HOW PRIMARY SCHOOL TEACHERS SUCCEED IN DESIGNING LESSONS TO TEACH STUDENTS 21ST CENTURY SKILLS

Dace Namsone[1], Liga Cakane[2]
[1,2]University of Latvia, Riga, Latvia

This paper describes how to find a way to help primary teachers develop deep learning in the classroom in the context of new curriculum reforms introduced in the country. The Continuous lesson based collaborative teacher professional learning (CLBCPL) model is used to develop primary teachers' skills for teaching of 21st century skills. The model is complex, mixed and driven by research and school practice. The model consists of three interconnected elements – collaborative workshops with lesson observation and analysis at schools involved in research, design and piloting of lessons by primary teachers individually and collaboration and reflection in teacher team at school level with participation of school leadership representatives. Analysis of empirical data show how teachers succeed to develop lesson plans to teach 21st century skills according to criteria corresponding to the level of cognitive demand and metacognitive activity. Analysis show that focus to cognitive depth is rather good, but teachers have difficulties to develop metacognitive activities. The gap between teachers' self-evaluation and evaluation done by expert-coaches during workshops is described.

Keywords: continuous lesson based collaborative professional teachers learning, lesson study

INTRODUCTION

The education reforms in Latvia in 2016 have set a direction toward promoting student 21st century skills - critical thinking, creativity, communication and collaboration (WEF, 2015). These skills are acquired during the study process where the pedagogical approach meets the tasks of deep (deeper, visible) learning (Fullan & Langworthy, 2014) and includes usage of a conscious cognitive and metacognitive strategy necessary to construct knowledge in different contexts and situations (science incl.). It is crucial to find a way how to help teachers develop deep learning because learning in science lessons in Latvia is performed on a rather low cognitive level (Namsone & Cakane, 2015). For many teachers it means to change their practice.

According to Guskey (2002), changes in teaching practice are related to the changes in student learning outcomes as well as teacher attitudes and beliefs. Among effective ways of teacher professional development (PD) enlist lesson study a *systematic inquiry into teaching practice*, and it is carried out by examining lessons (Fernandez, 2002, p. 394).

Continuous lesson based collaborative teacher professional learning (CLBCPL) model for teaching 21st century skills is based on our experience acquired with different groups of teachers in the period from 2006. The CLBCPL model consists of three structural elements. **The first element** is realized as the cycle of six workshops for lesson observation and analysis in real classroom environment (Namsone, Cakane, France, & Butkevica, 2016). During the school year input sessions, small group work (teams from 2-3 schools and an expert-coach) and planning sessions are included. Developing the cognitive activity was the focus of the program. Each group worked on a different skill (problem solving, modelling, constructing etc.). **The second element** involves teachers in every school team developing and piloting their own lesson plans according to the given criteria. **The third** element includes a school team teachers planning, mutually observing and analysing pilot lessons by providing and receiving feedback, as well as reflecting. Each team makes its own choice of how to organize collaboration at school level.

METHOD

The CLBCPL model for primary teachers was implemented during the course of two learning cycles. This paper uses data from school year 2015/16 focused on teachers' performance developing and piloting lesson

plans. Research included teams from 13 schools. Each team consisted of two primary school teachers and a school leadership representative. Eight expert-coaches from the University of Latvia were invited to lead the sessions during workshops and take part in the research. Quality of evaluation was ensured by expert-coaches experience in lesson analyses obtained from trainings and extensive personal experience.

To investigate the operation of the second element of the model, the research posed the following questions: *What is the cognitive depth of a teacher developed lesson for teaching 21st century skills? Are there differences between school teams? What do teachers think about their capability of teaching these skills to their students? How do expert-coaches evaluate teacher performance teaching these skills in the lesson?*

55 primary teacher developed lesson plans and 26 lessons observed during the workshop used. Each lesson was evaluated individually by two expert-coaches according to 0-4 level rubrics for every criteria, and then a consensus was reached on the overall level. Individual evaluations were made based on classroom observations and transcripts of a complete lesson that documented teacher and student activity in that lesson, tasks given and questions asked. The level of the cognitive demand rubric was created according to Structure of Observed Learning Outcomes (SOLO) taxonomy (Biggs & Collis, 1982). A rubric for criteria "metacognitive activity" was developed (see table 1).

