; Selwyn, 2011). When computers were first integrated into educational processes, the main concern was on learning about computers and how to use ICT. Computers were accepted as an efficient means of getting knowledge (learning from computers). Despite the growing number of computers used in schools and their increasing use, it cannot be said that revolutionary changes in schools have taken place under the influence of ICT. However, not the increased number of computers, but the process of ICT integration in curricula should matter. The reasons for the lack of integration of ICT into school curricula today are a complex mix of the level of access to ICT, teacher motivation and the relationship between pedagogy and the available technologies. New ICT can have an increasing influence in learning. ICT is primarily seen as one of the educational tools which can be used in the learning process (learning with computers) (De Corte et al., 1996). What is more, this implies far-reaching changes in the roles of teachers. It is expected that teachers will support, advise and coach students, instead of merely transmitting knowledge to them, and will be able to adjust to their individual pace, interests and learning styles (Volman, 2005).

Gregoire et al. (1996) reviewed a large number of papers and research studies regarding the integration of ICT within the classroom setting and identified fourteen outcomes that can arise:

1. Various intellectual skills including problem solving, reasoning and creativity.
2. Specific and finer learning of particular skills and subjects.
3. Students demonstrate higher interest in activities which are presented and taught using ICT.
4. Students have a longer attention span and have higher degrees of concentration when activities are carried out using ICT.
5. Interest in research is enhanced due to the easy accessibility to resources through ICT.
6. Cooperation amongst students is brought about through the use of ICT within the classroom, with different classrooms and even with different schools.

7. Due to processes such as simulation, virtual manipulation, merging of data and graphic representation, the assimilation of various aspects is brought about, hence leading to more profound learning and understanding.
8. Through the use of ICT, teachers are able to access and utilise a vast selection of instructional resources.
9. Teachers' communication and cooperation is improved with colleagues within and outside the school through ICT.
10. The orientation of planning for teachers is gauged more towards students performing real work in cooperation with other students rather than individualistic work.
11. The relationship of the teacher changes to that of facilitator and guide with a more interactive role between the teacher and student.
12. Through ICT, the learning process begins to be viewed as continuous research rather than a series of facts that are to be learnt.
13. A positive attitude towards assessment is instilled, while more demanding assessment methods are put into place.
14. The strengths and weaknesses of a student may be easily and rapidly identified through the use of ICT tools.

Integrating ICT in lessons requires teachers to develop new competences. Leburn (2007) states that a good teaching system aligns the teaching method and assessment to the learning activities stated in the objectives, so that all aspects of this system work together in supporting appropriate student learning. Educational institutions' efforts concerning innovation have meant that they have needed to integrate ICT, teacher training, methods, and tools developed to foster learning, all converging on the same ultimate goal: students' learning (Leburn, 2007; Urhahne et al., 2009) (see Figure 1).



**Figure 1: The connection between teacher training and fostering students' learning** (Source: Leburn, 2007)

ICT plays an important role in society when we take into account the social, cultural and economic role of computers and the Internet (Tondeur et al., 2008). Tondeur et al. (2008) state that, accepting the fact that all students are in the system of compulsory education, school is the appropriate place to develop ICT competencies. In order to cope with the demands of the knowledge society, and changing curricula in schools, teachers are put to the test to develop proper ICT competences (Tondeur et al., 2008). The main question is to what degree teachers integrate ICT in their teaching and learning, and do they have competences to do this. Teachers can have an access to ICT, professional development may be available, and digital curriculum resources may be accessible at schools. However, teachers' abilities to use these digital tools in their classrooms, that is, the digital pedagogies required for the effective implementation of ICT, have not been adopted by the majority of teachers and there still exists a division between the input of the early adopters and the reality of a more widespread implementation of ICT (Prestridge, 2012).

As the range of technology increases, so does the possibility of integrating a range of devices into learning environments to support different types of learning, interaction and teaching (Slotta, 2010; Passey, 2013). ICT can be seen as an important catalyst which helps to innovate teaching and learning approaches. ICT must be viewed as a means that supports teaching aspects such as extension of the special needs provision, participation, internationalisation, lifelong learning and intercultural education (Tondeur et al., 2008). Laurillard (2009), speaking about mobile technologies, concentrated more on what benefits technologies bring to the students and learning processes. Learning design can be richer than before, as mobile devices help students to communicate during the time of collaboration, as they need to collect the data while they are in site-specific practice environments (Laurillard, 2009).

Coudriet and Babich (2010) state that, in student-centred classrooms, the lecturer is removed as the visual and acoustical centre of attention. Instead, students are seated in groups around technology-enabled workstations, often facing away from the lecturer and other students (Coudriet and Babich, 2010).

## **5. ROLES OF INDIVIDUALS AND GROUPS IN COLLABORATIVE LEARNING**

Collaborative learning combines the pedagogies of constructionism and social learning to provide richer interactions between learners and their concepts and practice (Laurillard, 2009). According to Vygotsky (1978), students are capable of performing at higher intellectual levels when asked to work in collaborative situations than when asked to work individually. Constructionism prioritises the learner's activity in the practice environment, adapted by the teacher to their needs, where it provides intrinsic feedback on their actions in relation to the task goal, enabling them to reflect on that internal relation in the light of their actions adapted by their current understanding (Laurillard, 2009). Gokhale (1995) states that an instructor's role is not to transmit information but to serve as a facilitator for learning. In a lesson of collaborative learning, as in a traditional lesson, there are three kinds of actors: the teacher, the learner, and the learners' peers (Laurillard, 2009). But in traditional learning the importance of the learners' peers is not so strongly emphasised. Transactions between all three actors are quite complex; Laurillard (2009) classified them as operating on two contrasting levels: the discursive, articulating and discussing theory, ideas, concepts, and forms of representation; and the experiential, acting on the world, experimenting and practicing on goal-oriented tasks (expressing that both of them are essential).

Technologies also take part in the change of the roles in the teaching-learning process, and technologies can support collaborative learning (Mercier and Higgins, 2015). As Laurillard (2009) states, in traditional learning, the learning design ends with the teacher's summary or reflection on the learning, whereas in the digitally-facilitated version, the students' contributions are displayed in the classroom in the form of captured pictures, annotations, links between pictures, and examples, which together provide a collective answer to the teacher's overall question. For collaborative learning to be effective, the instructor must view teaching as a process of developing and enhancing students' abilities to learn (Gokhale, 1995). Soller (2001) supplements this view by stating that during collaborative learning lessons the most effective teachers help students to improve both their cognitive and their social skills. Laurillard (2009) says that teachers are privileged in defining the conception and designing the practice environment to match, and, they also learn, from receiving learners' questions and products, as well as reflecting on their performance; but, most importantly,

teachers are learning about teaching, rather than learning about the concept or practicing the skill. This involves creating and managing meaningful learning experiences and stimulating students' thinking through real world problems (Gokhale, 1995).

In collaborative learning, students depend on each other as they have unique knowledge and can look to the same task from a different perspective (Kaendler et al., 2014). While some learning groups interact naturally, others can struggle to maintain a balance of participation, leadership, understanding, and encouragement (Soller, 2001). Mercier et al. (2014) were interested in different leadership approaches in collaborative learning groups. Not looking to the fact that members of the group were constant across different tasks, different people emerged as leaders and different amounts of leadership were seen, depending on what kind of task they were involved in (Mercier et al., 2014). Mercier and Higgins (2015) state that, beyond the technology or the learners involved, the task and content area can influence how group members interact. Groups act differently, engaging in more interactive discussion than in a traditional learning lesson (Mercier and Higgins, 2015). However, Soller (2001) states that dysfunctional group activity does not benefit from collaborative learning, and may even devalue the overall learning. Marks et al. (2001), in research concentrated on teamwork processes, state that the teamwork process is multidimensional and that teams use different processes simultaneously and over collaborative assignments in order to multitask effectively. Marks et al. (2001) presented a taxonomy which contains a hierarchical structure of ten process dimensions nested within three super-ordinate categories: (1) transition phase processes; (2) action phase processes; and (3) interpersonal processes. Some processes are more likely to occur during transition periods, whereas others are more likely to occur during action periods, and as interpersonal processes are expected to occur throughout transition and action phases, naturally, the pertinent issues change at different times (Marks et al., 2001).

## 6. THE LITHUANIAN EDUCATION SYSTEM: SCHOOL EDUCATION

The early 1990s was the start of the development of the current system of education in the Republic of Lithuania, and it is still undergoing change. The education system has covered pre-school, general secondary, vocational, higher and adult education since 2003. There are different types of schools that offer these five types of education: pre-school education establishments (kindergarten); schools of general education (primary school, middle school, secondary school and gymnasiums); institutions of vocational education; higher education institutions (universities – offering university-level studies and colleges offering non-university-level studies); and institutions of complementary and non-formal education. For students with disabilities, there are special schools established, where they can finish secondary education. Also, today there is an integration policy for people with special needs and, as a result, classes can be established in secondary schools or, depending on abilities, students can gain education in secondary school. Education at general education schools and vocational schools is free of charge.

