Scaffolding Reflective Practice through VR-Mediated Mentoring of Teachers

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Abstract

Novice teachers often struggle navigating the complexities of in-service teaching practices when transitioning from education and practice, leaving them feeling unprepared without support structures. Tool-based mentoring can scaffold reflective practice by enabling teachers to collaboratively analyse video-recorded teaching episodes, supporting professional development, self-efficacy, and well-being.

This study examines the use of collaborative 360-degree video in virtual reality (360VR) as a reflective mentoring tool for novice teachers in Danish primary and lower-secondary schools. Grounded in Reflective Practice-Based Learning (RPL) and situated within a broader design-based research (DBR) project, the study focuses on how teachers and mentors experience and reflect on the potentials and limitations of immersive technologies for scaffolding shared reflection around classroom management situations.

Following each VR-mediated mentoring session, participants engaged in structured debriefing interviews, which have been thematically analysed. Four themes emerged from the analysis (1) immersion allows for re-experiencing authentic situations, (2) shared immersion affords multiple perspectives, (3) cycles of action and reflection link VR and practice, and (4) implementation perspectives. Findings highlight the potential of collaborative 360VR to mediate and scaffold reflective practice by creating create an immersive, shared space for reflective dialogue. The findings however also highlight technical and organisational challenges in terms of implementation. By engaging with participants' reflections during debriefings, this paper contributes to ongoing discussions about

using immersive technologies to support newly graduated professionals' development through reflective practice.

Keywords
Teacher mentoring, Virtual Reality, Classroom Management, Reflection, 360-degree Video

Introduction

One in five new teachers in Denmark leave the public primary and lower-secondary schools within three years (Klarskov et al., 2024). Teachers often cite lacking resources and high expectations as primary difficulties, leaving them unprepared and alone in dealing with these complexities (Böwadt & Vaaben, 2021; Stokking et al., 2003; Veenman, 1984). Mentoring has been highlighted as a relevant approach, especially when moving beyond here-and-now problems and into a reflective space (Frederiksen & Halse, 2021; Harrison et al., 2005). There is then a need to rethink induction periods for new teachers, where emphasis is placed on mentoring which can scaffold shared reflection, helping novice teachers in navigating the complexity of educational practices. In this paper we use the concepts of experience, thinking, and action from Reflective Practice-Based Learning (RPL) to discuss collaborative 360 Virtual Reality as a mediating tool for scaffolding mentoring of novice teachers (Kjærgaard et al., 2021).

One way of supporting reflection during mentoring is using tools. Tools in mentoring can help structure the shared reflective process, making teachers aware of their practices and help mentors in targeting their scaffolding of reflection (Hunskaar & Gudmundsdottir, 2023). A commonly used tool for mentoring is video, giving both teacher and mentor access to the same teaching situation. Video of teachers' own teaching is beneficial for reflection, but also requires more scaffolding (Gaudin & Chaliès, 2015) – making it a good case for mentoring which is inherently built around scaffolding. In this study, we are particularly interested in 360-degree video, a format which allows for panning and tilting the viewing angle, giving access to the entirety of the classroom, rather than having a pre-defined viewing angle as with a traditional 2D camera. Given the omni-directional affordance of 360-degree video, this video format is best experienced in Immersive Virtual Reality

headsets (360VR). 360VR allows participants to experience and explore real-world scenarios, making it relevant in educational scenarios that do not just require factual learning, but also a change in learners attitudes and engagement (Pirker & Dengel, 2021). VR in general has mostly been applied in teacher training through programmed VR applications using pre-defined scenarios focused on improving procedural knowledge, rather than exploring the complex situations that teachers engage with in daily practices (Wang & Li, 2024). These programmed environments are at risk of losing out on important parts of the reflective process, as they are mostly based on individually correlating input and output of different pre-programmed strategies, not letting teachers explore their own and other's experiences and reflections. Self-reflection work with 360VR has shown that teachers becoming immersed in their own practice creates a more nuanced understanding of practice, while also allowing teachers to see themselves from different perspectives (Walshe & Driver, 2019). Less focus has however been given to collaborative 360VR, allowing teachers and mentors to jointly engage in a shared space for reflection and problem-solving (Paulsen et al., 2024). While self-scaffolding can be a beneficial approach, mentoring with a qualified mentor allows for even more nuanced perspectives, enabling teachers to gain new perspectives and re-frame their own perspectives (Paulsen & Davidsen, 2024). In order to guide our paper, we then ask:

