Increasing teacher engagement in learning platforms through Future Workshops

Lone Dirckinck-Holmfeld

Department of Communication and Psychology, Aalborg University,
lone@hum.aau.dk

Abstract

The paper explores a methodical approach to implementation studies of learning platforms in Danish Schools, that combines Future Workshops (FWs), Activity Systems Analysis (ASA) and design interventions. The study documents a specific combination of approaches, new to the participatory design (PD) community, which provides ownership and creates meaning among participants in the implementation process. Further, the findings support that the meaning of using the platform is not given or determined, but is a negotiated enterprise under development in interaction with the plasticity of the platform and how the platform, principles and practices are combined with the teachers and the implementation process. The platform offers built-in design principles and pedagogical values and, as such, the materiality of the platforms afford certain practices. However, FWs, ASA and the design interventions also documented that the meaning construction is shaped under use (and no use). A critical and constructive appropriation of the learning platform is therefore strongly linked to participatory implementation methods in which teachers are exploring and experimenting with the learning platform in their professional practices.

"The project will focus on creating coherence between the schools' intentions and visions and the intentions behind the introduction of learning platforms (…) The project combines methodical approaches from Future Workshops, user involvement and design-based research, and will thus develop effective solutions that highlight and address problems and opportunities experienced in practice. At the same time, the project creates reliable and robust knowledge about how learning platforms affect teaching and learning in Danish primary school". (Misfeldt, 2016 p. 2, my translation)

Keywords
Learning platform, future workshop, teacher's engagement and ownership, implementation and meaning.

Introduction

In 2014, the Government and the Municipal Association agreed to adopt an initiative for learning platforms in primary schools. The agreement originated from the elementary school reform adopted in 2013 'Gør en god skole bedre - fagligt løft af folkeskolen' (Make a good school better - professional lift of the elementary school, translation LDH) and aims to support the reform through concrete digital initiatives. The user portal initiative required that all municipalities acquire two digital solutions for schools by the end of 2017: a collaboration platform and a learning platform (Kommunernes Landsforening, no year). As a result of this initiative, all municipalities have purchased a learning platform that is being used or soon will be used, in schools.

This article is based on a large-scale research and development project, 'Use of Digital Learning Platforms and Learning Materials' (Danish: Anvendelse af læringsplatforme og læremidler) (Morten Misfeldt, 2016), funded by the Danish National Agency for IT and Learning (STIL). The research was carried out by a large group of researchers and educational consultants (in itself, an interesting project) who worked with 15 schools across Denmark. The project addressed aspects of implementation that uses a top-down process into a school context and culture dominated by professional teachers with a tradition of methodological freedom. Further, the implementation followed a political conflict between the Teachers Association and the Government and Municipal Association regarding the organisation of teachers' work and the implementation of the school reform. The approach of this project is participatory, approach with a focus on pedagogy, technology and organisation:

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This paper particularly addresses methodical approaches that combine Future Workshops (FWs), user involvement and design-based research, based on work done with one of the 15 schools that participated in the larger-scale study. The case school uses the learning platform MinUddannelse (MU), one of the learning platforms designed to meet the specifications of the Municipality Association. MU was used for approximately one year before the intervention research took place.

Problem formulation

How can the combination of FWs and an expansive learning approach guide the process of integrating the new learning platforms into Danish schools? How can local ownership be established and strengthen the teachers' agency afforded by the platform?

Significance of the research in relation to the NL conference

Learning platforms are infrastructures for learning (Bygholm & Nyvang, 2009). The concept of infrastructure emphasises relationships between the technologies, the organisational elements involved and the use aspects. As key technologies, learning platforms help teachers and students. Research on learning infrastructures has been a core topic within the networked learning community, especially in higher education (see Bygholm & Nyvang, 2009; Guribye, 2009; Dirckinck-Holmfeld, Jones, & Lindström, 2009; Jones, 2015). The context of elementary schools has not been a strong focus of networked learning; however, with learning platforms adopted by schools, new practices may evolve related both to teaching and learning and to the collaboration between teachers, and between teachers, students and parents. This last group can learn from the networked learning community. I posit that learning platforms are an intermediary tool for stakeholders (managers, teachers, children and parents) and that activities and resources through the platform can connect the learners with their teachers and with the material in new ways. As such, it might be helpful to introduce networked learning philosophies to this area, both in pedagogy and in the ways teachers, or teacher, pupils and parents, communicate, connect and work together. As the culture of learning and networking transforms the culture of learning and networking, integration of learning platforms into the school becomes an important issue. What issues are at stake as the teachers appropriate the learning platform? How can local ownership be established, building on teachers' agency, and how can teachers' capacity be expanded to develop teaching and learning further?

