

The Networked Student: Contextualizing Scientific Knowledge for Educational Practice

Abstract: To study how stimulating networked learning in a formal education program contributes to teachers' meaning making and their contextualizing of scientific knowledge for their educational practice, a pilot was conducted. In an online distance learning course for teachers aspiring an academic degree in Educational Sciences principles of networked learning were applied to course design in a three-phase intervention: (1) creating of network awareness, (2) providing learners with tools for developing networking skills and (3) assessing of the value created in the network throughout the course. By combining Social Network Analysis and a value creation perspective on learning, teachers meaning making processes between scientific knowledge and the applicability of this knowledge in their everyday educational practice were reconstructed. This short paper provides an overview of the design of the study, results expected December 2017.

Introduction

The revenues of formal learning activities for the educational practice of teachers are not always clear cut. Teachers often perceive their professional development as unrelated to their classroom practice (Lieberman & Pointer Mace, 2008) and scientific knowledge, offered through professional development programs, hardly finds its way to teachers daily practice (Lysenko, Abrami, Dagenais, & Janosz, 2014). Teachers perceive little relationship between their complex educational problems and the existing body of educational research. Scientific knowledge largely exists in a disassembled state, which add to the difficulty teachers perceive in accessing and consolidating scientific knowledge and in using it for practical purposes (Lysenko, Abrami, Dagenais, & Janosz, 2014).

Research has shown that teachers value and use scientific knowledge more when they feel it relates to their professional practice: for instance when it matches their personal experience (Zeuli, 1994), tackles specific aspects of teaching (Everton, Galton, & Pell, 2000), and can be directly applied to their teaching (Ratcliffe, Bartholomew, Hames, Hind, Leach, Millar, & Osborne, 2005). Informal learning activities that entail social interaction with others are found to be a way to relate scientific research knowledge to teachers professional practice. As Baker-Doyle and Yoon (2011) argue, it is through teachers' informal social networks that knowledge is interpreted, shared, compiled, contextualized and sustained. Social interaction is the motor through which this meaning making process takes place (Nijland, 2011): the dialogue between a learner and important others tend to become an inner dialogue within the learner (Hoekstra & Korthagen, 2011; Lewis, 2002).

To study whether the use of networked learning might contribute to the practical revenues of formal education, a pilot was conducted. In the first course of an online distance education Master of Science program in Educational Sciences, a three-phased intervention for stimulating networked learning (Nijland, Van Amersfoort, Schreurs & De Laat, in press) was implemented. This two year Master of Science program is predominantly attended by teachers as a form of professional development aside of their daily teaching jobs in primary, secondary or tertiary education. The pilot was aimed at providing students with the opportunity to interpret and contextualize the knowledge they acquired in the academic curriculum in informal social networks with other students with similar teacher backgrounds, to stimulate the meaning making process between scientific knowledge and the applicability of this knowledge in their everyday educational practice. The research question we sought out to answer was: 'How does stimulating networked learning in a formal education program contribute to teachers' meaning making and contextualizing of scientific knowledge for their educational practice?'. This short paper provides an overview of the design of the study, which is still in progress.

Theoretical background

Networked learning is a form of informal learning, where individuals rely on their web of relationships to seek information, resources, support and beneficial opportunities (De Laat & Coenders, 2011; Jones, Asensio, & Goodyear, 2000). Social networks not only are a source of social and human capital, they also function as a conduit for contextualizing knowledge acquired elsewhere. To stimulate networked learning Nijland, Van

Amersfoort, Schreurs and De Laat (in press) have designed a three-phased intervention based on insights into networked learning. The three-phased intervention consists of phase (1) awareness: creating network awareness and accessibility, phase (2) ability: providing participants with tools for developing networking skills and phase (3) appreciation: assessing and promoting the value created in the network to contribute to an individual recognition of both contextualized knowledge and of social networks as a conduit for contextualizing knowledge.

Phase 1 is founded on the assumption that participants have to be aware of their social and human capital in order to effectively use their networks for knowledge sharing and construction (Baker-Doyle & Yoon, 2011). In addition, participants have to be able to access the knowledge of others, preferably at the moment help or knowledge is needed (Cross & Parker, 2004). Mapping the relationships between people and the knowledge they share in diagrams of social networks and subsequently feeding these diagrams back to the visualizes who can reach whom and aids to this accessibility (Cross, Parker, Prusak, & Borgatti, 2001; Nijland, Van Amersfoort, Schreurs, & De laat, in press).

Phase 2 is founded on the assumption that networked learning requires the ability to construct a learning relationship with others. Knowledge sharing between professionals is stimulated by a trusting relationship (Crona & Parker, 2012; Daly, 2012; Day & Hadfield, 2004). Davidson and Nowicki (2012) argue that teachers in particular tend to feel resistant when receiving knowledge from someone they don't know. Feelings of relatedness and trust can be fostered by socio-emotional interaction between people (Cutler, 1996; Rovai, 2001). Providing people with the opportunity to meet others who share the same professional interests, thus creating a common ground (Rajagopal, 2013), in an informal setting creates an atmosphere that stimulates the formation of learning relationships (Nijland, Van Amersfoort, Schreurs, & De laat, in press).

