Supporting knowledge transformation with Teams-mediated networked learning

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Abstract

Transfer between school and education - and more generally between persons' life practices - is a recurring issue within educational research. On the one hand, very generally speaking, the possibility of transfer is a prime rationale of the educational system - students are supposed to learn within education "something" which they can then use later in other contexts. On the other hand, theoretical and empirical research combine to question transfer both as a concept and as an empirically occurring phenomenon. This short paper reports on an ongoing Design-Based Research project with educators at The Business School. The outset for the project is the combination of a practice problem, experienced at The Business School, and the present authors' research interest in developing theoretically sound, operationalizable design principles to support students in learning to perform transfer and knowledge transformation. The practice problem at The Business School concerned the limited degree to which students (in their educators' experience) make use of their learning at school in their internship practice. The Design-Based Research project concerns the development and evaluation of design principles focusing on networked learning in mediator activities to facilitate students in performing transfer between school and internship. Microsoft Teams has been chosen by The Business School as the ICT platform to support the networked learning activities. We are inspired by a moderate situated learning approach to transfer which emphasizes the role of framing, the sense-making of the individual, the significance of anchorage of activities in primary contexts and of developed patterns of participation, as well as the thesis that context-dependency is itself context-dependent. Informed by this approach in combination with insights from networked learning research, we have formulated three design principles together with the educators at The Business School. The design principles address the practice problem identified by The Business School educators and take into account the aims of the educators as well as results from a pilot study. Through the Design-Based Research study the following research question and sub-questions are investigated: How can Teams-mediated networked learning support students at The Business School in transfer and transforming knowledge between school and internship? What are design principles for Teams-mediated networked learning to support knowledge transformation? What knowledge transfers and how does it transform in Teams-mediated networked learning for The Business School students traversing between school and internship?

Keywords

Transfer, knowledge transformation, Microsoft Teams, design principles, networked learning

Introduction

Transfer between school and education - and more generally between persons' life practices - is a recurring issue within educational research. On the one hand, very generally speaking, the possibility of transfer is a prime rationale of the educational system - students are supposed to learn within education "something" which they can then use later in other contexts. On the other hand, theoretical and empirical research combine to question transfer both as a concept and as an empirically occurring phenomenon (Lave, 1988; Packer, 2001; Tuomi-Gröhn & Engeström, 2003). The "problem of transfer" is accentuated in contemporary society where people, to an even higher degree than previously, traverse different contexts, both in a life-wide and a life-long perspective (Jarvis, 2007). Theoretically, this calls for a development of the concept of transfer which enables an understanding of what goes on in the situations where people succeed in putting knowledge to use across different contexts. Design-theoretically, it raises the question of how to design for students' learning of transfer - e.g. can relevant design principles be articulated to which learning designs should, all things equal, conform? Practically, the issue of how educators can support students in performing transfer between educational and professional contexts becomes pressing.

This short paper reports on an ongoing Design-Based Research project with teachers and educational developers (henceforth both termed educators) at The Business School (anonymized name). The outset for the project is the combination of a practice problem, experienced at The Business School, and the present authors' research interest in developing theoretically sound, operationalizable design principles to support students in learning to perform transfer and knowledge transformation. The practice problem at The Business School concerned the limited degree to which students (in their educators' experience) make use of their learning at school in their internship practice. Previous research indicates that networked learning focusing on utilizing ICT in mediator activities between primary contexts is a way to support students in establishing connections between contexts, and, in particular, in resituating insights across them (Dohn, 2014; Smith, 2012). Accordingly, the Design-Based Research project concerns the development and evaluation of design principles focusing on networked learning in mediator activities to support students in performing transfer between school and internship.

We understand Networked Learning along the lines of the first author's extension of the often-cited definition from Goodyear, Banks, Hodgson, and McConnell (2004). This extension stresses the connections between contexts, in addition to the original focus on connections between learners, tutors, and resources. This makes the definition particularly relevant for our study which focuses on the network of learners' and their individual and collaborative context couplings between school and their different internships. The definition reads:

> Networked learning is learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners; between learners and tutors; between a learning community and its learning resources; between the diverse contexts in which the learners participate. (Dohn, 2014)

The ICT platform chosen by The Business School was Microsoft Teams. This choice was motivated by the combination of the following three aspects: the academic and professional, yet relatively informal, user interface of Teams; the easy accessibility of Teams on mobile phones (which students always carry with them); and the possibility of seamlessly integrating Teams with student documents and assignments, produced in other Microsoft Office 365 apps.

