

A DIDACTIC MODEL TO DEVELOP TEACHERS' PRACTICES AND HANDLING DIDACTICAL DILEMMAS WHILE TEACHING CONTROVERSIAL SOCIO-SCIENTIFIC ISSUES

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This presentation will focus one result of a study that followed groups of teachers within an Erasmus+-partnership. The teachers conducted an interdisciplinary teaching about complex and controversial issues, including socio-scientific issues. Five schools, with students aged 12-16 years, in five different countries (Croatia, Poland, Italy, Sweden and Turkey) were involved. Through focus groups and participant observation, the study explored potential tensions that emerged during the enactment of the interdisciplinary teaching. Results show a variety of emerging tensions that might cause didactical dilemmas. The tensions are anchored both at different level, both concerning different types of curriculum goals and related to politics and religion, as well as those at the classroom level and at levels in between. One purpose of the study was to contribute to pre- and in-service teacher training and this resulted in a basis for a discussion tool. This tool is a didactic model aimed to raise awareness about both possibilities and potential negative consequences with different positions in didactical dilemmas. By means of abductive analysis, the empirical results of the study formed a basis for a model with four quadrant matrixes. In these matrixes, different tentative positions in didactical dilemmas are illuminated by fictional teachers that express statements about their position.

Keywords: socio-scientific issues, interdisciplinary teaching, controversial issues, education for sustainability, teacher professional development

INTRODUCTION

It this study there were groups of teachers from five schools, with students aged 12-16 years, in five different countries (Croatia, Poland, Italy, Sweden and Turkey). The schools participated in an Erasmus+-partnership with the objective to test and implement an interdisciplinary teaching about complex and controversial issues, including socioscientific issues (SSIs). The socio-dilemmas (complex SSIs) the schools worked with contained content from several different school subjects.

The overall study explored potential tensions that emerge during the enactment of this interdisciplinary teaching. Through focus groups and participant observation in all participating countries, we asked firstly, which tensions are discernible across the different classrooms? Secondly, we made a reduction of the data and focus the Swedish teachers in the light of the international pattern. We asked: "which tensions are most salient for the Swedish teachers"? These two questions were theoretically elevated and clustered in the discussion to "which didactical dilemmas may emerge during interdisciplinary teaching".

Based on the results of these questions a didactic model was constructed. This aims to provide support for teachers to develop their shared teaching knowledge and to be used in pre- and in-service teacher training.

THEORETICAL FRAMEWORK

Didactic models can be traced back to Wolfgang Klafki's didactic analyses in the 1950s with five general didactic questions (Klafki, 1995) and Ingerman and Wickman (2014) describe didactic models as a way of introducing teachers to a more general form of didactic analysis. To gain understanding of teachers' challenges and dilemmas that the didactic model builds on, the study considered this form of teaching as a "dilemmatic space" (Fransson & Grannäs, 2013) in which dilemmas are ever-present. The dilemmas are the result of social constructions, but the dilemmatic space is constantly in a dynamic process, where everyday positions and negotiations both redefine the dilemmas and the actors. Fransson and Grannäs described that teachers in their daily work often end up in dilemma situations. The teacher must deal with formal laws and regulations as well as more informal work routines. Furthermore, the teacher must balance different purposes of teaching towards each other, focusing on the three different functions that education should meet: qualification, socialization and subjectification (Biesta, 2009).

RESEARCH METHODS

The international setting of this study opens opportunities for cross-cultural comparisons and analyses that can generate knowledge about teaching, teaching content, learning and socialization. Comparative didactics is about comparing teaching within the same subjects or between different subjects, or as in this case, about studying similarities and differences in teaching in different socio-cultural contexts. This can lead to more precise descriptions of the teaching and thus generate new knowledge (Ligozat, Amade-Escot & Östman, 2015).

Data from focus group interviews and participant observations were put into themes. Four themes and eighteen tensions that could create didactical dilemmas emerged and these descriptions created a basis for a comparative didactical analysis. Here what is "taken for granted" in the teaching was made visible when both researchers and teachers could reflect on one's own practice in the light of the others practices. For each didactical dilemma two possibilities, neither of which is completely satisfactory, was placed in each end of a continuum.