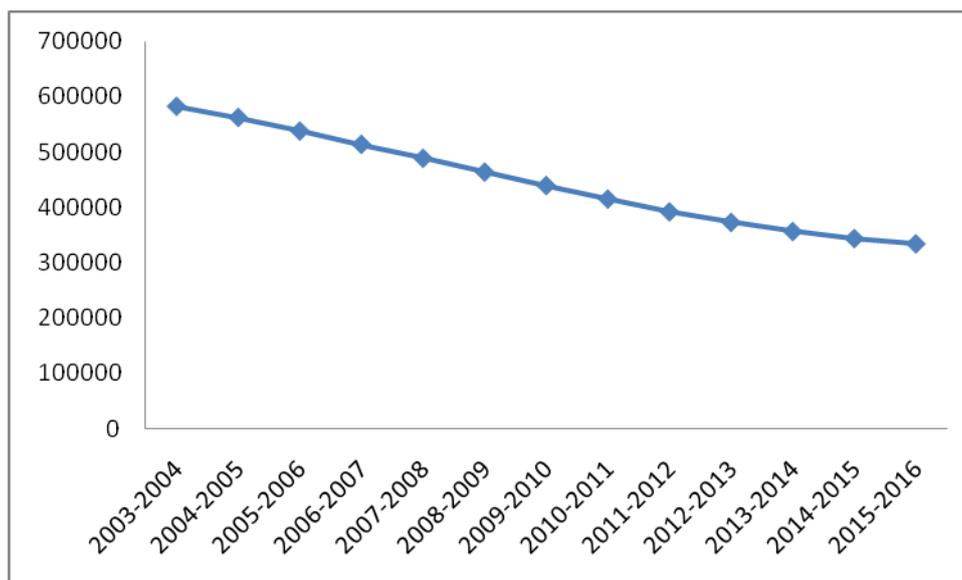
Historically, since 1986-1987, general education lasts for 12 years and is acquired in three stages: primary - 4 years (forms 1-4); lower secondary - 6 years (forms 5-10); and secondary - 2 years (forms 11-12). However, according to the Constitution of the Republic of Lithuania (Lietuvos Respublikos Konstitucija, 1992), education is compulsory until the age of 16 years.

**Table 1: The education system in Lithuania**

Age (years)	Types of education			Institutions of education
25 - 29	PhD studies			Universities/science institutes
23 - 25	Masters studies			Universities
19 – 23	Bachelor studies	Vocational education	Professional bachelor studies	Universities/colleges
	Secondary education			
14 - 19	Lower secondary education			Long gymnasiums/gymnasiums/institutions of vocational education
11 - 16				Middle schools, long gymnasiums
7-10	Primary education			Primary schools/middle schools, long gymnasiums
0-7	Pre-school education			Kindergartens/not compulsory

Each stage of education can be followed in a separate independent institution (e.g. primary school, then middle school and gymnasium) or in one general institution (e.g. long gymnasium). There are establishments providing general secondary education - gymnasiums. Gymnasiums admit all applicants who have completed eight grades in a general education school. Gymnasiums have a four-year curriculum. General secondary education can also be acquired at youth and vocational schools at appropriate levels. Youth schools provide lower secondary education for 12- to 16-year-old pupils who have trouble in adapting to society, learning problems or those who have interrupted their studies. Adults can acquire general secondary education at adult general education schools and in special classes at general education schools.

According to the data of the Lithuanian Statistics Department (Lietuvos statistikos departamentas, 2016), today in the education system there are 47,578 teachers, with 32,256 of them working in the general education system (primary, lower secondary and secondary education). Others are working in vocational or higher education institutions. In the general education system, we have 335,202 pupils, trying to achieve secondary education. Unfortunately, every year the numbers of pupils coming to school is dropping (see Figure 2).



**Figure 2: Numbers of pupils in general education**

Statistical data shows that today we have 1,314 institutions of education in Lithuania, and the majority of them – 1,193 – are institutions of general education.

In the primary schools, teachers cover all the curriculum subjects, except art subjects (e.g. dance lessons) and foreign language learning. Starting from lower secondary education, teachers cover subjects that are their speciality.

At the end of secondary education, all pupils must take national state examinations. The only compulsory examination is in the Lithuanian language, but pupils need to take two examinations for graduating from school. All examinations are held in National Examination Centres. After finishing general education, at the age of 18 or 19 years, pupils start university studies or start working.

The development of the current system of education in the Republic of Lithuania goes together with a shift of paradigms. The traditional education paradigm was changed to a humanistic paradigm of free education (Bruzgelevičienė, Žadeikaitė, 2008). Today it is possible to see a dominant post-positivist paradigm in Lithuanian education. According to the 'Good School Conception' (Ruškus et al., 2013), schools are understudied as learning communities, but teachers are also recognised as learners, looking for modern ways of organising learning and finding a diversity of learning environments. In the same conception, it is stated that good schools should help students to develop skills which are important in everyday life.

When talking with Lithuanian teachers, it is obvious that collaborative learning has been a success in Lithuania, as teachers are using collaborative learning in lessons practically and develop different methods of active learning. In the research field, the topic of collaborative learning is not very popular, but aspects have been analysed since early studies in 1996. Butkienė and Kepalaitė (1996) studied collaboration from an educational psychology perspective and suggested that there is a need for developing collaboration skills and producing different suggestions for teachers. Gailienė et al. (1996) looked from the perspective of developmental psychology and argued that the process of socialisation would be better if the skill of collaboration would be developed as early as possible. Teresevičienė and Gedvilienė (2000) concentrated on a more educational perspective, suggesting different collaborative learning methods for teachers, and the positives and negatives of collaborative learning. Lipeikienė (2003) discussed virtual learning environments and the focus was on collaborative learning environments. Ozolaitė and Čiapas (2005) researched collaborative

learning in special schools. As in previous research studies, they found positive and negative effects of collaborative learning.

## 7. A STUDY OF COLLABORATIVE LEARNING IN LITHUANIA

The main focus in this research is on teachers in Lithuania, and their experiences about engaging with collaborative learning enhanced with different ICT. This collaborative learning study, which takes account of the uses of technologies among teachers, is the first in Lithuania. This state-of-the-art research gives an opportunity to see how collaborative learning is happening in practice from teachers' perspectives.

It is recognised in presenting the results of this study that different lessons can have different pedagogical scenarios. Every teacher can implement the same lesson differently. However, all scenarios will have basic elements, which can be found in the lesson. Trying to find different elements of teachers' practice, activities, particularly elements of lessons, is a new approach to research into collaborative learning.

### METHOD

#### Sample

For the selection of respondents, non-probability sampling was used, sending a URL of a questionnaire and a short description of the research to schools all over Lithuania, inviting them to participate. According to statistical data of the Lithuanian Education Ministry and the Centre of Information Technologies in Education (Lietuvos statistikos departamentas, 2016), in 2016 there were 32,256 teachers across Lithuania. According to this, the calculated sample size for this state-of-the-art research should be 380 teachers (when the desired confidence level for results is 95% and with a margin of error of 5%, according to the method described and used - <http://www.factus.lt/main-calculator/>).

In this research, 411 respondents participated, 374 of them were women (91%) and 37 men (9%). This is a fairly good reflection of the entire population of Lithuania teachers. The average of their age was 48.7 years, and their average pedagogical work experience was 24.6 years (the minimum – 1 year, the maximum – 46 years) (see Table 2).

**Table 2: Age and pedagogical work experience of teachers**

Socio-demographic characteristics	Distribution of respondents	
	Mean	Standard deviation
Age of the teachers	48.70	9.403
Pedagogical work experience	24.59	10.397

Looking at qualifications of the teachers' responding, the majority of them were support teachers (who are at quite senior levels in schools), and the minority were teachers who did not have any qualification category (see Table 3).

**Table 3: Socio-demographic data of the respondents**

Socio-demographic characteristics	Distribution of respondents		
	Frequency	Percentage	
Gender	<i>Women</i>	374	91
	<i>Men</i>	37	9
Qualification category*	<i>Junior teacher</i>	54	13.1
	<i>Senior teacher</i>	124	30.2
	<i>Support teacher</i>	214	52.1
	<i>Expert teacher</i>	19	4.6

\* Junior teacher refers to early stage career teachers; senior teacher refers to those with school support responsibility; support teacher refers to those with city-wide responsibility; expert teacher refers to those with nationwide responsibility.

The majority of the respondents work in long gymnasiums (with pupils aged from 6 to 19 years) and middle schools (pupils aged from 11 to 16 years), with only 5 teachers working in primary (pupils aged from 6 to 11 years) and 9 in secondary (pupils aged from 6 to 19 years) schools. Eighty per cent of teachers are working in schools that are located in cities and only 27 teachers are working in small villages (see Table 4).

**Table 4: Data about schools**

Schools	Distribution of respondents		
	Frequency	Percentage	
Type	<i>Primary</i>	5	1.2
	<i>Middle</i>	139	33.8
	<i>Pro-gymnasium</i>	40	9.7
	<i>Secondary</i>	9	2.2
	<i>Long gymnasium</i>	143	34.8
	<i>Gymnasium</i>	75	18.2
District in which school is located	<i>City</i>	305	74.2
	<i>Small city</i>	79	19.2
	<i>Village</i>	27	6.6

The smallest school where teachers are working has only 15 pupils and the biggest has 1,500 pupils. The smallest class where teachers are working has 6 pupils and the biggest has 36 pupils (see Table 5, which shows the mean average numbers). The small classes (up to 10 pupils) could be classes of pupils with special needs.