Theoretical background

Transfer is a contested concept. Over the past hundred years, several different understandings have been proposed. They range from the view that transfer theoretically is a straightforward matter of knowledge retention and reactivation in new situations (Gagné, Wager, Golas, & Keller, 2005) to the position of radical situated learning which denies the meaningfulness of the concept because it presupposes a clear but unviable distinction between activity, cognition, and context (Lave, 1988; Packer, 2001). The view we take here is a more moderate one than either of these extremes. Thus, we acknowledge the context-dependency of knowledge, i.e. that knowledge takes on form and content from the situation; but propose that context-dependency is itself context-dependent. This means that it will depend on domain, activity and setting how much form and content knowledge takes on from the situation and, conversely, to which degree some aspects may stay the same across contexts (Dohn, 2017; Dohn & Hansen, 2020; Hansen, 2020). We follow the moderate situated learning theorists who emphasize the significance of activities in transfer, acknowledging that what transfers often will be patterns of participation and that these patterns have a decisive influence on the degree to which aspects of knowledge are transferred between situations as well as the degree to which the aspects are transformed in the process (Greeno, 1997). Hence, we focus on knowledge transformation as a way of performing transfer.

The point is that the character of the context-dependency is an empirical question that needs answering in any given situation of people traversing between contexts. In presenting this view, we draw on the work of Lobato who has argued for an actor-oriented approach to transfer which focuses on the sense-making of the individual, rather than on the transfer which teachers and educational institutions expect to happen (Lobato, 2012). On this approach, the question is less whether transfer takes place and more what transfers, how, why and with what transformations: Learners will often generalize their learning experiences to new situations, but their generalizations may be highly idiosyncratic and therefore go unnoticed by their educators or, alternatively, will be dismissed as wrong. In both cases, educators will construe the situation as one of non-transfer.

Combining Lobato's actor-oriented view with a pedagogical design perspective leads to the question how we can support students in generalizing the aspects we as educators wish them to generalize, rather than leave it up to the individual. To answer this question, it is helpful to look to the research of Engle who has investigated how to support transfer through expansive framing (Engle, 2006; Engle, Lam, Meyer, & Nix, 2012; Engle, Nguyen,

& Mendelson, 2011). Framing here refers to the way a given situation is characterized as relevant by the teacher. Expansive framing links current activities to future contexts of use. Bonded framing, in contrast, anchors the relevance of activities (only) in the current situation. Engle's studies indicate that expansive framing helps students to link learning activities across situations and to perform transfer of knowledge from the situation in which expansive framing took place to future situations. With expansive framing explicating specific details of e.g. content relevance in future situations, educators can support students in performing desired, rather than idiosyncratic, transfer (or none at all) and transformation of knowledge. In Lobato's terms, the expansive framing serves as "focusing phenomena", helping students "notice" the possibility of generalizing beyond the current situation.

However, both Lobato and Engle have focused their research at a micro-level and looked at transfer between, respectively, specific mathematics problems (Lobato) and lessons in a course spanning a few weeks (Engle). Their studies are valuable as they indicate elements which potentially are supportive of transfer beyond the microlevel (expansive framing and focusing phenomena). Nonetheless, their studies need to be supplemented to address the broader question of how to design for transfer and transformation across different life settings such as school and professional practice. Elsewhere, the first author has argued for the importance of anchoring learning activities in the primary contexts of the learners, i.e. in the contexts which matter to them as persons, because learners draw on the tacit knowledge perspectives, which they have from such contexts, in making sense of other situations: The tacit knowledge provides meaning and grounding to words and actions in the new situations. Here, networked learning is most adequately used as mediator activities between primary contexts, rather than as designated online communities intended to be primary contexts of their own. In the case of The Business School students, the internship work practices of the students can reasonably be expected to be primary contexts for (most of) them, as they constitute the type of authentic work practices that they are aiming to become participants in. This consideration concurs with the experience of The Business School educators. Coupling this consideration with Lobato's and Engle's insights, it is significant to frame learning activities at school as relevant for the internship work practices to help students make significant-rich sense of their learning at school (i.e. help them 'fill out' the theories and ideas presented at school with the experiential knowledge of their internship). This, on the other hand, will, all things equal, also support them in transforming knowledge from school back into the internship, as connections of meaningfulness and relevance have already been established.

