

CRIAÇÃO DE CONHECIMENTO AUTOGERIDO E DIALÓGICO PARA PROMOVER A APRENDIZAGEM PROFUNDA: O CASO PILOTO NA FORMAÇÃO DE PROFESSORES

SELF-PACED AND DIALOGICAL KNOWLEDGE CREATION FOR PROMOTING DEEP LEARNING: THE PILOT CASE IN TEACHER EDUCATION

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RESUMO: A educação está sendo desafiada através da revolução sócio digital; o mundo tornou-se socialmente conectado e a tecnologia oferece novas oportunidades para o aprendizado. Com base nos estudos anteriores e nas experiências de pilotagem, a necessidade de um novo design de aprendizagem é clara. Neste artigo, enfatizamos que é importante incluir a aprendizagem autogerida como parte do processo dialógico de criação de conhecimento colaborativo, devido à internalização individual de conhecimentos e habilidades. O artigo é um breve relatório sobre os resultados profundos de aprendizagem de alunos-professores (n = 27) através de um novo projeto de aprendizagem pedagógica. Inicialmente, algumas indicações mostraram que o trabalho autogerido aprofunda as conquistas, bem como a criação de conhecimento colaborativo dialógico. Os artefatos criados nos círculos de estudo incluíam sinais de aprendizado profundo alcançados através do processo de 4 fases. As experiências da pilotagem estimulam o pensamento sobre novas etapas de desenvolvimento para o design da criação de um processo de conhecimento colaborativo, autogerido e dialógico. É também necessário desenvolver processos de aprendizagem transparentes, onde o conhecimento e a tecnologia tem sido identificados como críticos para a compreensão do futuro da formação de professores.

PALAVRAS-CHAVE: Aprendizagem autogerida. Criação de conhecimento dialógico. Aprendizagem profunda. Formação de professores.

ABSTRACT: *Education is being challenged through the socio-digital revolution; the world has become socially connected and technology offers new opportunities for learning. Based on the earlier studies and on the piloting experiences the need for a new learning design is clear. In this article we emphasize that self-paced learning is important to include as a part of the dialogical collaborative knowledge creation process, because of individual internalizing of knowledge and skills. The article is a brief report on the deep learning results of student-teachers (n=27) through new pedagogical learning design. Initially, some indications showed that self-paced working deepens achievements as well as dialogical collaborative knowledge creation. The artifacts created in the study circles included signs of deep learning reached through the 4-phase process. The*

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experiences of the piloting foster thinking about new development steps for designing the self-paced and dialogical collaborative knowledge creation process. It is also necessary to develop transparent learning processes, where knowledge and technology have been identified as critical for understanding the future of teacher education.

KEYWORDS: *Self-paced learning. Dialogical knowledge creation. Deep learning. Teacher Education.*

Introduction

Teaching and learning are undergoing significant changes. The world has become socially connected and accessible technology offers new opportunities for the design of learning processes. Against this backdrop, the role of the professional teacher education has never been so demanding, and teachers must be qualified and agile users of pedagogically meaningful new learning environments.

The quality of collaboration defines a successful learning environment because knowledge creation is fundamentally a social process (VYGOTSKY, 1978; WENGER, 1998). According to Sfard (1988) learning is seen through three metaphors: learning as individual knowledge acquisition; learning as participation in dialogue in a community; and learning as knowledge creation. Facilitating deep learning requires a teaching and learning process that involves curriculum restructuring and a wide range of open, technology-driven, individual and collaborative learning. In addition, scaffolding and guidance need to be improved (RUHALAHTI; KORHONEN; RASI, 2017) through new possibilities in digital environments. However, it is not simply enough to increase the use of different web tools. Careful consideration needs to be given to what kind of pedagogical approaches and communicative competences are required to create deep learning in both students' competence and personal development, and also in teachers' professional growth. We too often assume that learning is a social process, but how often do we pause to reflect on how we support the formation of the dialogical knowledge collaboration and creation?

Previous research and implications have shown that there is a need for improvement in dialogical collaboration as well as in achieving deep learning (ENQVIST; AARNIO, 2004; AARNIO, 2015; RUHALAHTI; KORHONEN; RASI, 2017; RUHALAHTI; AARNIO; RUOKAMO, [in-press]). Dialogical collaborative knowledge creation is challenging. In this article we emphasize that self-paced learning is important to include as a part of a dialogical collaborative knowledge creation process,

because of individual internalizing of knowledge and skills. Based on this starting point and on our earlier research findings we will present the piloting case from the professional teacher education point of view.

