ABSTRACT
This paper is about students’ attitudes towards and interest in science in the lower secondary school in Sweden. The study was part of a larger project, an evidence-based research project to understand more about how and why students in secondary school develop interest, knowledge and self-efficacy working with socio-scientific issues. The project involved 1427 students completing an attitude questionnaire. Many of the questions have been used in different context and therefore it will also be possible to compare the results from this study with others to see if there are any tendencies of change about students’ attitudes towards and interest in science. The results show that students’ interest to learn more science declined as they progressed through the lower secondary school, Grade 7 to Grade 9, particularly for the girls. Previous studies have also given the same picture. This indicates that school science is an important area that needs to be investigated more on how different learning situations in school affect the attitudes towards science.
Background, Framework, and Purpose
According to many documents (Osborne & Dillon, 2008, Tytler, 2008) there is a strong need to renew science education. Arguments for change are that young people’s interest in choosing a scientific career is declining, scientific ignorance in the general populace is extensive, economic importance of scientific knowledge is inclining and last but not least students’ opinion that science in school is boring and not relevant for them. One way to increase students’ interest and learning could be to bring in a humanistic perspective (Aikenhead, 2006) and to focus more on scientific literacy than science literacy. From this background we have designed an evidence-based research project to see what happens with interest, knowledge and self-efficacy when students in lower secondary school work with socio-scientific issues (SSI). Ratcliffe and Grace (2003) have characterized SSI as important for society and with basis in science. First we developed a teacher guide with six authentic cases (Ekborg et al., 2009) and different attitude questionnaires. The data collection started in 70 classes where students answered a questionnaire, worked with the cases and then answered another questionnaire. Currently we are performing a qualitative study in six classes aiming at studying teachers and students’ development in more detail. In this paper the results from the first student questionnaire will be presented.

Many of the questions have earlier been used in different context and therefore it will also be possible to compare the results from this study with others to see if there are any tendencies of change. Here we will give a picture of the students’ view of science education and science in society. We will also compare girls’ and boys’ views of science and compare their interest in science with other subjects in school.

Rationale
The following research questions have been starting points in the empirical work:
- How do attitudes towards and interest in science look for students in the lower secondary school?
- How do attitudes towards and interest in science vary with gender?

Several studies on attitudes towards and interest in science have been completed, and show a complex picture how attitude and interest are defined and conceptualized (see Osborne, Simon & Collins, (2003) and Blalock et al., (2008)). Secord and Backman (1969, as cited in Arnold, Cooper, & Robertson, 1998, p. 241) defined attitudes as: “certain regularities of an individual’s feelings, thoughts and predispositions to act toward some aspect of his environment”. They proposed three attitudinal components; affective, cognitive, and behavioural, directed toward a specific object. Interest refers to the liking and willfull engagement in a cognitive activity (Schraw & Lehman, 2001). Interest includes also like attitude an affective component (Krapp, 1999). In this study we use attitude and interest as synonyms for the affective component in these concepts.

Methods
The data presented in this paper were collected from the first questionnaire. In another paper by Winberg & Lindahl (2008) we have described how the questionnaire was developed. The questionnaire consists of six parts with questions about the student’s view of school, how good the student thinks s/he is in different school subjects, how interested the student thinks s/he is to learn more in different school subjects, the student’s view of science class, the student’s view of learning science and the student’s view of science in society. The data collection consists of 683 girls and 744 boys at the age of thirteen to sixteen from different parts of Sweden.

Results
Analysis of the data is underway and is scheduled to end in spring 2009. Here we present some preliminary results. Diagram 1 and 2 show the relationship between the students self-efficacy and how interested they say they are to learn more in various school subjects for
Grade 7 and Grade 9. Each student is self-evaluated to a value between 1 (not at all interested or not good) to 5 (very interested or very good). 3 is a ”neutral” response on a scale 1-5. Then the average value of a measure for each girl and boy have been calculated for each subject. The boys have more self-efficacy than the girls in all school subjects except for Swedish. The same result gave the longitudinal study done by Lindahl (2003). We observe a decline in the values of interest to learn more in science subjects as students progress through secondary school. It is interesting to note that the differences between girls and boys increase from Grade 7 to Grade 9. This finding has also been confirmed by Barmby, Kind & Jones (2008) and in previous studies.

Diagram 3 shows the proportion of girls and boys who agree with the statements of science and technology in society. Less of half of the students think that science and technology are important for society. This can be compared with the ROSE study (Schreiner & Sjøberg, 2007), which showed that children in all countries agree strongly that science and technology are important for society, and the gender differences were negligible.
### Conclusions and Implications

Again we see how the students’ attitudes declining through the school, especially how students experience science in secondary school. Further analysis of the data will give a deeper understanding about students’ attitudes towards and interest in science. However, keeping in mind the low number of students that will pursue science in the future, it seems important to investigate how different learning situations, for example socio-scientific issues, in school affect the attitudes towards science.

### Bibliography