Theoretical concepts

The case study draws especially from studies of infrastructure for learning, arguing that learning platforms are social, technical and socio-cultural constructs (Guribye, 2015; Bygholm & Nyvang, 2009; Dirckinck-Holmfeld, Jones, & Lindström, 2009). The concept of infrastructure strengthens attention to the relationship between the elements involved. On a technological level, an infrastructure is heterogeneous, including sub-infrastructures based on different versions of the same standard or different standards covering the same functionality. Also, it often builds on an installed base (backward compatibility), which means that the existing heavily influences how the new can be designed (Hanseth, 2000: p. 37).

The traditional concept of an infrastructure is something that is just there, ready to use, completely transparent and often taken for granted (for example, water or electricity, the railway, mail services and the internet). As Bygholm and Nyvang (2009), drawing on Star & Ruhledger (1996), put it: '[T]here is a tendency to perceive infrastructure as hardware--implying something that is built and maintained and which then sinks into the invisible background, to be noticed only when it breaks down' (p. 37). However, infrastructures are socio-technical, meaning that, to qualify as an infrastructure, a system requires not only hardware but also organisations, socially communicated background knowledge, general acceptance, reliance and near ubiquitous accessibility (Bygholm & Nyvang, 2009, p. 37). However, these requirements are not only socio-technical but also socio-cultural, with built-in values and assumptions about teachers' work, pedagogy, didactics and pupils' learning. Learning platforms, as an infrastructure, function in line with physical, educational buildings. They do not determine the teaching and learning taking place; however, they afford the use more or less efficient. Wenger's concepts of

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reification (to make into thingness/standards) and participation are also useful in understanding the dynamics and use related to learning platforms (Wenger, 1998). Other useful concepts are Hansbøls concept of 'learningplatformations' as summarized in Tamborg, Kiær, Misfeldt (2017), which underlines that a learning platform takes many forms that link tools, principles and practices as combined by the educational staff. Also, Tamborg et. al.(2017) describes 'partial coupling and uncoupling', referring to the integration or disintegration of the learning platform by existing practices, as well as the 'plasticity' of a learning platform, describing the possibilities for adaptation and support of different practices.

To support how the learning platform is used, the project has applied elements from participatory design (PD), especially FWs (Jungk & Muellert, 1984), and design experiments (Gynther, n.d.). Because infrastructure is a construct, and because of the special culture and methodological freedom in Danish schools, the assumption is that teachers should be strongly integrated into the process of developing, designing and implementing learning platforms to make them a productive tool for teachers to facilitate and scaffold pupils' learning. Further, as noted by Bygholm and Nyvang, these methods should facilitate communication about values and use practices, not only about technical issues (Bygholm and Nyvang, 2009: pp. 46-47). Finally, the project also draws upon the perspectives of expansive learning (Engeström, 2001). Expansive learning is seen as the overall goal for the implementation process. The learning platform should not only be integrated into the teachers' practice, but also contribute to further development of their practice, including the potentials of the learning platform. Applying Engeström's concept of 'contradictions' and 'tensions' as springboards for expansive learning, the paper employs ASA (Engeström, 2001) as a lens to analyse experiences from the FWs.

State-of-the art approach

This state-of-the art approach builds upon a systematic literature review carried out in the research project 'Use of Digital Learning Platforms and Learning Materials' (Tamborg, Bjerre, Albrechtsen, Andreasen & Misfeldt, 2017). The survey identified three main categories of scholarly work: 1) implementation of digital learning platforms; 2) competence development of teachers in the use of digital learning platforms; and 3) digital learning platforms and pupils' learning. The key findings of relevance for this article are especially linked to the two first categories.

