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Experience a sense of being, becoming and belonging to an educational design project as professional development

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Research on professional development generally focuses on teacher change as the core of professional development. However, there remains an undocumented variability in how teachers change that identity studies try to document. This paper focuses explicitly on two teachers', Diana and Nicolina, participation in an educational design research project and how the project might or might not support change when viewed from the teacher's perspective. Through the lens of identity and ethics, we look at how teachers express a sense of being, becoming and belonging concerning their professional development. Participation in the project gives Diana a safe space of being the teacher she wants. But for Nicolina, the project is a way of becoming, providing other options for her future career. Both teachers feel a need, imagine a different way of being, and believe it is possible through their participation, and by that, the project supports change if they decide to change.

Keywords: Professional development, educational design research, teacher change, ethics.

Introduction

Research on professional development generally focuses on teacher change as the core of professional development. The aim is to benefit students' learning by developing teachers teaching (Sowder, 2007). To study teacher change, studies within beliefs research concern whether beliefs are changeable or static, and how best to change beliefs if they are changeable (Phillip, 2007) while other studies focus on the knowledge possessed by or needed for teachers (Hill et al., 2007). Others describe teacher change as a development through predefined stages (Sowder, 2007). These foci are based on an implied liaison between the stages, beliefs and/or knowledge, teachers' teaching, and the intervention from the professional development program. However, there is little consensus regarding the features of this liaison (Hill et al., 2007; Phillip, 2007; Sowder, 2007) and seldom a strive towards understanding professional development from the teachers' perspectives (Battey & Franke, 2008).

Concerning the process of change, Battey and Franke (2008) conclude that “there remains a large and often undocumented variability in how teachers make use of ideas learned” (p. 127). One way of describing this variability is through identity studies. Interest in such studies has grown during the last twenty years (Skott, 2019) and has become one way to provide insights in how teachers make use of “ideas learned”. Research on professional identity, attempts to understand the variability in how teachers react to different situations and focuses on how professional development might or might not support changes in teachers' identity. In line with this, the focus of this paper is explicitly teachers' participation in an educational design research (EDR) project and how the project might or might not support change when viewed from the teacher's perspective.

At CERME-12 in TWG18, a discussion concerning ethics in relation to professional development and teacher change arose among the participants. This discussion was thoughtful but also by some

regarded as somewhat provoking. In the summary paper of TWG18, this discussion is described as an emergent issue “with questions asked such as whether it is right to try to change teachers in certain ways, and who should make those decisions” (Fauskanger et al., 2022, p. 3059). As a continuation, Ebbelind and Helliwell (2023) point out that teachers’ personal history influences the range of possibilities to re-position themselves in new ways during professional development. Thus, even if researchers have intentions for development or change in a specific classroom, it cannot be expected that teachers will change in predefined ways as there is a variability in how teachers use the ideas circulating within any professional development and research project.

In this paper, an EDR project on problem solving and problem posing with Swedish six-year-olds will serve as an example. In Sweden, six-year-olds attend preschool class which is part of the formal education system, intending to provide a smooth transition between preschool and school. Two teachers participating in this project will serve as cases to highlight a discussion about change and ethics in relation to professional development. The research question is: How do the teachers express a sense of being, becoming and belonging in relation to professional development and the ethical question about teacher change? (The notions of being, becoming and belonging are elaborated on in the method section).

We are not changing teachers; teachers are changing themselves

Mathematics education “is a discipline prone to the lure of single solutions” (Pimm, 1993, p. 30), which is why researchers need to be aware of the will to get the research result they want. The researchers’ lust to change teachers in specific ways (Pimm, 1993) seems still present in much research today because of this implied liaison mentioned in the introduction, and one wonders if this contributes to the choice of re-positioning oneself as a teacher sincerely and profoundly. The desire to change must come from within. Teachers need to feel a need, to imagine a different way of being and to believe it is possible (Ebbelind & Helliwell, 2022). Further, the researcher should be careful about making claims about what is worth changing, where Mason (2003) warns of the ethical implication when an external force attempts to get teachers to “adopt practices that are deemed valuable or even necessary” (p. 282).

Participating in educational design research as professional development

As been concluded by several researchers (for example, Bakker, 2018), EDR is diverse concerning forms, names and criteria but shares the endeavour to design new educational materials. Along with this endeavour, EDR also strives to implement teaching as part of the research. This implementation needs classrooms and teachers teaching in those classrooms to contribute to research and practice (Bakker, 2018). As EDR is conducted in iterative cycles, collaboration between teachers and researchers is required (Palmér & van Bommel, 2021). According to Cai et al. (2018), a teacher’s role in EDR is to contribute to the student's experience and the educational context and to “provide an insider's nuanced and reality-based perspective” (p. 518).

