

# LESSON BASED PROFESSIONAL DEVELOPMENT: HELPING PRIMARY TEACHERS TEACH 21<sup>ST</sup> CENTURY SKILLS

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## Abstract

In the context of planned curriculum reforms in Latvia, teachers will have to acquire the necessary understanding and experience for teaching 21<sup>st</sup> century skills. This goal demands real changes in lesson design and how teaching is presented in the classroom. Therefore, this paper seeks to describe and analyse two years of experience in implementing a lesson-based professional learning model for primary school teachers. Empirical data were gathered through a case study design documenting the experience and professional growth of two teacher teams over the course of two years. Results show the first measurable evidence that a lesson-based professional learning model can be helpful to primary teachers for teaching 21<sup>st</sup> century skills.

Keywords: 21st century skills, competency-based education, learning study, research based design.

## 1 BACKGROUND AND PROBLEM STATEMENT

### 1.1 How 21<sup>st</sup> century skills enter the education system in Latvia

Similar to other world countries [1], Latvia is planning to shape its learning content by developing student competencies, also called 21<sup>st</sup> century skills. By 21<sup>st</sup> century skills, we understand the following: critical thinking, problem solving, creativity, communication and collaboration [2]. Changes in learning content are directly related to competency-based education (CBE) and it is believed that CBE will help to bridge the gap between the labour market and education [3], and proposes competencies as a way to heighten student functional effectiveness in society [4].

Despite the fact that 21<sup>st</sup> century skills are particularly important for an innovation-intensive labour market, consensus does not yet exist on how education systems should develop and assess teaching of these skills systematically [5]. One of the most widespread approaches for acquiring 21<sup>st</sup> century skills is deep learning, also called *deeper learning*, *visible learning* [6, 7]. Deep learning imply usage of a conscious cognitive and metacognitive strategy necessary to construct knowledge in different contexts and situations. During a deepened learning process students develop their skills to generalize or transfer new knowledge and skills to unknown situations. This is accomplished by primary emphasis on processes that help to acquire knowledge (*how we know*), rather than a focus only on accumulated subject matter content (*what we know*).

The course towards development of basic 21<sup>st</sup> century skills in Latvia was set in 1998 [8], and in 2006 it was included in the learning content of educational regulations [9, 10] highlighting analytical and critical thinking, creativity, self-expression, communication, collaboration and learning skills. Our previous research based on lesson observations as a teacher learning tool identified a gap between Latvian education policy regulations and the actual teaching approaches practiced in schools. It is obvious that education requirements enter school practices far too slowly and incompletely [11, 12]. Likewise, Fullan has pointed out the same widespread discrepancy between educational policies and their actual implementation in schools and classrooms [13]. This highlights the necessity to seek additional solutions that would help teachers implement teaching of 21<sup>st</sup> century skills and deep learning approaches in the classroom. Teaching and learning must undergo significant changes, therefore teacher professional development (PD) must focus on real classroom environment, which would help teachers acquire experience and practice, while improving their professionalism through immersion and detailed analyses of their performance during a classroom lesson.

This paper will seek solutions to help primary teachers bridge the gap in implementing teaching of 21<sup>st</sup> century skills in the classroom and to offer insights for teacher educators and those who implement education reforms. In order to determine the continuity for several aspects of curriculum reforms carried out in the last ten years in Latvia, specified categories of 21<sup>st</sup> century skills for research were chosen: 1) analytical and critical thinking, 2) self-directed learning and 3) collaboration.

## 1.2 What is professional development for teaching 21<sup>st</sup> century skills?

Implementing teaching of 21<sup>st</sup> century skills demands substantial changes in the practice of teaching and teacher PD. We offer a continuous collaborative teacher professional learning model based on experiences acquired by primary teachers. Teacher professional learning experience in Latvia is based on the principle that teachers must learn in the same way that he/she is expected to teach his/her students and our model implies that this principle can be achieved through lesson-based professional development (LBPD).

