Polyphonic agency as precondition for teachers' research literacy

Mirva Heikkilä & Andreas Eriksen

Submit your article to this journal ⤤

View related articles ⤤

View Crossmark data ⤤

Routledge
Taylor & Francis Group

Polyphonic agency as precondition for teachers' research literacy

Mirva Heikkilä[a] and Andreas Eriksen[b]

[a]Department of Teacher Education & Centre for Research on Learning and Instruction CERLI, University of Turku, Turku, Finland; [b]Centre for the Study of Professions, Oslo Metropolitan University, Oslo, Norway

ABSTRACT

This article provides a conceptual clarification of the complementary relationship between teachers' research literacy and their role-based agency. In many countries, teachers are increasingly expected to actively use and develop research. However, without taking account of teachers' distinct conditions of agency, this expectation may weaken rather than strengthen the profession. Top-down mechanisms that push teachers to follow rigid evidence-based procedures diminish their professional autonomy. At the same time, conceptual research on teachers' agency has developed new tools for promoting research literacy in a way that is conducive to professional autonomy. By conceptualizing research literacy as shaped by polyphonic agency, the article clarifies this field to support future teachers in terms of teacher education and working life. The article also articulates strategies for enhancing agency, such as raising awareness of the relevant standards, responding to accountability mechanisms, and developing teacher education programs.

The need for research literacy among teachers

The need for teachers to be research literate is increasingly highlighted by both researchers and policymakers. The expectations range on a continuum from perspectives that treat teachers as mere technicians who enact evidence-based scripts, to professional perspectives that emphasize the need for judgement in deciding what and how to teach (Boyd et al., 2021). This article is an attempt to unpack what the professional perspective should entail. It therefore focuses on clarifying the role of teachers' agency as a component of research literacy. By highlighting the polyphonic structure of teacher agency, we illustrate how research literacy can be supported to enhance the teaching profession.

The need for teachers to engage with educational research is quite understandable in today's complex knowledge environment. The teaching profession is widely considered as the basis for societal change and development (Mikkilä-Erdmann et al., 2019). Primary teachers educate societies' future actors and decision-makers, who must deal with a variety of knowledge and information. Thus, teachers must learn to apply theoretical knowledge in their work and to

conceptualize phenomena using theoretical concepts (Tynjälä et al., 2014). Gut feelings and non-scientific beliefs are not sufficient (Murtonen & Salmento, 2019) in an age of post-truth, where beliefs that are only based on emotions threaten scientific expertise (Hughes, 2019), and research-based knowledge is increasingly criticized or ignored (Jensen et al., 2012; Lynch, 2019).

In line with the above, it has been argued that teachers require research literacy to inform the reasoned judgements they make as part of their day-to-day professional practice and to inform their professional contribution to school leadership and the development of educational practice and policy (Boyd, 2021). In several countries, such as the UK, Finland, and Norway, the aim to educate research literate teachers is stated policy (BERA, 2014; the Finnish Ministry of Education & Culture, 2022; the Norwegian Ministry of Education & Research, 2018). Researchers (e.g., Boyd, 2021; Mikkilä-Erdmann et al., 2019; Niemi & Nevgi, 2014) have also addressed such needs. However, it should be noted that the kind of agency these perspectives anticipate or expect from teachers differ from each other. The agency anticipated by the BERA definition, for example, is not as holistic as the agency anticipated by Boyd's (2021) definition of research literacy.

In any case, the research literacy of teachers is usually referred to in terms that describe basically the same competence that citizens need for the "public understanding of science" (Miller, 1983). This approach is especially salient in the influential report from the British Educational Research Association (BERA) that defines research literacy as being "familiar with a range of research methods, with the latest research findings and with the implications of this research for their day-to-day practice, and for education policy and practice more broadly" (BERA, 2014, p. 40). Some authors have expanded on this by emphasizing the active aspect of research literacy; it does not only involve understanding but also applying and in some cases developing research (Evans et al., 2017, p. 404; Foreman-Peck & Winch, 2010, p. 29). Moreover, it also involves an evaluative judgement of "utility and ripeness for adaptation to context" (Waring & Evans, 2015, p. 18).

More recently, however, Boyd has advocated that we see research literacy as including an understanding of the "contested" nature of educational knowledge and "the interplay between research and practical wisdom" (Boyd, 2021, p. 19). This move towards seeing research literacy as involving practical wisdom is helpful in several regards. First, the contested nature of educational knowledge—and even sources of knowledge—speaks in favor of disconnecting research literacy from any distinct set of research methodologies. Second, it highlights that teacher professionalism involves a form of complex integration of knowledge that cannot be captured by algorithmic rules. Third, it gestures towards the fact that research literacy takes a distinct form in the teaching context, and that the "public understanding of science" does not fully deliver the necessary dimension. Research literacy deserves a separate conceptual treatment with added features.