Phase 3 is founded on the assumption that when people are aware of the value of their personal networks, they may actively shape it to further their professional development (Van Waes et al., 2016). Wenger, Trayner and De Laat (2011) developed a framework that was intended for grasping both the process and the revenues of network and community engagement: the Value Creation Framework (VCF). They note that learning is not solely valuable for the learner, but also for his or her stakeholders: people in the social network of the learner, who experience the effects of what is learned by the learner. Learning is therefore an inherently collective event. Feeding back the value constructed through network engagement to learners results into awareness of the way knowledge is constructed and contextualized thus promoting informal learning (Nijland, Van Amersfoort, Schreurs, & De laat, in press).

The VCF (Wenger, Trayner, & De Laat, 2011) explores elements of value in five cycles. The cycles they describe are: Cycle 1, Immediate value: Activities can have value in and of themselves. They can be fun and inspiring. They can recognize your competence, provide a sense of social relatedness and reaffirm your sense of autonomy. Cycle 2, Potential value: Activities and interactions can produce 'knowledge capital', which value lies in its potential to be realized later. Cycle 3, Applied value: Looking at applied value means identifying the ways practice has changed as a result from network involvement. It is the value of experimentation and innovation, of doing something new. Cycle 4, Realized value: Changed practice can lead to improved performance. Cycle 5, Reframing value: When social learning causes a reconsideration of the learning imperatives and the criteria by which success is defined, value is reframed.

Methodology

Context

To study how stimulated networked learning effected formal learning, all 71 students of an introductory course in a distance education Master of Science program in Educational Sciences were invited to participate in a pilot study. While the Master's program is delivered online, the introductory course starts with a face to face meeting in which all students and teachers of the course meet and work together during six hours. After that students study online for 11 weeks on a course in which they are introduced into the workings of scientific research. The main part of the course was to design, conduct and report on a study into the visibility of learning theories in teacher behaviour in the classroom. Students write their own research proposal, create research instruments, conduct their research and present their results in both a poster presentation and a scientific article.

Design

To answer our research question the three-phased intervention for stimulating networked learning (Nijland, Van Amersfoort, Schreurs, & De Laat, in press) was implemented throughout the course. The content of the course,

which was primarily aimed to be carried out individually online, was not altered, only the opportunity for informal social learning was added. Phase 1: awareness and phase 2: ability were implemented at the face to face meeting of the course. First, all learning relationships between students and their expertise, hobby's and learning aims in relation to their professional practice were gathered and fed back to the students, to create network awareness and common ground. Second, all students were asked to form learning groups during the three breaks, for support and the opportunity to discuss the content of the course during the eleven weeks. The formation of these study groups was voluntary. In phase 3: appreciation, twelve students were interviewed on the interaction they had within their learning groups and with other students during the course and the way these interactions effected their learning and their teaching practice. These interviews were anonymized and the results were fed back to all students. After this, all students received an online form containing the interview questions, and were asked to report on their valuable conversations during the course. All 71 students participated in the study.

Data gathering and analysis

The learning relationships between the students participating in the course were mapped out on three occasions using Social Network Analysis: before and at the end of the face to face meeting, and at the end of the course. The learning relationships were gathered by asking participants 'With whom did you have one or more valuable conversations?' and were analyzed using UCInet software for network analysis. The way students created and contextualize knowledge in their informal social networks was assessed using a semi-structured interview to explore the value created in these valuable conversations. The questions used were:

1. What valuable conversations did you have? Could you describe these valuable conversations?
2. How did you experience having this conversation?
3. What did you get out of this conversation?
4. How did that affect your work in practice?
5. What difference did that make for your achievements, those of your pupils or those of your school?
6. Did you gain a different perspective on something by having this conversation?

Based on the centrality measures derived from the final SNA, twelve students were interviewed: four with a central position in the learning network, four with a position at the edge of the network and four with an intermediate central position. The interviews and the online forms were analyzed using VCF (Wenger, Trayner, & De Laat, 2011). Results are expected in December 2017.

References

- Baker-Doyle, K.J. and Yoon, S.A. (2010) Making expertise transparent: Using technology to strengthen social networks in teacher professional development. In: Daly, A.J. (ed) *Social Network Theory and Educational Change* (115–27). Cambridge, MA: Harvard Education Press.
- Cross, R. L., & Parker, A. (2004). *The hidden power of social networks: Understanding how work really gets done in organizations*. Cambridge, MA: Harvard Business Press.
- Cross, R. L., Parker, A., Prusak, L., & Borgatti, S. P. (2001). Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics*, 30, 100–120.
<http://doi.org/10.1093/0195165128.003.0005>
- Cutler, R. H. (1996). Technologies, relations, and selves. In L. Strate, R. Jacobson, & S. B. Gibson (Eds.), *Communication and cyberspace: Social interaction in an electronic environment* (pp. 317–333). New Jersey: Hampton Press INC.
- Davidson, K., & Nowicki, E. (2012). An exploration of the utility of a knowledge utilization framework to study the gap between reading disabilities research and practice. *Alberta Journal of Educational Research*, 58, 330–349.
- De Laat, M., & Coenders, M. (2011). Communities of Practice en netwerklere. In J. Kessels & R. Poell (Eds.), *Handboek human resource development* (pp. 417–428). Houten: Bohn Stafleu van Loghum.
http://doi.org/10.1007/978-90-313-8565-2_24
- De Laat, M. F., Schreurs, B., & Nijland, F. (2014) Communities of practice: Balancing openness, networking and value creation. In R. F. Poell, T. S. Rocco & G. L. Roth (Eds.), *The Routledge companion to human resource development*. London: Routledge.
- Everton, T., Galton, M., & Pell, T. (2000). Teachers' perspectives on educational research: Knowledge and context. *Journal of Education for Teaching*, 26, 167–183. doi:10.1080/02607470050127081