Innovative teaching practices tend to be reported more frequently by teachers whose recent PD happened over a longer term and included more hands-on activities [14]. Therefore, one of the cornerstones of LBPD is that teachers have to acquire experience based on practice (and that this practice can be directly observed and assessed by expert-coaches as well as peer teachers). Furthermore, change in teacher attitudes and beliefs occur primarily after they gain evidence of improvements in student learning [15] which is possible only if teachers experiment with new instructional approaches, use new materials or curricula, make modifications in their teaching procedures or classroom format. It can be argued that it is not the PD per se, but the experience of successfully practicing new teaching approaches that changes teacher attitudes and beliefs. Lastly, PD encourages teachers to develop their own communities of inquiry [16] which was one of the goals of our continuous collaborative teacher professional learning model.

Among effective ways of teacher PD are educational design research [17], action research [18], teaching research groups [19], learning study [20] and lesson study (LS) [21]. There are many aspects of LS for which we believe it is a fruitful approach to teachers' PD. LS can break the isolation of teachers through its collaborative lesson planning process [22]. Collaboration as collegial support enhances teacher confidence in experimenting with new teaching ideas [23]. Collaborative work during LS is one of the most crucial elements, but also individual work during a LS cycle is crucial and we term it learning study. There are different variations of LS organization. The most suitable structure of steps is adapted from Fernandez [21] and Lewis [24]:

- collaboratively set goals for student learning, and plan a preliminary lesson to reach this goal;
- conduct the lesson, with one teacher teaching and others observing and gathering data on teacher delivery and student learning;
- analytically reflect on the strengths and weaknesses of the lesson in order to improve it;
- continuously repeat these steps until the lesson has improved and reached its goal.

Our proposed LBPD model is complex and driven by teachers who collaborate, try out new teaching approaches, reflect on their and others' work, gain new experience and in doing so change their attitudes and beliefs. This approach to LBPD can help teacher teach 21<sup>st</sup> century skills.

## 2 METHODOLOGY AND RATIONALE

The goal of this article is to describe the developed LBPD, which was approbated in the group of primary school teachers, and to answer the following research question: *What are the first signs that evidence the positive impact on the LBPD model on teacher performance in teaching 21<sup>st</sup> century skills?* To answer the question, research was conducted to find out teacher and school administration opinion on the impact of LBPD on teacher professionalism and to identify the skills demonstrated by the primary school teachers involved in the learning group for teaching students 21<sup>st</sup> century skills.

Research design corresponds to a case study research within which the LBPD model was piloted in two regional primary school teacher groups over a period of two years, focusing on teaching mathematics and science. The research enabled us to describe the operation of the model and discuss its usage in different subjects among teachers working with students representing different age groups. It is crucial in the context of the state planned education reforms that envisage development of teacher understanding and skills so that, irrespective of the lesson subject, the learning process would be targeted on acquiring 21<sup>st</sup> century skills, and students would learn how to construct knowledge and transfer it to new situations.

## 2.1 Research methodology

### 2.1.1 Who are the participants

National network for schools with previous innovative experience (SIE), hosted by the National Centre of Education, was used as a basis to establish a new group of primary school teachers. It included teams from thirteen schools from which eleven schools had five to ten years of experience in implementation of innovations. Each team consisted of two primary school teachers (without previous innovative experience) and a school administration representative. To facilitate teacher learning and collaboration, two regional groups were established: one group included six teams, the other – seven. Schools were selected in school year 2013/2014, so that the implementation of the model could commence in school year 2014/2015 and continue in 2015/2016. Eight experts from the Interdisciplinary Center of Educational Innovation (ICEI) of the University of Latvia were leading teacher learning and conducting research.

### 2.1.2 Data acquisition and analyses

To assess teacher progress and factors influencing it, data was collected and various research tools were used:

- teacher questionnaires – self-evaluation of skills (adapted from PROFILES project [25]; evaluation of different learning aspects on the Likert scale (authors' original);
- final teacher focus group discussion;
- structured interviews with school administration;
- lesson plans developed by teachers and transcripts of the observed lessons;
- expert-coaches focus group discussions.