> *"How do teachers and mentors experience and reflect on the potentials and limitations of collaborative 360VR as a mediating tool for scaffolding reflective practices?"*

In seeking to answer this question, we wish to contribute to an understanding of how immersive technologies may support the scaffolding of reflective practices, and what it means for RPL processes in terms of experience, thinking and action (Kjærgaard et al., 2021). We use participants' accounts of their lived experiences to understand how VR technology is used to shape what can be seen, said, and reflected upon. First, we present the theoretical frame for our analysis. Secondly, the context of study is presented along with the collected data and analytical methods for inductive coding. Finally, we present results from a thematic analysis of debriefing sessions following collaborative 360VR-mediated mentor-

ing sessions, before discussing the results of the thematic analysis against experience, thinking and action (Kjærgaard et al., 2021).

Theoretical frame

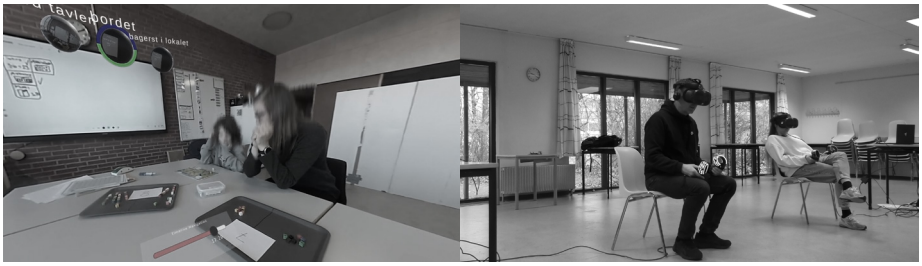
Theoretically, we view the mentoring sessions through RPL, emphasising how reflective processes are built on bridging theory and practice (Kjærgaard et al., 2021). Within RPL, reflective processes are viewed as active engagements with experiences, where reflection both takes place in-action and on-action in iterative cycles of reflection and action (Dewey, 1933; Schön, 1983). RPL aims to develop people's ability to make informed decisions and develop their practice based through three processes: *experience* – having an experience which may lead to learning, *thinking* – linking experiences to future actions and judgement through reflection and analysis, and *action* – operationalising experience and thinking by trying out and adjusting actions in practice, creating new experiences (Kjærgaard et al., 2021). RPL then aims to combine theoretical perspectives with the practice of the professions (Dau, 2024). Further, RPL emphasises that learning processes should be rooted in exploration of learners' own experiences, balancing disturbances and good examples in collaborative dialogue with teachers (Horn et al., 2021). Here we view the mentor as the primary scaffold for letting the teacher explore, reflect-on, and analyse their practice in order to build actionable synthesises that can qualify future action. In this paper we are then interested in looking at how immersive technologies can support this process of scaffolding reflective practice, both from a teacher and mentor perspective. When we apply, the concept of scaffolding we draw on Driscoll´s (2005) description of scaffolding as an instructional act supporting learners in achieving tasks that would be unattainable without such assistance. Thus, scaffolding aims at enhancing learners' independent activities such as managing teaching practice. The experience-based foundation of RPL and the affiliated principles of dialogue, appropriate disruptions and collaborative inquiry supports the instructional acts (Horn, et al., 2021) and hence the scaffolding of the learning trajectories of novices' teachers.

Context of the study

This study is part of a larger design-based research (DBR) project conducted as part of the first author's doctoral research, which aims to explore how 360VR can support novice teachers' development of classroom management competencies through structured reflection with mentors (Paulsen & Davidsen, 2024, 2025a). The DBR project follows iterative cycles of (1) problem exploration, (2) design, (3) implementation, and (4) reflection leading to refinement (McKenney & Reeves, 2018). Over the course of eight intervention cycles, the design was progressively adapted based on data collected from each cycle. This paper reports on one empirical strand of this broader DBR process. Here, the focus is on teachers' and mentors' accounts from post-session debriefing conversations following collaborative 360VR-mediated mentoring sessions. While the broader DBR project integrates findings from multiple data sources to inform ongoing design, this study uses participants' accounts to uncover the perceived potentials and limitations of 360VR for scaffolding reflective practices, interpreted through the RPL lens (Kjærgaard et al., 2021). In this way, the paper contributes to both the empirical understanding of 360VR-mediated mentoring and the ongoing iterative refinement of the intervention within the larger DBR framework.

