

# WHAT LESSON OBSERVATION DATA REVEAL ABOUT THE SKILLS OF LATVIAN CHEMISTRY TEACHERS TO ORGANIZE STUDENTS' SCIENTIFIC INQUIRY?

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In 2005 a new chemistry subject standard for basic education was developed in Latvia. It includes a new component, 'scientific inquiry'. In order to develop students' inquiry skills, their teachers need to master them first. The purpose of this case study was to examine Latvian chemistry teachers' skills to effectively organize student scientific inquiry within their lessons.

The research included 18 chemistry teachers from local schools. 56 experts' observation and 56 experts' analysis sheets on 31 lessons with student scientific inquiry were analyzed.

The research shows that teachers of Group B (had already accumulated particular experience before 2008) demonstrated appropriate skills (to plan the lesson towards the achievable result, effectively apply the teaching method and students' collaboration in the lesson, communicate feedback in the lesson) in 90% of cases. On the contrary among teachers of Group A (had neither experience in organizing scientific inquiry teaching nor had they improved their analysis and reflection skills), from 54% to 73% of cases these skills were inadequate. So there is a big difference between Group A and B teachers' skills to organize scientific inquiry lesson – while teachers of Group B have rather well-developed skills, for the most part Group A teachers' skills are insufficient.

The contradiction between the actual situation in the classroom and Group A teachers' opinions confirms the idea that in order to develop effective scientific inquiry organization skills, teachers have to have analysis and reflection skills. In this situation, innovative professional development models can successfully provide methodological support to effective Group A teachers' scientific inquiry organizing skills. These models have to focus on teachers' complete immersion into the lesson and receiving appropriate feedback.

Before 2008 teachers of Group B had already attended a number of experience exchange seminars and worked individually with an expert-trainer to learn organization of an effective teaching process for mastering scientific inquiry skills. This helped teachers of Group B to be better prepared for scientific inquiry than teachers of Group A. Organization and leading student scientific research can only be mastered by planning the teaching, practicing it, and analyzing its successes and shortcomings. This shows the significance of the teachers' ability to analyze their performance during the lesson and to reflect on it.

This point of view coincides with the findings of other researchers: 'Good teaching requires that teachers reflect on their practice' [1] or 'Becoming an inquiry-based teacher will require creating and sustaining reflection practices and discourse with other teachers' [2].

## References

1. Sergiovanni, T. J. (1996). *Leadership for the schoolhouse: How is it different? Why is it important?* San Francisco: Jossey-Bass.
2. Llewellyn, D. (2005). *Teaching high school science through inquiry: A case study approach*. Thousand Oaks, CA: Corwin Press.

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