The research looked into 52 lesson plans developed by teachers and were evaluated by two independent expert-coaches according to rubrics. Workshops offered 44 lessons for observation; evaluation was made by an expert-coach also according to rubrics. Rubrics were adapted from Biggs and Tang [26]; SRI International [27]; and ICEI original rubrics; (see Table 1 as an example of a rubric). Quality of evaluation was ensured by expert-coaches experience in lesson analyses obtained from trainings and extensive personal experience.

**Table 1.** Sample rubric for category “Facilitation of Self-Driven Learning” for criteria “Clarity of Learning Goals.”

0	1	2	3	4
Teacher fails to communicate lesson outcome or communicates it formally but the message is not understood by students	Teacher sets well defined goal; but fails to make sure it is understood by students	Teacher sets goal and expresses it clearly; makes sure that it is understood by students	Teacher sets goal and performance criteria; makes sure that it is understood by students	Students participate in defining, elaborating and amending goals

The survey was electronically filled out by 20 respondents and the data were processed (with Statistical Package for the Social Sciences - SPSS); validity - Cronbach's Alpha 0,92 and 0,94. The teacher final focus group consisted of 21 respondents; the school administration structured interview included 12 interviewees. All teacher and school administration surveys, focus groups and interviews took place during seminars; the data were coded and categorized; the content was analysed. Expert-coaches focus group discussions following each seminar were transcribed, coded and analysed. All data was gathered during two learning cycles from 2014 through 2016 and included eleven workshops.

## 2.2 Model development

### 2.2.1 Structure of LBPD model and how it works

The new LBPD model with the focus on mutual lesson observation and analyses was developed based on a teacher learning model termed Continuous Professional Development Model (CPDM) operating and approved in Latvia previously. In collaboration with science and mathematics teachers in the Latvian SIE Network and elsewhere this model proved to be effective since 2011, and was analyzed in several publications [11, 28, 29, 30, 31]. The CPDM model is a successful way to improve teacher skills to effectively and meaningfully lead a lesson and implement innovations in learning in the classroom. It facilitates immersion and helps a teacher transfer the acquired knowledge to personal practice, apply it and receive personalized feedback from his/her colleagues. The model has been improved to enliven the idea that teacher learning must be identical to what we want to see in the classroom [32]. It is teacher learning by doing.

The improved LBPD model consists of three structural elements (see Figure 1):

- Long term – learning through collaborating for research, which is realized as workshops for lesson observation, for analyses (acquiring new experience and training for teachers' reflection skills in seminars, collaboration with teachers from other schools and an expert-coach similarly as in the CPDM model).
- Learning study – structured teacher independent work which includes developing lesson samples according to the assignment, given criteria and by piloting them in the classroom; reflection; finding artefacts or in other words examination of personal practice with an aim of improving it (action research).
- Support at school – collaboration among the school team to learn by planning, mutual observation and lesson analyses, by feedback provided to and received from colleagues, by reflecting.

