The purpose of this study is to examine how teachers' PCK is expressed in a Science teaching practice, both from a teacher and a student perspective. The study is a qualitative study of three teachers' physics classroom lectures in grades 7-8. International research highlights the teacher's impact on students' achievement in general and in science education in particular and there are several ongoing projects that investigate these components of this impact. This study investigates how teachers describe and reflect on their teaching actions while teaching physics and how these actions are experienced by the students. The study uses the concept, Pedagogical Content Knowledge (PCK) as a perspective on teacher knowledge. In the study, lessons were prepared in a collegial collaboration using the conceptual tool Content Representation (CoRe). The lessons were conducted, video-recorded and reflected through stimulated recall interviews in video clubs with both teachers and students. Teachers and students watched the video-recordings in the video club settings which were also video-recorded and transcribed for further analysis. The results show how the implicit PCK was made explicit in video clubs. The dialectic process between teaching and learning was made visible to the teachers and led to a professional development and an extended understanding of the students' response to the teachers' actions.

1 INTRODUCTION
Teacher quality is presented as one of the most important factors on student learning by different researchers (Hattie, 2009; Nilsson & Loughran, 2012) but there is a limited consensus about what that teacher knowledge looks like in action. Park and Oliver (2008) highlight PCK as a possibility to describe the professional knowledge both from outside about teaching and from inside and meanwhile teaching. Loughran, Mullhall & Berry (2004) invented a reflective tool mentioned Content Representation (CoRe) to unpack the embedded components in PCK. With help of explicit prompts to reflect on when planning, the teachers could reveal the tacit parts of PCK (Loughran, Mulhall, & Berry, 2004). Eames, Williams, Hume & Lockley (2011) found that the tool helped both novice and experienced teachers to develop their PCK while working together. The teachers became more sensitive to student needs’ (Eames, Williams, Hume, & Lockley, 2011). Cross & Lepareur (2015) investigated the connection between PCK and students growing understanding in physics and highlighted that there is not a linear connection between PCK and student learning, but rather that PCK must be understood in relation to the complicated and multifaceted context in which teaching is conducted (Cross & Lepareur, 2015). The intention of this study is to examine how teachers’ PCK is expressed in a science teaching practice, from both teacher and student perspectives. As such, the study tries to make the action parts of PCK more visible and talkable to teachers and students. How do teachers describe and reflect their PCK in action while teaching physics and which of the teachers’ actions do students find facilitate their learning?

2 METHOD
This is a qualitative case study (Cohen, Manion, & Morrison, 2011) of three teachers’ physics lessons in grades 7-8, in lower secondary school in Sweden. The teachers are all well experienced and serve as head teachers at the school. The teachers were informed about the study, the design and the extent of their participation and the parents of the students had given a written consent for their son or daughter to attend in the study.
The teachers reflected their PCK together in collaboration with the help of the conceptual tool CoRe before teaching. They taught three different content of physics, the energy principle, energy, magnetism and support surface in three different classes. The lessons were video recorded with two cameras in the classroom. The teachers and the researcher met three times in Video Clubs (Sherin & van Es, 2009) to watch three video recorded lessons. Students in each class were asked to join researcher in similar Video Clubs to watch and talk about the lesson they had participated in. Six to eight students in each class were willing to contribute in Video Clubs. The films were used as video stimulated recall were the participants stopped the film when they found some important teacher action they wanted to discuss, pinpoint or criticize. The Video Clubs where video recorded and later transcribed in Transana, a tool for transcription and analysis (Thorsteinsson & Page). Next step was to present the student’s transcript for the teachers. After their reading, the teacher where interviewed in a semi structured way (Cohen et al., 2011). Last step in the data collection was a focus interview with the three teachers together. All interviews were transcribed and the transcriptions from Video Clubs and Interviews are the primary data of the study. As such, the data provides an analysis of how teachers identify their PCK in action while teaching physics and how the students find the teaching facilitating their learning.

3 RESULTS
Teachers talk about their actions in a positive critical way. They talk about how they do to assess, understand and facilitate the students’ understanding of content presented and how to balance between the different needs and ambitions of them. They talk about the science teaching and learning activities and how to make student motivated to work. They talk about time and pace and what challenges them. Some students indicated the importance of knowing about teacher aim and purpose with different actions in order to better promote their understanding. The students express different experiences of the same action, with different teachers. They talk about relations to, and the personality of the teacher. They discuss the importance of having fun and specifically that the teacher is having fun. The students also talk about how the teacher shows an understanding, both of the content and of them as learners and that it is of great importance that a teacher is sure of him- and herself while teaching.

In the interviews teacher express gratitude to have attained Video Clubs together and to have the student’s reflection on their teaching. The teachers were surprised about the knowledge about teacher actions the student expressed.

4 DISCUSSION AND CONCLUSIONS
Developing professional knowledge of teaching is a complex process. As Loughran, Mullhall and Berry (2004) indicated, teachers need systematic tools (such as Content Representations, CoRe) to better capture and analyse their own teaching practice. As this study indicates, using students’ eyes and letting them reflect on their teachers’ actions provides a deeper insight into the relation between a teachers’ teaching and the students’ learning. This result could be an acknowledgement of the importance that Cross & Lepareur (2015) described as a need to make the Didactical Contract more visible to students and pinpoint the importance of explicit methods for teachers to do that. Teachers on the other hand experienced the reading of the students’ reflection about their action in science classroom meaningful and as a way to learn more about what actions of their PCK gain or do not gain student learning in physics. The result implies that the design of the study could be a way to facilitate that which Cross & Lepareur (2015) called for, understanding PCK in action within the complex context where it is conducted.
5 REFERENCES


Thorsteinsson, G., & Page, T. Empirical Data Collection and Analysis Using Camtasia and Transana", *I-manager’s journal on educational technology, 6* (2), September 2009: ISBN.