Table 1. A rubric for criteria "metacognitive activity"

L	Description of the level
0	Lack of necessary preconditions for learning awareness
1	Learning goals are not explained to students and related performance criteria or reflection is absent
2	Learning activity ends with reflection; knowledge and skills are clearly defined and their usage is discussed
3	and students must think about the way they learn, reason and remember
4	and students must evaluate different strategies, their efficiency (the way they learn, reason and remember) and choose the most appropriate one

According to the criteria, two questions from teacher questionnaires (total – 22 questions) were chosen on the Likert scale (0-3, do not know to perfectly capable) adapted from PROFILES Project (PROFILES, 2014). The survey was electronically filled out by 20 respondents; the data were coded and categorized; content analysis was used. The survey data were processed using R 3.1.2. software; Cronbach's Alpha 0,92. Expert-coaches focus group discussions following each workshop were transcribed, coded and analysed.

RESULTS

1) 55 examples developed by primary school teachers reveal the following: cognitive demand: 0 level - 2% lessons, 1st level - 29%, 2nd level - 31% and 3rd level - 38% lessons; metacognitive activity: 1st level - 67% lessons, 2nd level - 19%, 3rd level - 12% and 4th level - 2% lessons; 2 school teams reached 100% and 2 teams around 70% on cognitive demand level 3; one school team stay on level 1; metacognitive activity: 1 school team reached 4 level, 4 teams reached level 3; 5 teams stay on 1 level.

2) Teacher answers to questions about their capability of teaching these skills to their students are seen in Table 2.

Table 2. Teachers responds about their skills according to criteria (% of the respondents)

Criteria	Statement Questionnaire	0	1	2	3
Cognitive demand	Improve student higher order thinking skills	0	35	60	5
Metacognitive activity	Teach students awareness of their thinking and learning	0	40	55	5

3) Expert–coaches average evaluation of the observed lessons during workshops – criteria "facilitation of metacognitive activity" was 1,3 out of 3.

DISCUSSION AND CONCLUSIONS

The cognitive level of developed lessons is rather good (38% on 3rd level) especially compared to our previous research that learning in science and math in our country are on a rather low cognitive level. Many

teachers encountered serious difficulties developing metacognitive activity.

A number of encouraging examples were observed where teachers understood the essence of the 21st century skills; they teach it and operate the metacognitive level. The gap between the findings of the survey, which reveals 60% of teachers being sure that they have good skills of facilitating student higher level cognitive skills and metacognitive activity, while expert-coaches give a low assessment of teacher developed examples and performance in the classroom. Expert-coaches concluded that teachers tend to focus only on the subject content. Even if a skill is taught in a lesson it is not highlighted to students and the teacher fails to mention the skills among lesson outcomes. From written comments by expert *"Science lesson in grade 1. Students used symbols to develop a "passport" for a plant - how to grow it and care for it. Lesson analyses revealed that neither the teacher nor students were aware that they were learning how to plan"*. Risks are that the teacher considers a particular skill to be of lesser importance; skills are not taught on a conscious level.

Lesson study conducted by primary teachers (individually and in school team) which was done for the first time in Latvia, confirm that continuous PD tools utilize dimensions of lesson study. These dimensions are essentially classroom-based, lesson-specific, collaborative, reflective, teacher-driven, and based on problem solving and practice sharing which are the dimensions described by other scholars (Puchner & Taylor, 2006; Pollard et al., 2014). Looking to our previous research (Namsone, Cakane, 2015) we conclude that the significant differences between schools cannot be explained only by differences in teacher professional expertise. It is obvious that school leadership has an impact on performance of the school team. Expressions of this impact will be subject to future research.

ACKNOWLEDGEMENT

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