Abstract
The aim of the study is to provide evidence about student teachers’ learning about some specific science concepts, relevant for environmental education, during their initial training. The aim is also to investigate the students’ reasoning about a socio-scientific issue. Finally the aim is to also provide evidence about the student teachers’ learning from a student perspective by using the theory of intentional learning. The research questions are:

- How do science student teachers develop conceptual understanding of some key ecological concepts, relevant to their future practice as science teachers, during their initial training?
- How do the students teachers develop ability to discuss complex issues develop?
- What intentions do the student teachers bring to the teacher education programme and how do these intentions influence their learning during their initial training?

The study originated from an interest in how science teachers are prepared for environmental education. Therefore understanding of the following concepts was investigated: matter, energy, photosynthesis, respiration, decay and combustion. The ability to discuss complex issues is defined as ability to draw upon knowledge from several subject areas, to describe a complex issue, to use causes and consequences in explanations, to identify conflicts of interest and arguments underpinning the interests and to identify values.

Data were collected mainly by questionnaires and interviews. The whole student group (N=62-47) answered questionnaires three times and 14 students were interviewed three times. In the questionnaires the students answered questions about the ecological concepts. In the interviews the student teachers discussed a complex issue dealing with weather or not it is ethical to use surplus heat from a crematorium for district heating. They were also asked explicit questions about what happens to the bodies in cremation and when buried. Finally they were asked about reasons for the choice of the teacher education programme and about their learning experiences. The teachers were asked about the courses and about the students’ learning.

The results show that a majority of the students did not develop understanding of the investigated concepts. Most students did not use much science as a tool for decision-making when discussing the complex issue. All the students had the intention to become teachers for young pupils. Parallel to this they wanted to pass the exams and to understand. Depending on the intentions the students interpreted both the questions they were asked and the relevance of the contents in the science courses. There was a discrepancy between the students’ intentions and the teachers’ intentions for the students. When the students experienced this gap they went into rote learning to pass the exams. Students with the intention to understand developed a better scientific understanding.

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