**Table 5: Data about pupil numbers in schools**

Schools	Distribution of respondents	
	Mean	Standard deviation
Number of pupils in the school	481.39	286.44
Number of pupils in the class	21.40	6.37

### Data gathering method

A survey format adopted was a web-based self-completion questionnaire with closed-ended questions and scaled responses (a copy in Lithuanian is presented in the Appendix), which provided the research participants with a set of answers. SPSS 22.0 for Windows (IBM, 2016) was used to process the collected data. The internal consistency and reliability of the questionnaire developed and piloted for this study was tested with Cronbach's alpha, resulting in a level of statistical significance of  $\alpha = .833$  (a high value, showing positive statistical validity).

### The tool

The original validated questionnaire was used. The questionnaire itself consisted of five parts: (1) socio-demographic characteristics of teacher; (2) information about schools; (3) teachers' working practices; (4) collaborative learning implementation; and (5) technology usage in collaborative learning lessons. The statements of the questionnaire were carefully constructed to achieve methodological rigour. The tool avoided presenting too much detail in every part of the questionnaire, striving not to predispose the research participants to specific responses. The tool consisted of 34 statements in total. Every question in the tool was a matrix-type with the answer above the table and the statements in the matrix. The internal consistency of the questionnaire was high (Cronbach's  $\alpha = .906$ ). To measure every statement in every part of the tool, research participants were asked to use the Likert-type scale ranging from 1 (totally disagree) to 5 (totally agree). Only in the part about technology usage in collaborative learning were teachers asked to choose one or more technologies they mostly used.

## Ethics

The questionnaire was voluntarily and anonymously answered with no possibility of tracing the respondents. Informed consent, the right to refuse or withdraw from the study, confidentiality, and anonymity of the participating managers, were all ensured in the research (Moore and McCabe, 2003).

## RESULTS

From the 411 teachers, data were collected about the type of software that they used in different parts of collaborative learning lessons (see Table 6).

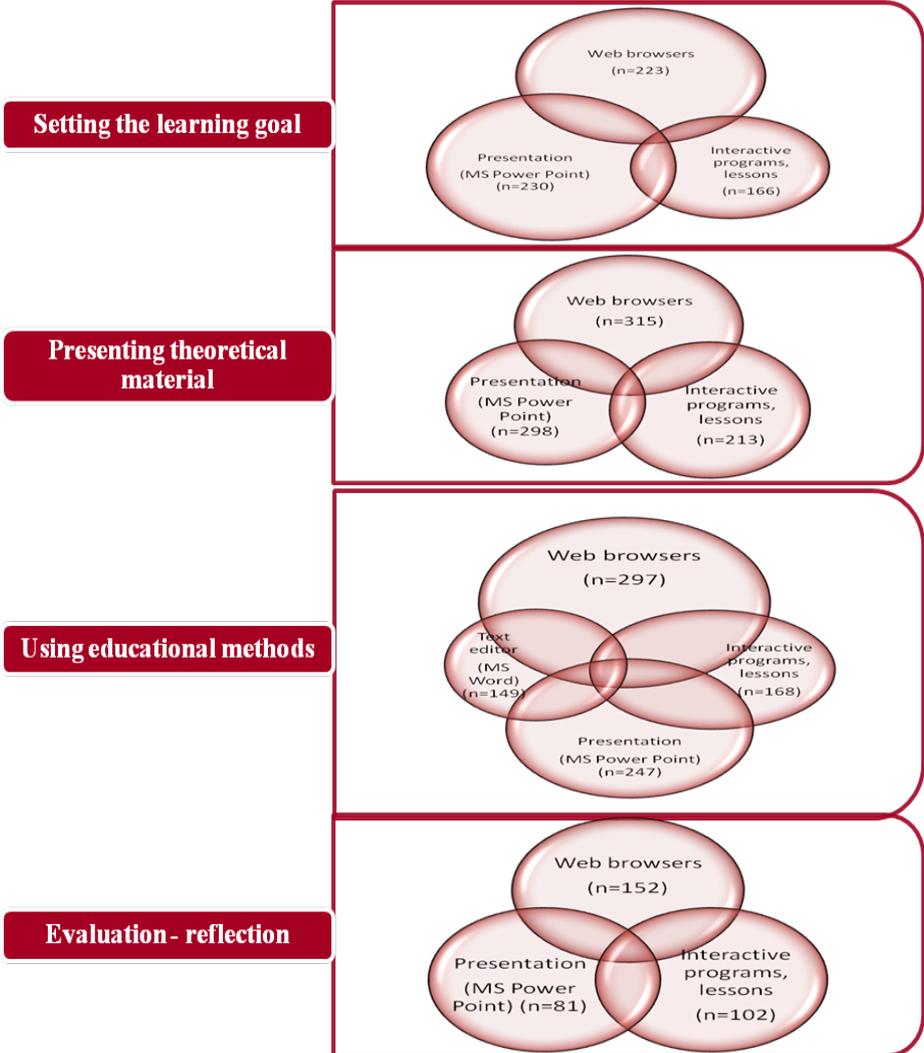
**Table 6: Software that teachers are using in collaborative learning lessons**

Software	Distribution of respondents (Frequencies)			
	Setting the learning goal	Presenting theoretical material	Main learning activities	Evaluation - reflection
Web browsers	<b>223</b>	<b>315</b>	<b>297</b>	<b>152</b>
Text editor (MS Word)	54	24	<b>149</b>	54
Spreadsheet (MS Excel)	56	77	67	32
Presentation (MS Power Point)	<b>230</b>	<b>298</b>	<b>247</b>	<b>81</b>
Web page creation tools	41	68	58	28
Interactive programs, lessons	<b>166</b>	<b>213</b>	<b>168</b>	<b>102</b>
Internet discussion groups, chat rooms	34	30	53	22
Social networks	77	74	98	38
Not using technologies	48	17	22	69

\* indicated in bold – the highest values

When setting the learning goal in the lesson, teachers are using web browsers (e.g. Internet Explorer, Chrome, Mozilla), presentation programs (e.g. Microsoft PowerPoint), or interactive programs and lessons. Teachers are using the same software while presenting theoretical material for pupils. At times when main learning activities are used, besides all the software stated above, teachers are also using text editors (e.g. MS Word). At the end of the lesson, when it is time to evaluate and reflect, teachers usually use web browsers (e.g. Internet Explorer, Chrome, Mozilla), or interactive programs and lessons. Overall, web browsers and interactive programs and lessons are used consistently in all four parts of the lesson; presentation programs are used in the first three parts of the lesson but less so in the last part;

text editors are used more in the third part of the lesson. The patterns (with size of bubbles being equivalent to levels reported) are shown in Figure 3.



**Figure3: Software that teachers are using in collaborative learning lessons**

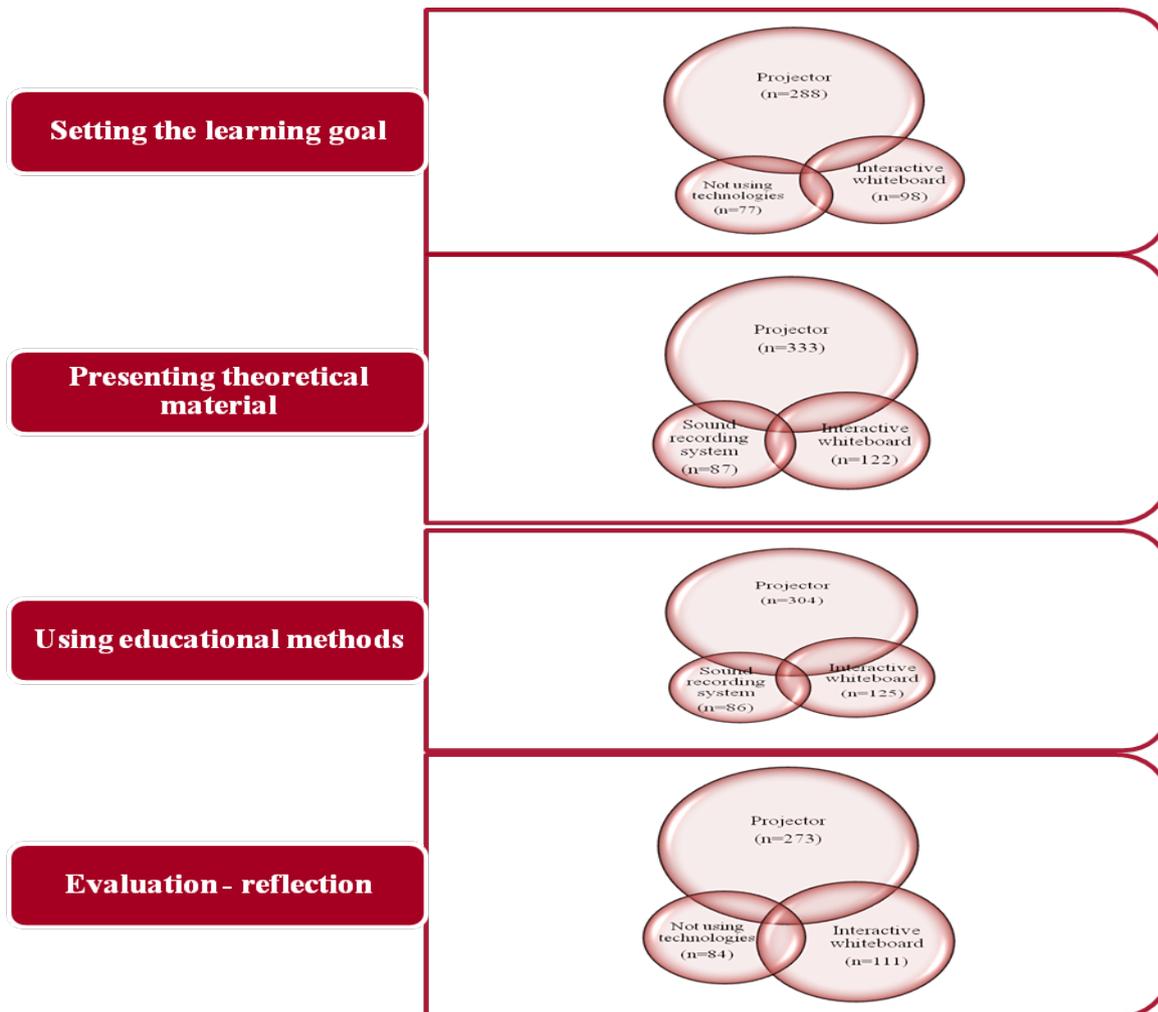
Data from the 411 teachers were also collected about their uses of different technologies in different parts of the lesson (see Table 7).