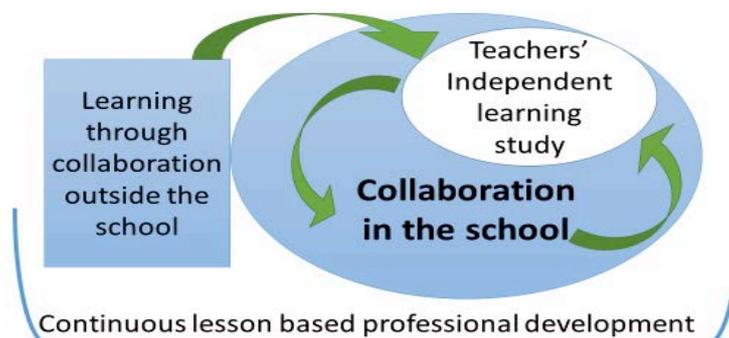
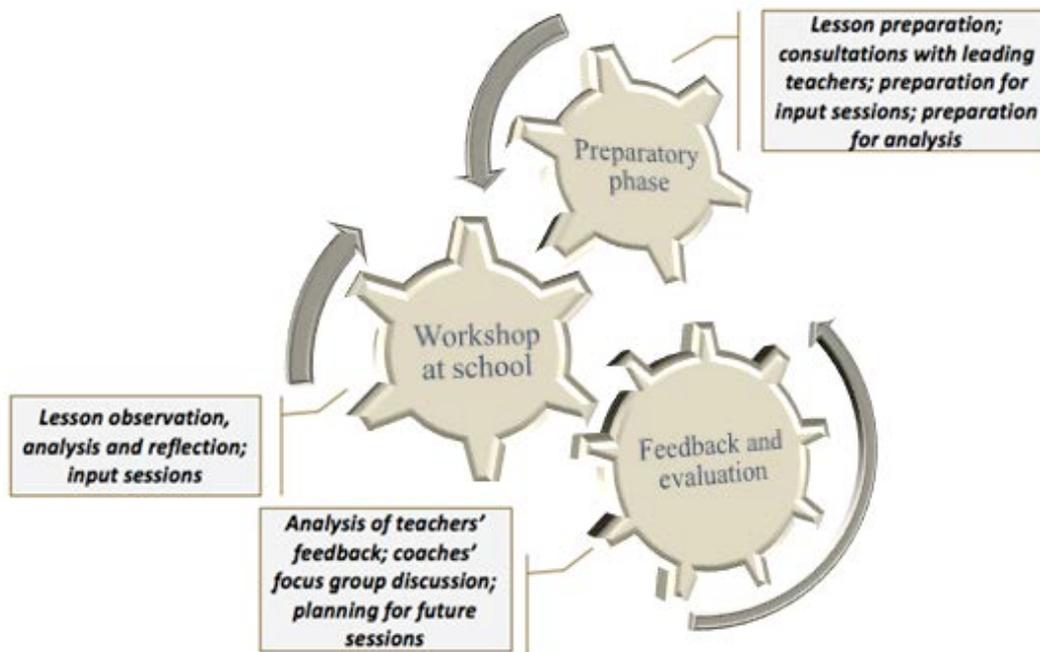


Figure 1: LBPD model.

All elements of the model include collaboration, new experience and analyses based teacher learning, and highlights improvement of teacher reflection skills. Action research includes the following activities: *observe – reflect – discuss*. They are performed by all teachers for multiple times during every workshop as well as during school year workshop cycle and between workshops at the school.

### 2.2.2 First element of LBPD model

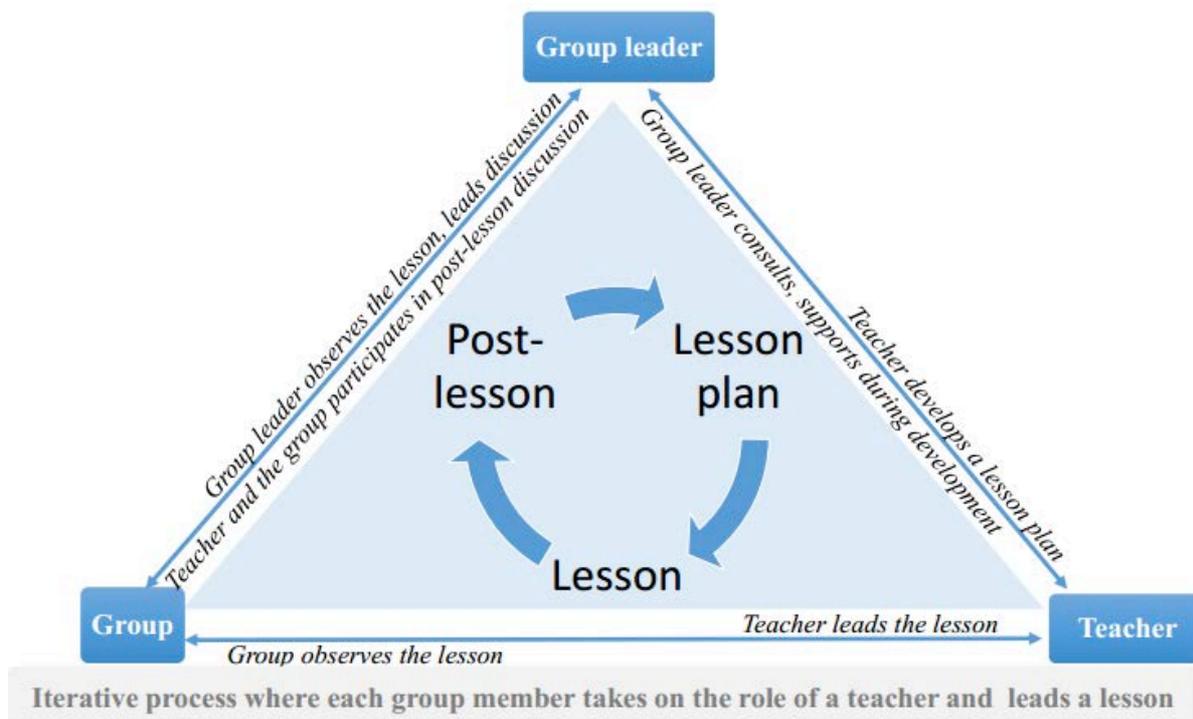
The first element of the LBPD model is designed as a regular teacher learning workshop where teachers learn from one another in a real school environment. Figure 2 shows the three phases of the implementation of the model.