Implementation of digital learning platforms
In the literature, two related sub-categories were identified: one related to the concerns of the teachers, and the other to users' acceptance of, and satisfaction with, a learning platform. Lochner, Conrad and Graham as referred to by (Tamborg et al., 2017) researched the concerns of secondary teachers regarding learning platforms and identified concerns regarding involvement, management, personal and informational concerns. Teachers' lack information about the implementation process; they are concerned whether they will have the necessary time to learn how to incorporate the platforms into their working life as well as being concerned about eventual changes and consequences on the personal level. The same study also shows that adequate information and involvement related to the platform and objectives can address most of these concerns. Tamborg et al. (2017) also referred to Selwyn, who founds that even the initial implementation of a learning platform established a culture in which all functions across the school--management, administration and teachers--supported each other and collaborated, it was not the learning platform per se that supported the change in the organisational culture, but the organisational process around the implementation. In particular, the teachers felt that the learning platform implied standardisation of the teaching and learning process instead of supporting methodological freedom and the development of the individual teachers' professional judgement because the platform was based on best practice examples. Further, the teachers found that the platform primarily produced data about what was happening instead of supporting their aims to develop their teaching and learning. Also, the work of Underwood and Stiller as discussed by (Tamborg et al., 2017) focused on teachers concerns, finding that teachers associated the platform with an increased workload, and that teachers will turn away from the platform if it is too time-consuming and does not provide more value, either functional or epistemic.

Further (Tamborg et al., 2017) draws our attention to Tamborg, Bourgonjon, Wever, Schellens and Valcket's work having researched the reasons for teachers' acceptance of a learning platform and how teachers adopt the platform for teaching and learning. Their study found that perceived use value, usability, information, communication and personal innovation capacity are significant factors that interact and are mutually. Further, Underwood and Stiller was referenced by Tamborg et al. (2017) to argue that the teachers' use of the learning platform did not correlate with the teachers' knowledge of the learning platform, the positive take on learning platform was more dependent on experienced use value and the decrease in experienced workload. Finally, Tamborg et al., (2017) found that the aspect of interface design and overall platform concept as identified by

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Granic and Cukusic were significant in the teachers' assessment of the platform; also, the time required to complete key actions influenced teachers' satisfaction.

To summarise the international literature study, there is some indication of patterns in the use of learning platforms, which can guide this study. When the teachers experience how the learning platform contributes to better teaching, strengthening their professional judgement and methodological freedom without giving too much extra work and the platform is easy to use, then the teachers use the learning platforms. The studies also show that the implementation process is important. Teachers expect to participate and be involved and to find ways to use the platform to support their work. Also, designers should care about standardisation and avoid rigid standardisation of didactics and learning approaches. These overall findings support the approaches in the research project 'Use of Digital Learning Platforms and Learning Materials' (Misfeldt, 2016). In the following section, we develop a model for implementation and use of learning platforms in schools, incorporating the insights from the literature review.

Methods

The case study used a model that combined FWs, ASA, design experiments and systematic reflection work from the perspective of expansive learning. We aimed to develop a model that gives teachers a sense of ownership regarding the platform and to engage teachers in testing new ideas for teaching and learning (expansive learning). The FW acted as a framework for the process, which was intended to enable the seven participating teachers: first to establish an understanding of current critical issues and then to expand their understanding of new pedagogical opportunities and solutions, including the platform. The first two phases of the FW--the *critique phase* and the *fantasy phase--w*ere planned according to Jungk and Müllert (1984)'s recommendations, and these two phases were completed in the first workshop. The *realisation phase*, the last phase of the FW, was modified with techniques from design experiments (Gynther, n.d.). These design techniques provided the teachers with an opportunity to design actual concrete actions that they wanted to test. To understand the teachers' learning process throughout both workshops, we applied Engeström's ASA model to the data. ASA was used to understand contradictions and tensions that could potentially lead to new pedagogical understandings of how the platform could be used or tensions that would be necessary to address (Engeström, 2001).

Data collection and analysis

The collected data for this study includes data from the FW, video recording of the two workshops, content logs based on the recordings, pictures, transcriptions of the teachers' design materials and observational notes (Dirckinck-Holmfeld, Nielsen, & Ræbild, 2016). Further, the study has drawn on the general data produced in the overall project, interviews with head teachers, focus groups and surveys with all teachers involved, and a survey of schoolchildren. The content logs were created based on the recommendations of Jordan & Henderson (1995), and the observational notes were based on predefined categories and written during the workshops. Because the main aim of the study was to gain an in-depth understanding of the teachers' understanding related to the learning platform and based on the FW, the analysis is based on the more detailed open content logs, rather than predefined field notes.

Based on the critique phase of the FW the seven participating teachers formulated 58 critique statements, resulting in at least eight critique statements per teacher. The teachers were afterwards given 10 points each to prioritise the critique statements. Based on the points given, the following critique themes were identified. (The total points are an aggregation of the points given to the prioritised critic statements).