**Table 7: Technologies used by teachers in collaborative learning lessons**

Technologies	Distribution of respondents (Frequencies)			
	Setting the learning goal	Presenting theoretical material	Main learning activities	Evaluation - reflection
Document camera	30	39	36	24
Interactive whiteboard	<b>98</b>	<b>122</b>	<b>125</b>	<b>111</b>
Projector	<b>288</b>	<b>333</b>	<b>304</b>	<b>273</b>
Sound recording system	54	<b>87</b>	<b>86</b>	46
Television	33	52	49	33
Video camera	27	41	58	41
Not using technologies	<b>77</b>	27	43	<b>84</b>

\* indicated in bold – the highest values

In terms of technologies they use, when setting the learning goal in the lesson, teachers are using projectors, interactive whiteboards or do not use technologies at all. While presenting theoretical material and using educational methods teachers are choosing to use projectors, interactive whiteboards or sound recording systems. In the reflection and evaluation part of the lesson the same technologies as at the beginning of the lesson are used: projectors, interactive whiteboards or they do not use technologies at all. Overall, interactive whiteboards and projectors are used consistently by most teachers in all four parts of the lesson, while sound recording systems are used by many teachers in the second and third parts, but many do not use technologies in the first or last part of the lesson. The patterns are shown in Figure 4.



**Figure 4: Technologies used by teachers in collaborative learning lessons**

During collaborative learning lessons, teachers can use different educational activities to engage pupils in collaborative activities. When engaging in educational activities, pupils tend to make decisions about the task from different perspectives. Learning together activities allows pupils to look for decisions together. In group research, pupils together analyse and summarise information, engaging with the problem being investigated. Mind maps give opportunities to visualise connections between ideas or pieces of information. Think, discuss and share activities are helpful when pupils are encouraged to find a problem solution individually and discuss it with other pupils. Engaging with the activity of pencils on the table allows pupils an opportunity to present their ideas to others one by one and put the pencil on the table. Puzzle activities give pupils the broader picture of the problem when they seek the right answer when solving decisions in groups. Four corners lets pupils discuss the problem, where they try to give arguments from different perspectives. Project methods engage pupils in solving real-life problems and presenting their work. It is the teacher's choice which

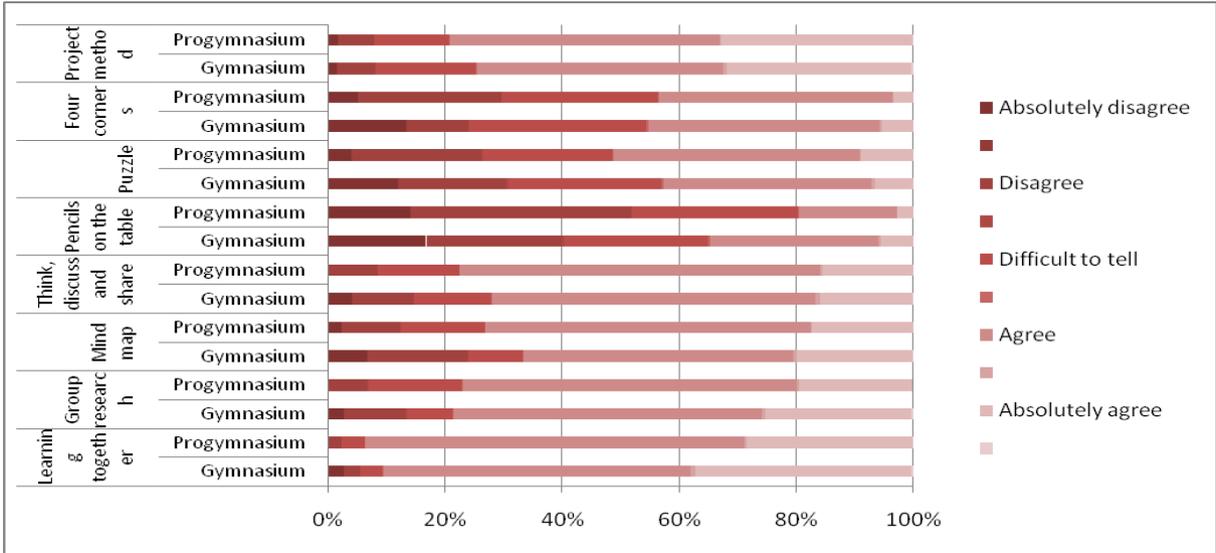
activity will help pupils to make the most of the lesson. From the 411 teachers in the survey, Table 8 shows the frequency of their uses of these different educational activities.

**Table 8: Different learning methods used in collaborative learning lessons**

Educational activity	Distribution of respondents (Frequencies (percentage))				
	Absolutely disagree	Disagree	Difficult to tell	Agree	Absolutely agree
Learning together	2 (0.5)	7 (1.7)	20 (4.9)	<b>253 (61.6)</b>	<b>129 (31.4)</b>
Group research	3 (0.7)	31 (7.5)	54 (13.1)	<b>239 (58.2)</b>	<b>84 (20.4)</b>
Mind map	13 (3.2)	52 (12.7)	64 (15.6)	210 (51.1)	72 (17.5)
Think, discuss and share	6 (1.5)	34 (8.3)	55 (13.4)	254 (61.8)	62 (15.1)
Pencils on the table	64 (15.6)	124 (30.2)	101 (24.6)	102 (24.8)	20 (4.9)
Puzzle	24 (5.8)	73 (17.8)	96 (23.4)	180 (43.8)	38 (9.2)
Four corners	34 (8.3)	83 (20.2)	111 (27.0)	164 (39.9)	19 (4.6)
Project method	7 (1.7)	26 (6.3)	57 (13.9)	<b>185 (45.0)</b>	<b>136 (33.1)</b>

\* indicated I bold – the highest values

From these results, the main activities that teachers are using are ‘learning together’, ‘group research’, and ‘project work’. There are no differences with the kinds of educational activities teachers use, working in different schools, when undertaking collaborative learning lessons (see Figure 5).



**Figure 5: Educational methods used by teachers working in gymnasiums and progymnasiums**

According to the results, teachers use the same educational activities, working with pupils of different age groups (see Table 9).

**Table 9: Educational activities used by teachers working in gymnasiums and progymnasiums**

Educational activity		Distribution of respondents (Frequencies)									
		Absolutely disagree		Disagree		Difficult to tell		Agree		Absolutely agree	
Learning together	Gymnasium	2	0.03	2	0.03	3	0.04	40	0.53	28	0.37
	Progymnasium	0	0	4	0.02	7	0.04	117	0.65	51	0.28
Group research	Gymnasium	2	0.03	8	0.11	6	0.08	40	0.53	19	0.25
	Progymnasium	0	0	12	0.07	29	0.16	103	0.58	35	0.20
Mind map	Gymnasium	5	0.07	13	0.17	7	0.09	35	0.47	15	0.20
	Progymnasium	4	0.02	18	0.10	26	0.15	100	0.56	31	0.17
Think, discuss and share	Gymnasium	3	0.04	8	0.11	10	0.13	42	0.56	12	0.16
	Progymnasium	0	0	15	0.08	25	0.14	111	0.62	28	0.16
Pencils on the table	Gymnasium	12	0.16	17	0.23	18	0.24	21	0.28	4	0.05
	Progymnasium	25	0.14	68	0.38	51	0.28	30	0.17	5	0.03
Puzzle	Gymnasium	9	0.12	14	0.19	20	0.27	27	0.36	5	0.07
	Progymnasium	7	0.04	40	0.22	40	0.22	76	0.42	16	0.09
Four corners	Gymnasium	10	0.13	8	0.11	23	0.31	30	0.40	4	0.05
	Progymnasium	9	0.05	44	0.25	48	0.27	72	0.40	6	0.03
Project method	Gymnasium	1	0.01	5	0.07	13	0.17	32	0.43	24	0.32
	Progymnasium	3	0.02	11	0.06	23	0.13	83	0.46	59	0.33

Teachers in the survey also indicated the different methods they used to evaluate and reflect on collaboration in lessons (shown in Table 10).

