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Innovative Approaches to Mentoring: Towards a Common Ground for a Theoretical Framework

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Abstract

This conceptual article explores how the principled innovation (PI) framework can challenge and structure multi-participant co-construction of innovation processes striving to enhance quality in mentoring. In a time when innovations in education contexts are plentiful and diverse, the authors illustrate how PI can be used to benefit innovative co-construction activities. We also use an ongoing project whose goal is to develop tools for mentoring to exemplify how PI can guide and challenge innovation. The PI approach is found to offer a structure that enforces activities that involve multiple actors while being mindful of their educational needs. The approach also allows flexibility in each stage. We catalogue the benefits and posit that the framework can be suitable for a larger research and development agenda with potential to engage multiple actors such as researchers, mentors, mentees, technicians and lawyers in systematic co-construction in innovation.

Keywords: Co-construction, evidence-based practice, innovation, mentoring, teacher professional development, tools.

Introduction

Several attempts to innovate and improve teacher education have taken place to allow future teachers to meet the changing demands of society and the needs of new generations of students (Chauhan, 2017; Hatlevik, Jakhelln, & Jorde, 2024b; Jenset, 2024; König, Jäger-Biela, & Glutsch, 2020; Nesje & Lejonberg, 2022). The interconnectivity between research and practice has received increased focus, as the earlier perception of gaps was identified as a problem (Snow, 2015). These days, the ideas of transforming teacher education by research based innovation, has reached a stronghold (Hatlevik, Jakhelln, & Jorde, 2024a). Efforts to strengthen quality of practical training and research-based development in schools is part of such trend (Hatlevik, 2024). Critical dialogue between faculty and school partners are considered essential in processes driving quality and coherence in teacher education (Jenset, 2024).

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Within the field of mentoring, challenges related to teacher recruitment and attrition, has gained attention from researchers for several years (Helms-Lorenz et al., 2013; Hobson et al., 2009). However, a variety of approaches characterize mentoring, and poor quality can hamper mentoring outcomes (Hobson et al., 2009; Hobson & Malderez, 2013; Lejonberg, 2016). To accommodate such challenges, several actors strive to develop beneficial tools to promote quality conversations and professional development for mentees. Quality, indeed a fussy concept, can be understood as a positive description of preconditions for and various characteristics of what constitutes good mentoring (adjusted from Hatlevik, 2024; Kvernbekk and Wittek, 2011). Good mentoring then, can be understood as mentoring contributing to mentee professional competence development (Hatlevik, 2024). A review of tools in school-based mentoring of pre-service teachers indicate that such innovations holds "great potential for boosting preservice teachers' reflections about teaching and learning" (Nesje and Lejonberg; 1). However, the mentioned review also indicate "a knowledge gap in the need for a more holistic and structured approach to the mentoring" (Nesje and Lejonberg; 12), and describe a need for more holistic approaches when adopting tools or innovating for quality in mentoring. Hence, it is thought that innovations in fields like teacher preparation might benefit from a well-supported conceptual framework (Peschl & Fundneider, 2014). Notably, the complexity of practices such as those related to mentoring and teaching can present significant obstacles to innovation in such contexts (McDonald, Kazemi, & Kavanagh, 2013; Praetorius, Grünkorn, & Klieme, 2020). Therefore, in this conceptual article, we visualize how ideas from a framework can be used for innovating mentoring in teacher education: the Principled Innovation (PI) framework. We do so, guided by the following research question: How can a framework for innovation guide and challenge development of tools for mentoring?

This article adds to the body of literature that has long sought to improve the contexts within which we teach and learn. After the introduction, we provide a supporting case involving the co-construction activities of an ongoing real-world innovation project whose goal is to develop research-based mentoring tools.

Innovation and its Relationship to Tools

The Organisation for Economic Cooperation and Development uses the term innovation to denote a new or significantly improved product, process or method (OECD, 2005). For the purposes of this work, such understanding of the term innovation is applied to framings for thinking and working, exemplified within the context of mentoring in teacher education. Several researchers working with innovation have drawn upon the work of Wartofsky (1979), who denoted a hierarchy of tools and artefacts that can be used to improve human intelligence (Cole & Derry, 2005). Such understandings are grounded in the acceptance of a strong link between human technologies and intelligence, as the human brain not only develop the tools, but is also developed alongside the use of the tools. As such, tools cannot be understood separately from human thinking and actions, as they mediate human practice (Cole & Derry, 2005). Säljö (2010) has stated that, "[technology] transform how we learn and how we come to interpret learning" (p.53).