**Figure 2:** Three phases of CPDM.

Lesson observation and analyses is the most significant part of the regular learning workshops. Within each workshop, a lesson is led by a teacher from a different group, while other participants observe the lesson and participate in the post-lesson discussion working by the principle *observe - reflect - discuss* adapted from the CPDM. The group is established for long term collaboration (up to at least one school year). It is crucial to develop trust based relationships among participants, the group and the expert-coach. The group consists of several teams from different schools. Several teachers lead lessons simultaneously in different classrooms at the school, which ensures an optimum number of teachers observing a lesson and participants for discussion on productive lesson analyses. Every school hosts one workshop annually. This enables every teacher to attend five to seven seminars.

The workshop (one day) consists of introduction (agreeing on the goals – the focus question, lesson observation in the classroom (one to two lessons) and joint lesson analyses (including reflection on the analyses). Each workshop ends with feedback by participants. For the purpose of lesson observation and analyses, special transcript, analyses forms and a procedure for post-lesson discussion were developed. During the workshop cycle, a teacher gets a chance to demonstrate several significant roles in his/her PD - teacher as a learner, teacher as a leader and teacher as a reflective practitioner. Within CPDM, a significant role is played by both the group and the group leader – expert – coach (see Figure 3 [33]). Previous research studies highlight the importance of expert-coaches: they must be able to immerse into the lesson, facilitate effective discussion on analyses in the group of teachers, and provide individual feedback to teachers between workshops. For the purpose of quality, each workshop commences and ends with an expert-coach focus group discussion. Experts also receive regular lesson observation and analysis training. The initial preparation before individual practice included analysis of lesson observation videos within a group of expert-coaches as well as expert pair-work on real lesson observation and evaluation.



**Figure 3:** The role of expert-coach as a group leader in CPDM.

### 2.2.3 Second element of LBPD model

Between workshops, every school team and teachers individually organized a learning study requiring teachers to adapt and pilot lesson plans designed by expert-coaches in the 1<sup>st</sup> year and design and pilot their own lesson plans in the 2<sup>nd</sup> year. Learning study is a structured, individual teacher independent work, which includes developing lesson samples with support from the expert-coach, as specified in the assignment, using the provided criteria and piloting the samples in the classroom. After the workshop every teacher received an assignment to develop a lesson plan and lead a lesson at school or at the next large group seminar. Expert-coaches were available for assistance between workshops. Analyses and sample development was supported by availability of rubrics, checklists, lesson analysis forms, lesson plan frameworks, theoretical frameworks of competencies/skills, etc.