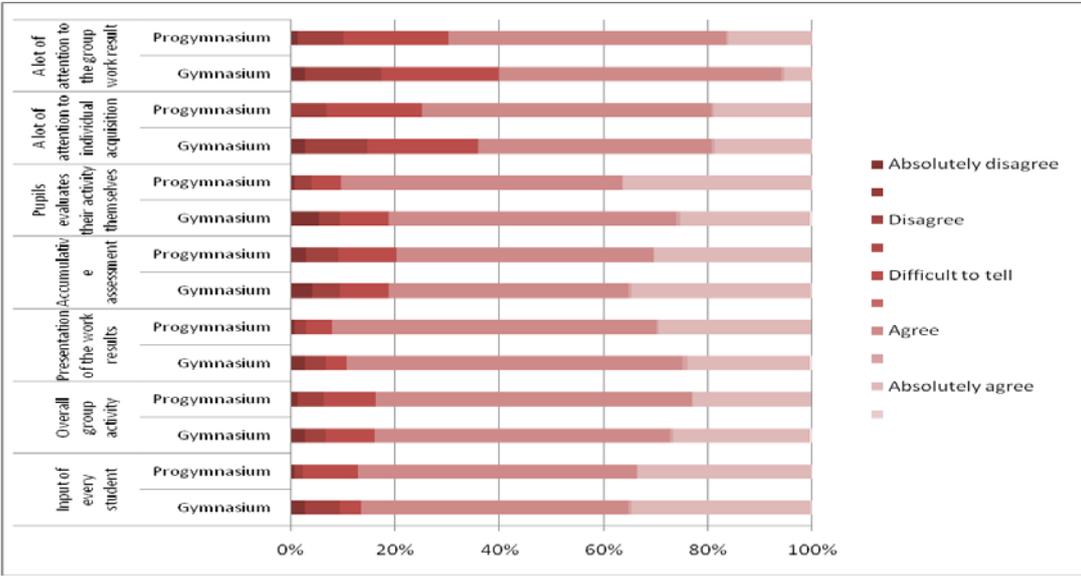
**Table 10: Different types of evaluation and reflection used in collaborative learning lessons**

Evaluation - reflection	Distribution of respondents (Frequencies (percentage))				
	Absolutely disagree	Disagree	Difficult to tell	Agree	Absolutely agree
Input of every student	5 (1.2)	10 (2.4)	36 (8.8)	<b>222</b> (54.0)	<b>138</b> (33.6)
Overall group activity	5 (1.2)	16 (3.9)	43 (10.5)	239 (58.2)	108 (26.3)
Presentation of the work results	4 (1.0)	8 (1.9)	20 (4.9)	<b>252</b> (61.3)	<b>127</b> (30.9)
Accumulative assessment	12 (2.9)	27 (6.6)	42 (10.2)	200 (48.7)	130 (31.6)
Self-assessment	5 (1.2)	13 (3.2)	21 (7.5)	<b>217</b> (52.8)	<b>145</b> (35.3)
A lot of attention to individual acquisition	2 (0.5)	27 (6.6)	70 (17.0)	229 (55.7)	83 (20.2)
A lot of attention to the group work result	4 (1.0)	43 (10.5)	82 (20.0)	223 (54.3)	59 (14.4)

\* indicated in bold – the highest values

These findings show that the main evaluation and reflection methods adopted by the teachers were to assess the ‘input of every student’, ‘presentation of results’, and ‘self-assessment’.

There was no difference found in uses of evaluation and reflection methods in different school types (see Figure 6).



**Figure 6: Evaluation and reflection methods used by teachers working in gymnasiums and pro-gymnasiums**

The results also suggest that teachers use the same evaluation and reflection methods with different age groups of pupils (see Table 11).

**Table 11: Evaluation and reflection methods used by teachers working in gymnasiums and pro-gymnasiums**

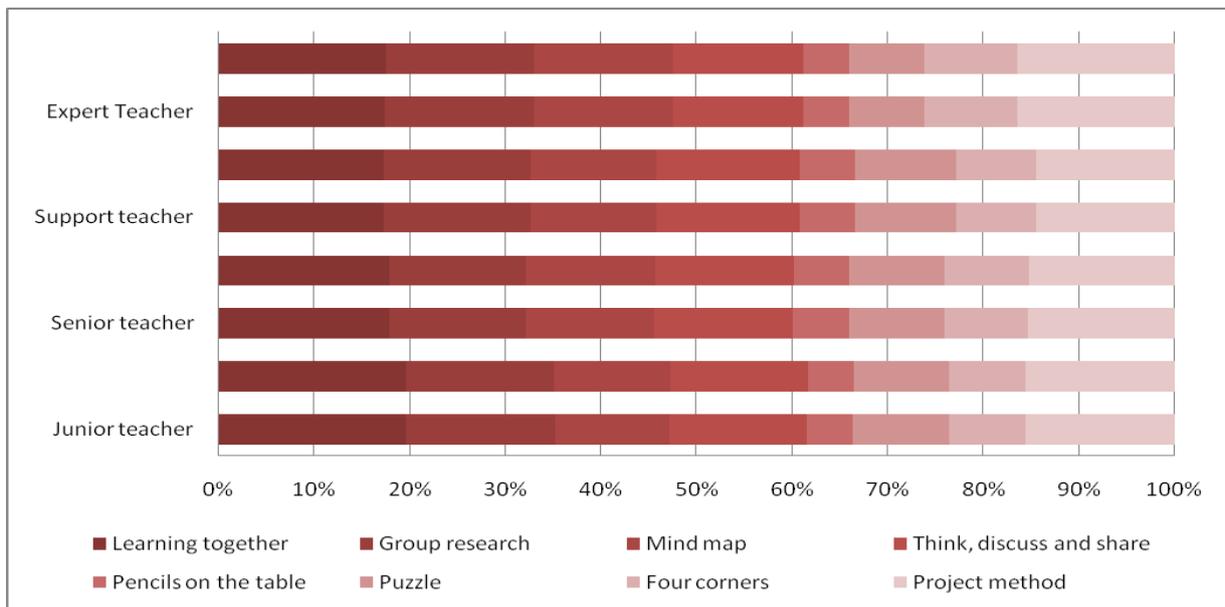
Evaluation - reflection		Distribution of respondents (Frequencies)									
		Absolutely disagree		Disagree		Difficult to tell		Agree		Absolutely agree	
Input of every student	Gymnasium	2	0.03	5	0.07	3	0.04	39	0.52	26	0.35
	Progymnasium	1	0.01	3	0.02	19	0.11	96	0.54	60	0.34
Overall group activity	Gymnasium	2	0.03	3	0.04	7	0.09	43	0.57	20	0.27
	Progymnasium	2	0.01	9	0.05	18	0.10	109	0.61	41	0.23
Presentation of the work results	Gymnasium	2	0.03	3	0.04	3	0.04	49	0.65	18	0.24
	Progymnasium	1	0.01	4	0.02	9	0.05	112	0.63	53	0.30
Accumulative assessment	Gymnasium	3	0.04	4	0.05	7	0.09	35	0.47	26	0.35
	Progymnasium	5	0.03	11	0.06	20	0.11	88	0.49	54	0.30
Pupils evaluates themselves	Gymnasium	4	0.05	3	0.04	7	0.09	42	0.56	19	0.25
	Progymnasium	1	0.01	6	0.03	10	0.06	97	0.54	65	0.36
Attention to individual acquisition	Gymnasium	2	0.03	9	0.12	16	0.21	34	0.45	14	0.19
	Progymnasium	0	0	12	0.07	33	0.18	100	0.56	34	0.19
Attention to the group work result	Gymnasium	2	0.03	11	0.15	17	0.23	41	0.55	4	0.05
	Progymnasium	2	0.01	16	0.09	36	0.20	96	0.54	29	0.16

Looking from the perspective of teacher qualifications, again, there was no difference found, as teachers of all qualification levels are using the same educational methods (see Table 12).

**Table 12: The use of educational methods according to teacher qualification**

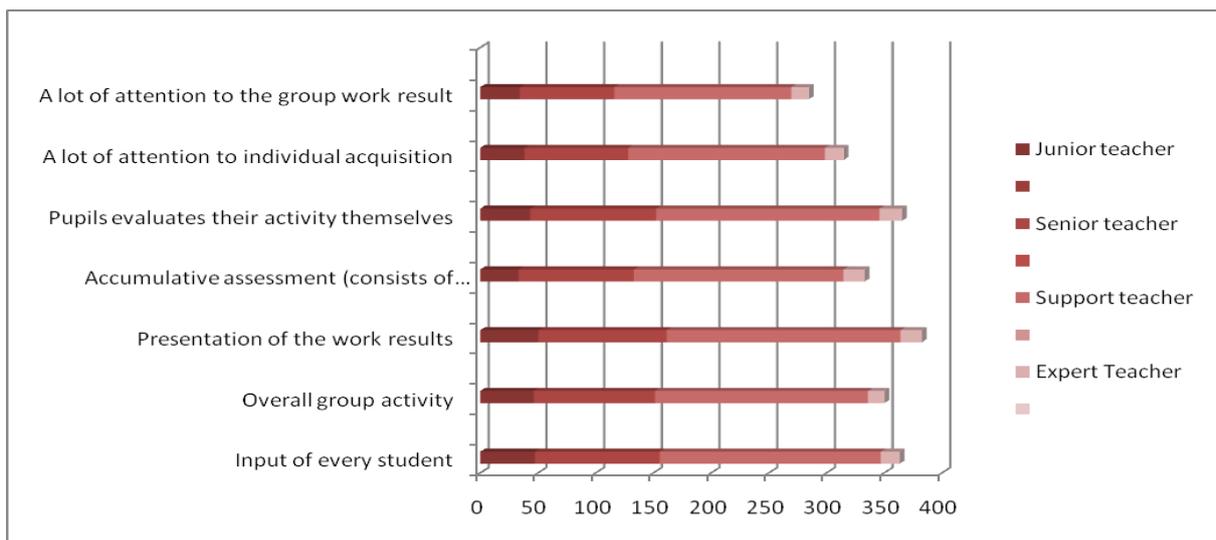
Educational activity	Distribution of respondents (Frequencies)							
	Junior teacher		Senior teacher		Support teacher		Expert Teacher	
Learning together	49	0.91	114	0.92	201	0.94	18	0.95
Group research	39	0.72	90	0.73	178	0.83	16	0.84
Mind map	30	0.56	85	0.69	152	0.71	15	0.79
Think, discuss and share	36	0.67	92	0.74	174	0.81	14	0.74
Pencils on the table	12	0.22	37	0.30	68	0.32	5	0.26
Puzzle	25	0.46	63	0.51	122	0.57	8	0.42
Four corners	20	0.37	56	0.45	97	0.45	10	0.53
Project method	39	0.72	97	0.78	168	0.79	17	0.89

The results also show that collaborative learning lessons involving various educational activities do not depend on teacher qualification (see Figure 7).