The term tools is used used both about conceptual and practical artefacts employed to provide structure and/or content to educational settings, for example in mentoring settings (Grossman, Hammerness, & McDonald, 2009; Nesje & Lejonberg, 2022). A practical mentoring tool may for instance consist of a smartphone app that records teaching sessions (UiO, 2020). A conceptual tool could be a guide for mentoring with use of recorded teaching sessions, or a holistic approach to practicum with use of several tools (UiO, 2022). Such tools are typically designed to enhance the quality of mentoring by influencing aspects of human thought by introducing (alternative) perceptions related to professional practice (as described by Cole & Derry, 2005; Wartofsky, 1979).

Actors who lead innovative works can be called innovators. In this text, the term is used to denote researchers employed at universities who develop teacher education and mentoring programmes, together with actors such as technical expertise. However, as benefits related to extensive collaboration

in all phases with those one innovates for is promoted in this work, also actors such as mentors and mentees are included in the term innovators.

Notably, there is a critical line of research that challenges how innovations actually promote change. Ellis, Souto-Manning and Turvey (2019), for example, argued that "technology-based claims of innovation in teacher education [...] must be viewed critically" (p. 8) and that "many 'innovations' merely reproduce unequal and unjust situations, educationally and more socially" (p. 3). The notion of disruptive technology and innovation is relevant to highlight how contributions to mentoring processes should be critically examined, and also that innovation may come from unexpected sources or actors (Bower & Christensen, 1995; Ortlieb, Susca, Votypka, & Cheek, 2018). In the current work, we build on such awareness to argue that a critical approach to innovation can enhance quality in mentoring. PI provides a stepping stone to connect innovation to norms and values. PIs is understood as a framework to guide "our ability to imagine new concepts, catalyse ideas and form new solutions, guided by principles that create positive change for humanity" (Arizona State University and Mary Lou Fulton Teacher College, 2024).

Tools for Mentoring as an Exemplifying Context

Use of mentoring tools has potential to enhance preservice teachers' learning and professional development. However, findings show that the use of tools for mentoring are individual and dispersed. Hence, there is a need for a holistic approach (Nesje and Lejonberg, 2022). To exemplify how the PI framework can benefit a real-world case, we draw upon experiences from the Developing Tools for Mentoring project.[1] In this project, several tool are developed related to 1) a decision simulator, 2) pupil response aligned with teacher self-evaluations, 3) practice videos, 4) lesson planning aligned with classroom observation, and 5) structures to build awareness of mentees as resources (UoO, 2022, 2023). The authors of this paper were involved in this project, whose goal was to produce a holistic approach to mentoring, and to investigate how encountering such theoretically and research based mentoring tools can affect mentoring and professional development. The innovations intend to influence particular forms of human action, however the adopted understanding of tools also open for understandings of tools to not only change actions directed outwards, but also change the process of mentoring itself (Cole & Derry, 2005).

Mentoring is considered essential to promote professional development for teachers, especially for beginning teachers (Cochran-Smith & Zeichner, 2009; Hobson, Ashby, Malderez, & Tomlinson, 2009), as the impetus is to develop reflection skills and essential competencies teachers need to master in their profession (Helms-Lorenz, Slof, & van de Grift, 2013; Hobson, Ashby, Malderez, & Tomlinson, 2009). However, studies indicating/demonstrating challenges related to mentoring quality and diversity (Garza, Reynosa, Werner, Duchaine, & Harter, 2019; Hobson et al., 2009; Hobson & Malderez, 2013; Lejonberg, 2016), indicate a need to strive for better innovation for quality outcome for mentees. Such challenges can be seen as reason to develop and adopt well-grounded frameworks in innovation processes. As argued by Hoffman et al. (2015), such calls for improvement should not be left to mentors alone; teacher education institutions must also engage. The aim of this contribution is to examine a framework for co-construction and innovation of mentoring with potential to ground evidence-based practice in this area.

