

# Motivation and Constructive Learning in Secondary Technical School

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## Abstract

Students in secondary technical education programs in Slovenia rapidly lose motivation to study. Some approaches favor the use of new multimedia technologies and contents. We however focused on the learning attitude, because students like studying the subjects that interest them. Therefore teacher must be the one, who changes the way (s)he teaches and this can only be done by the use of active teaching methods such as group discussion, problem solving, collaborative learning, project work, research approach, and writing articles.

We want to indicate the positive effect on enhancing motivation for learning and student activity through the use of collaborative constructivist teaching methods.

The method is based on the student-oriented education and student's active participation in the learning process.

We set up the hypothesis, that collaborative constructivist teaching methods in Technical educational courses in computer science have a positive impact on student's motivation and his or her activity. The learning theme of an experiment was computer networks. Topics discussed were an introduction to computer networks, client-server model and a review of types of network services, and were split into two phases (learning units).

We carried out an experiment in two groups. In the control group, the course was taught in a traditional way, and in the experimental group, the course was taught in collaborative constructivist way. As said, the experiment consisted of two phases that were both performed in the same way in each group. Student's motivation in both groups was measured prior each phase using a short questionnaire. It is important, that students of the experimental group already encountered the new approach of teaching before the second phase. Therefore we hypothesized, that the autonomous motivation for the second phase should be higher in the experimental group. Moreover, at the end of each phase we also measured the impact of collaborative learning activity on learning outcome. Similarly as with motivation, we also made hypothesis that the experimental group should have a higher level of innovation and by thus better achievements.

During the course teacher increased motivation with an active way of learning, while considering the student groups with different motivational patterns, such as

competitive students, active students, unconfident students, passive students and unmotivated students. A teacher used different motivational strategies during the course.

Preliminary results indicate that the student's motivation and their activity after first learning unit are higher in the experimental group with collaborative constructivist way of learning. For example, usefulness of learning, collaboration between the students, interest in studying and real life problem solving was improved in the experimental group.

### **Keywords**

Motivation, collaborative constructivist method, active teaching methods, active learning, problem solving, secondary technical school.

### **Biography**



**Nataša Kristan** graduated from University of Ljubljana, Faculty of Education in 2011 and became a teacher of Mathematics and Computer Science. She has been teaching Logic and Mathematics group in Primary school. Now she organizes CS Competitions and Summer School at Faculty of Computer and Information Science, University of Ljubljana. Her main research is CS Didactics and Computational Thinking.



**Gregor Mede** graduated in 2012 from University of Ljubljana, Faculty of Computer and Information Science. He has been teaching Computer Science at Secondary Technical School of Computer and Information Science, Novo mesto, Slovenia since 2008. He is involved in field of Computer Networking and security. His field of research also includes active learning and collaborative-constructivist teaching.



**Andrej Brodnik** got his PhD from the University of Waterloo, Canada. Afterwards he worked as a head of research and CTO in industry and was affiliated with the University of Primorska and the University of Technology in Luleå. Andrej's prime research interest is in data structures and algorithms, and didactics of CS. Prof. Brodnik is a recipient of a national award for exceptional achievements in higher education teaching. He currently holds position with the University of Ljubljana.