**Figure 7: The use of educational methods according to teacher qualification**

Results indicate that the selection of educational activities does not depend on teachers' qualifications. What is more, there are no big differences in what kind of evaluation and reflection methods teachers of different qualifications are choosing (see Figure 8).



**Figure 8: The use of different kinds of evaluation and reflection according to teacher qualification**

However, there is a slight difference in how teachers are using accumulative assessment. According to the data, junior teachers tend to use less accumulative assessment than other teachers (see Table 13). This difference can be explained by the fact that junior teachers are just starting their work as a teacher and it may be more difficult for them to take into account the various different aspects of evaluation that are involved in accumulative assessment.

**Table 13: The use of different kinds of evaluation and reflection according to teacher qualification**

Evaluation – reflection	Distribution of respondents (Frequencies)							
	Junior teacher		Senior teacher		Support teacher		Expert Teacher	
Input of every student	47	0.87	107	0.86	191	0.89	15	0.79
Overall group activity	46	0.85	104	0.84	184	0.86	13	0.68
Presentation of the work results	50	0.93	110	0.89	202	0.94	17	0.89
Accumulative assessment	33	0.61	99	0.80	181	0.85	17	0.89
Pupils evaluates their activity themselves	43	0.80	108	0.87	193	0.90	18	0.95
A lot of attention to individual acquisition	38	0.70	89	0.72	170	0.79	15	0.79
A lot of attention to the group work result	34	0.63	81	0.65	153	0.71	14	0.74

Spearman’s correlation analysis revealed that there is no strong correlation between educational activities used and evaluation and reflection methods adopted in collaborative learning lessons (see Table 14). These results indicate that teachers are able to choose educational activities independently of the kind of evaluation and reflection they use, and vice versa. It should be noted that while the level of probability is significant in many cases, this relates to the reliability of the correlation coefficient; the coefficients themselves are all low (below 0.4, which indicates very weak, if any, correlation).

**Table 14: Correlations between educational activities and different finds of evaluation and reflection**

Educational activity	Evaluation - reflection (correlation coefficients (p))						
	Input of every student	Overall group activity	Presentation of the work results.	Accumulative assessment	Pupils evaluates their activity themselves	A lot of attention to individual acquisition	A lot of attention to the group work result
Learning together	.284** (.000)	.346** (.000)	.307** (.000)	.201** (.000)	.332** (.000)	.305** (.000)	.161** (.001)
Group research	.219** (.000)	.297** (.000)	.270** (.000)	.204** (.000)	.317** (.000)	.249** (.000)	.220** (.000)
Mind map	.242** (.000)	.175** (.000)	.183** (.000)	.249** (.000)	.259** (.000)	.191** (.000)	.170** (.001)
Think, discuss and share	.124* (.012)	.170** (.001)	.169** (.001)	.202** (.000)	.262** (.000)	.180** (.000)	.178** (.000)
Pencils on the table	.112* (.023)	.146** (.003)	.161** (.001)	.111* (.024)	.129** (.009)	.191** (.000)	.179** (.000)
Puzzle	.036 (.469)	.165** (.001)	.195** (.000)	.161** (.001)	.179** (.000)	.210** (.000)	.270** (.000)
Four corners	0.046 (.357)	0.072 (.144)	.142** (.004)	.166** (.001)	.157** (.001)	.191** (.000)	.202** (.000)
Project method	.188** (.000)	.245** (.000)	.270** (.000)	.233** (.000)	.377** (.000)	.167** (.001)	.256** (.000)

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

Also there was no strong correlation found between short-term, long-term and home assignments of collaborative learning groups (see Table 15).

**Table 15: Correlation between different types of collaborative learning**

	Long-term (several weeks)	Collaborative tasks as a homework assignments
Short-term (1-2 lessons)	.158 (.001)	.179 (.000)

These results show that teachers chose either to engage in short-term or in long-term collaborative activities.

Additionally, results indicate that there is no strong correlation between the types of collaborative learning and the kinds of educational activities that teachers are choosing (see Table 16).

**Table 16: Correlations between educational activities and types of collaborative learning**

Educational activity	Types of collaborative learning (correlation coefficients (p))		
	Short term (1-2 lessons)	Long term (several weeks)	Collaborative tasks as a homework assignments
Learning together	.364** (.000)	.175** (.000)	.160** (.001)
Group research	.280** (.000)	.237** (.000)	.202** (.000)
Mind map	.179** (.000)	.134** (.000)	.190** (.000)
Think, discuss and share	.208** (.000)	.178** (.000)	.171** (.001)
Pencils on the table	.004 (.930)	.135** (.006)	.125* (.011)
Puzzle	.101* (.042)	.252** (.000)	.174** (.000)
Four corners	.162** (.001)	.133** (.007)	.238** (.000)
Project method	.238** (.000)	.204** (.000)	.144** (.003)

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

The same results were found when looking for correlations between types of evaluation–reflection and types of collaborative learning. In Table 17 it is possible to see that there are no strong correlations between either the types of evaluation and reflection or the short- or long-term collaborative learning.

**Table 17: Correlations between types of evaluation and reflection and types of collaborative learning**

Evaluation-reflection	Types of collaborative learning (correlation coefficients (p))		
	Short term (1-2 lessons)	Long term (several weeks)	Collaborative tasks as a homework assignments
Input of every student	.197** (.000)	.148** (.003)	-.003 (.952)
Overall group activity	.146** (.003)	.149** (.002)	.048 (.334)
Presentation of the work results	.175** (.000)	.172** (.000)	.090 (.067)
Accumulative assessment	.102* (.038)	.129** (.009)	.093 (.059)
Pupils evaluates their activity themselves	.218** (.000)	.142** (.004)	.122* (.014)
A lot of attention to individual acquisition	.125* (.011)	.107* (.030)	.043 (.386)
A lot of attention to the group work result	.117* (.018)	.106* (.031)	.179** (.000)

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

In terms of teachers using interactive whiteboards, Table 18 indicates that there are no strong correlations between kinds of evaluation and reflection and educational activities used in collaborative learning.

**Table 18: Correlations between educational activities and kinds of evaluation and reflection in the group of teachers using interactive whiteboards**

Evaluation - reflection (correlation coefficients (p))							
Educational activity	Input of every student	Overall group activity	Presentation of the work results.	Accumulative assessment	Pupils evaluates their activity themselves	Attention to individual acquisition	Attention to the group work result
Learning together	.355** (.000)	.386** (.000)	.320** (.000)	.172* (.033)	.302** (.000)	.307** (.000)	.111 (.172)
Group research	.297** (.000)	.304** (.000)	.264** (.001)	.105 (.199)	.236** (.003)	.257** (.001)	.155 (.056)
Mind map	.356** (.000)	.182* (.025)	.108 (.184)	.065 (.426)	.197* (.014)	.105 (.198)	.079 (.332)
Think, discuss and share	.157 (.053)	.080 (.325)	.059 (.468)	.178* (.027)	.165* (.042)	.191* (.018)	.116 (.153)
Pencils on the table	.122 (.132)	.081 (.323)	.143 (.077)	.085 (.294)	.052 (.524)	.257** (.001)	.169* (.037)
Puzzle	.025 (.757)	.211** (.009)	.275** (.001)	.096 (.236)	.148 (.067)	.103 (.207)	.238** (.003)
Four corners	-.021 (.792)	.116 (.152)	.217** (.007)	.107 (.186)	.042 (.602)	.145 (.074)	.205* (.011)
Project method	.060 (.464)	.198* (.014)	.204* (.011)	.077 (.343)	.250** (.002)	.125 (.125)	.154 (.058)

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
 \* . Correlation is significant at the 0.05 level (2-tailed).

But, results indicated that there are differences in terms of which learning activities are chosen by teachers who use interactive whiteboards and those who use other technologies (see Table 19).

**Table 19: Different learning methods used in collaborative learning lessons, comparing those who use interactive whiteboards with those using all technologies**

Educational activity	Distribution of respondents (Frequencies)	
	Interactive whiteboard (n = 153)	All responses (n = 411)
Learning together	141 (0.92)	270 (0.66)
Group research	125 (0.82)	286 (0.70)
Mind map	114 (0.75)	297 (0.72)
Think, discuss and share	123 (0.80)	288 (0.70)
Pencils on the table	48 (0.31)	363 (0.88)
Puzzle	91 (0.59)	320 (0.78)
Four corners	77 (0.50)	334 (0.81)
Project method	122 (0.80)	289 (0.70)

When using interactive whiteboards, teachers tend to use educational activities such as learning together, group research, project method, think, and discuss and share method, whereas teachers using different technologies use pencils on the table, four corners or puzzle methods much more. When comparing these two groups, there are also differences in the types of evaluation-reflection they choose (see Table 20).