Table 1. Critique themes from Future Workshop at the case school

Technology and design	Total: 2 points
Didactics	Total: 6 points
Teachers' use of MinUddannelse	Total: 12 points
Human values, formation and view of human nature	Total: 32 points
Consequences of the use of MinUddannelse for children and parents	Total: 18 points

Issues related to the theme 'Technology and design' got the most attention in the brainstorming phase but, in the subsequent scores, the theme 'Human values, formation and view of human nature' received the most attention (32 points, compared to two points for 'Technology and design').

The teachers in the workshop expressed their surprise regarding the FW because it enabled them to discuss core principles of pedagogy and digitalisation. They valued the five hours devoted to discussion of fundamental questions as a point of departure for a design- and solution-oriented process. Overall, the teachers saw potential in the digital learning platform. However, there were some issues of concern. Most fundamentally, they found that the values built into MU conflicted with their ethical and humanistic values. They saw the learning platform as too rigid, and the goal-orientation, combined with simplistic evaluation, particularly disturbed them. In the visionary phase, they qualified these uneasy feelings. In the pictures below (Fig.1), which are excerpts from the visionary phase, this unease is illustrated in the first picture (A) and in the statement 'Barnet er nogen, ikke-noget' (The child is some-one, not some-thing).

A   B
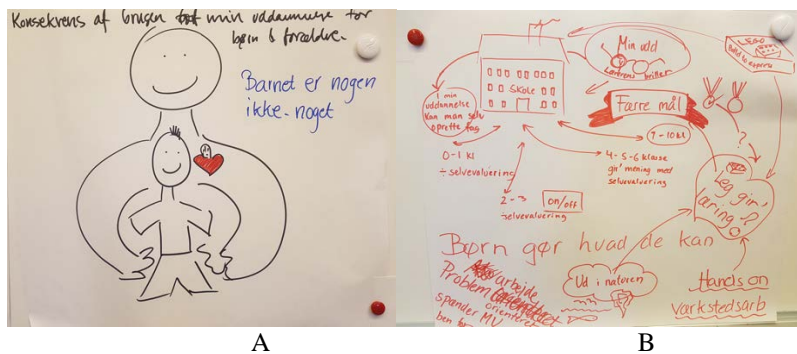
Figure 1: illustrations from the visionary phase
A: The child is some-one, not some-thing.
B: Children do what they can.

The teachers, especially those who specialised in Danish and Music, were very concerned and engaged in how the digital learning platform could support them in promoting a practice based on ethical, humanistic values. Further, as illustrated in the second picture (B, figure 1), the teachers wanted to use MU to promote a manifold of pedagogies and learning practices such as problem and project-based learning, outdoor school pedagogy, play and Lego hands-on workshops. Further, they wanted the aesthetics, linguistics and functionality of the platform to match the age-groups of the students.

Tensions and contradictions in Object 1 (Future Workshop)
Based on the application of Engeström's (2001) ASA model we have identified some first-order tensions and contradictions, as seen from the teachers perspective. Below is one example from the analysis:
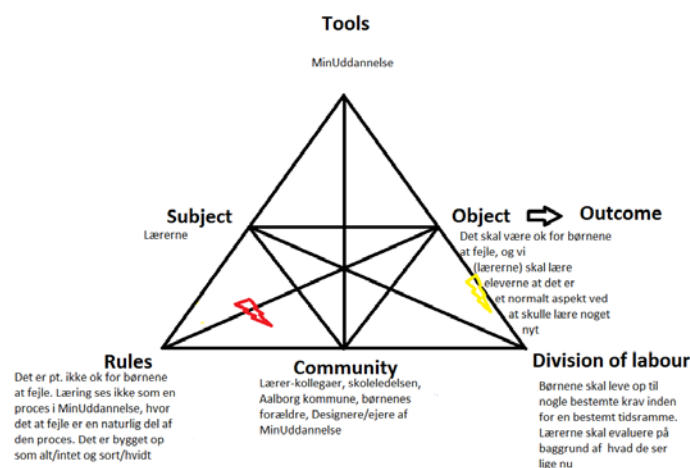
Figure 2: First-order contradictions in the activity system 'Menneskesyn'

The analytical model should be read as follows: The teaching practice is mediated by the tool, MU [1]. For the subjects (the teachers), the purpose of learning new skills and competences are, that the pupils should acquire a culture of trial and error and that it is fine to make mistakes and errors when learning new things. However, the teachers experience this as a tension in the activity system between the rules in MU and the object. MU sees competence and mastery as absolute black-and-white categories. Instead, the teachers see learning as a process of mastery over time. This time aspect also establishes another tension in the system, as the teacher has to decide whether a pupil has mastered a task within a specific timeframe and not in a longer perspective or process. The tensions and contradictions between MU and the teachers in this analysis is a tension in the view and practice of evaluation, which the system imposes on the teachers. The system imposes a digital evaluation standard based on a view of competences and knowledge from an absolute scale, while the teachers aim at using formative evaluation and stimulating the development of a learning culture based on trial and error. The community is understood to include all the actors: teachers, management and leaders of the school, parents and pupils, Aalborg municipality school management and the developers of MU.

