

# HOW TO SUPPORT A LOW-ACHIEVING STUDENT IN CHEMISTRY

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*To participate in society should be everyone's equal right. The certain level of chemistry knowledge should be accomplished. About 20 percent of all students in the world that participate PISA-tests have poor results in science-exercises. Data that the Finnish National Board of Education had collected in 2011 was allowed to be used as material for this research. 2949 students were evaluated. This research only uses the chemistry-related material of low-achieving students' interests and preferred teaching methods. The learning process can be supported by choosing the suitable methods that interest students. Low-achieving students are interested in excursions, computer and group work and they prefer that kind of methods. The possibility to influence one's own learning is also important. The teachers should have sufficient knowledge about different learners, suitable methods and topics that interest students for example with the help of additional and further teacher-education.*

*Keywords: Chemistry, Equity, Student Interest*

## INTRODUCTION

There is not a specific definition for describing a low-achieving student. Researches in the Programme for International Students Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) have taken a better look at low-achieving students. Therefore it would be wise to take their definitions into consideration. On average, 20 % of all the students that do PISA test from all over the world will do poorly in science-exercises. (OECD, 2010)

No such things exist as support measures for low-achieving students in natural sciences. Typically the supporting of low-achieving students in natural sciences happens in the same contact with other learning difficulties. In most countries, the schools are alone responsible for identifying low-achieving students and how to support their learning. (Education, Audiovisual and Culture Executive Agency, 2011)

Poor performance in science-subjects may weaken the student's possibilities to participate in society (OECD, 2010). Students need to accomplish knowledge in chemistry so that they can use that knowledge in decision-making (Sjøberg & Schreiner, 2006). The main problem is that students don't find natural sciences interesting (Lavonen, 2008). A receptive, encouraging and flexible teaching promotes the development of interests (Durik, 2007). A teacher can have an influence on a student's situation-specific interest by choosing the suitable working methods, contexts and contents. When the teacher is giving choices to the students, the students are able to influence their own learning (Schraw, Flowerday, & Lehman, 2001). For example group work, real-life problems and working with computers can all help create situation-specific interest (Hidi & Renninger, 2006).

Students find that teaching methods are mostly traditional. There are lots of teacher-centered basic tasks in the classroom like listening, reading, writing and laboratory work. The students seldom have out-of-school visits (Juuti et al., 2010). Students wish to work in smaller groups and do practical work. More different kinds of excursions and illustrative representations have been requested as a working methods. The book work and traditional teaching done by the teacher is less preferred. (Lavonen, Juuti, Uitto, Meisalo, & Byman, 2005)

This research aims to find out opinions concerning the interests and needs of students. The research-questions are how to support low-achieving students in chemistry and what kind of teaching methods they prefer. This paper is a smaller part of the larger study about low-achieving students and teacher support.

## METHOD

133 schools took part in the evaluation and 2949 students answered the chemistry-related questions in this survey-research. In an evaluation report based on the original data, students were divided into five groups based on the percentage they had received in the test. There were 159 students in the weakest performing group (the low-achievers). The evaluation was organized as a sampling. The fundamental set consisted of 9<sup>th</sup> grade students from both Swedish and Finnish speaking schools. There were 30 questions on background information and opinions on chemistry. In a part on working methods, there were 27 questions, which each contained an extra question asking how often the student would like to use this method. The claims were answered on a scale of 1-5. (Kärnä, Hakonen & Kuusela, 2012)

## RESULTS

The low-achieving students wanted to have more out-of school excursions, computer work and videos. They preferred less writing, working alone and teacher-centered traditional tasks. It seems that working with computers, group work and having possibilities to influence their own learning are methods that can awaken the interest in chemistry. It's also suggested not only by this research that the teacher should listen to the students wishes and find out about their interests and future plans. The teacher should also be flexible and let the students also make decisions.

## CONCLUSION AND DISCUSSION

This research provides some suggestions what can be done to support low-achieving students. It's important that the teacher has a sufficient knowledge about different learners and methods. With the help of suitable additional and further education, it is possible not only to answer to the need of support but also to offer versatile teaching materials and information, which come in handy in teaching all kinds of learners. The teacher's own positive and supportive attitude can also be very important. However, no matter how fun the chemistry-lesson is, the teacher should also make sure that the students accomplish the sufficient level of learning that is needed. It's especially important to learn by real-life situations and contexts because it helps the future decision-making and being part of the society.

## ACKNOWLEDGEMENT

The authors thank Rajka Kavonius for constructing the original study.

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