**Table 20: Different types of evaluation and reflection used in collaborative learning lessons, comparing those who use interactive whiteboards with those using all technologies**

Evaluation-reflection	Distribution of respondents (Frequencies)	
	Interactive whiteboard (n = 153)	All responses (n = 411)
Input of every student	136 (0.89)	275 (0.67)
Overall group activity	132 (0.32)	279 (0.68)
Presentation of the work results	149 (0.97)	262 (0.64)
Accumulative assessment (consists of individual input and group work overall)	131 (0.86)	280 (0.68)
Pupils evaluates their activity themselves	137 (0.90)	174 (0.67)
A lot of attention to individual acquisition	120 (0.78)	291 (0.71)
A lot of attention to the group work result	111 (0.73)	300 (0.73)

When teachers are evaluating or doing reflection with pupils and enhancing this process with interactive whiteboards, they often tend to look through presentation of the work results, encourage pupils to evaluate the activity themselves or to look for inputs of every pupil. While using interactive whiteboards, teachers reflect less on inputs of every pupil, which they tend to do while using other technologies (see Table 20).

There are differences also in the length of collaborative learning activities that are chosen. Table 21 shows these differences.

**Table 21: The lengths of collaborative learning activities, comparing those using interactive whiteboards with those using all technologies**

The length of collaborative learning	Distribution of respondents (Frequencies)	
	Interactive whiteboard (n = 153)	All responses (n = 411)
Short-term (1-2 lessons)	133 (0.87)	278 (0.68)
Long-term (several weeks)	69 (0.45)	342 (0.83)
Collaborative tasks as a homework assignments	82 (0.54)	329 (0.80)

Teachers using interactive whiteboards tend to use collaborative learning for short-term (1-2 lessons) activities, whereas teachers using other technologies tend to use collaborative learning for long-term (several weeks) activities or give collaborative tasks for students as their homework (see Table 21).

## 8. DISCUSSION

The population of Lithuania's teachers consists of many more female (87.5%), than male (12.5%) teachers, and their overall working experience is high (up to 4 years of teaching there are 6.3% of the total, from 4 to 14 years of teaching 15.4%, and the majority, 78.3% of teachers, have worked for more than 15 years). More schools are situated in the cities (Lietuvos statistikos departamentas, 2016). In the current research, an attempt was made to construct a representative sample of teachers. Overall, 411 teachers participated in research, 374 of them were women (91%) and 37 men (9%), the average of their pedagogical work experience was 24.6 years (4.4% in the group of teacher with experience up to 4 years, 12.2% in the group of teachers in the range of 4-14 years, and 83.5% of teachers with more than 15 years' working experience). As Lithuanian teacher qualifications depend on years of working experience, the qualification groups in this research are also representative; the analysis showed that the majority of teachers are support teachers (those with city-wide responsibility), and the minority were teachers who did not have any qualification (junior teachers, which refers to early stage career teachers). Teachers in this study sample and the overall teacher population in Lithuania are in the more-experienced categories. The majority of the respondents in the survey are working in long gymnasiums (pupils aged from 6 to 19 years) and in middle schools (pupils aged from 11 to 16 years), with only 5 teachers working in primary (pupils aged from 6 to 11 years) and 9 in secondary (pupils aged from 6 to 19 years) schools. Eighty per cent of teachers are working in schools that are located in cities and only 27 teachers are working in small villages. The smallest school where teachers are working has only 15 pupils and the biggest has 1,500 pupils. The smallest class where teachers are working is of 6 pupils and the biggest has 36 pupils.

The main focus of this research was to get a clear view about how teachers use software and technologies in collaborative learning lessons, looking at the lesson in terms of its four basic parts: (1) setting the learning goal; (2) presenting theoretical material; (3) involving main learning activities; and (4) evaluation – reflection. Research results showed that in collaborative learning lessons, teachers can use different educational activities to engage pupils in collaborative learning. The main methods that teachers are using are 'learning together', 'group research', and 'project work', while for evaluation and reflection teachers assess the 'input of every student', 'presentation of results', and 'self-assessment'.

It was found that teachers who use short-term collaboration activities do not use long-term collaborative activities. Also results indicate that there was no correlation found between the use of educational activities chosen and evaluation and reflection in the groups of teachers engaging in long- and short-term collaborative learning. According to this we can state that teachers are able to choose educational activities they like, not dependent on linking these to the kind of evaluation and reflection. Overall, the forms of educational activities and kinds of evaluation and reflection are wide enough for choice, and teachers can develop various pedagogical scenarios for pupil collaborative learning.

In different parts of collaborative learning lessons, teachers are most likely to use the same software: web browsers (e.g. Internet Explorer, Chrome, Mozilla); presentation programs (e.g. Microsoft PowerPoint), or interactive programs and lessons. The use of web browsers can be explained by the fact that when pupils engage in, for example, group research activities, they need to find some kind of information. Presentation programs are used to present outcomes of collaborative learning, while interactive lessons and programs are more likely used for activities concerned with preparing projects or group work activities.

Research results showed that while engaging in collaborative learning, teachers use projectors and interactive whiteboards in all parts of the lesson. Also, teachers tend to use sound recording systems while presenting theoretical material and using educational methods. However, there are a number of teachers who do not use technologies at the beginning of the lesson – setting learning goals - or at the end of the lesson – evaluation and reflection. Overall, technologies seem to be important to the teachers when they are presenting theoretical material for pupils and when pupils engage in main learning activities.

This research has allowed a focus on the use of interactive whiteboards in collaborative learning lessons. Teachers using interactive whiteboards tend to use collaborative learning for short-term (1-2 lessons) activities, whereas teachers using other technologies tend to use collaborative learning for long-term (several weeks) activities or to give collaborative tasks for students as their homework.

When using interactive whiteboards, teachers engage with educational methods such as ‘learning together’, ‘group research’, ‘project methods’, ‘think, discuss and share’, whereas teachers using different technologies use ‘pencils on the table’, ‘four corners’ or ‘puzzle

methods' much more. For evaluation or reflection with pupils and enhancing this process with interactive whiteboards, they often tend to look through presentation of the work results, encourage pupils to evaluate the activity themselves or to look for inputs of every pupil. When using interactive whiteboards teachers reflect less on inputs of every pupil, which they tend to do when they are using other technologies. The results suggest that interactive whiteboards are used in activities, when pupils need to research, find information, present and discuss it. Results of this survey indicated that there is no strong correlation between educational activities and evaluation methods in the group of teachers who enhance learning with interactive whiteboards. These results indicate that including interactive whiteboards in educational processes leads to the same opportunities for the teacher to choose from the variety of educational activities and kinds of evaluation and reflection. This means that improvement of learning processes is determined only by teachers' choices of methods.

## 9. CONCLUSIONS

From the research results, it was interesting to find that those teachers who use short-term collaboration activities do not use long-term collaborative activities. What is more, teachers using interactive whiteboards tend to use collaborative learning for short-term (1-2 lessons) activities, whereas teachers using other technologies tend to use collaborative learning for long-term (several weeks) activities or to give collaborative tasks for students as their homework.

This survey revealed that the most popular software among teachers is: web browsers (e.g. Internet Explorer, Chrome, Mozilla); presentation programs (e.g. Microsoft PowerPoint); or interactive programs and lessons. The most popular technologies are interactive whiteboards and projectors. Research results do not explain why the third technology - sound recording systems - is used by teachers; further research is needed to answer the question of what the purpose is of the sound recording system.

One of the findings of this research shows that teachers who use interactive whiteboards tend to choose a different balance of educational activities and different kinds of evaluation and reflection than those who use other technologies. The results suggest that interactive whiteboards are used in activities when pupils need to research, find information, present and discuss it.

As this research was focused on observation of teachers' practices nationwide, it would be interesting to look at teachers' practices close up, by creating collaborative learning lessons together with teachers. To take this research further, design-based research will be implemented in order to do this in one of Lithuania's gymnasiums (pupils of the age 14 to 19 years). Two teachers will be asked to participate, one engaging with short-term collaborative learning and the other with long-term collaborative learning. In discussion with these two teachers about implementation of collaborative learning, they will be asked (in order to supplement the detail identified from the survey): how they perceive or will consider constructing the main parts of collaborative learning lessons; what kind of educational activities they will choose and how they would like to involve pupils in collaborative learning lessons; what kind of evaluation and reflection they would like to implement and why;

whether their choice of evaluation and reflection is in any way linked to the selection of educational activities and vice versa; in what sections and how technologies are coming into collaborative learning lessons; what kinds of technologies they will use in collaborative learning lessons and why. The answers to these questions and the observations of their lessons will give a broader view of how teachers are coping with collaborative learning, what it brings to the learning processes and how technologies enhance that learning.

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## Appendix: Survey questionnaire

### Mokymasis bendradarbiaujant ir technologijų naudojimas pamokoje

Esu VDU Edukologijos mokslo krypties II kurso doktorantė Justina Naujokaitienė (disertacijos vadovė prof. Margarita Teresevičienė).

Disertacijoje analizuojame kaip mokytojai planuoja bei taiko grupinio darbo veiklas pamokose bei kokį vaidmenį pamokoje užima technologijos.