A step towards this separate conceptual treatment has been taken by Eriksen (2022) with a virtue approach to the research literacy of professionals. Eriksen has argued that research literacy is an intellectual virtue that involves special tasks of the application of research to professional practice. The argument is that the requirements of professional research literacy can be illuminated by distinguishing between three "sensitivities." Genre sensitivity is about recognizing that translation from research to practice involves different normative grammars. The thresholds for acceptance and the success conditions of research are not the same as for professional practice. Professionals need to act even where evidence is lacking, and they have special obligations to their own pupils. Practice sensitivity is about meeting research as a professional community engaged in ethical reflection, where values are jointly interpreted, and trustworthiness is established through shared commitments. This delimits the authority of research. For example, even if research were to find that authoritative attitudes and strict discipline correlate with good grades, the research literate teacher would know where to draw the line. Situational sensitivity concerns the ability to understand the demands of a particular context. Rather than being satisfied with generic problem definitions that fit ready-made solutions, the research literate

professional understands that situations are complex, and that the application of research requires care.

Arguably, the virtue approach to professional research literacy described above delivers a way of illuminating Boyd's notion of "the interplay between research and practical wisdom in deciding what and how to teach effectively" (Boyd, 2021, p. 19). However, further interpretive work is required to apply the approach in a substantive way to the teacher's context. The virtue approach highlights the sophisticated agency involved in discerning and mediating between a variety of considerations. In the next section, we provide an overview of relevant conceptualizations of agency.

The agency approach to research literacy

The teaching profession has faced several accountability policies in many countries (Siegel & Biesta, 2022). The intentions behind these kinds of policies might be good but they have been found to diminish the professional space and agency of teachers, because they can become internalized as strict notions of what to do in the classroom (Buchanan, 2015; Campbell, 2019). They push the teacher toward the technician, rather than the professional (cf., Boyd et al., 2021). As accountability policies narrow the scope of what is held as quality teaching, they also close down the space for different voices and perspectives that can enrich teachers' agency. Joram et al. (2020) found that teachers felt a lack of agency when they found that administrators were forcing them to accept someone else's research and ignoring their own experience. However, this is contrary to the purposes of training research literate teachers who base their thinking and decision-making on educational science. Thus, when enhancing research literacy among teachers, it is crucial to take account of teachers' agency.

Both students' and in-service teachers' agency have recently been empirically studied from various perspectives in educational science, and also some theoretical work has been conducted. However, no universal definition has been established for teachers' agency perhaps because researchers from various research traditions and fields examine it. The following section outlines different approaches to agency with a view to clarifying the different theoretical starting points and contributions to the conceptualization of agency. It is notable that the location of agency as well as the purpose and the quality of agency changes in these different definitions. The polyphonic conception of agency that we develop is supposed to capture key insights from this literature (leaving some theoretical disagreements aside).

Teachers' agency has been defined as teachers' capacity to *effect change* (e.g., Maclellan, 2017). From this perspective, agency is often regarded as a measurable capacity of an individual; this perspective can be depicted as cognitive and post-positivist. Researchers following this tradition often use quantitative methods (e.g., Toom et al., 2017) to investigate how large numbers of student teachers or in-service teachers sense their agency, sometimes through a longitudinal design or mixed-methods research (e.g., Heikonen, 2020).

On the other hand, departing from the concept that agency is something that teachers can have, it can also refer to something that teachers do, that is, "the *quality of the engagement* of actors with temporal–relational contexts-for-action" (Biesta et al., 2015, p. 626). This strand of research is inspired by the ecological model of teacher agency (Priestley et al., 2015), in which agency is regarded as the temporal and relational actions of an individual within a structure. Researchers leaning on this model have also developed their own applications, for example, for investigating teachers' agency for special purposes, such as social justice (Pantić et al., 2019).

In sociocultural accounts, teachers' agency is regarded as a crucial element in the *dialectic of person and practice*, unfolding when "actions are taken in activities, which are themselves located in institutional practices" (Edwards, 2017, p. 273). This sociocultural tradition can also be seen to encompass the cultural-historical activity theory, in which the concept of

transformative agency is often used. Thus, agency is regarded as an element between the individual/collective self and the structure (e.g., Brevik et al., 2019; Juutilainen et al., 2018).

In the subject-centered sociocultural tradition, agency is regarded as *intertwined with individuals' and communities' identities within a structure* (e.g., Eteläpelto et al., 2015; Kayi-Aydar, 2019). Thus, in this line of research, teachers' identities are taken into account when investigating agency. It has also been noted that agency might manifest not only as change but also *via* oppositional stances and less progressive actions (Vähäsantanen, 2015).