Innovations of Tools and their Relation to Disruptive Technology

Innovations do not necessarily contribute to positive change for the actors involved. Thus, processes and outcomes should be viewed critically (Ellis, Souto-Manning and Turvey, 2019). Researchers have, with different perspectives, highlighted key competences and skills perceived to be crucial to the teaching profession (Blömeke, Gustafsson, & Shavelson, 2015; Ferguson & Danielson, 2015; Grossman et al., 2009; McDonald et al., 2013; Metsäpelto et al., 2021; Santagata & Yeh, 2016). This contribution accepts the premise that tools have the power to change what and how we learn, and how we understand learning

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[1] This project includes two projects founded by different sources (UoO, 2022; 2023).

(Säljö, 2010). Säljö (2010) claimed that "what we know and master is, to an increasing extent, a function of the mediating tools we are familiar with" (p. 53). This point underscores the potential power of a tool and the need to innovate with awareness.

The term disruptive technology is relevant to innovations of all types. Bower and Christensen (1995) used the term to denote technology that innovates a market by introducing alternative products that, over time, take over a market segment by expelling (or surpassing) the leading providers of a given product. Notably, such innovation however sometimes result in worse performance on one or two dimensions seen as defining the products. Such shortcomings typically leads to an underestimation of the power of new technologies (Bower & Christensen, 1995). Other researchers have used this idea to advocate for improved digital competencies to improve teacher education (Ortlieb, Susca, Votypka & Cheek, 2018). Related to mentoring, disruptive innovation provides a useful lens through which we can understand how diverse actors strive to contribute to improving the quality of education.

In this case however, the ideas of disruptive technology is used as a step stone to awareness of interplay between innovations and actors in educational settings. Innovators are typically eager to convince sector-specific actors about the benefits of their products (Player-Koro, Bergviken Rensfeldt, & Selwyn, 2018). Technology get implemented in educational contexts despite individual doubts. The idea of disruptive technology can shed light on the need for practitioners' collaboration in innovations. For instance, familiarity with pupil behaviour in real life classrooms, can be essential knowledge when developing a simulator representing pupil behaviour.

Innovations of Tools and the Relationship to Research Evidence and Pedagogical Theory

Garrigan and Pearce already in 1996 found reason to argue against what they interpreted as a trend towards (too) little focus on theory in mentoring in initial teacher education. Rehak, Gomoll, Hmelo-Silver, & Danish (2016) have argued that pre-service teachers need to develop theoretically based understanding to understand practice. Toom, Husu and Patrikainen (2015) found that pre-service teachers strive to relate practice to theory and argue that "the guidance of an experienced colleague would be crucially important" to develop reflections on interplay between theory and practice (p. 334). Such findings indicate that grounding mentoring in theory and evidence-based practice have the potential to enhance mentoring quality. However, it is relevant to ask whether it is manageable for mentors to access, become familiar with, critically examine and adapt such research on their own (Lejonberg, Elstad, Sandvik, Solhaug, & Christophersen, 2018). Relevant evidence in this matter could be research indicating teaching skills teachers need to master (Ferguson & Danielson, 2015), fruitful strategies in mentoring (Hobson et al., 2009; Schwille, 2008) and theory about values and approaches influencing the teacher role (Baumrind, 1971/1991; Ragnemalm & Samuelsson, 2016). Assistance from researchers or artefacts such as research- and theory-based tools, can be helpful to accommodate challenges related to connecting theory and practice in mentoring.

Researchers' knowledge about a field from a generalist stance can be useful for practitioners if used to anchor innovations in research evidence and theory. However, the idea that it is desirable to use research evidence or pedagogical theory to ground practices in educational contexts is disputed. The term evidence informed practice has been introduced to accommodate critique of the idea of evidence based practice understood as use of research to determine that "what works"-recipes for practice is a failure (Kvernbekk, 2018). Debating this quandary further is a project for future work. Here, we adopt the assumption that research evidence can contribute to pedagogical practice while challenging assumptions (Marthinsen, 2004; Pfeffer & Sutton, 2006). For the purpose of this work, the term evidence includes propositions that support the truthfulness of a theory, claim or assumption. It follows that the primary function of evidence can be summarised as support (Kvernbekk, 2018).