These ideas have been further developed in Dohn, Hansen, and Goodyear (2020). Here, a set of basic design principles are developed for learning designs which aim to support students in performing knowledge transformation. Following Beach (2003), a distinction is made between four different transition forms, and design principles are discussed for each of the forms. In The Business School case, the students are performing collateral transitions, i.e. they traverse between the contexts in question (school and internship) several times over the course of their education. For this type of transition, there is a need for anchoring school learning in actual tasks in work practice; for both school and work practice to frame the learning in the other setting as relevant for learning in the present setting; and for assessment to prioritize the work practice perspective, ideally by being performed by workplace and school in collaboration.

A final point of inspiration comes from the networked learning literature, in particular the focus on how a learning community, and the collaboration and negotiation with peers, can support learners in developing nuanced perspectives on the subject matter (Dohn, Cranmer, Sime, Ryberg, & De Laat, 2018; Goodyear et al., 2004; McConnell, Hodgson, & Dirckinck-Holmfeld, 2012). As the traversing between contexts may be stressful for individual students, both theoretically and personally, the support of a learning community is highly significant, both as a trusted base for exploration and as a network with which to investigate different ways of transforming knowledge in context coupling and boundary crossing.

Rationale and setup of the design-based research study

Design-based Research is a methodology which combines development of educational practice with the investigation of research questions (Amiel & Reeves, 2008; Van den Akker, 1999). Typically, the outset is a practice problem, i.e. a problem identified in practice by teachers or educational developers. In collaboration with researchers, the teachers or educational developers will develop a learning design which aims to address the problem. When the design is then subsequently realized in practice, it both allows testing the viability of the design and opens the possibility for investigating a related research question. The research question can e.g. concern design principles for this type of design; theoretical aspects of learning and cognition; or system

features of classroom interaction made visible by student reactions to the design (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Kali, Levin-Peled, & Dori, 2009).

The practice problem identified by The Business School

This design-based research study takes its outset in the practice problem experienced at The Business School. As indicated, the practice problem concerned the limited degree to which students make use of their learning at school in their internship practice. At The Business School, a typical educational programme is structured in the following way: the students spend two weeks on theoretical education at school, followed by a two-to-three months period of working in their internships. This means that the students spend most of their time working and doing practical training. In The Business School educators' experience, many of the students do not see the point in spending time at school and do not find the theoretical education relevant as compared to the practical experience they get from working in their internships.

In 2018, The Business School decided on a three-year digitalisation strategy which included a requirement that the school must be in contact with each student before, during and after their school attendance. To meet this requirement and as an attempt to support transfer through ICT-mediated learning, The Business School chose the ICT platform Microsoft Teams. Teams is a part of the Microsoft Office 365 suite, which the school already uses. It is the fastest growing application in Microsoft's history with more than 329.000 organisations worldwide today using Teams as a platform for teamwork, where people can exchange and generate ideas in an online community (Markezich, 2018). Teams has replaced the Office 365 Education, and offers services aimed at education, including assignments and quiz distribution. Originally conceived as a competitor to Slack and offering comparable functionality, Teams integrates with a range of Microsoft platforms. The growing adoption of adds to the relevance of Teams as a communicative platform for The Business School, as the students may be expected to enter companies utilizing it after they graduate.

Teams was introduced at The Business School in early 2019, but without an articulated strategy for use and students and educators got no thorough guidelines on how to use it. In mid-2019, a more detailed introduction was provided, and the students were told no longer to use Facebook or e-mail to communicate with educators or other students, with regards to academic or educational matters.

Pilot study

For The Business School educators, the aim of using Teams is to have a platform, where students and educators easily can stay in contact with each other and students can learn from one another. Also, students - especially during internship periods - can be asked to carry out academic and theoretical assignments to support them in thinking in theoretical and academic ways while being away from school. The idea is that this will facilitate their drawing of educationally relevant connections between school practice and internship practice. To help realize this idea, The Business School educators initiated the collaboration with the present authors (as researchers) to create a learning design aimed at supporting connection-drawing with Teams, since neither educators, nor students had managed to use Teams as a way to support transfer. Through several workshops and interviews with The Business School educators, we learned that Teams had not been used to the extent that they wanted, and that they had found it challenging to use Teams, since it was an unknown platform to them. We also learned that they did not know how to motivate the students to use Teams, but that they had high hopes for the future use of Teams and that they thought the platform had great potential.