Lastly, in post-structuralist understandings, also used in this article, agency does not merely signify individual teachers' will to act (Loutzenheiser & Heer, 2017), because post-structuralism, though a heterogeneous field as such, escapes the assumptions of clearly defined subjects and the centering of human subjects as conscious, rational, and autonomous beings (Andreotti, 2014). Despite the decentering of humans, agency is a relevant concept, signifying that agency is not denied but seen in a broader light (Allen, 2002). In teacher education, this means that agency is *always incomplete and intertwined with and produced through the linguistic and narrative systems and relationships within which teachers act* (Loutzenheiser & Heer, 2017).

Post-structuralist perspectives can be depicted, first, as socio-material (e.g., Charteris et al., 2017; Heikkilä & Mankki, 2021). Here, agency is regarded as consisting of both human and nonhuman elements and materials, and not merely controlled by humans. Second, post-structural accounts can be narrative. In those ones, including this article, agency is regarded as *a polyphony of multiple voices, implying diverse qualities of action* (Heikkilä, 2022). This narrative conceptualization suggests that teachers can be agentic and vulnerable at the same time and that different qualities of agency can exist simultaneously. Using a metaphor from the world of music, it illustrates the diversity and complexity of the linguistic resources and vocabularies used when expressing action.

In line with the ecological perspective, the perspective of polyphonic agency focuses on doing rather than being. It also takes into account that teachers do not act in a vacuum but as part of multiple structures—an issue highlighted within the socio-cultural perspective. In addition, in line with the subject-centered sociocultural approach, it recognizes that identities are vital in terms of agency. However, this perspective expands traditional perspectives by its focus on the multiple narrative qualities of agency at one time.

Polyphonic agency

The conceptualization of teachers' agency as a polyphony of multiple voices, implying diverse qualities of action resonates with Bakhtin's (2002) dialogical perspective. Bakhtin's (2002) polyphony recognizes the presence of many voices derived from different perspectives, participants, and social genres. The metaphor of voice by Bakhtin (2002) can be used as an analytic tool not to compare participants' agencies but to illustrate the insight that all of us imply different voices of agency (see Heikkilä et al., 2020). Bakhtin's (2002) philosophy promotes engagement with diversity to enrich and refine understanding. Thus, it literally argues against monological perspectives (Dufva & Aro, 2014) by elucidating internal tensions in agency.

In addition, the conceptualization has features common with those of Emirbayer and Mische (1998) theoretical work, in which social actors can assume different simultaneous agentic orientations and in which agency is conceptualized as an internally complex temporal dynamic.

In terms of research literacy, these existing conceptualizations of teachers' agency make visible that teachers are situated at the crossroads of conflicting demands and diverging institutional priorities. We propose to use the notion of polyphonic agency to capture this overarching aspect of much research on teacher agency. As Heikkilä (2022, p. 51) has noted, the teacher role is the nexus of "tensioned" relationships, where agency is negotiated through "realised and imagined encounters with colleagues, families, and pupils as well as social demands

and societal expectations". Teacher agency is evaluative, and actions express priorities and conceptualizations of problems.

As a musical term for conceptualizing agency in general, the notion of polyphony has an ancient philosophical lineage (Pesic, 2017). Plato's notion of musical harmony is a model both of the agency of the just person and the state (*Republic*, esp. 443d). This has reverberated through Cicero and Shakespeare.[1] However, the normative implications of polyphonic agency for teachers have barely been addressed. Moreover, the notion that polyphonic agency can illuminate the demands of research literacy is unexplored territory. We begin this exploration by briefly examining three features that can help us understand the agency and responsibilities of teachers.

First, polyphonic agency resists reductive interpretation. Just as a polyphonic instrument sounds multiple notes at once, teacher agency involves the simultaneous realization of several distinct goals (cf. Westbroek et al., 2021, p. 117). A single teacher act can be grounded in concerns about classroom environment, testing new equipment, didactic experimentation, and student teacher education.

Second, polyphonic agency contains a range of simultaneous expressive qualities. Similar to the way a polyphonic composition can express different emotions through simultaneous melodies, teachers can evaluate and respond to their situation according to multiple values (e.g., joy for pupil enjoyment, mixed with concern over slow progress).

Third, just as a polyphonic piece may be more or less harmonic, polyphonic agency can be more or less integrated. That is, a teacher may pursue a range of goals either in a haphazard way or in a way that preserves some principled order. For example, a teacher may seek harmony by finding the right proportion of spontaneity to structure.