Based on the ASA, the following tensions were identified between the teachers' objectives and MU as the tool (Dirckinck-Holmfeld, Nielsen & Ræbild, 2016):

Table 2: Tensions related to evaluation and setting the learning goal

Tensions related to evaluation and the setting of learning goals
Object: To include the pupils in the evaluation <-> the pupils' lack of self-awareness + inadequate tools
Object: To use a more differentiated evaluation form <-> Platform affords standardised evaluations
Object: A nuanced but foreseeable way of evaluating the pupils <-> too many different ways of evaluating the pupils + too many goals
Object: To give a 'fair' evaluation of the pupil <-> not visible criteria for evaluation, can/cannot evaluate
Object: To use the platform to benefit the pupils' learning <-> the parents use the platform more than the children; it is for 'show'
Object: Is it natural to fail to learn <-> learning is not seen as a process in the platform, and teachers must evaluate fragmented moments

Table 3. Tensions related to the pedagogical use of MinUddannelse

Tensions related to the pedagogical use of MinUddannelse
Object: A 'child friendly' platform <-> too much text hinders the younger pupils in working with the platform
Object: Multimodal teaching <-> too complicated to use the platform in a multimodal work (copyright problems, double work)
Object: More problem-oriented and creative teaching methods <-> other teachers always have access to others lesson plans, and you may have to answer for your specific lesson plan
Object: For teachers to know what they are doing with the platform and why <-> teachers avoid the system because it is not aligned with their value system

A broader view of Future Workshops

Based on the survey, teachers expressed engagement in the FW. They were surprised how efficient the method was in identifying the core challenges with the learning platform and how to engage with the platform in relation work. Further, they expressed a need to participate in collective and structured processes, where they could work together to explore the challenges of the learning platform through the intensive critique phase. They valued both phases. Formulating a future vision kickstarted the participants to think of possibilities and opportunities and to build upon each other's ideas. Thus, FW provided an important framework for their future work and engagement with the learning platform.

The findings from the FW at the case school were in line with the general findings from the Learning Platforms project, using FW to situate the project in the school's practice (Dirckinck-Holmfeld & Ræbild, 2017). Among other findings, it was emphasised that FW shifted the focus from technical to didactic and pedagogical foci. For some schools, FW opened new perspectives and issues because they usually do not have much time to discuss

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[1] MinUddannelse. http://www.uvdata.dk/produkter/minuddannelse-2/

didactic development as there are always some practical tasks that come first. A representative from a single school emphasised that the FW also opened space for reflection on mistakes in their practice. In addition, the work became more concrete and structured because of specific deadlines, so it ended up not only with talk but also with ideas for solving and changes. However, some of the teachers also felt locked into following the design workshop because they could not use the visions they had devised in the FW, as originally thought (sketching a new system). Despite the feeling that they did not quite have the influence they had hoped for, several of the educational staff emphasised that the FW had nevertheless opened relevant reflections about their work, both with and without the platform.

Design experiments
FW was followed by a design workshop for the participating teachers, in which they were to develop and co-design a specific intervention or activity to be tested in MU as presented in (Gynther, n.d.), Between the two workshops, the researchers performed the ASA. The design workshop started to recall discussions from the FW, based on a walk-through of the ASA triangles. This mirroring worked very well and supported the groups in making choices about the design interventions. The groups decided to work in two subgroups for their interventions. The groups had two months to work on the cases, and the project was finalised through a knowledge seminar, where the teachers reported their detailed experiences with the experiment.
These experiments, which are reported in more detail elsewhere (Dirckinck-Holmfeld & Ræbild, 2017), identified new technical challenges and breakdowns. However, it is important to note that it also offered ideas to use with the learning platform in line with the groups' ideas for expanding the current practice.