In viewing 360VR as a digitally mediated space for professional development, classroom management is understood through how the teacher's actions can facilitate a space for learning (Doyle, 2013). Classroom management is accomplished by the teacher noticing, understanding and interpreting classroom interactions and using this interpretation to adjust actions and activities as they unfold in the classroom (Doyle, 2013). The aim is then to support teachers in these shifts between noticing, understanding and interpreting – or experiencing, thinking and acting (Kjærgaard et al., 2021).

Figure 1: What participants see within VR (left) participants co-located in the 'real' world (right)



In the collabo rative 360VR space, teachers can re-experience and reflect on teaching episodes with mentors in order to explore, analyse and qualify action. Mentoring sessions are built around five key steps. First, teaching is recorded using two 360-degree cameras following ethical approval from the university research ethics committee and informed written consent from all participants, including parents. After the recording, the teacher selects a number of clips that they wish to further explore within the VR mentoring sessions. Clip selection is partially guided by teachers experiencing a disturbance in their practice which they wish to zoom in on, but selected clips can also act as the good example. After the clips have been selected, teachers and mentors participate in a VR-mediated mentoring session, figure 1, where participants are jointly immersed in the clips using the free open-source software CAVA360VR[2] (Paulsen & Davidsen, 2025b). During the clip selection the teacher articulates a focus for each clip which is shown to participants in the VR-space before each clip. This focus is the starting point of the reflective process, giving the mentor access to the teacher's perspective when viewing and interpreting the clip. After the mentoring session, the session is debriefed with the researchers, summarising the created knowledge, with key themes and potential strategies being written down on a piece of paper with screenshots from each clip, supporting the transformation of knowledge from VR to practice. Lastly, after the session, teachers are given a couple of weeks to try out knowledge in practice before the cycle begins again. In the broader DBR project, the first author held a dual role as both researcher and designer, collaborating with mentors to iteratively refine the intervention design, while also collecting and an-

alysing data from post-session debriefings. This involvement provided direct access to participants' immediate reflections but may also have shaped the interaction during debriefing sessions and the interpretation of participants' accounts.

Data / Method

From October 2023 to June 2024, eight intervention cycles were conducted with three teacher–mentor pairings from two schools, as part of the broader DBR project described in the previous section. All VR mentoring sessions and subsequent debriefing sessions were video recorded, capturing both the participants' view inside the VR environment and their actions in the physical space. Debriefing sessions had two purposes (1) to support knowledge transformation and inquiry related to the mentoring process, and (2) to gather participants' reflections on their experiences with collaborative 360VR. The analysis focuses on this second part, which took the form of a shared dialogue between teacher (T), mentor (M), and researcher (R). The debriefing sessions analysed in this paper amount to approximately three hours of video recording. The sessions were transcribed in full and read through to become familiar with, and gain an overview of the data. Analysis followed Braun and Clarke's (2006) approach to thematic analysis as an inductive approach. No pre-defined coding framework was applied, and codes were generated directly from the data to reflect participants' own accounts. Coding was non-exclusive, allowing excerpts to be assigned multiple codes. Codes were iteratively refined, re-coded, and grouped into themes and subthemes as patterns emerged across sessions. This process was validated collaboratively between researchers by jointly reviewing and discussing coded excerpts. Coding, grouping, and analysis were conducted in the original language (Danish) and translated for presentation in this paper. All participant names are pseudonymised.

Results: Scaffolding reflective practice

The inductive coding and grouping resulted in four overarching themes that are present across all 8 debriefing sessions: immersion, shared immersion, iterative cycles and implementation perspectives. For an overview of primary codes and sub-codes, see table 1. Number of coded instances are listed in parenthesis after each code.