Self-paced Working Crucial in Deep Learning

The definition of deep learning is the achievement of higher order thinking skills such as analysing, interpreting, inquiring, comparing, evaluating, producing understanding, and creating knowledge (ANDERSON et al, 2001). Biggs and Tang (2011, p. 26) found that deep learning arises from a need to meaningfully engage in the task, and from students trying to use the most appropriate cognitive activities to accomplish it. Furthermore, learning is self-paced working in separate phases of a learning process. It has connections to self-reflection and self-regulation which are conditions for deep learning. In the literature, the definition of self-paced learning varies. It can be seen as an individual, self-paced online learning but also as a collaborative learning process with peers. Tullis and Benjamin (2011) have found out that if learners pace themselves, make metacognitive judgments of their learning, and spend more time on difficult concepts, they are more likely to succeed in a self-paced situation. Self-paced learning outside the classroom means freedom for students to start and complete learning assignments at any time. A blended learning approach will comply with students' own pace as well collaborative knowledge creation.

In this article we understand self-paced learning as an important part of the dialogical collaborative learning process, in the beginning and throughout the study module. Individual learning is scaffolded and each student is able to proceed on her/his own development level. Thus, students have freedom to work and collaborate from their own zone of proximal development (ZPD). Peers and teacher scaffold in an individual internalization of knowledge and skills. The significance of others in the process of scaffolded individualization is highlighted within the commognitive development (BENZVI; SFARD, 2007), and a unique form of thinking develops when a student turns the discourse-for-others to a discourse-for-oneself. In addition, Sfard (2007) describes about commognition in area of mathematic learning and the idea is to mix communication and cognition in order to understand and manage mathematical concepts and problem solving. Moreover, this is an important point to take into account when designing a learning process for professional teacher education.

Dialogical Knowledge Creation

Technology is seen as a possibility that enhances collaborative knowledge creation, and learning through dialogue can result in better engagement and collaboratively shared artifacts (AARNIO; ENQVIST, 2016; ENQVIST; AARNIO, 2004; WEGERIF, 2006). Dialogue is seen as a key factor in supporting and encouraging deep learning in a learning community (AARNIO, 2006; ENQVIST; AARNIO, 2004; MERCER; HOWE, 2012; RUHALAHTI; KORHONEN; RASI, 2017; SMITH; COLBY, 2007). Dialogue does not simply mean talking or having a conversation (BOHM, 2004; ISAACS, 1999). According to Bohm (2004) discourse is divided into two types; dialogue and discussion, and he keeps dialogue requirement for wide and deep understanding and insights. Bohm (2004) pointed out that in genuine dialogue, active participation is required, which has two meanings: to take part both of and in the dialogue. According to Isaacs (1999), dialogue enables a person's attitudes and self-knowledge to undergo changes, while it also improves our ability to listen and familiarize ourselves with others' points of view. Understanding dialogue as a specific competence in knowledge creation and problem-solving is still an unknown thinking and action culture. When collaborating through dialogical actions, it is essential to be equally and consciously present, engaged, listening, participating, and "suspending" (BOHM, 2004; AARNIO, 2012).

The research results clearly demonstrate that dialogical knowledge creation does not happen by itself, but requires pedagogical modelling and structuring. Bound (2010) developed and instigated the "Map of Dialogic Inquiry" model to improve online dialogue in the context of adult and vocational education. The results showed that the model supported and facilitated dialogical inquiry. In British Columbia, Canada, a dialogic learning community model, which emphasized dialogue focusing on real-world problems, was used to guide adult learners. For the dialogue to be successful, the researchers argue that its characteristics must be featured in the learning model (GUILAR; LORING, 2008). Matti Aarnio (2015) concludes in the context of PBL (Problem Based Learning) that the medical students could not achieve deep learning without competent collaborative knowledge construction. Students rarely engaged in solving knowledge-related conflicts or reflecting on different points of view with the peers or asked questions about other students' thinking. Knowledge and skills of dialogue were missing. To improve dialogical actions and become aware of dialogical knowledge and skills of ones' own, we suggest specific "dialogue shower days or weeks". In

developing dialogical competence and, at the same time, dialogical knowledge creation, students evaluate concretely their dialogical work and actions in digital and other environments:

- 1) How equally do I communicate in collaborative knowledge creation?
- 2) How symmetrically do I participate in dialogical knowledge creation?
- 3) How carefully, word-for-word, do I listen or receive information?
- 4) How do I inquire with open questions information in order to understand another person's thinking or to advance the processing of the topic with peers or teachers?
- 5) How reciprocally, described by small actions, do I act in dialogue and collaborative knowledge creation?