- Hoekstra, A., & Korthagen, F. (2011). Teacher learning in a context of educational change: Informal learning versus systematically supported learning. *Journal of Teacher Education*, 62(1), 76–92. <http://doi.org/10.1177/0022487110382917>
- Jones, C., Asensio, M., & Goodyear, P. (2000). Networked learning in higher education: practitioners' perspectives. *Research in Learning Technology*, 8(2), 18–28.
- Lewis, M. D. (2002). The dialogical brain: Contributions of emotional neurobiology to understanding the dialogical self. *Theory & Psychology*, 12, 175-190.
- Lieberman, A., & Pointer Mace, D. H. (2008). Teacher learning: The key to educational reform. *Journal of Teacher Education*, 59, 226–234. <http://doi.org/10.1177/0022487108317020>
- Lysenko, L. V., Abrami, P. C., Dagenais, C., & Janosz, M. (2014). Educational research in educational practice: Predictors of use. *Canadian Journal of Education*, 37(2), 1–26.
- Moolenaar, N. M. (2012). A Social Network Perspective on Teacher Collaboration in Schools: Theory, Methodology, and Applications. *American Journal of Education*, 119(1), 7–39. <http://doi.org/10.1086/667715>
- Nijland, F. J. (2011). *Mirroring interaction. An exploratory study into student interaction in independent working*. Tilburg: Tilburg University. Retrieved from <http://arno.uvt.nl/show.cgi?fid=121427>
- Nijland, F., Amersfoort, D. V., Schreurs, B., & De Laat, M. (in press). Stimulating teachers' learning in networks: Awareness, ability, and appreciation. In S. A. Yoon & K. J. Baker-Doyle (Eds.), *Social Capital, Social Networks, Teachers, and Educational Change: Interventions and Outcomes*. London: Routledge.
- Rajagopal, K. (2013). *Networking for Learning: The role of Networking in a Lifelong Learner's Professional Development*. Open University, Heerlen. Retrieved from <http://hdl.handle.net/1820/6518>
- Ratcliffe, M., Bartholomew, H., Hames, V., Hind, A., Leach, J., Millar, R., & Osborne, J. (2005). Evidence-based practice in science education: The researcher–user interface. *Research Papers in Education*, 20, 169–186. doi:10.1080/02671520500078036
- Rivera, M. T., Soderstrom, S. B., & Uzzi, B. (2010). Dynamics of Dyads in Social Networks: Assortative, Relational, and Proximity Mechanisms. *Annual Review of Sociology*, 36, 91–115. <http://doi.org/10.1146/annurev.soc.34.040507.134743>
- Rovai, A. P. (2001). Classroom community at a distance. *The Internet and Higher Education*, 4, 105–118. [http://doi.org/10.1016/S1096-7516\(01\)00053-7](http://doi.org/10.1016/S1096-7516(01)00053-7)
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <http://doi.org/10.1037/0003-066X.55.1.68>
- Schreurs, B., De Laat, M. (2012), Network awareness tool – learning analytics in the workplace: detecting and analyzing informal workplace learning. In: *Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*, p. 59-64, ACM, New York.
- Schreurs, B., Van den Beemt, A., Prinsen, F., Witthaus, G., Conole, G. and De Laat, M. (2014), An investigation into social learning activities by practitioners in Open Educational Practices. *Review of Research in Open and Distance Learning*. Retrieved from <http://www.irrodl.org/index.php/irrodl/issue/view/63>
- Van Waes, S., Moolenaar, N. M., Daly, A. J., Heldens, H. H. P. F., Donche, V., Van Petegem, P., & Van den Bossche, P. (2016). The networked instructor: The quality of networks in different stages of professional development. *Teaching and Teacher Education*, 59, 295–308. <http://doi.org/10.1016/j.tate.2016.05.022>
- Wenger, E., Trayner, B. and De Laat, M. (2011) *Promoting and Assessing Value Creation in Communities and Networks: A Conceptual Framework*. Retrieved 24 October 2013 from <http://www.bevtrayner.com/base/docs/Wenger_Trainer_DeLaat_Value_creation.pdf>.
- Zeuli, J. (1994). How do teachers understand research when they read it? *Teaching and Teacher Education*, 10, 39–56. doi:10.1016/0742-051X(94)90039