Table 1: Coding of debriefing sessions

Code	Code	Code	Code
Immersion (66)	Shared immersion (52)	Cycles of action / reflection (65)	Implementation perspective (72)
Sub-codes	*Sub-codes*	*Sub-codes*	*Sub-codes*
VR affords immersion (24)	Being there together (7)	Facilitating transfer (22)	Four steps (52)
360-video (31)	Establishing a joint focus (10)	Outcomes of mentoring (17)	Usability / Learnability (14)
Looking at yourself (4)	Multiple perspectives (15)	Cyclic nature (21)	Organisational perspectives (3)
Jumping between viewpoints (3)	The mentor-role (12)	Involvement of colleagues (5)	Ethical perspectives (3)
Broken immersion (3)	Traditional mentoring (8)		

Within this format, it is not possible to go in depth with all the sub-themes, but sub-themes which address how the technology mediates the scaffolding of teachers' and mentors' reflective processes will be highlighted.

Theme 1: Immersion allows for re-experiencing authentic situations

The first theme deals with immersive affordances of 360-video viewed through a VR-headset, and how the technology can be used as a mediating artefact to scaffold reflective processes. One of the key affordances of video is giving access to real-world situations (Gaudin & Chaliès, 2015). Video as mentoring tool then allows for targeted mentoring (Hunskaar & Gudmundsdottir, 2023). Teachers and mentors importantly highlighted that the omnidirectional affordance of 360-videos also allowed them to go beyond their initial focus, and view the complexity of classroom interactions in a more holistic perspective, contextualising targeted situations by seeing what else is going on in the classroom:

T: I would never have noticed how much Olivia cuts me off if I hadn't seen the clip again. M: or Mia who is waiting patiently for you to address her, before she eventually puts on her jacket and walks out. T: no, I didn't notice that at all when I was down there (in the classroom).

360-video allows for greater exploration and inquiry of the situated nature of the selected clips, allowing participants to orient themselves freely as spectators in the classroom, even jumping between different viewing angles (if multiple synced 360-videos are recorded), and allowing participants to rewind the video, and orient their view to a new area of the classroom.

Participants also highlighted the immersive affordance of the VR-mediation, and how it allows them to feel completely present in the classroom, both for the teacher who is re-experiencing their own practice, and the mentor who is experiencing the situation for the first time:

M: when the clip began, I completely forgot my surroundings, I forgot everything. I was inside the classroom. T: I also forgot we were actually sitting here (in the empty room in the physical space). I imagined that we were in the classroom, and that we're pausing reality.

The two quotes presented in this theme, show that the omnidirectional affordance of 360-video and the immersive affordance of VR allows participants to experience, re-experience and reflect on real-world scenarios in an embodied way, which allows for reflective dialogues which are deeply rooted in practice. While some teachers initially described the act of feeling present in the recorded classroom while viewing their own teaching as "slightly unsettling", they also felt that they became aware of their teaching in a way they hadn't experienced before, which greatly outweighed the initial feeling of weirdness. Throughout the iterative cycles, it became clear that the camera perspective was important to this feeling, as a close distance between the camera and teacher, made the teacher appear larger in the 360-video, which felt unnatural when re-watching the clips.

Theme 2: Shared immersion affords multiple perspectives

The second theme deals with shared immersion, going beyond the first theme by exploring how the pedagogical arrangement of being there together, can further scaffold the reflective process. One of the key advantages that both teachers and mentors highlight when talking about being immersed together, is that they get to explore different perspectives. Teachers emphasise that the mentor being able to highlight specific parts of the video helps them re-evaluate their own initial interpretation of what is happening in the clip, what it means for their teaching practice, and how they can transform their reflective dialogue into action:

> *T: if I came to talk to you about something that had just happened during my teaching, then I would have only been able to show you my version of it. I could only say what I interpreted, and you could only give feedback on that interpretation. M: I completely agree.*

> *T: then you couldn't have done as you do now, identifying what is also happening which influences the interpretation. M: completely agree, here you get a fellow interpreter for looking at what is happening.*

Mentors emphasised that this format allows them to more precisely scaffold reflective processes, as they are able to ask more relevant question when they get to shape their own interpretation of the situation, rather than only relying on the teachers' interpretations.