The “dialogue shower-method” could be applied to small groups’ dialogical knowledge creation training too. In any case, dialogical knowledge creation studies show that if students’ and teachers’ concrete conscious training into the dialogical competence is not overtaken, students do not even know how to start to work together in blended learning environments. Dialogical knowledge creation, necessary for a deep learning, is then not possible, and it has impacts like superficial learning outcomes.

Pedagogical Model DIANA for Promoting Deep Learning

The shift from passive, teacher-centred pedagogy to active, learner-centred activities promise to help students achieve deeper levels of understanding, thinking and reasoning as they apply what they are learning to real working life situations (CHO; RATHBUN, 2013). Engeström and Toiviainen (2011, p. 33) consider how to integrate demanding theoretical principles of productive learning, communities and practices, and technological solutions into one process and a meaningful product. The starting point in designing a blended learning process is the applied pedagogical model, because it may include the crucial elements promoting deep learning. Gibson (2013) discovered that open learning environments provide students with new possibilities by engaging them in such practices as learning communities, learning with peers, and publishing one's work for a peer audience. When the goal is deep learning, the sense of community is seen as a motivating factor (RYAN; DECI, 2000). It has been observed that community-based

learning results in deep learning (NÄYKKI, 2014; BEREITER, 2002; ENQVIST; AARNIO, 2004).

The basis of the teacher education piloting case reported in the article is in the DIANA model (Dialogical Authentic NetLearning Activity) described in (Fig. 1), designed and revised by Aarnio and Enqvist (2001; 2016). The learning process starts from cornerstone A, in which students create a common ground for learning together (AARNIO; ENQVIST, 2016). Students are introduced to the idea of authentic dialogical learning, the teacher's role is to ensure that students are progressing in their learning paths and to provide scaffolding. Cornerstone B deepens the individual and group processes of finding and formulating authentic questions that are connected to the learning objectives of the study module. Each student individually devises their own authentic question concerning the learning goals of the study module. Thereafter, the students formulate shared authentic questions and categorize them into themes. The teacher's role is to scaffold and guide the learning process into the relevant direction. Deep-oriented learning, through specific dialogical actions and collaborative knowledge creation, are at the heart of cornerstone C. In practice, this entails seeking answers to the questions set at the beginning of a learning process, providing symmetrically theoretical and practical contributions fought by each student, clarifying and inquiring with pure open questions the meaning of the other's speech, continuing focused the speech of others, and engaging in the construction of a shared understanding. Cornerstone D combines the theoretical and practical knowledge creation, and calls for the students to weave together a synthesis, develop an artifact, and dialogically search for missing pieces (new questions) pertaining to the learning goals of a study module. In addition, the dialogical evaluation is one aspect of the cornerstone, which means also dialogical reflections in order to develop a new contextual understanding (AARNIO; ENQVIST, 2016).

Figure 1: The structure of the DIANA model.

Source: Aarnio e Enqvist (2016, p. 44)

The self-paced learning is implicitly included in the DIANA model, but it is not enough. According to our studies, student teachers' learning in teacher education is just collaborative knowledge construction. Individual worked-out contributions are minimal, and dialogical working together is missing. It is the reason for formulating the self-based learning as a part of a learning process. When dialogic working together is in practice only collaborative knowledge construction, the “dialogical shower days or weeks” are needed. Overall, the missing competence of dialogue has been the main reason for unsuccessful DIANA learning processes. In the next section, we briefly present the process and results of the teacher education pilot in autumn 2017, where self-paced learning phases have been taken into account for promoting deep learning in a study module.

Piloting Case Process and Preliminary Results

In many cases, a blended learning approach will allow teachers and students to experience the best of both worlds; from the many advantages of both self-paced and live online learning, while avoiding the drawbacks of each method. With blended learning,

students are typically asked to work at their own pace, while attending live online courses with the facilitator in other instances.

The presented piloting is based on our deep learning research in the field of professional teacher education (Ruhalahti, Aarnio & Ruokamo, in-press), which may have impacts in changing blended and digital learning. In the piloting, the individual and dialogical collaborative knowledge creation is combined, in the framework of blended learning. The self-paced learning is emphasized in the learning process. In the piloting, the teacher educator used an open online blog as a guiding environment and a web conferencing program for scaffolding sessions. Student-teachers used Google Drive folders to document their dialogical knowledge creation and artifact development process in the study circle. They also reported by using mobile apps to communicate online. One of the ideas was to offer open and online access to content in a self-paced learning environment. The piloting combined self-paced online and classroom-based learning, and it was implemented with student-teachers at the beginning of their studies in 2017 academic year.