These three features—goal pluralism, expressive multiplicity, and harmonic integration—illustrate key dimensions of polyphonic agency. The overarching ambition of this agency is striking a balance between *responsiveness* to the voices of the surroundings (pupils, leadership, and stakeholders) and *articulating* a distinct voice of one's own. Part of the task of achieving balance is to assess the authority of the input. Appealing voices may be siren songs (e.g., acquiescing in ready-made teaching programs without critical judgment). Hence, polyphonic agency is not merely about absorbing and managing diverse expectations, but also about shaping their influence through the evaluative outlook of professional integrity and creativity.

The image of a symphony orchestra is perhaps useful. A conductor once noted that for a good musician, "one ear is for listening to the orchestra, the other for one's own performance" (Shore, 1938, p. 17). An orchestra is not simply aiming to coordinate separate performances to follow a pre-determined recipe. Rather, the goal is to *communicate* with the multiplicity of voices to create a joint symphonic expression. Similarly, for a teacher, one ear is for absorbing expectations and situational dynamics, the other for the voice of one's professional calling and the verdicts of individual judgment. In the next section, we consider this concept of agency in relation to the concept of research literacy.

Addressing the relationship between the concepts of agency and research literacy

How do the two concepts discussed so far relate to each other? The polyphonic conception of agency highlights the *plurality* of dimensions in the educational context, while the virtue approach to research literacy introduces standards that can illuminate how polyphonic agency becomes *harmonic*. In other words, these are complementary concepts that illuminate each other. In this section, we provide some illustrations of these claims.

First, the polyphonic conception of teacher agency helps unpack what the concept of genre sensitivity means in practice. In being responsive to the findings and methods of research—in addition to political signals, the school's policies, collegial agreements, etc.—teachers are listening

to and managing several forms of input at once. This means they are not using strategies such as dividing their attention to values over time ("cycling") or compartmentalizing them into separate domains ("firewalling"). These are strategies that are often recommended for effective decision-making, focusing on getting things done quickly rather than in a way that requires judgement (Thacher & Rein, 2004, p. 469).

Against the above, the polyphonic conception of teacher agency enjoins teachers to *integrate* the values and concerns of practice into a meaningful and, ideally, harmonious whole. It does not require perfection in this regard, but at least an attempt to move in this direction. The notion of genre sensitivity helps explain how this is possible. The demands and expectations that teachers face may clearly be the result of conflicting logics of reasoning. The clash between the scientific logic of organized skepticism and the professional logic of action is a case in point, where the objectivity of science demands high thresholds for accepting a hypothesis, while the imperatives of professional responsibility require teachers to take a more pragmatic approach and lower the epistemic threshold for an adequate warrant (Hammersley, 2005). By having genre sensitivity, the research literate teacher recognizes the differences in epistemic thresholds, and thus understands that lacking full back-up of research is not always a reason for rejecting an initiative. Genre sensitivity requires a judgement where the right proportion between uncertainty and action is tailored to the concerns of the teacher role. For example, even if the evidence on the uses of certain classroom management practices remains inconclusive from a scientific viewpoint, the evidence may be good enough to warrant adoption in practice, given the lack of plausible alternatives and the need for change.

The second way that the virtue approach to research literacy and the polyphonic concept of teacher agency complement and illuminate each other concerns professional value commitments. Teachers possessing research literacy exhibit practice sensitivity, in the sense that they understand how the moral commitments—that are developed in the profession through negotiation with the surroundings—limit the authority of research. According to the narrow metrics geared only to achievements in the form of grades, for example, programs that require strict discipline or much collaboration with parents might "work." They may however be too harsh or unjust to be acceptable to teacher ethics. The polyphonic concept of teacher agency highlights the need for teachers to have a language that is sufficiently modulated. That is, teachers need a language to evaluate research in ways that recognize that the notions of implementation science—such as "fidelity," "efficiency," "integrity," and "validity"—come in different pitches, where some lack moral force, given the concerns of teacher practice.

Although new research-based initiatives may enter as a new "melody," they must create a counterpoint with existing practice. This integrative aspect is something the practice of teaching shares with other normative domains, such as law. Our model can usefully be supplemented by the melodic model of adjudication developed by the legal philosopher Gerald Postema: "Melody-thinking is holistic thinking, that is, thinking in temporal sound patterns and melodic lines as the notes are sounding, keeping in mind the path already marked out and anticipating where it will go next" (Postema, 2018, p. 208). Standardized accountability mechanisms do a poor job of keeping track of the marked path and anticipating its natural continuation. It is a matter for judgement and requires a form of research literacy realized through polyphonic agency.