While the large potential for exploration of situations is emphasised as positive, it also necessitates that participants establish a joint focus in order to structure the reflective dialogue. Both mentors participating in the project highlighted that they had to "keep a lid on themselves", as they quickly identified multiple relevant foci when watching the clip together with the teacher. A key part in establishing this joint focus is through the built-in laser pointer in CAVA360VR[2] (Paulsen & Davidsen, 2025b), which allowed participants to virtually point and highlight where they are looking, making the other participant aware:

> *T: I definitely felt we were there together. Especially because I could say "no, the group over here" and then point with the laser. And you can't see me turning around in the real world, but you could follow*

the laser. M: yes, we had aligned our way of looking by the end. **T**: *yes, so the laser is good.*

While the feeling of being there together when revisiting previous practices seems to be what allows for the reflective dialogues to go from exploring and analysing specific situations to inferring more general statements about the situation that the participants can use to formulate actionable strategies (Paulsen & Davidsen, 2024), the teachers also emphasised that this kind of mentoring requires trust between teacher and mentor, as the immersive affordance also makes it a very personal kind of mentoring. Teachers also highlighted that they would rather get feedback on their general actions as a teacher, e.g., classroom management, rather than getting feedback on whether they have chosen a good task in a subject. This is in alignment with Pirker & Dengel (2021) conceptualisation of 360VR as a space that is ideal for changing attitudes and values, rather than purely producing procedural knowledge.

Theme 3: Cycles of action and reflection

The third theme goes beyond the collaborative 360VR space and explores how action and reflection are tied together in cycles of trying out knowledge in practice and then reflecting on-action (Schön, 1983) in the VR-space. While most programmed VR applications for training classroom management allow teachers to receive direct feedback on their change in strategies when interacting with virtual classrooms, e.g., Huang et al. (2023), 360VR creates a temporal gap between reflection and trying out in the classroom. In order to make the reflective dialogues actionable in practice, mentors emphasised the need to abstract the specific situation to a more general statement, that could be the driving force behind trying out changes in the classroom:

M: i think that we really quickly establish a think-aloud space, where we tie the specific to the abstract. The abstract are problem statements that go across situations. There is no use in spending an hour solving a problem that isn't a problem in most of the hours we are teaching. We are only interested in the overall problem, because that can follow through to other situations and make it better for you and the children.

In order to support the transformation of knowledge, these statements were written down on a piece of paper during the first part of the debriefing sessions, allowing knowledge to be reified. Teachers all addressed that the cyclic nature of the format was what allowed them to become more reflective about their practice. The second mentoring session allowed the teachers to select clips where they had tried out different actions / strategies based on the reflective dialogue from the first mentoring session. Being able to see the difference between the clips from the first and second session was often addressed:

> *T: It was really fun to see the difference from the first time we recorded. They are really productive during my classes now. It is getting better and better.*

In general, it was noted by the teachers, that the scaffolded reflection during mentoring sessions also led to them becoming more observant and reflective during their everyday practices:

> *T: I realise that of course it also has a lot to do with getting to know the pupils better and that I've been here longer. But I think there are so many focus points I've been made aware of in these VR sessions which I've just been able to work so intensely with in my teaching.*

This was also noted during the clip selection sessions, where less researcher facilitation was needed during the second and third intervention cycles. This shows the importance of designing mentoring activities that involve active cycles of reflection and action, rather than just focusing on one-off sessions.

Theme 4: Implementation perspectives

The fourth theme takes a macro-perspective on the mentoring process, dealing with implementation perspectives of the current state of collaborative 360VR for scaffolding reflective practices.

While most of utterances coded under implementation perspectives, especially the ones coded under 'format', concern themselves with the iteration done to the format throughout the intervention cycles, some of them are of a more general character. Throughout the analysis, immersion has been highlighted as one the key scaffolding mechanisms

for supporting the reflective dialogue between teacher and mentor. One teacher mentor pairing however changed up their way of using the technology after their first cycle. In order to contextualise the use, we briefly refer to previous work within the project, where the reflective processes during the sessions have been modelled showing that participants move between three primary phases, analysis, abstraction and actionability (Paulsen & Davidsen, 2024). During the first cycle the teacher mentor pairing were mainly centred on exploring and analysing which led to a lot of warping between camera positions and laser use. The selected clips in the second and third sessions were dominantly follow-up clips, which led to less analysis and more abstraction. In this shift, participants switched from being fully immersed during the entirety of the session, to embracing a more hybrid format, taking the glasses on and off depending on the phase of the reflective process. If analysis of actions was required, they re-immersed themselves to do so. If they had already agreed on the theme of the clip, they preferred to jointly reflect in the physical space, emphasising the human connection of being able to look each other in the eyes. This stands in contrast to the other two teacher-mentor pairs, who explicitly stated that they preferred keeping the entire reflective process within the VR-mediated space, stating that when the VR-glasses are off, "the magic is gone". This divergence suggests the need to further explore different ways of working with 360VR as a mediating tool for scaffolding mentoring.