### 2.2.4 Third element of LBPD model: support at school and collaboration in school team

In a school team teachers plan, mutually observe and analyze pilot lessons by providing and receiving feedback as well as reflecting. A school administration representative provides support, enables mutual observation of lessons, and participates in lesson observation and analysis. Each school makes its own choice of how to organize collaboration.

### 2.2.5 The content of learning

In order to prepare for the research in the school year of 2013/14, seven learning preparation workshops were organized. They included the following input topics: developing and analyzing of an effective lesson targeted towards a particular student outcome; actual learning content aspects in mathematics and science in primary school; commencement of lesson observation and analyses in joint workshops.

The school year of 2015/2016 followed the guidelines of the current learning content reforms, which planned and implemented a focus on learning general transversal skills crucial for the 21<sup>st</sup> century student. A decision was made to focus on particular skills that according to the current standard had already been incorporated in the learning content. In order to determine the continuity for several aspects of curriculum reforms carried out in the last ten years, specified categories of competencies for research were chosen: 1) analytical and critical thinking (knowledge construction), 2) self-directed learning and 3) collaboration.

Teacher learning was organized in a way that teachers would have maximum usage of the above mentioned skills. The key focus was on the need to immerse, analyze, evaluate, develop samples, and demonstrate ability to transfer the acquired skills to new situations. Three small groups of teachers (teams from two to three schools) were formed in each regional group. Each group was led by an expert-coach who trained teachers to develop lessons that facilitate a particular, significant science or mathematics learning related skill among the following: asking questions, planning research, planning data acquisition; analytical skills – grouping, categorization, development of conclusions and correlations, argumentation, modelling for acquiring knowledge, and solution of engineering problems. The particular skills in focus had to be included in the learning process in the respective grades where the teacher was working and applied to the particular student according to the topic addressed in mathematics or science.

### 3 OUTCOMES AND DISCUSSION

The research is still ongoing. Data processing revealed the initial evidence about the benefits of teacher learning in CPDM workshops, receiving school support, collaborating among the school team, partaking individual independent activities during learning study. Initial outcomes show that LBPD helps teachers teach 21<sup>st</sup> century skills. Expert-coaches concluded that when teachers developed lesson samples according to LBPD activities, primary school teachers have learned how to plan a successful lesson where students can master particular 21<sup>st</sup> century skills, such as cognitive and self-directed learning skills. For example, the depth of cognitive activity and complexity in 38% of the developed samples reaches level 3 (on the scale 0-4). This means that during a lesson students must focus on various structural elements and find the interconnectedness among them.

Teacher skills of providing feedback to students, communicating learning goals and even developing student meta-cognitive skills were gradually improving. These are necessary preconditions for students to learn how to learn. During analyses training, teachers demonstrated appropriate reflection skills. For example, they were aware of their weaknesses: *“I realize that students receive most feedback from me. I have to teach them how to provide feedback to each other. It is very important.”*

Work on developing student collaboration skills is continuing because only 19% of lesson plans show a higher level of collaboration in the lesson, which means sharing responsibility, joint decision making in the group on the content, process or outcome, as well as interdependence during work.

According to expert-coaches' evaluation of observed lessons, teachers practice teaching approaches that are crucial for the development of 21<sup>st</sup> century skills. For example, average evaluation (max evaluation is 3) against criteria regarding facilitation of student learning was: student understands each task – 2,5; lesson contains deepened review activity for updating students' previous experience – 2,5; students are involved – 2,4. During a focus group discussion, when speaking about teachers' strategic clarity and appropriate performance one of the expert-coaches concluded that: *“Planned visible outcomes of the lesson are becoming clearer. In most lessons they are successfully communicated to students”*. This means that teachers became more effective in communicating the desired outcomes and in conducting formative evaluation in their lessons.

Teachers admit that they have come to a better understanding and assurance; they have started to immerse in their teaching practice: *“I feel certain about what I am doing. I clearly understand that a precise achievable outcome and feedback are crucial parts of a successful lesson.”* *“I figure I have started to think more about criteria, and this helps me understand if the goal of the lesson has been achieved.”* However, not all teachers are so certain about their immersion and progress, implying that perfect acquisition of the necessary new teacher skills takes time: *“I know how to do it, but I have not learned how to do it in the classroom”*.