To illuminate the interconnectivity between evidence, actor characteristics, tools and context, we introduce a model of evidence-based mentoring (EBM) in Figure 1 to illustrate how several components

play together in evidence based practice. The model grounds following justifications for why and how researchers and practitioners can innovate together, applying the PI framework.
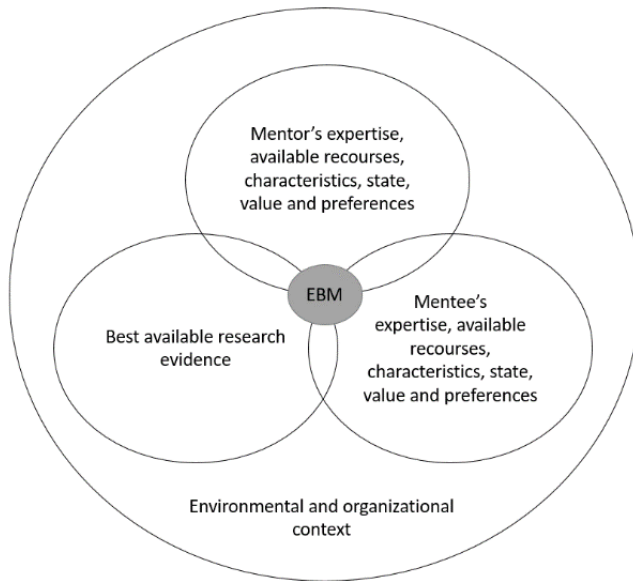

Figure 1. Evidence-Based Mentoring (EBM) (adapted from Satterfield et al., 2009 and Simmons, 2020).

Figure 1 visualises how multiple actors and their characteristics are significant to the practice of mentoring. The model also highlights how research evidence conducts one of several features constituting evidence based practice, indicating that research evidence is an important, but limited source of answers to "what-works"-questions. Thus, we leverage the term EBM to argue that researchers, mentors and mentees should all be engaged in the innovation of the field.

Over the past few decades, talking and thinking together to promote classroom learning has been of great interest (Mercer, Hennessy, & Warwick, 2019). Research related to transformation of teacher education through innovation has argued that schools' actors need transformative agency to develop practice in schools, as well as to contribute to development of teacher education (Hatlevik, Jakhelln, & Jorde, 2024a; Andreasen, 2023). The term co-construction denotes how collaborative interactions can be construed as a process of engaging a common phenomenon (Maskiewicz & Winters, 2012). The term co-creation has been used for similar processes, however typically highlighting interaction with students in educational settings (Bovill, 2020; Cook-Sather, 2020). In the current work, we use the term co-construction in reference to the application of the PI framework (Maskiewicz & Winters, 2012; Mercer et al., 2019). From an EBM foundation, PI can guide and challenge processes such as efforts to develop tools for mentoring.

Using PI to Guide and Challenge Innovations in Mentoring

In this section, we establish the basis for leveraging the PI framework to develop, and challenge innovations in the educational sector. The objective is to better understand the application of a framework of co-construction to innovate educational practices such as mentoring.

The PI Framework

The PI framework is developed by the college of Mary Lou Fulton Teacher College (2020) as an "ecological and operational" approach to educate school practitioners (p.12). The intention of the development of the framework was to articulate core values to approach the role of teacher educators (Mary Lou Fulton Teacher College, 2024). A concrete outcome of these processes has been formulation of principles intended to "create positive change for humanity" (Mary Lou Fulton Teacher College, 2024). The principles enables educators to challenge their actions related to how such decisions can affect the lives of those

one strives to innovate for. Three overarching principles were formulated (Mary Lou Fulton Teacher College, 2020):

- Innovate for uniqueness: This reflects the importance of flexible designs while acknowledging the uniqueness of individuals.
- Innovate with care: This refers to the consistent consideration of the needs, wellbeing and motivations of the actors and communities.
- Innovate for problem solving: This implies the promotion of positive change based on creative solutions to pressing problems.

Steps of Innovative Work

The PI framework provides a step-by-step imaginative iterative process (Mary Lou Fulton Teacher College, 2020; 2024) to enforce the three principles. The first step is to investigate the context in which the innovation will function. Context investigation consists of an exploration of the history, experiences, culture, knowledge and beliefs of the relevant actors. The innovation begins by investigating the context-specific problems while simultaneously identifying potential solutions. Mindfulness and consideration for the actors are crucial to this step.

The next step is to leverage the research findings and personal relationships to establish common goals that align with the context and problem. The innovators strive to expand their understanding by investigating the contextual problems and possible solutions that have been proffered, and to identify affected groups. By using their imagination, innovators explore possible future scenarios and consequences based on interaction with reference groups. Such groups, hypothetical or known, play an essential role in helping innovators frame criticisms of potential solutions and come up with alternatives.