Klausimynas, kurį prašome Jūsų užpildyti, yra anoniminis. Tyrimo duomenys bus naudojami tik moksliniais tikslais, neviešinant jokios asmeninės informacijos.

Klausimyne nėra teisingų ar klaidingų atsakymų, tad prašau būti nuoširdžiais ir atsakyti į visus klausimus.

Dėkoju už skirtą dėmesį ir laiką!

**ATSAKYKITE Į KLAUSIMUS APIE SAVE BEI MOKYKLĄ, KURIOJE DIRBATE.**



**Įvardinkite savo lytį**

<input type="checkbox"/>	Moteris
<input type="checkbox"/>	Vyras

**Irašykite savo amžių**

**Įvardinkite savo pedagoginę kvalifikaciją**

<input type="checkbox"/>	Mokytojas
<input type="checkbox"/>	Vyresnysis mokytojas
<input type="checkbox"/>	Mokytojas metodininkas
<input type="checkbox"/>	Mokytojas ekspertas

**Irašykite savo darbo stažą?**

**Kiek mokinių mokosi mokykloje, kurioje dirbate?**

**Mokykla, kurioje dirbate yra:**

<input type="checkbox"/>	Pradinė
<input type="checkbox"/>	Pagrindinė
<input type="checkbox"/>	Vidurinė
<input type="checkbox"/>	Progimnazija
<input type="checkbox"/>	Ilgoji gimnazija
<input type="checkbox"/>	Išgryninta gimnazija (4-metė)

**Kur įsikūrusi mokykla, kurioje dirbate?**

<input type="checkbox"/>	Miestas
<input type="checkbox"/>	Miestelis
<input type="checkbox"/>	Kaimas

**Kiek, vidutiniškai, klasėse, kuriose dirbate mokosi mokinių?**

## MOKYMASIS BENDRADARBIUJANT

Šioje dalyje pateikti klausimai apie tai, kaip mokytojas planuoja, įgyvendina bei įvertina pamoką, kurioje organizuojamos bendradarbiavimą skatinančios veiklos.



Grupinis darbas pamokose gali būti trumpalaikis (t.y. 1 ar 2 pamokų trukmės) ir ilgalaikis (trunkantis mėnesį ar semestrą). Įvertinkite kokią mokymosi bendradarbiavimo formą, atsižvelgiant į taikymo trukmę Jūs naudojate savo darbe.

	Visiškai nesutinku	Nesutinku	Sunku pasakyti	Sutinku	Visiškai sutinku
Mokymosi bendradarbiaujant veiklas organizuoju 1-2 pamokų trukmės.					
Mokymosi bendradarbiaujant veiklos trunka keletą savaičių.					
Mokymosi bendradarbiaujant užduotis skiriu atlikti namuose					

Pamokose mokytojai taiko įvairius ugdymo metodus, siekdami, kad mokiniai pasiektų išsikeltus tikslus. Kokius metodus Jūs naudojate dažniausiai, organizuodami grupinį darbą pamokoje.

	Visiškai nesutinku	Nesutinku	Sunku pasakyti	Sutinku	Visiškai sutinku
Organizuodamas grupinį darbą pamokose naudoju MOKYMOSI KARTU metodą, kuomet mokiniams skiriama užduotis ir jie kartu ieško jos sprendimo.					
Organizuodamas grupinį darbą pamokose naudoju GRUPINIO TYRIMO metodą, kuomet mokiniai kartu analizuoja bei apibendrina gautą informaciją, atlieka tyrimą.					
Organizuodamas grupinį darbą pamokose naudoju MINČIŲ ŽEMĖLAPIO metodą.					
Organizuodamas grupinį darbą pamokose naudoju PAMAŠTYK, APTARK IR PASIDALINK metodą, kuomet mokiniai skatinami atrasti sprendimą individualiai ir tuomet jį patarti su kitais mokiniais.					
Organizuodamas grupinį darbą pamokose naudoju RAŠIKLIAI ANT STALO metodą, kuomet mokiniai po vieną išsako savo nuomonę, o ją išsakę deda rašiklį ant stalo.					
Organizuodamas grupinį darbą pamokose naudoju DĖLIONĖS metodą, kuomet mokiniai tinkamai atlikę užduotį pamato bendrą, platesnį vaizdą.					
Organizuodamas grupinį darbą pamokose naudoju KAMPUJ metodą, kuomet mokiniai užduoties sprendimą argumentuoja skirtingai.					
Organizuodamas grupinį darbą pamokose naudoju PROJEKTŲ metodą, kuomet mokiniai sprendžia realaus gyvenimo problemas tam tikra tema ir darbą pristato.					

### Kaip Jūs vertinate mokinius?

	Visiškai nesutinku	Nesutinku	Sunku pasakyti	Sutinku	Visiškai sutinku
Vertinu kiekvieno mokinio įdėtą darbą.					
Vertinu bendrą grupės veiklą.					
Vertinu grupės pristatytą darbą.					
Taikau kaupiamąjį vertinimą (vertinama už individualų darbą+veiklą grupės darbe)					
Prašau, kad mokiniai savo veiklą įsivertintų patys.					
Vertindamas daugiau dėmesio skiriu mokinio išmokimui.					
Vertindamas daugiau dėmesio skiriu grupės darbo rezultatui.					

### TECHNOLOGIJŲ NAUDOJIMAS PAMOKOS METU

Tai paskutinė klausimyno dalis, kurioje yra pateikti teiginiai apie technologijų naudojimą planuojant pamoką bei ją įgyvendinant.



### Kada ir kokias technologijas naudoju pamokose, kuomet organizuoju mokymosi bendradarbiaujant veiklas.

Kiekviena pamoka turi savo struktūrą, kurią pats mokytojas gali koreguoti. Pamoka, kurioje mokiniai dirba grupėse, bendradarbiauja tarpusavyje skiriasi nuo tradicinio ugdymo pamokos. Žemiau prašoma įvertinti kaip dažnai skirtingose pamokos dalyse Jūs naudojate išvardintas technologijas. *Tick all that apply.*

### Pamokoje formuluodamas uždavinį (tikslą).

	Interaktyvi lenta
	Projektorius
	Dokumentų kamera
	Televizorius
	Garso įrašymo įranga
	Video kamera
	Nenaudoju technologijų

**Mokiniamis pristatydamas teorinę pamokos medžiagą.**

	Interaktyvi lenta
	Projektorius
	Dokumentų kamera
	Televizorius
	Garso įrašymo įranga
	Video kamera
	Nenaudoju technologijų

**Taikydamas ugdymo metodus pamokoje, kurie skatina mokinių bendradarbiavimą.**

	Interaktyvi lenta
	Projektorius
	Dokumentų kamera
	Televizorius
	Garso įrašymo įranga
	Video kamera
	Nenaudoju technologijų

**Vertindamas mokinius (reflektuojant, mokiniams pristatant rezultatus ir pan.).**

	Interaktyvi lenta
	Projektorius
	Dokumentų kamera
	Televizorius
	Garso įrašymo įranga
	Video kamera
	Nenaudoju technologijų

Kada ir kokias technologines programas naudoju pamokose, kuriose skatinu mokinius bendradarbiauti.

**Pamokoje formuluodamas uždavinį (tikslą).**

	Interneto naršykles (pvz. Internet Explorer, Chrome, Mozzila ir kt.)
	Teksto redaktorių (Ms Word)
	Skaičiuoklę (Ms Excel)
	Pristatymą (Ms Power Point)
	Internetinių puslapių kūrimo įrankius
	Interaktyvias ugdymo programas, pamokas
	Diskusijų grupes (pvz. forum, chat ir kt.)
	Socialinius tinklus (pvz. facebook, linkedIn ir kt.)
	Nenaudoju technologijų

**Mokiniams pristatydamas teorinę pamokos medžiagą.**

	Interneto naršykles (pvz. Internet Explorer, Chrome, Mozzila ir kt.)
	Teksto redaktorių (Ms Word)
	Skaičiuoklę (Ms Excel)
	Pristatymą (Ms Power Point)
	Internetinių puslapių kūrimo įrankius
	Interaktyvias ugdymo programas, pamokas
	Diskusijų grupes (pvz. forum, chat ir kt.)
	Socialinius tinklus (pvz. facebook, linkedIn ir kt.)
	Nenaudoju technologijų

**Taikydamas ugdymo metodus pamokoje, kurie skatina mokinių bendradarbiavimą.**

	Interneto naršykles (pvz. Internet Explorer, Chrome, Mozzila ir kt.)
	Teksto redaktorių (Ms Word)
	Skaičiuoklę (Ms Excel)
	Pristatymą (Ms Power Point)
	Internetinių puslapių kūrimo įrankius
	Interaktyvias ugdymo programas, pamokas
	Diskusijų grupes (pvz. forum, chat ir kt.)
	Socialinius tinklus (pvz. facebook, linkedIn ir kt.)
	Nenaudoju technologijų

**Vertindamas mokinius (reflektuojant, mokiniams pristatant rezultatus ir pan.)**

	Interneto naršykles (pvz. Internet Explorer, Chrome, Mozilla ir kt.)
	Teksto redaktorių (Ms Word)
	Skaičiuoklę (Ms Excel)
	Pristatymą (Ms Power Point)
	Internetinių puslapių kūrimo įrankius
	Interaktyvias ugdymo programas, pamokas
	Diskusijų grupes (pvz. forum, chat ir kt.)
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	Nenaudoju technologijų

**Ačiū už bendradarbiavimą.**



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