As EDR is developed to increase the impact of research on practice, the teachers within the study presented here are utmost important. One aim has been to build productive and sustainable partnerships between researchers and teachers. Since different collaborations between researchers and teachers give different outcomes in terms of professional development, the role of the teachers

has been reflected upon from a methodological perspective by Palmér and van Bommel (2021). In Palmér and van Bommel (2021), the collaboration between the researchers and teachers in the study was presented in three phases that correspond to the development of the role the teacher has had during the years of the project. In the first phase, the researchers conducted all the problem-solving lessons and the interviews with the children. In the second phase, the researchers conducted interviews, but the teachers implemented the lessons and collected documentation from their students. In the third phase, the teachers continued implementing lessons, gathered documentation, and also conducted interviews with their students. Thus, through the three phases, the preschool class teachers' participation developed from merely giving access to their students to being responsible for gathering data.

In contrast to Palmér and van Bommel (2021), focussing on the challenges different collaborations between researchers and teachers pose for research quality, this paper focuses on the identity of these teachers. Identity in terms of how they describe their being, becoming and belonging related to the project. In this way, we try to contribute to research by raising questions related to various classrooms and personal experiences that participants in educational design research may have.

Method

Five preschool class teachers participate in the EDR project on problem solving and problem posing with Swedish six-year-olds (Palmér & van Bommel, 2021). They were funded by ten per cent (five h/w) working in the project. After participating in the study for several iterative cycles (see phases 1-3 above) the teachers were interviewed, approximately one hour each, by one of the researchers. The transcripts of these interviews provide the component of empirical material used in this study.

To analyse and interpret professional development and the ethical question about teacher change, the conceptual framework of Patterns of Participation was used. Within this framework and within our study, identity is understood as the teachers' experience of being, becoming and belonging (Skott, 2019), that is, how the teachers' position and re-position themselves linguistically in relation to the project and other past, present, and future social practices. Identity is not considered a static entity but is situated and constant in the makings (Skott, 2019). We seek to understand if and how the teachers' interpretations of and contributions to the project relate to their engagement in various other social practices. To elicit the teacher's interpretation the transcripts were analysed using parts from Systemic Functional Linguistics, SFL, (Halliday, 1978) in the search for discursive patterns. Discursive in the sense how a person transforms experience into the present situation and transforms utterances from one social practice to another (Ebbelind, 2023). According to Halliday (1978) SFL allows us to explore particular patterns of wordings to the extent that other frameworks generally do not. SFL focuses on how and why an individual produces a particular wording rather than any other wording in a specific social practice through three meta-functions; ideational, interpersonal and textual. The ideational meta-function focuses on the transitivity structure of the transcript, that is the relationship between a person or entity and the process verb. Through analysing the transitivity system, we can gain insights into how the teachers represent their experience of the project, their being, becoming and belonging. The interpersonal meta-function is used to analyse how social relationships are established and maintained by looking at how the information is given, the mood

system (as a statement, question, offer, command, or request), modality concerning what degree of certainty there is in the transcript (high, medium, or low), and the tense (past, present and future). Mood, modality, and tense together indicate attitudes toward the aspects found in the transitivity analysis. Finally, the analysis focuses on the thematic structure, the textual meta-function, through which, we can gain insights into how the transcript is cohesive. This part of the analysis makes us interpret the relationships between clauses, sections and experiences identified in the transcript.

Then, the analysis was followed by closely reading and annotating the transcriptions, marking discursive patterns. For example, in the transcript one can identify a discursive pattern related to how the information is given. There are many statements from one of the respondents with an underlying request. “I would like to”, “but not in that way”, “but I am also satisfied”, “I'm not unhappy”. This pattern can be interpreted both in relation to her sense of *being* a member in the project, how she *belongs* to the project and that there is another *becoming* that might be requested.

Two of the teachers are selected as critical cases in this paper, Nicolina and Diana. Nicolina was educated as a preschool teacher in 2012 and has worked in preschool class for six years. Diana was educated as a preschool teacher in 1992 and has worked in preschool class for eight years. They were selected based on their diversity presenting two very different cases. Aware that one can express a sense of being while simultaneously striving for another becoming, we present the result as a narrative story told by the researchers where the boundaries between being, becoming and belonging are blurred. Note that ... below refer to a pause in speaking and [...] refers to words omitted.