Finally, the third area of complementarity between the concepts concerns the way the situational sensitivity of research literate teachers depends on the kind of responsiveness to simultaneity that polyphony highlights. A particularly relevant form of simultaneity is the presence of multiple possible patterns of action. As Christopher Winch has argued, a key part of professional expertise is the ability to appreciate the possibilities of a situation: "Possibilities are important because they are indicative of future courses of action, and often require immediate and decisive judgement and decision-making" (Winch, 2018, p. 151). Seeing possibilities requires a rich evaluative vocabulary, because one cannot interpret a pattern of action as "just," "caring," or "effective" without a finetuned grasp of how complex situational factors interact.

These factors may be rules made through democratic classroom procedures, social dynamics that have evolved over time, school regulations, national statutes, happenings in the news, cultural and religious differences among pupils, and so on.

This way of connecting the concept of research literacy to polyphonic agency is of course quite expansive. Compared to the standard conception of research literacy as familiarity "with a range of research methods, with the latest research findings and with the implications of this research for their day-to-day practice" (BERA, 2014), the current conceptualization draws on much broader set of normative resources. On the other hand, contemporary calls for research literacy to reflect "the interplay between research and practical wisdom in deciding what and how to teach effectively" (Boyd, 2021, p. 19) remain incomplete without systematic reflection on the broader dimensions of practical wisdom.

This connection between research literacy and polyphonic agency has clear connections to more general theories of professionalism. A couple of related approaches should be mentioned. First, it may constitute a continuation of Donald Schön's concept of the "reflective practitioner" (Schön, 1983). Charting the connection between polyphonic agency and research literacy is a way of unpacking what it means to be a reflective practitioner in context of multiple voices and contested sources of knowledge. Second, to use Winch's terminology, it explains what it means for teachers to engage with research as professionals rather than mere "executive technicians" (Winch, 2017). As Winch rightly notes, "protocol-driven" agency fails to appreciate the need for situational judgment and individual characteristics (Winch, 2017, p. 138). The focus on polyphonic agency adds the need for evaluative judgment to integrate a multiplicity of concerns.

Conclusion

The two main concepts that we have discussed are not unattainable ideals but rather implicit in much practice, at least in their incipient form. Polyphonic agency can serve teachers and teacher education in ways that take into account the contested nature of teacher knowledge and necessitate inclusion of situated sensitivities that resist ready-made solutions. Student teachers may speak with diverging voices when outlining their education and thereby professional agency (Heikkilä et al., 2020). Teacher educators should be sensitive to this polyphony, which can sound enthusiastic and uncertain at the same time (Heikkilä et al., 2020).

In conclusion, we would like to highlight five strategies for promoting research literacy based on polyphonic agency. A first step is raising awareness of the issues involved, especially at a time when schools are faced with an abundance of readymade programs in the name of evidence-based practice. Awareness can be raised by changing the standard definitions of research literacy into descriptions that highlight the demands on moral and interpretive agency.

A second step is to reconsider what it means for teachers and schools to be accountable. As even Hattie has remarked, we should be careful with labels such as "visible learning" that give the impression that everything can be made transparent and quantifiable (Hattie & Larsen, 2020, pp. 40–41). The core sense of accountability is giving reasons, and we should surely expect teachers to justify their decisions to all stakeholders. However, proper justification should flow from a form of agency that is responsive to the whole gamut of practice, which requires the freedom to exercise polyphonic agency.

Thus, a third step is to integrate teacher education in research skills with education in ethical reflection. This is not simply about learning the basics of research ethics (e.g., consent and verifiability), but more about how the logics of research may diverge from the demands of practice. Without attunement to the ethical ambiguities and subtle dilemmas of teaching, the challenges of connecting research and practice remain obscure.

A fourth step is to clarify the role of research-based teacher education for both student teachers and teacher educators. Research should not be a passive and merely obligatory element

in teacher education. As Finnish studies indicate (Heikkilä et al., 2020; Mikkilä-Erdmann et al., 2019), research can be used as a conduit to support future teachers' learning by enacting enquiry approaches into their teaching (Tatto, 2015). This involves also teacher educators. They should be perceived as fully-fledged researchers besides teaching and supervision to support their professional knowledge and expertise in research-based teacher education (Jegstad et al., 2022).

Fifth, fusing research literacy with a research skills component raises awareness that knowledge is always uncertain and created by humans (Murtonen & Salmento, 2019). It has been recommended that research skills should be integrated with other parts of teacher education, such as teaching practice periods and subject didactics, so that these skills can be practiced in real contexts (Niemi & Nevgi, 2014). These strategies respect student teachers' agency as active participants in the information society and embrace teachers' creativity in finding inspiration for and conceptual understanding of their work in research-based knowledge. Hence, these strategies are likely to enhance teacher professionalism in terms of fostering research literate teachers who act sensitively and ethically.