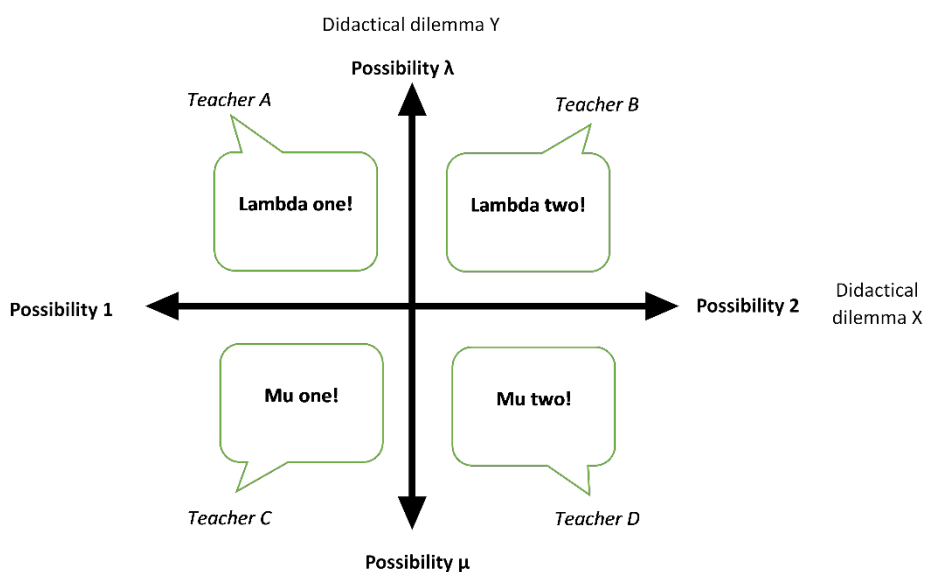
Some selected didactical dilemmas from a Swedish point of view was divided into four meta dilemmas. During a concluding focus group interview, the Swedish teachers critically reflected on their own positions by comparing their didactical choices to the positions and choices the other teacher groups made. The groups' positions were illustrated by using open four quadrant matrixes, where two didactical dilemma continuums were combined. During these discussions, the Swedish teachers could see both pros and cons with the different positions and they could then reflect on the underlying factors that makes a teacher taking one position or another.

RESULTS

The positions of the teachers in some dilemmas were strongly related to tensions about the curriculum's different goals, the influence of the national tests on the teaching and tensions around assessment. Other didactical dilemmas discussed was whether the fact-finding primarily should be done by letting the students work individually using computers, or if the teacher could present relevant facts and information about the issues through more traditional methods. Didactical dilemmas also originated from tensions regarding whether the teacher should choose a whole class or group work approaches, as well as tensions related to the teacher's objectivity and neutrality. A related dilemma for the teacher was how to balance learning of subject content and the development of general critical thinking abilities.

The favorable outcome of using four quadrant matrixes in the concluding focus group made this the basis of the didactic model the study aimed to develop. Diagrams of this type is a well-used way in social science to illustrate possible scenarios when you have different factors that interact. The matrix design, see figure 1, opens up for reflection about the different options in the quadrants and is therefore a tool for discussions of pros and cons with different positions.

Figure 1. Schematic model of the matrix design



PRELIMINARY DISCUSSION

The results from this study shows that this kind of teaching is complex and Biesta (2015) points out that the teacher's different forms of judgement are extremely important for good teaching. The teaching that was used in this study is a challenging endeavour where you inevitably encounter didactical dilemmas were the teachers' previous teaching habits needs to be questioned. Sannino and Nocon (2008) explain that it may appear that the educational system has become "multiresistant", but by making challenges and didactical dilemmas visible and exploring solutions to these, transformation of the teaching could be possible. Through reflection and discussion, the taken for granted can be visible and this increases the

prerequisites for a successful transformation of the teaching. This didactic model can support teachers in making sound didactical choices in didactical dilemmas.

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