The third step is to test the ideas to estimate how different scenarios may play out. Communication is crucial in this step as well, both internally and externally, to the innovation group. Furthermore, ideas, findings and plans should be circulated to a wider audience for feedback.

Next, we expand upon the three PI principles to illustrate how the presented steps and activities can provide an analytical approach to guiding innovations in mentoring. For each principle, we strive to visualize how concrete actions can be grounded in this framework. We do this based on experiences from a project innovating for mentoring, called Developing Tools for Mentoring (UoO, 2023; 2024).

Principle 1: Innovate for Uniqueness

To innovate for uniqueness, it is necessary to gather insights and knowledge about the actors and the contexts involved, as well as to adapt to and respect uniqueness (Mary Lou Fulton Teacher College, 2020; 2024). To accommodate challenges related to the diverse characteristics of actors, such as mentees and mentors and the unique contexts in which they interact, flexibility can be a great facilitator. Student teachers' agency, understood as them making choices, act on these and thereby influencing their life and environments, is acknowledged as important for student teachers' learning (Hatlevik, 2024). However, also mentors have unique competence and needs, and also contexts differ. Therefore, mentoring tools need to be flexible. However, challenges related to mentoring being arbitrary, depending on mentor's individual judgements, experiences and values has been highlighted in research (Hobson et al., 2009; Skagen, 2016).

Accounting for uniqueness can be challenging, as the flexibility needed distributes the choices made on how to use the essential features of a tool. Vygotsky's sociocultural theory of cognitive development distinguishes between non-reflective and reflective uses of resources. The difference is whether the actor using the tool focuses mostly on the resource itself or the use of the resource during the application. Non-reflective users are typically task-focused, whereas reflective users focus on (psychological) achievement and resource utility (Gillespie & Zittoun, 2010). In light of this distinction, the juxtaposition of flexibility and standardisation may appear to be a trade-off in terms of empirical prescription vs. professional judgement. Hence, adaptation is needed (Clutterbuck, 2004). However, adaption is also complex for

actors, and professional teachers are characterized by ability to "integrate and transform knowledge from various sources and apply, adopt and transform this knowledge in professional practice" (Hatlevik, 2024: 37). Also studies of use of tools in mentoring has underlined how use of tools presuppose mentors and mentees to adapt their practice, which can be demanding (Hunskaar & Gudmundsdottir, 2023).

Table 1. Overarching Goals Characterised as Essential to PI, Related to Relevant Resources, Driving Questions and Outcomes (Based on Mary Lou Fulton Teacher College, 2020; 2024)

Goal	Recourses	Questions to drive innovation	Products/outcomes
Getting to know the people we innovate for	Actors in the given context Research	Who are the people we are designing for? What are their histories and contexts within which they live and work? How does this knowledge affect the ways in which we move forward?	Knowledge about people
Getting to know the contexts	Actors in the given contexts Research	What challenges does the people who work in these contexts perceive? What do they need?	Knowledge about contexts Framing problems
Develop thoughts about relevant solutions	Actors in the given context Research	What can possible solutions be? How will such innovations affect individuals, communities and society (possible pitfalls)?	Framing of solutions/formulation of directions/visions for further innovation processes
Map what innovations already exists	Providers of relevant technology Research	What exists that are relevant to our overall goals for the innovations?	Overview of existing technology
Assess existing technology	Existing designs Providers of relevant technology Research	How does this innovation align with our principles/framing of direction of designs/our vision for innovations?	Assessment based on the grounding visions for the innovation processes
Design technology	Actors in relevant context, Providers of existing designs	How can we design technology to accommodate our visions? Can we develop existing technology to accommodate our visions?	Ideas of concrete new designs or adaptions of current designs
Develop technology by imaginative iterative process	Actors in the relevant context Existing technology Ideas for new designs	How does these ideas accommodate our visions?	Repetitive/ongoing development of new ideas of concrete new designs or adaptions of current designs
Final products for implementation in the relevant context	Actors in the relevant context	How do we inform/prepare relevant actors? How do we implement innovations?	Implementations, evaluations and further adjustments of designs

Based on such understanding, efforts can be done to align mentoring tools to individual learning and development goals. Guides for mentoring can be developed to promote flexible use, suggesting several alternative approaches and alternative questions to elaborate on during mentoring sessions. Such approach challenges fixed structures while allowing use of tools to adapt to mentee, mentor and contextual uniqueness (UoO, 2023; 2024).