In sum, the idea of seeing teachers' research literacy as governed by polyphonic agency holds far-reaching normative potential. On the one hand, it serves as an aspirational ideal for teachers' professional development, giving them a substantive role conception to strive for. On the other hand, it serves a regulatory institutional function, highlighting polyphonic agency as a quality that external institutions need to respect and promote. However, in line with this broad potential, the current conceptualization of the teacher agency involving research literacy has a somewhat programmatic character. As a first approximation, it serves to bring different strands of literature together and unite them to an overarching framework. Hopefully, the categories that make up this framework can serve to guide future empirical research and help provide normative standards for assessment.

Note

1. This may require a somewhat liberal notion of polyphony; see Danielson (2019). For the Cicero and Shakespeare references, see note 6 by James Adam at http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.01.0168:book=4:section=443d

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

Notes on contributors

Dr. Mirva Heikkilä holds a PhD in Education and works as Senior Researcher at the Department of Teacher Education at the University of Turku, Finland. Her research focuses on the interconnections between higher education and working life, especially in terms of the teacher profession.

Dr. Andreas Eriksen holds a PhD in the Studies of Professions and is Associate Professor at the Centre for the Study of Professions, Oslo Metropolitan University. His research interests include professional ethics, legitimacy, and expertise.

ORCID

Mirva Heikkilä 🆔 http://orcid.org/0000-0002-6873-3943
Andreas Eriksen 🆔 http://orcid.org/0000-0001-7229-6902

References

Allen, A. (2002). Power, subjectivity, and agency: Between Arendt and Foucault. *International Journal of Philosophical Studies*, *10*(2), 131–149. https://doi.org/10.1080/09672550210121432

Andreotti, V. (2014). Conflicting epistemic demands in poststructuralist and postcolonial engagements with questions of complicity in systemic harm. *Educational Studies*, *50*(4), 378–397. https://doi.org/10.1080/00131946.2014.924940

Bakhtin, M. (2002). *Speech genres and other late essays* (C. Emerson & M. Holquist (Eds.), V. W. McGee, Trans.). University of Texas Press. (Original work, published 1979).

BERA (British Educational Research Association. BERA-RSA-Research. (2014). Research and the teaching profession: Building the capacity for a self-improving education system. Final report of the BERA-RSA inquiry into the role of research in teacher education. London: BERA-RSA. https://www.bera.ac.uk/wp-content/uploads/2013/12/. Teaching-Profession-FULL-REPORT-for-web.pdf.

Biesta, G., Priestley, M., & Robinson, S. (2015). The role of beliefs in teacher agency. *Teachers and Teaching*, *21*(6), 624–640. https://doi.org/10.1080/13540602.2015.1044325

Boyd, P. (2021). Teachers' research literacy as research-informed professional judgement. In P. Boyd, A. Szplit, & Z. Zbróg (Eds.), *Developing teachers' research literacy. International perspectives* (pp. 17–44). Wydawnictwo Libron.

Boyd, P., Szplit, A., & Zbróg, Z. (2021). Prologue. In P. Boyd, A. Szplit, & Z. Zbróg (Eds.), *Developing teachers' research literacy. International perspectives* (pp. 9–18). Wydawnictwo Libron.

Brevik, L. M., Gudmundsdottir, G. B., Lund, A., & Strømme, T. A. (2019). Transformative agency in teacher education: Fostering professional digital competence. *Teaching and Teacher Education*, *86*, 102875. https://doi.org/10.1016/j.tate.2019.07.005

Buchanan, R. (2015). Teacher identity and agency in an era of accountability. *Teachers and Teaching*, *21*(6), 700–719. https://doi.org/10.1080/13540602.2015.1044329

Campbell, L. (2019). Pedagogical bricolage and teacher agency: Towards a culture of creative professionalism. *Educational Philosophy and Theory*, *51*(1), 31–40.https://doi.org/10.1080/00131857.2018.1425992

Charteris, J., Smardon, D., Foulkes, R., & Bewley, S. (2017). Heterarchical coaching for continuing teacher professional learning and development: A transversal analysis of agency. *International Journal of Qualitative Studies in Education*, *30*(6), 546–559. https://doi.org/10.1080/09518398.2016.1265688

Danielson, J. (2019). Book review: Polyphonic minds: Music of the hemispheres. *Journal for the History of Astronomy*, *50*(1), 103–105. https://doi.org/10.1177/0021828618817136

Dufva, H., & Aro, M. (2014). Dialogical view on language learners' agency: Connecting intrapersonal with interpersonal. In P. Deters, X. Gao, E. R. Miller, & G. Vitanova (Eds.), *Theorizing and analyzing agency in second language learning: Interdisciplinary approaches* (pp. 37–53). Multilingual Matters.