When asked about visible professional growth in their lessons, teachers mention both specific skills and student learning improvements: *“I have improved my skills in providing and receiving feedback. I have several ideas in my mind and I don't need much time to figure out what works best in a particular situation.”* *“Students learn to self-evaluate their performance – why they succeeded or failed. How to improve next time?”*. *“Practical activity helps students come to a conclusion. This is permanent for them”*. *“Regarding modelling, kids enjoy the process they are going through. It was fascinating”*.

School administration representatives point out how their teachers demonstrate professional growth in their lessons: *“Teachers think what, how and why they will ask questions; what they will do and how and why they will do it, and what skills will be used. They have learned better activity linking skills to communicate the message and achieve the outcome. They consider ways of receiving feedback and*

*using it afterwards. Teachers seek different, life related facts and activities so that the lesson makes sense and students develop understanding about the essence of things. Teachers consider the methods for achieving outcomes and discuss student participation in learning. They think over what skills they will develop”.*

Among the key factors facilitating professional skills, teachers mentioned the following: mutual lesson observation and analyses together with colleagues (70% teachers); regular joint planning meetings with colleagues (85%); ongoing collaboration with an expert-coach, analyzing performance and planning future activities (40%), individual feedback on implementation of new things in learning, developed lesson plans etc. from colleagues (75%) and from expert-coach (65%). Teachers also point out that practice is crucial because they need to gain assurance of the effect of different possibilities: *“It helps when colleagues observe the lesson – they notice significant details that must be improved. Examples of good practice are very helpful – see how others do it – and they want to incorporate those skills in their own practice. Methodological support is most needed as well as thorough analyses, especially feedback.”*

Data reveal that work must continue to develop teacher skills to teach students, to give, receive and use feedback as well as to teach meta-cognitive strategies. Teachers need help to facilitate more productive discussion in the lesson that leads to new knowledge, to achieve student immersion and differentiate work during the lesson.

Initial results show that LBDP is effective for helping primary teacher teach 21<sup>st</sup> century skills. The survey reveals that collaboration with colleagues in a CPDM workshop (element one of LBDP) helped teachers to improve their lesson analyzing skills, provide and receive feedback on their performance, understand the necessity of immersion in their professional development, readiness to share ideas and experience, to trust in mutual relations, develop a sense of “shoulder” and support, ownership of common values (learning philosophy), skills to respect differences, raise self-esteem, positive emotions, assurance of personal professional performance. Teachers highlight that leading, observing and analyzing lessons motivated them to improve their skills, lesson planning and structure, and reflect on the essence of the lesson and its effectiveness. 59% responded with “certainly yes”, “yes”, or “rather yes” to the question of whether they had acquired assurance as a leader. At the same time 71% of teachers admitted that this kind of learning created a certain level of stress.

Among factors that have positive impact on the outcomes (elements two and three of LBDP) teachers mentioned the understanding and interest of school administration, support in resolving practical issues; relationship among colleagues and their professionalism on the school team. Teachers have come to understand the importance of collaboration and seeking help: *“At the beginning we were each “stewing in our own pot”. We were hesitant to ask the administration or other colleagues for help; we wanted to do everything ourselves. However, when we failed, we understood that we had to start collaborating.” “It is important that we can both share and have recommendations. We were used to accepting feedback as critique, but now we have learned that it is not personal. We share ideas and listen to each other – it is great collaboration.”*

School administration say the following about teachers: *“Teacher reflection and analysis skills have changed. I have joy and satisfaction watching how active my colleagues are in seminars, how they share their opinions, discuss and ask questions. They do not sit still! And it is great!”. “Teachers have stopped viewing lesson observation as a tool for control but see it as a possibility to demonstrate their performance to other colleagues and receive feedback.”*

From CPD implementation tools mentioned by Craft [34] our LBDP model combines the elements from action research, self-directed study, school-based and off-site courses, peer networks and collaborative learning, professional learning teams, sharing experience among schools, personal reflection, experiential assignments etc.