To find out why the students didn't use Teams as much as the educators had wished for, we first conducted a pilot study in a class where the educator had taken an inductive, exploratory approach to Teams, trying out different prompts (e.g. "I have seen that there isn't much dialogue in here, why is that?") and tasks (related to schoolwork and internship) to engage students on the platform, without following specific design principles or guidelines. Five students were selected for interview on information-based criteria to maximize variation (Flyvbjerg, 2006). More specifically, they were selected based on their degree of participation in class (at school) and on Teams (during internship). All four participation possibilities were represented, with two students representing the possibility of high degree of participation in both settings. All five students received a list of questions through e-mail, concerning their use of Teams. Four out of five students replied, with short but informative statements. The statements allowed thematizing some general observations:
- The primary users of Teams were the educators
- The use of Teams was widely considered to be a less attractive alternative to dominant social media platforms, and consequently displaced by those
- The students were unsure of how to use Teams

- The students were hardly motivated to use it
- The format of the communication taking place on Teams had been very much characterized as one-on-one communication, mainly between educator and individual students.

The e-mail interviews also indicated that the students actually do think that they can use what they learn in school, during internship. This contrasts with the beliefs of the educators (cf. above).

Preliminary design principles and research question

Following the results of the pilot study, a set of design principles has been developed in collaboration with The Business School educators. The design principles are informed by transfer theory; studies of design for transfer and knowledge transformation; and research in networked learning (cf. section above). They centre on the educators' wish to increase student perception of relevance for their internship practice of the theoretical and academic perspectives learned at school, i.e. of establishing connections between school and internship. And they draw on the results of the pilot study which show the need for explicit guidelines and support in how to use Teams, as relevant use does not happen 'of itself', neither from educator side nor from students'. These considerations led to the following design principles:

- Anchor Teams communication in the internship organisation's actual tasks, so that the communication on Teams seems relevant for students and the organisation as well (a concretization of a design principle in Dohn et al. (2020) (cf. above), based on the educators' wish to increase perception of relevance)
- At the school, initiate the formation of habits of the kinds of communication that you want students to use during internship (an implication of the thesis from moderate situated learning theory that what transfers between contexts are often patterns of participation, coupled with the pilot study result that students need explicit support in how to use Teams)
- Exploit the Teams functionalities that allow for a number of distinct networking possibilities: In addition to private one-to-one communications between educator and student and student-to-student, a more group-oriented communication on Teams (many-to-many) should be facilitated (an implication of the networked learning thesis is that a learning community is supportive theoretically and personally, when investigating different ways of transforming knowledge in context coupling and boundary crossing, coupled with the educator wish for students to learn from one another).

In sum, the learning design developed to address the practice problem identified at The Business School focuses on supporting students in connecting between school and internship through engaging with each other and the educator on the Teams platform. This allows us to investigate the following overall research question

- How can Teams-mediated networked learning support students at The Business School in transfer and transforming knowledge between school and internship?

As part of investigating the overall research question, we have formulated the following sub-questions:

- What are design principles for Teams-mediated networked learning to support knowledge transformation?
- What knowledge transfers and how does it transform in Teams-mediated networked learning for The Business School students traversing between school and internship?

The three preliminary design principles developed together with The Business School are a first hypothesis for an answer to the first sub-question, to be tested in the design experiment.

Setting for the design experiment

The design principles are the outset for our ongoing design experiment, which at the time of writing is performed with one class from The Business School. Future classes will also be involved in the design experiment. The current class has been introduced to Teams and are required to use Teams actively during their school period and internship period. The class holds 16 female students, all in the age between 19 and 29, and all of them working their internship at The Women's Bodywear Retail (anonymized name). We shall observe and analyse their use of Teams, as concerns both content and communicative practices between students and between students and educator. In addition, and based on this, we shall select students to participate in a focus group interview, where they will be asked about their use of Teams. We shall conduct the same data collection with future classes to be involved in the design experiment. The aim of the design experiment is to assess whether or not the design principles work in the sense that they can be used to create connections between school practice and internship practice and thus to support transfer with Teams-mediated networked learning.

Concluding remarks

In this short paper, we have presented the theoretical background and research design for a Design-based Research study on Teams-mediated networked learning to support transfer and knowledge transformation in

students' collateral transitions between school practice and internship practice. The study is performed in collaboration with educators at The Business School who initiated the collaboration, due to their identification of a practice problem as regards students' limited use of their learning at school in their internship.

Our preliminary findings, based on theoretical considerations, previous research, and a pilot study at The Business School, have led us to hypothesize three design principles for Teams-mediated networked learning. It is our aim in our ongoing design experiment to assess the viability of these design principles, as a step in answering our broader research question concerning how to support students' transfer and knowledge transformation.

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