Edwards, A. (2017). The dialectic of person and practice: How cultural-historical accounts of agency can inform teacher education. In J. Clandinin & J. Husu (Eds.), *The SAGE handbook of research on teacher education* (pp. 269–285). SAGE.

Emirbayer, M., & Mische, A. (1998). What is agency? *American Journal of Sociology*, *103*(4), 962–1023. https://doi.org/10.1086/231294

Eriksen, A. (2022). The research literacy of professionals: Reconciling evidence-based practice and practical wisdom. *Professions & Professionalism*, *12*(3), e4852. https://doi.org/10.7577/pp.4852

Eteläpelto, A., Vähäsantanen, K., & Hökkä, P. (2015). How do novice teachers in Finland perceive their professional agency? *Teachers and Teaching*, *21*(6), 660–680. https://doi.org/10.1080/13540602.2015.1044327

Evans, C., Waring, M., & Christodoulou, A. (2017). Building teachers' research literacy: Integrating practice and research. *Research Papers in Education*, *32*(4), 403–423. https://doi.org/10.1080/02671522.2017.1322357

Finnish Ministry of Education and Culture. (2022). *Teacher education development programme 2022–2026*. https://urn.fi/URN:NBN:fi-fe2022053140998.

Foreman-Peck, L., & Winch, C. (2010). *Using educational research to inform practice: A practical guide to practitioner research in universities and colleges*. Routledge.

Hattie, J., & Larsen, S. N. (2020). *The purposes of education: A conversation between John Hattie and Steen Nepper Larsen*. Routledge.

Heikkilä, M. (2022). *Agency as polyphony. Student and primary teachers' narration embedded in theory and practice* [Doctoral dissertation]. University of Turku. https://urn.fi/URN:ISBN:978-951-29-8871-6.

Heikkilä, M., & Mankki, V. (2021). Teachers' agency during the Covid-19 lockdown: A new materialist perspective. *Pedagogy, Culture & Society*, 1–16. https://doi.org/10.1080/14681366.2021.1984285

Heikkilä, M., Iiskala, T., & Mikkilä-Erdmann, M. (2020). Voices of student teachers' professional agency at the intersection of theory and practice. *Learning, Culture and Social Interaction*, *25*, 100405. https://doi.org/10.1016/j.lcsi.2020.100405

Heikkilä, M., Iiskala, T., Mikkilä-Erdmann, M., & Warinowski, A. (2022). Exploring the relational nature of Finnish teachers' agency negotiation through master- and counter-narratives. *British Journal of Sociology of Education*, *43*(3), 397–414. https://doi.org/10.1080/01425692.2022.2038541

Heikonen, L. (2020). *Early-career teachers' professional agency in the classroom* [Doctoral dissertation]. University of Helsinki. http://urn.fi/URN:ISBN:978-951-51-6547-3.

Hughes, G. (2019). Developing student research capability for a "post-truth" world: Three challenges for integrating research across taught programmes. *Teaching in Higher Education*, *24*(3), 394–411. https://doi.org/10.1080/13562517.2018.1541173

Jegstad, K. M., Fiskum, T. A., Aspfors, J., & Eklund, G. (2022). Dichotomous and multifaceted: Teacher educators' understanding of professional knowledge in research-based teacher education. *Scandinavian Journal of Educational Research*, *66*(6), 1005–1019. https://doi.org/10.1080/00313831.2021.1958255

Jensen, K., Lahn, L. C., & Nerland, M. (2012). Introduction – Professional learning in new knowledge landscapes: A cultural perspective. In K. Jensen, L. C. Lahn, & M. Nerland (Eds.), *Professional learning in the knowledge society* (pp. 1–26). Sense Publishers.

Joram, E., Gabriele, A. J., & Walton, K. (2020). What influences teachers' "buy-in" of research? Teachers' beliefs about the applicability of educational research to their practice. *Teaching and Teacher Education*, *88*, 102980. https://doi.org/10.1016/j.tate.2019.102980

Juutilainen, M., Metsäpelto, R. L., & Poikkeus, A. M. (2018). Becoming agentic teachers: Experiences of the home group approach as a resource for supporting teacher students' agency. *Teaching and Teacher Education*, *76*, 116–125. https://doi.org/10.1016/j.tate.2018.08.013

Kayi-Aydar, H. (2019). A language teacher's agency in the development of her professional identities: A narrative case study. *Journal of Latinos and Education*, *18*(1), 4–18. https://doi.org/10.1080/15348431.2017.1406360

Loutzenheiser, L., & Heer, K. (2017). Unsettling habitual ways of teacher education through "post-theories" of teacher agency. In J. Clandinin & J. Husu (Eds.), *The SAGE handbook of research on teacher education* (pp. 317–332). SAGE.

