Abstract
The research presented is a case study after the implementation of an innovation. The innovation is the 'Medieval Lab'. This is an online working space for students (grade 12). In this working space the students learn by 'enquiry learning'. Fitting out the lab and managing it calls for the development of specific competences in teachers. Research aimed at finding clues for supporting the development of these specific competences is started.
In and around the Medieval Lab, students, teachers and other actors form a Community of Practise (CoP; Lave and Wenger, 1991).
As a first step in the research, Actor Network Theory (ANT; Fox, 2005) is used to identify the actors and to analyse their relations and identifying conflicts in the actor network. These conflicts will give direction to the development of services and instruments that support the development of the specific competences the teachers need and the interventions needed to overcome these conflicts.

The central question in the research, presented here, is: ‘Which actor networks play a role in the innovation?’ Derived from that: ‘Which are the correspondences and the differences between the actor networks?’
In particular, the answers to the latter question will, is expected, give starting-points for interventions. These interventions will be supported by services and instruments as stated before.
An additional aim is to gain experience with the use of ANT in an educational context.

Applying ANT showed that the human actors in the network had different perceptions of the roles and/or the intentions of each other. Based on these outcomes interventions and next steps in the research are planned.
ANT seems to be a powerful instrument for mapping actors, their relations and identifying conflicts in networks.

Summary
Subject/problem
The research presented is a case study after the implementation of an innovation. The innovation is the 'Medieval Lab'. This is an online working space for students (grade 12). In this working space the students learn by 'enquiry learning'. Fitting out the lab and managing it calls for the development of specific competences in teachers. Research aimed at finding clues for supporting the development of these specific competences is started.
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As a first step in the research, Actor Network Theory (ANT; Fox, 2005) is used to identify the actors and to analyse their relations and identifying conflicts in the actor network. These conflicts will give direction to the development of services and instruments that support the development of the specific competences the teachers need and the interventions needed to overcome these conflicts.

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Relevance of the findings
Online research labs, colaboratories, communities of practice, and many more concepts are used to
address networked groupware applications used for knowledge development and exploitation. In the context of this paper, we are interested in an authentic workspace, the Medieval Lab, and media channels for learners and other 'co-workers’. Within these workspaces we develop didactical arrangements that enable learners to work together with teachers, professionals to ‘produce productions’. These productions may be issued by media channels. The Medieval Lab is applied in higher secondary education. The central theme is ‘social, economical, and cultural aspects of the historical period between 1100 and 1400’. In our case, these labs do function as independent web applications; however they are part of an integrated lab platform ScienceLabs (www.dinkel.konict.nl). This lab platform offers integrated services, like personal study rooms, job aids, webcast facilities, a helpdesk, metadata profiles and publication opportunities (eZines: electronic magazines).

Teachers play different roles within the lab platform, like coach of learning processes, producer of new content and knowledge circulator with colleagues.

The object of Actor Network Theory is to explain how networks grow. ANT has been developed by Callon en Latour (Fox, 2005). The theory gives clues for describing equal actors bound in a network to gain a certain goal (Stalder, 1997). A network not only consists of humans and social groups, but also of artefacts like documents, etc. (Walsham, 1997 in Gao, 2005, p.257). These actors need to be treated equally when analysed (symmetrical analysis: Fox, 2005). Not every actor is ‘visible’ for every other actor. Sometimes, actors are hidden behind another actor that acts as a black box. In case of conflicts actors ‘open up’ the black box and act upon the hidden actors (Fox, 2005).

Procedure/instruments used:
Participants in the research are one principal, 4 teachers, 10 students. These participants have been interviewed. The interviews were semi structured. The interviews all had the same content and structure. Questions asked concerned, name, role within the school and towards the innovation, the network as they saw it (actors, relations, weights), knowledge and skills needed.

Data is analysed quantitative in frequency, mean and standard deviation. Data is analysed qualitative on actors mentioned, similarities and differences.

Practical implications of the findings:
The number of people that where interviewed is rather low, so the results should be interpreted with care. Nevertheless, some of the things that surfaced:
- The various aspects (like black boxes) of actor networks occurred as ANT mentions
- The actors that represented groups in the school (students, teachers, principals) had different perceptions of the roles and/or the intentions of each other
- Teachers are in need for contact with external expertise on teaching and learning

Based on these outcomes interventions are planned like
- Clarifying perceptions to the various actors
- Clarifying the didactical approach towards students. With consequences for the fine tuning of the didactical approach and of the online educational materials and the professionalising of the teachers
- Realisation of a knowledge circle on teaching and learning matters for teachers and external experts. Online and eye-to-eye. This will support the professionalising of the teachers

ANT seems to be a powerful instrument for mapping actors, their relations and identifying conflicts in networks.

Next steps in the research involve:
- A more expanded and detailed mapping of the actor-networks using ANT.
- Analysis of the various aspects of the use of the Medieval Lab platform by teachers and students
- Clarifying the competences, needed by the teachers and the students, in order to be able to us a lab platform like the Medieval Lab