The LBDP model highlights the role of the school team and the school administration. Initial data show significant differences between the individual and/or team performance of teachers from different schools. For the internal organization of collaboration among LBDP school teams, each school had freedom to choose its form and intensity. It is necessary to conduct more detailed analyses and describe the optimal versions as possible outcome facilitating factors.

In the context of Latvia it is necessary to review the formal regulations for teacher continuing education because the LBDP model and other innovative teacher learning forms fail to fit into the traditional approach in which learning is a course or a seminar which teachers need to attend only occasionally.

The LBDP model by contrast determines an individual, personal commitment by a teacher, deep immersion in the process, sustainable activity, recording of performance changes (outcomes, process), personal performance in analyzing and reflection skills, all of which is crucial for essential implementation of learning study. Teachers with good outcomes show real ownership. Expert-coaches highlight their observations from collaboration saying that these teachers fulfill all obligations in a timely manner, develop samples for learning goals and daily practice; they proactively seek feedback from expert-coaches and their colleagues outside workshops. A teacher's personal qualities play a significant role as well as his/her attitude, freedom and responsibility to make choices. This corresponds to what Lewis [24] discussed about benefits of LS: lesson based model develops new pedagogical content knowledge, there is improvement of interpersonal relationships with other teachers, a feeling of ownership of their instructional methods, a feeling of more interdependence and responsibility among colleagues for one another's instruction.

The acquired experience proves the idea that teacher learning must be developed in the way that we want to see student learning which is important for implementing CBE [35]. It is not easy; some teachers demonstrated initial restraint and requested ready-made samples. These requirements were met during the first LBDP year. However, providing ready-made lesson samples and avoiding teaching independent lesson plan development only encouraged samples being copied or particular lesson forms taken over, while the content failed to address the particular skill. This halted further development of the skill in the classroom because a teacher would develop a set of identical lessons instead of meaningfully structure the learning process together with the students.

The time factor plays a significant role in teacher development. It is time consuming to practice and acquire experience in teaching skills. Comments from an expert-coaches focus group discussion reveal the following: *"After the third observed lesson I see that teachers develop gradual understanding of the skill of how to teach and how to teach to think."* Formal results (about lesson plan and quality of the lessons) could be desired to be more convincing. However, they give a realistic picture of the teacher skills and experience. This must be taken into account within the context of reforms – implementation of innovations requires sustainable, long term teacher learning and practice in the classroom. Even the teacher learning process described above, designed to achieve a far more significant outcome than an isolated course that fails to achieve any change in teacher independent activity, does not guarantee quick success.

## 4 CONCLUSIONS

Two additional elements have been successfully incorporated into the teacher CPDM. They are targeted towards more support to teachers at school, namely, collaboration in the school team, as well as toward an essential part of individual activity – learning study. The initial research mostly focused on activity with an individual task for the teacher. However, we need to continue to focus more on improving collaboration at school through mutual learning.

The LBDP model presents the following initial outcome in groups of primary school teachers: teachers have acquired experience in developing essential 21<sup>st</sup> century skills in students, teachers have significantly improved their collaboration and reflection skills, acquired assurance about the significance of mutual lesson observation and analyses of their professional growth.

Teaching of 21<sup>st</sup> century skills is possible through conscious incorporation of these skills into the learning process, as well as through formation of an understanding about the content of the particular subject which traditionally has been viewed as more important than skill acquisition. This research shows that primary teachers participating in a lesson-based professional development program with a strong continuous collaborative element gain an understanding of the importance of implementing skills in the classroom. However, more experience in learning how to implement teaching of 21<sup>st</sup> skills must be accumulated. Therefore dissemination of good practice must be continued and research about impact of the cross-functional skills on overall student outcome must be encouraged.

## ACKNOWLEDGEMENTS

This research is supported by the Latvian National Research Program Project VPP 2014-2017.

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