Discussions
This paper is concerned with increasing teachers' engagement with learning platforms through PD. Combining FWs with ASA turned out to be efficient in gaining insight into the teachers' perceived tensions in the case school as related to the learning platform MU. The use of FW gave the teachers to the ability to criticise some of the fundamental design values within MU, but also to begin formulating visions of how to integrate the learning platform in their teaching. As such, the FW provided a shared space for the teachers to discuss their concerns beyond technical hands-on issues.

From the number of critiques and images from the vision phase, the teachers were very engaged in the FW. They expressed that it was much more engaging than they had expected and that it was wonderful to be taken seriously, the facilitators listened to them, and there was time enough to get deep into the problems, but they were also very surprised by the efficiency of the method, even if they were not used to critiquing a phenomenon systematically. After –six or seven rounds of critique, participants began to think positively about their vision and how they could see the learning platform being used. Hence, the FW seems to work very well in a school setting and with teachers. As a method, it provides insights into the problem areas of learning platforms, based on the teachers' experiences, and shows the strength of a teacher collective and teachers' collaboration. Further, the method facilitates '*for*' engagement and 'learningplatformations', for more ways of use.

The combination of FW and ASA has also provided valuable information and demonstrated their usefulness in supporting the groups' work in the design experiments from an expansive learning perspective. The FW provided an opportunity to work with the teachers' first-order tensions (see Object 1 and Figure 2). The combination of FW and ASA is new to the PD community. From an epistemological point of view, FW and ASA draw on different paradigms, with FW belonging to a critical tradition for democratisation and experiential learning, while ASA is the core of Engeström's cultural and historical activity theory (chat). However, FW, as a quite simple method, gives life to working with first-order tensions. The perceived experiences, which teachers collectively had an opportunity to express, are *their* experiences and this provides a base for establishing ownership. However, using the ASA model gave us an extra opportunity to work with these contradictions on a more abstract level, which we reported back to the teachers using the triangle diagrams as illustrations. Mirroring these contradictions back to the teachers gave credit to the researchers since the teachers also felt involved in the research process as partners. Further, they could follow the analysis. It also helped the teachers get a more complex understanding of the learning platform and a sense of order in the complexity of the domain. The FW underlines that it is important to deal with both the rational and analytical, as well as the intuitive and emotive, knowledge forms. FW, as we used it, especially contributed to the intuitive and emotive knowledge forms, as well as the phronetic practical wisdom, practical judgement and values knowledge forms, while ASA contributed to a rational externalisation of the complex phenomenon and its related tensions.

Conclusion

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Learning platforms are social, aesthetic and technical constructs. The meaning of using the platform is not given or determined. However, the platform is a negotiated enterprise under development in correspondence with the plasticity of the platform and how the platform, principles and practices are combined by the teachers in the implementation process. The platform has built-in design principles and pedagogical values and, as such, the materiality of the platforms affords certain practices. However, the FW, the ASA, and the design experiments also documented that the meaning construction is shaped under use (and no use). A critical and constructive appropriation of the learning platform is thus strongly linked to participatory implementation methods, where teachers give voice in exploring and experimenting with the learning platform in their professional practices. How the learning platform is implemented influences the meaning constructions of the involved groups. Hence, applying methods that involve and engage the users in critically exploring the learning platform and its many potentials and pitfalls is the first step for fruitful meaning construction.

The case study has documented that teachers are engaged in the potential of learning platforms. However, they are also critical and want to ensure that the learning platform supports more quality to their pedagogical objectives and that the platform supports their everyday work as teachers in supporting children's learning and social, cognitive and emotional development. The teachers are key figures in the pedagogical process, so their interpretation of the learning platform is key to the success of the implementation.

Applying FW as a method provides a forum for teachers to discuss the fundamentals of the learning platform, which go beyond the technical features as well as providing an arena for the teachers to imagine the future development of their teaching and learning, using the platform. Through this process, both the critique and the fantasy, FW facilitates a critical and constructive interpretative flexibility. The teachers become aware of the design values in the learning platform, and also learn how to get around the functions they do not like or to explore new functions. A danger in using FW is that the workshop is not followed up or realised in practice. The integration of FW and design thinking stimulate a systematic approach to change, and I suggest exploring this integration further. Also, the ASA has provided valuable insights and demonstrated its usefulness in supporting the groups' work. One way of understanding the role of ASA is that it served as a boundary object in the groups and collaboration with the researchers.

This paper does not discuss how to scale these methods. How can we bring the model to all schools? Would the methods provide enough capacity-building on its own, or would we need to expand the model further? It also raises questions about who can run these workshops and who will pay the teachers for the time spent in workshops to learn to use the learning platform.

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