Principle 2: Innovate with Care

Innovating with care requires being mindful of individual, community and societal needs when innovating (Mary Lou Fulton Teacher College, 2020; 2024). Mentees can seek mentors' recognition that they are good enough teachers. This relies on an asymmetrical relationship that places mentees in vulnerable positions (Hobson & McIntyre, 2013). The inherence of power and asymmetry in mentoring relations (Kemmis, Heikkinen, Fransson, Aspfors, & Edwards-Groves, 2014), call for attendance when innovating. Hence, the tools and methods employed in mentoring must leverage these patterns in a way that helps, rather than hampers, development (Eriksen, Lejonberg, Tschannen-Moran, Christophersen, & Elstad, 2020; Hobson & Malderez, 2013; Hobson & McIntyre, 2013). Consequently, there is a need to reduce the gap of information asymmetry between mentor and mentee. Thus, standards of data ownership and data sharing are important, and appropriate. Further, it is essential to take function ability into account, keeping in mind actors' mastery of increasingly sophisticated technologies (Säljö, 2010). However, such structures for collaboration can not replace the insights from daily interaction with relevant actors. Throughout the process, cultivated partnerships between relevant actors such as researchers and practitioners, can provide foundation for collaboration (Lejonberg, Elstad, & Hunskaar, 2017).

Based on such understanding, mentors' roles as assessors and companions in development can be discussed with mentors and mentees themselves. Innovators can decide that all data from tools should be owned and distributed by the mentees, to avoid solutions enhancing mentors' assessment of mentees (Lejonberg et al., 2024). Structures for peer mentoring can contribute to common exploration of teacher practice. Another approach to safeguard mentees is to embrace a critical approach to data generated by the tools. By posing critical questions to tool generated data and underlining use of data as grounds for common exploration and reflection, innovators can promote a desirable critical distance to data (UoO, 2023; 2024).

Principle 3: Innovate for Problem-Solving

This principle challenges innovators to promote accessibility in resolving pressing problems. From a research angle, it is important to ground development in research, especially when innovating social processes. Thus, close dialogue with the affected actors is crucial (Sirotnik, 1999; Mary Lou Fulton Teacher College, 2024).

The PI framework guides innovators through problem definition and solution brainstorming steps to drive innovation and to solve problems. As such, the framework facilitates accounting for the perceptions, values and approaches that contribute to mentee development, while reducing risks of poor decision-making and mindless assertions (Hobson et al., 2009; Hobson & Malderez, 2013; NOKUT, 2019; Skagen, 2016). However, when innovating for mentoring, the core visions and challenges of teacher education is relevant as point of departure for mentoring tools to be able to contribute to problem-solving (Hatlevik, 2024).

Two parallel processes can contribute to understanding relevant problems and possible solutions: literature reviews and personal discussions. For instance, investigating the use of tools in mentoring can contribute to developers understanding of how to contribute to the professional development of mentees (Nesje and Lejonberg, 2022). Such knowledge can ground innovative problem solving and help developers critical thinking related to imagined innovations.

Also, discussion with actors in the core of the practices one innovate for, can be useful. Researchers, mentors and mentees can be understood as key actors in such processes. Several formal and informal meetings with mentors and mentees before beginning the actual innovation work and throughout all phases of the innovation process, can promote quality innovation processes. Pilot tools can be tested and developed several times. Opinions and insights from interactions with practitioners should play a key role. Such ideas illuminate why the term co-construction describe processes of innovating tools in several phases, as opposed to approaches where outsiders develop and implement innovations.

Discussion: What Can We Learn from this Approach to Challenge and Develop Innovations?

According to Ellis, Souto-Manning and Turvey (2019), it is important to critically review development efforts, including products and processes. The ideas presented in this contribution can drive discussions about relevance of educational research by emphasising the interconnections between research and practice (Satterfield et al., 2009; Simmons, 2020; Snow, 2015) and how to contribute to innovations for future mentoring and teacher education. Given the strong link between human technologies and human intelligence, tool innovations were described in this paper as efforts to mediate human actions (Cole & Derry, 2005). According to Säljö (2010), the hybrid nature of human knowing and learning is obvious, given that mastery is intertwined with the tools used. Thus, the notion of challenging actors becomes circumspect, especially as it relates to media hype, marketing logic, technical-rational positions and constructs of novelty, uniqueness or cutting edge (Ellis et al. 2019; Mozorov, 2014). When developing for mentoring quality, the application of the PI framework can encourage innovators by structuring and challenging the innovation processes (Sirotnik, 1999; Mary Lou Fulton Teacher College, 2024).