Another important point regarding the format concerns the temporal aspect of the cycles between reflection and action. It became clear that there had to be a relatively short time span between recording-selecting-mentoring in order for teachers to be able to effectively recall not just the recorded actions, but also how they felt during the clips. The timespan between mentoring and recording should however be extended, preferably around two weeks, for being able to try out different ways of transforming knowledge into action.

Regarding the general usability and learnability of the hard- and software, a general theme was that it was a bit tricky at first. None of the participants had prior VR-experiences before participating in the project but agreed that the technology quickly became useable to a point where it did not in any way compromise the reflective process.

While ethical perspectives were briefly addressed during some of the debriefing sessions, none of the participants viewed it as a major concern,

nor addressed that they felt it was a concern for their pupils. Throughout the project the ethical dimension was highly emphasised, and the researcher initially met with the classes that were going to be recorded, explaining the recording equipment and answering questions.

Discussion

This study set out to examine how teachers' and mentors' experiences of collaborative 360VR mediated mentoring inform an understanding of the technology mediated activity's potentials and limitations for scaffolding reflective practices. In the introduction, we situated this aim within the framework of RPL, conceptualising reflection as an interplay between experience, thinking, and action (Kjærgaard et al., 2021). In the following discussion, we use the RPL concepts of experience, thinking, and action as a lens to discuss the four themes and consider 360VR's potentials and limitations in scaffolding reflective practice.

Experience

In RPL, experience is seen as a personal experience which may lead to learning (Kjærgaard et al., 2021). Through the first two themes it becomes clear that 360VR hold great potential for mediating experiences in a more bodily manner than traditional video. Participants feel that they are experiencing the situations with their bodies rather than just watching them through their eyes. While the immersive affordances of the mediation makes the participants feel that they are experiencing the interactions firsthand, what they are actually experiencing is more of a mediated secondary experience. The teacher has already experienced these interactions, but through a different set of eyes (her own original eyes), where the teacher now gets to re-experience the interactions through the camera's 'eyes'. While 360VR allows participants to feel like they're experiencing first hand classroom interaction, the camera is important to keep in mind, as video recordings are never objective, but only capture a version of a situation as it unfolds (Heath et al., 2010). While 360-degree video allows for capturing more context than a traditional 2D camera, we're still not capturing all of the aspects of experiencing that we might capture through our own bodies, such as smell or the general atmosphere in and around the classroom.

Another part of experience is highlighted through the second theme. The collaborative 360VR mediation allows for experiences to become shared experiences, as learners get access to the same set of mediating eyes (the camera). While the teacher and mentor both construct their own observations and interpretations based on their differing professional vision (Goodwin, 1994), they do so from the same mediated point-of view, as they are both watching through the same camera lens. In a typical observation scenario, the teacher would observe from one vantage point (typically the front of the class), with the mentor observing from the back of the class. Instead, 360VR allows for a new way of experiencing, where learners look at the same situations from the same point-of-view, but notice and observe different aspects. Here, the 360VR mediation further allows for different orientations within this point-of-view. Where 2D cameras are locked in their orientation, 360VR allows learners to look at different parts of the classroom while standing in the same place, potentially leading to different interpretations of the observed classroom situations.

A potential limitation with this way of experiencing classroom situations is when immersion gets broken, making learners feel less present in the mediated recordings. One cause of this can be cybersickness, a known hinderance with VR (Chang et al., 2020). While far from all learners will experience cybersickness, it is important to have in mind when designing and developing pedagogical activities which involve VR, as it may comprise the learners' ability to experience situations. In our case, a minor case of discomfort was eliminated after participants were moved from standing up to sitting down. Participants were sat down on chairs which still allowed them to rotate in order to experience the spatial affordance of the 360-degree videos. If any form of cybersickness should still occur, the utilised software also allows learners to participate through a traditional computer screen (using a computer mouse for looking around) ensuring that cybersickness doesn't exclude any learners from participating in 360VR activities.