The piloted learning process was based on the following phases that promote self-paced, deep and dialogical knowledge creation. Two study modules were combined for the piloting, themes were Self-knowledge (3 ECTS) and Dialogue (3 ECTS). The learning objectives in these two study modules were: “The teacher student is able to evaluate his/her own personal qualities and performance as a professional teacher. He/she is able to promote students’ and the entire learning community’s learning, sense of community and well-being through dialogue” (HAMK, 2017.) Group consisted of in-service student teaches (n=27) and age varied between 30–55 years.

In the first phase: The learning process started with a self-paced phase. The student-teachers had an individual learning assignment to accomplish during the summer (in 2 months). Assignment included beforehand given theoretical sources and video materials. The self-paced assignment had two aims:

- 1) To scaffold student-teachers in orientation to the learning themes through given material sources.
- 2) To help in reflection on their experiences and in adding self-awareness according to study module’s learning objectives.

Each student saved their individual assignment to the Google Drive folder which was shared with the study circle members.

The second phase continued in the classroom by creating authentic learning questions individually and collaboratively from the study module's learning objectives. Authentic questions of the student-teachers integrate their competence development with real life contexts and personal experiences, which promote engagement and responsibility. The teacher's role was to scaffold the student-teachers in their study circles (n=5) on finding relevant questions and learning themes, which covers all learning objectives.

In the third phase, dialogical collaborative knowledge creation was based on an earlier set of authentic questions. The study circles created knowledge online through dialogical actions in the digital learning environments. Dialogue was based on equal participation in collaborative thinking, which emerged during the conversation. Each study circle started to design an artefact, a theoretical and practical combination of the study module's issues. During the third phase, each study circle had an online guidance/feedback session (2 hours) with the teacher. Afterwards, each study circle wrote a reflective letter to the teacher on how they have implemented their collaborative working and artefact concrete into work. The student-teachers were lightly prepared to dialogical collaborative knowledge creation through basic dialogical methods (Aarnio, 2012), for example Spontaneous participation, As equals and Dialogue tickets. Thus, during the online scaffolding sessions, the dialogical actions were reflected upon again by finding better online tools to support dialogical knowledge creation.

In the fourth phase, in the classroom session each study circle presented their own created artefact. Each of them had to conduct an-hour teaching session, where they presented the artifact, which was created through dialogical knowledge creation. The first group had designed an active and reflective teaching session concerning the temperaments of students in the classroom. The second study circle focused on group development process and integrated the Padlet and Flinga platforms into their session to support participants' collaborative writing. The third group used multimedia material (video clips) as a learning object to reflect on dialogical actions in different conversations. They had created a dialogue bingo to catch certain dialogical actions (Fig. 1). The fourth study circle designed a mobile game (Seppo.io), which challenged participants to move around the school area. The main focus was to gain understanding about dialogical actions (Fig. 1) through activating tasks. The fifth study group created a Kahoot (game based platform) and themes covered the learning objectives from these two study modules.

The above created artefacts finally showed the achievement of deep learning when student-teachers presented their own contribution of how gained theory linked into teaching practice. Furthermore, the integration of digital application showed deep learning results as an opportunity to share created knowledge and skills with other student-teachers. A dialogical evaluation and reflection summarised the process in the study circle and helped the student-teachers to continue their own development in the area of self-knowledge and dialogue.

Finally

Based on the earlier DIANA studies and on the piloting experiences, the need for a new learning design is clear. Some indications showed initially that self-paced working deepens achievements as well as dialogical collaborative knowledge creation. The artifacts created in the study circles included signs of deep learning reached through the 4-phase piloting. Overall, student-teachers report more positive learning experience and higher motivation when study modules started with a self-paced phase. The experiences of the piloting foster thinking about new development steps for designing self-paced and dialogical collaborative learning process. It is also necessary to develop transparent learning processes, where knowledge and technology have been identified as critical for understanding the future of teacher education. The piloting experiences may generate ideas for designing learning processes for a range of learning environments (e.g. classroom, blended, online, mobile, MOOC).

We think that the authentic joy of discovering a student's development potential is worth striving for, as well as the best possible dialogical learning community too.

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