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8. USING TRIALOGICAL DESIGN PRINCIPLES TO ASSESS PEDAGOGICAL PRACTICES IN TWO HIGHER EDUCATION COURSES

INTRODUCTION

Design-based research has become a popular methodology in educational research because it provides results that can explicitly be applied to inform pedagogical practice, unlike surveys or experimental studies conducted in controlled laboratory settings (Brown, 1992; Edelson, 2002). One basic aspect of design-based research emphasised by many researchers is that it combines empirical research and theory-driven design of educational settings, aiming to understand how to assess and improve pedagogical practices in authentic contexts, and simultaneously develop the theories further (Bell et al., 2004; Design-Based Research Collective, 2003).

One recent approach to designing complex learning settings is to define generic design principles that explain the central features of a pedagogical approach to guide the designer (Kali et al., 2009). Design principles may be theory-driven or constructed inductively from empirical findings. Theory-driven design principles are intended to support the evaluation or construction of an educational setting with guidelines based on a specific learning theory; in this sense, they can be regarded as normative, defining conditions for “ideal learning” (on the basis of the theory in question). Data-driven design principles, according to Bell, Hoadley and Linn (2004), form an intermediate step between research findings that need to be reproducible and generalized and practical examples from unique educational settings. They are used as heuristic guidelines for improving educational practice rather than for falsifying scientific laws.

A well-known example of theory-driven pedagogical design principles is the set of knowledge-building principles introduced by Scardamalia (2002). In the context of activity theory, Kaptelinin, Nardi and Macaulay (1999) offered a theory-driven ‘Activity Checklist’ for designing and evaluating the usability of computer technology. Examples of empirically constructed design principles include the Scaffolded Knowledge Integration Framework (Linn, Davis & Eylon, 2004), and a design principles database (Kali, 2006).

In accordance, design principles can be used to design new educational units by educational researchers or practitioners as well as to assess or evaluate current educational practices in order to move them towards the ideal pedagogical
approach behind the principles. For instance, Lee, Chan and van Aalst (2006) used a subset of knowledge-building principles to investigate how students themselves could use the principles to guide their self-reflective activities as part of a collaborative knowledge-building endeavour.

The motivation of our study is the current challenge for educational institutions to develop their teaching practices to support students in acquiring a diverse range of competences for modern knowledge work as addressed in several policy papers (e.g., Ala-Mutka, Punie, Redecker, 2008; Johnson, Smith, Willis, Levine & Haywood, 2011). Present-day university students will probably be employed in positions that require ability to apply technology for knowledge creation and collaboration. Knowledge work in the globalized economy is increasingly done in spatially and temporally distributed multi-professional teams, mediated by digital technologies. In educational practice the required competences are not well addressed. These include 21st-century skills or digital competence, applied to co-construction of things in complex real-life settings and enabling participation in virtual communities of a networked society (Jenkins, Clinton, Purushotma, Robinson & Weigel, 2006; Muukkonen, Lakkala, Kaistinen & Nyman, 2010).

To explicate core issues that require attention in educational transformations, Paavola and Hakkarainen (2005) introduced the idea of the trialogical approach to learning, which emphasizes the importance of organizing learning settings to promote the modern knowledge work competences of students. In the trialogical approach, deliberate engagement to advance shared workable knowledge artefacts and practices are considered as the third, essential element, adding to individual efforts (‘monological’) and community participation (‘dialogical’) (see, e.g., Paavola, Engeström & Hakkarainen, this volume). As part of the KP-Lab (Knowledge-Practices Laboratory), a set of Trialogical Design Principles was developed to describe the basic elements of the trialogical approach and guide its implementation into pedagogical practices and supportive digital technologies.

The present article describes how the trialogical design principles were applied for examining existing pedagogical practices in two higher education courses. Within the trialogical approach, the aim is to develop pedagogical practices and tools that emphasise the organisation of learner activities around shared objects that are created for some meaningful purpose or reason. For instance, in the first course investigated, engineering students learned professional project work by jointly producing real multimedia products for customer companies. In the second course, behavioural science students iteratively revised digital concept maps for explicating their conceptualizations and improving their competences in using qualitative research methods in their own studies. We investigated the ways two teachers structured student activities in these courses, aiming at expert-like collaborative knowledge practices in various ways. The results allow us to suggest recommendations that might be appropriate for developing the course designs and related tools further. Finally, the research exercise is used to discuss how the trialogical design principles could be applied in informing the future design of educational settings for actualizing trialogical learning.