Thinking

In RPL, thinking is what links experiences to future actions and judgement (Kjærgaard et al., 2021). When it comes to thinking, 360VR bridges experience and thinking, both on an individual and shared basis. For the teacher, the re-mediation of the classroom allows for seeing more

than in-action (Schön, 1983). The 360VR mediation allows for pausing the classroom, looking around, and rewinding – things which are not possible when reflection occurs in-action. In this sense, the mediation blurs the boundary between reflection in- and on-action, as the teacher re-enters a recorded version of their classroom in order to expand on their reflections in-action while reflecting on-action. This allows for more contextualised reflection, as the teacher can observe situations through different lenses by looking at different areas of the class, leading to a better understanding of the classroom in its entirety. This aligns with the more ecological view of classroom management, where observing and interpreting classroom interactions is the key to adjusting actions (Doyle, 2013).

In RPL, thinking is scaffolded through dialogue, giving others something to think about, and ways of thinking (Kjærgaard et al., 2021). As a collaborative activity, the reflective dialogues allow for thinking together about shared experiences – both mediating something to think about (immersion in a 360-degree video), and a way of thinking about it (shared immersion). The ability to observe from the same point-of-view allows for more nuanced thinking, as different perspectives are exchanged and challenged in a collaborative manner.

Action

Action in RPL is the operationalisation of linking experience and thinking – trying out and adjusting actions in practice, creating new experiences (Kjærgaard et al., 2021). An important consideration when it comes to the acting part of RPL, is that 360VR creates a temporal gap between reflection and action. Where learners in programmed VR environments can interact directly with the 3D-generated worlds to try out different scenarios (Wang & Li, 2024), 360VR promotes social interaction over interactivity. While learners can't directly try out knowledge within 360VR, they can reason about possible future actions together with others, qualifying future action. In this view, knowledge transformation can be seen as situated (Dohn & Markauskaite, 2019), acknowledging that knowledge constructed within VR is different from the knowledge applied in the classroom, meaning that knowledge is not transferred, but transformed. Through this lens, it is important to design and develop supportive measures that can scaffold this transformation process, ensuring that constructed knowledge is not isolated within the

VR space. In this case we have done so through storyboards, where a screenshot from each selected teaching episode is printed together with a blank text field on an A4 paper sheet. After teachers and mentors have concluded the 360VR-mediated mentoring, they fill out the paper in the shared physical space, allowing them to ensure that their perspectives are aligned when noting down the theme of the clip and the planned points of action. The video-mediation allows for risk-free reflection, reasoning and imaginative experimenting. While teachers and mentors can't directly experiment with alternative actions within 360VR, they can imaginatively reason about what actions the teachers could take, and how they would shape the classroom interactions. This gives the teacher the opportunity to imaginatively judge their actions, allowing for pre-adjustment of actions before trying out knowledge in-action, without the risk of interfering with the classroom practice.

Lastly, it is important to highlight that the thematic analysis also shows that the cyclical nature serves as a link between experiencing, thinking and acting. While teachers also benefited from the first VR-sessions, they saw the greatest benefit from their second VR-sessions, where they could link their experiencing and thinking back to the acting, they performed in the classroom based on the thinking done in the first VR-session. If possible, iterative cycles should be implemented in mentoring activities, ensuring an iterative cycle between experiencing, thinking, and acting.

Conclusion

Throughout this paper we have explored the potential and limitations of collaborative 360VR as a mediating tool for scaffolding reflective processes. The strongest potential lies in 360VR mediating both access to recorded situations from practice and mediating a tool-based reflective dialogue between novice teachers and mentors, allowing for different perspectives to emerge and be discussed. The thematic analysis of debriefing sessions showed this through three key themes (1) The immersive affordance of 360VR allows for re-experiencing authentic situations from real life practices. (2) Shared immersion allows for multiple perspectives, leading to a better understanding of classroom interactions, and their implications for the teaching practice. (3) cycles of action and reflection allow for linking experience, thinking, and action by working with themes in VR, trying out knowledge in practice, and then re-vis-

iting themes through another cycle of VR-mediated mentoring. The fourth theme of the thematic analysis and the subsequent discussion also highlights that implementation issues and cybersickness are currently seen as potential hinderances for large-scale use of this approach. Future research should explore different ways of working with this method and consider how the intervention design can be designed to minimise facilitator intervention, making it easier for schools to implement the method in their induction periods. The preliminary results surrounding the approach also show great promise in adapting 360 VR-mediated in other professions, where reflection is also a key component to engaging with complex real-world practices.

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