Nicolina's experience of being, becoming and belonging

Nicolina expresses her *belonging* to the preschool profession; she is a preschool teacher but now working in the preschool class. The reason for working in the preschool class is a longing to *become* more knowledgeable, but there seems to be another search for yet another different *belonging* in the future. Nicolina became a preschool class teacher “because I sought new challenges, and I have been a school team leader in every setting I have attended, both as a preschool teacher and a preschool class teacher”. Nicolina is in a constant *mode of becoming*. She always aims for further development for, as she says, the best of the students she teaches.

Nicolina attributes the desire to develop, *becoming*, to her university studies and points out that this “is a beautiful desire... the desire to develop”. She always finds a new depth concerning teaching everywhere and describes an underlying drive and commitment to the profession. Therefore, Nicolina never stopped studying after university. “I continued to study a little... and then studied a little more... and more... now I am going to study a master's program”. The preschool teacher education program gave her new input and became the starting point. Her later engagement in professional development and research initiatives improved her understanding of teaching and learning mathematics. Nicolina points out that there is a relationship between her search for knowledge and her classroom's now calm and focused working climate, “with each passing year, it becomes more peaceful and more concentrated in the classroom,” she adds.

Nicolina's path to *becoming* a member of the project Problem solving in Preschool class (PiF) started with an in-service professional development initiative within the municipality. The in-service professional development dealt with how to incorporate problem solving in the school's early years

and is attributed great importance because Nicolina got so inspired that she chose to read a 7.5 ECTS credit course in problem solving. After this course, she got involved in the PiF project and *being* a member feels good.

I think we think this feels good... fun and meaningful... we get things to implement in our classes... and then we have a good time [...], we all can talk to each other and dare to say what we think... now we also know you quite well, we have gotten to know each other and have a kind of relationship. It has to be a bit personal too.

During the interview, Nicolina expresses a different *being and becoming* than the other teachers. In comparison, the other teachers in PiF are interpreted to describe *becoming* and *belonging* to the group of five teachers. On the other hand, Nicolina *belongs* to the group but shows an interest in teacher education and the researchers' practice. She looks for possibilities to change and wants to try out teacher education because she thinks she has "something to add". Nicolina talks about change concerning her classroom and her future profession. Participating in different in-service initiatives has made it possible for Nicolina to meet other teachers, inspiring her and researchers that got her interested in research. She states: "it is a little interesting to participate in research". It is interpreted that Nicolina is interested in *belonging* or wanting to engage more closely with the researchers. This can be seen, for example, in the citation below.

My job is not to analyse the particular material I gathered. I would like to... but then you still do it in some way in the discussions at our meetings... but not in that way [...] I always think it's fun to be more informed... but I am also satisfied as it is... I'm not unhappy... but it's always fun to be more inside... I think...

By *being* a member of PiF, Nicolina has *become* interested in research and teaching in teacher education. She emphasises that this is because of the researchers who "involve us in other things than PiF and help us on the way". Above all, the researchers' promotion of the teachers presenting their experiences of teaching problem solving and *being* a teacher participating in educational design research at official gatherings, and conferences with other teachers, Nicolina highlights.

For Nicolina, the ten per cent funding is crucial to be able to participate in the way she wants and expects to participate. Further, she emphasises her *belonging* "I feel that I am part of PiF through the ten per cent." Participating in the project has created a sense of *being* and, foremost, *belonging*. Nicolina adds, "now I feel that I have accumulated so much knowledge from this... so what I want right now is to be a part of this [...] I was certainly not as aware of teaching then as I am now". Nevertheless, she does not just do it for the project. It is also in her interest to *belong*. Wanting tasks that can challenge her is central, but there is also a desire to feel so safe with the researchers that one can make suggestions as to whether "something can be improved or changed or so".

However, with a sense of *belonging* comes demands. According to Nicolina, a contributing factor to the greater demands is that she places higher demands on herself when she feels involved, but Nicolina "likes the demands" and sees them as positive, something to strive for. She adds that it is clear "what expectations you have of me... but also what expectations I have of you [...] it is clear what I have to do in PiF and when it has to come back to you [...] but you must organise that we meet

and let us share each other's experiences". Nicolina adds with a laugh "you should also make sure that there is some quality in the problems... I assume that".

