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I'm just thinking - How learning opportunities are created in doctoral supervision (0186)

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Outline

Background

With this paper we aim to contribute to an understanding of learning dynamics in doctoral supervision by analysing how learning opportunities are created in the interaction. Research into doctoral supervision as reported to date is of general character, and falls short of empirical studies on how doctoral students learn how to undertake research. Furthermore, most higher education research on doctoral supervision is based on interviews, while relatively few studies analyse actual interaction. Learning to be a researcher involves building competences in research practice together with an understanding of the research process. Earlier studies have been vague on this question, suggesting that learning how to undertake research happens in the process of researching under supervision, rather than exploring *how* supervisors 'guide' or 'direct' doctoral students to acquire specific understanding or build specific competences within a discipline.

Theoretical approach

Empirically, we have based our analysis on four supervision sessions each with two supervisors and one doctoral student discussing life science research in a major Danish university. The supervision sessions were sound and video recorded to provide for verbatim transcripts.

We are interested in learning opportunities in doctoral supervision, inspired by phenomenography and variation theory ([Marton & Booth, 1997](#); [Marton & Tsui, 2004](#)). Here the *space of learning* reflects what it is possible to learn about a specific object of learning in a certain situation. The space of learning is characterized by the way the critical features of the object of learning are *varied* in the situation; opening dimensions of variation expands the space of learning and thereby increases opportunities for learning. This means that we make distinctions between the *intended* object of learning (what should be learned from a supervisor perspective) and the *lived* object of learning (what is actually learned by the doctoral student) and the *enacted* object of learning (what is possible to learn in the situation). The learning opportunities can be identified through analysis of the transcripts with the use of this notion of variation. There are different patterns of variation in the space of learning: *contrast*, *separation*, *fusion* and *generalisation* (Marton & Tsui, 2004). For example, contrasting aspects is a pattern of variation where aspects of the phenomenon are contrasted to other phenomena, e.g. to learn what a square is, you must discern what it is not, for example a pentagon or a rectangle. An example of contrasting is found in the excerpt below.

Results

In our data we identified two phenomena that were in focus in the discussions: 1) how to produce valid results, and 2) values and norms in life science research.

Learning how to produce valid results

From the analysis we found that supervisors and doctoral students create learning opportunities by varying aspects of phenomena in different ways, following the patterns of variation described by [Marton and Tsui \(2004\)](#) e.g. by contrasting:

Student	I'm just a bit, yeah, I don't know, of course <i>an ash always more or less mixes</i> , especially if it's wet
Main supervisor	yes
Student	<i>but the char and the solids, they are completely different</i>

The doctoral student contrasts ash with biochar and solids with respect to one aspect, how well the material mixes with sand. By bringing this variation into focal awareness she opens the possibility of learning more about the properties of these materials and how to work with them. Contributions in the discussion open up dimensions of variation within the research project, and thereby allow the participants to deepen their understanding of the particular aspect.

Values and norms in research

Another aspect of PhD education concerns the PhD student becoming a scientist. At this level the aim is to become a member of the scientific community, and this requires an understanding of the values and norms in research. In the analysis of the transcript we found variation of phenomena that have to do with learning about research practice and research process. In the following quote the main supervisor is giving variation to how the other participants can understand what he is saying: "I'm not saying we should do it, I'm just thinking". The extent to which what is said is thought through in the communication (in the research process) can vary and should not be taken for granted. This allows the doctoral student to gain a deeper understanding of the research process, about how to communicate and plan future research. It also indicates that the process of research includes thinking aloud to allow for others to engage in discussion and help to evaluate new ideas and thoughts. In another case the meeting mainly concerned the PhD plan (the proposal) and they discussed can be achieved in a three year period. The co-supervisor questions whether the fourth objective of the proposal is realistic. The main supervisor contrasts a good thesis with a thesis that "tried to do too much" and ends up only "scratching the surface of the research questions". By contrasting, the supervisor creates the opportunity for the doctoral student to discern what a good doctoral research project is in contrast to what it is not.

Implications

The results illustrate how learning opportunities are created by supervisors as well as doctoral students when bringing aspects of phenomena into the foreground and by varying aspects of the phenomenon. Learning how to research is not merely something that doctoral students learn from their research work with passage of time, nor is it a learning trajectory that supervisors can design. Learning in the context of doctoral education is illustrated here as interaction between supervisors and doctoral student, where they

open dimensions of variation in the discussion about research. Greater awareness of this mechanism of creating learning opportunities can help supervisors develop their competences in supervisory pedagogy.

Marton, F., & Booth, S. (1997). *Learning and awareness*. New Jersey: Lawrence Erlbaum Associates.

Marton, F., & Tsui, A. B. M. (Eds.). (2004). *Classroom discourse and the space of learning*. New Jersey: Lawrence Erlbaum.