The illustrative examples related to developing tools for mentoring, were included to visualize how the three innovative principles of uniqueness, care and problem solving can be used in innovation processes, for instance by inspiring the framing of a problem, open processes, flexible approaches and principled decision-making. However, we also acknowledge that other approaches can have similar contributions as PI, such as for instance design research (Collins, Joseph, & Bielaczyc, 2004) and design-based research (Anderson & Shattuck, 2012).

Relevant in this matter is the notion that innovation includes the design of not only artefacts but also processes, experiences, systems and cultures (Mary Lou Fulton Teacher College, 2020; 2024). The notion of disruptive technology and innovation, is used to underline the importance of including expertise of actors in different sectors in innovation processes. Dialogue with external resources, such as technical experts, lawyers and commercial players, is crucial. However, as illuminated by Gillespie and Zittoun (2010), reflective tool-related awareness can make it difficult to proceed with dedicated tool use, which is a contemporary cornerstone of iterative processes in practices such as mentoring. The fear is that use of tools can distract attention from mentee professional development to new practices related to use of tools (Hunskaar, comming). Therefore, flexibility must be balanced with considerations related to mastery and efficiency of use (Gillespie & Zittoun, 2010; Säljö, 2010). And we also need to be patient to allow actors to adapt to new practices when using new technology (Hunskaar & Gudmundsdottir, 2023). If a principled approach (e.g. PI) is applied, innovators can be better equipped to critically review the relevant extant disruptive processes, adopt and adapt new tools and collaborate with others. However, to contribute to quality teacher education with complex processes as described here, both campus and school based teacher educators need to engage in continuous competence development (Hatlevik, 2024).

As illuminated, EBM and PI, can be understood as frameworks illuminating how principles of uniqueness, care and problem solving can guide development of evidence based mentoring practices. However, contemporary models present oversimplifications of reality, and grounding innovation in PI is no magic pill to ensure quality innovation. For instance, even when empirical and theoretical approaches serve as fruitful anchors to innovations, opinions about what constitutes the best evidence in a given context may differ, notwithstanding that discussions about the value of evidence and its interpretations may lead directly to developmental discussions (Jensen & Christiansen, 2012).

However, researchers have attested to the fact that the lack of a common language limits our ability to engage in understanding practices and supporting learning, arguing that common knowledge of precise terms could enhance exploration of phenomenon such as how teachers learn, how they practice and how they support others (McDonald et al., 2013). PI's application to the innovation processes related to mentoring can enhance a common language for actors in mentoring, as well as for innovators striving to enhance quality in mentoring. However, what constitutes quality in mentoring is indeed a question inviting discussion and operationalization in local contexts (Hatlevik, 2024; Wittek and Kvernbekk, 2011)

However, use of the PI framework does not secure justice and quality in innovation processes. As highlighted by González (2017), innovators should strive to use their imaginations to explore possible future scenarios and improvements, including the consequences of the people we innovate for. The actor-focus in PI, combined with what has been presented here as EBM, can push us in that direction. However, there will always be a high degree of uncertainty and disagreement related to abstract questions about what constitutes positive change to society (Mary Lou Fulton Teacher College, 2020; 2024).

Concluding Remarks

To promote quality placements' situations in teacher education, we should strive to facilitate situations where student teachers can discuss and reflect on practice experiences with peers and mentors (Hatlevik, 2024). Innovation in the educational sector, however, has been described as overwhelmingly complex (Peschl & Fundneider, 2014). In this contribution, the notion of PI was explored as a framework to enable innovators to co-construct, guided by norms, values and ideas to which they agree. This article presented examples of how this framework aligned with the EBM model can afford processes of developing tools for mentoring, based on experiences from a real-world project, in which the authors participated (UoO, 2023; 2024). On the one hand, we argued that innovation should be grounded in research. However, only one-third of the EBM model is devoted to research, as individual needs are essential for quality mentoring. As such, practitioners (mentors and mentees) also need to contribute to the different steps in PI. The expansion of this overarching principle-based approach to guide innovations, must be driven by co-construction involving practitioners, and anchored in research evidence.

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