Diana's experience of being, becoming and belonging

Diana is a preschool teacher that works in the preschool class. She focuses on the moment she teaches and seeks satisfaction in the small moments of quality classroom interaction. In a somewhat problematic working situation, Diana finds trust in small moments of feeling successful. In her eyes, *being* a member in and *belonging* to the project PiF significantly contributes to those moments.

There are moments when you feel that this turned out well... and then you must absorb those moments [...] you feel that the children are there... listening... they think it is fun... they want to know more... you feel that they are involved [...] that someone comes and hugs you and says... oh what fun it is at school

PiF offers Diana structure, she values her *belonging* to the project. "You feel that you do not get thrown into things". However, most importantly, it allows her to relax and feel secure because "there is a sense of security that makes you dare... yes... let go a little of what you normally do, and you dare to throw yourself out and just do things". Diana describes it as knowing her work situation limits her from doing the kind of teaching expected from her in the project as an everyday thing. Concerning PiF, Diana says, "I can try things and do not place so much prestige in the fact that it did not turn out well". She says *being* in the project allows her to think, "we try... test if it works", and she adds, "it is so liberating in a way". Diana *becomes* another teacher when teaching the problems within the project. She and her colleagues conclude, according to her, that they are surprised that the teaching in relation to PiF works so often as they do not think it should work with the children in their class. *Being* there right then, feeling small moments of success, keeps her in the profession, and PiF is attributed as important. What is interpreted as essential for Diana right there when teaching is when she feels that her students are sharing a teaching moment. "You are so happy... they do things together... they build something together". She even implies that without PiF she might not even be in the profession anymore.

Diana continued studying directly after her education. "I studied 30 points [ECTS Credits] ... right there". Then it took a long time before Diana started her search for professional development. "I had probably wanted it for a while or some change at least". Diana is torn between her will to *become* an even better teacher and the reality she experiences, "I have always wanted to be good... wanted to do well... wanted to do as well as possible for these students". Moreover, the reality she describes herself working in is an impossible educational mission from her point of view.

The path to *becoming* a member of PiF is attributed great importance. With a foundation in an in-service professional development initiative, Diana became a part of yet another research project, some years before PiF started. She remembers that it was in connection with the completion of that project that she became involved in PiF. Diana concludes that she has *become* another teacher through the project and says "I have developed... I am more prepared to handle things that come up during teaching... you dare to lose control of the situation with PiF".

Diana emphasises that PiF differs from what she has experienced before and underlines that she gets ten per cent funding within the project. This ten per cent is “a statement”. Regardless of what happens at the school, they have ten per cent pay from the project, from the university. No principal can touch these, which is a blessing. Participating in the project has created a *sense of belonging*, a safe space, and Diana focuses much more on the role of the researchers and the project than on her own role. “The role of the researchers is to seek new knowledge... new things... put the light on processes and help us to raise the right questions at the right time that we might not have raised before [...] keep the dialogue going between us so that we can help you [...] you know we want the core of the teaching”.

Diana expresses trust in the researchers because she and her colleagues feel that the plans and instructions from the researchers are working, even if it is sometimes not an optimal day for the group of children or the teachers themselves. Diana thinks that the reason for this is that “research contributes to quite high demands in any case on how I should perform a task [...] it should be done in a special way... then I cannot change it because I have a template that I have to follow so that it should become valuable for research.” However, as highlighted by Diana earlier, this is also why she can relax, feel secure and just *being* in the moment and teach.

Discussion

The teachers’ expressions of being, becoming and belonging influences their re-positioning (see Ebbelind & Helliwell, 2022) in different ways during the project. This is in line with EDR as a shift in focus from researching (on) teachers to researching *with* teachers. The benefits of such collaboration with teachers are that it provides teachers with different options where different positions can be taken (Palmér & van Bommel, 2021). Participation in the project gives Diana a safe space of being, which allows her to re-position herself and proceed with the plans that is given to her. But for Nicolina, the project is a way of becoming, providing other options. In this way, Diana and Nicolina adopt practices that they deem valuable or necessary, not practices that we deem valuable or even necessary. Even though the aim with the EDR project is not to set out as change of teachers, they express change. However, as in professional development programs there are no predefined stages, productive beliefs or knowledge possessed by or needed for teachers as standards for change. Of course, researchers would like them to change, but change can be thought of as a by-product of the research process that allows the participating teachers to feel a need; to imagine a different way of being, and to believe it is possible (Ebbelind & Helliwell, 2022). Belonging to the group seems vital when discussing whether the project supports the potential change. We argue that the answer to who should make those decisions (Fauskanger et al., 2022) is the teachers.

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