Lynch, M. P. (2019). *Know-it-all society: Truth and arrogance in political culture*. Liveright Publishing.

Maclellan, E. (2017). Shaping agency through theorizing and practicing teaching in teacher education. In J. Clandinin & J. Husu (Eds.), *The SAGE handbook of research on teacher education* (pp. 253–268). SAGE.

Mikkilä-Erdmann, M., Warinowski, A., & Iiskala, T. (2019). Teacher education in Finland and future directions. In J. Lampert (Ed.), *Oxford encyclopedia of global perspectives on teacher education*. Oxford University Press. https://www.oxfordreference.com/view/10.1093/acref/9780190670221.001.0001/acref-9780190670221-e-286?rskey=rUQAaF&result=60.

Miller, J. D. (1983). Scientific literacy: A conceptual and empirical review. *Daedalus*, *112*(2), 29–48.

Murtonen, M., & Salmento, H. (2019). Broadening the theory of scientific thinking for higher education. In M. Murtonen & K. Balloo (Eds.), *Redefining scientific thinking for higher education. Higher-order thinking, evidence-based reasoning and research skills* (pp. 3–29). Palgrave Macmillan Press.

Niemi, H., & Nevgi, A. (2014). Research studies and active learning promoting professional competences in Finnish teacher education. *Teaching and Teacher Education*, *43*, 131–142. https://doi.org/10.1016/j.tate.2014.07.006

Norwegian Ministry of Education and Research. (2018). *Teacher education 2025. National strategy for quality and cooperation in teacher education*. https://www.regjeringen.no/contentassets/d0c1da83bce94e2da21d5f631bbae817/kd_teacher-education-2025_uu.pdf.

Pantić, N., Taiwo, M., & Martindale, A. (2019). Roles, practices and contexts for acting as agents of social justice – student teachers' perspectives. *Teachers and Teaching*, *25*(2), 220–239. https://doi.org/10.1080/13540602.2018.1562441

Pesic, P. (2017). *Polyphonic minds: Music of the hemispheres*. MIT Press.

Postema, G. J. (2018). Time in law's domain. *Ratio Juris*, *31*(2), 160–182. https://doi.org/10.1111/raju.12202

Priestley, M., Biesta, G., & Robinson, S. (2015). *Teacher agency: An ecological approach*. Bloomsbury Publishing.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Shore, B. (1938). *Orchestra speaks*. Books for Libraries Press.

Siegel, S. T., & Biesta, G. (2022). The problem of educational theory. *Policy Futures in Education*, *20*(5), 537–548. https://doi.org/10.1177/14782103211032087

Tatto, M. T. (2015). The role of research in the policy and practice of quality teacher education: An international review. *Oxford Review of Education*, *41*(2), 171–201. https://doi.org/10.1080/03054985.2015.1017405

Thacher, D., & Rein, M. (2004). Managing value conflict in public policy. *Governance*, *17*(4), 457–486. https://doi.org/10.1111/j.0952-1895.2004.00254.x

Toom, A., Pietarinen, J., Soini, T., & Pyhältö, K. (2017). How does the learning environment in teacher education cultivate first-year student teachers' sense of professional agency in the professional community? *Teaching and Teacher Education*, *63*, 126–136. https://doi.org/10.1016/j.tate.2016.12.013

Tynjälä, P., Häkkinen, P., & Hämäläinen, R. (2014). TEL@work: Toward integration of theory and practice. *British Journal of Educational Technology*, *45*(6), 990–1000. https://doi.org/10.1111/bjet.12164

Vähäsantanen, K. (2015). Professional agency in the stream of change: Understanding educational change and teachers' professional identities. *Teaching and Teacher Education*, *47*, 1–12. https://doi.org/10.1016/j.tate.2014.11.006

Waring, M., & Evans, C. (2015). *Understanding Pedagogy: Developing a critical approach to teaching and learning*. Routledge.

Westbroek, H., Jongejan, W., Kaal, A., & de Vries, B. (2021). Research literacy in initial teacher education: Supporting the development of personal theories. In P. Boyd, A. Szplit, & Z. Zbróg (Eds.), *Developing teachers' research literacy. International perspectives* (pp. 113–135).

Winch, C. (2017). *Teachers' know-how: A philosophical investigation*. John Wiley & Sons. https://doi.org/10.1002/9781119355700

Winch, C. (2018). Professional knowledge, expertise and perceptual ability. In M. Addis & C. Winch (Eds.), *Education and expertise* (pp. 138–156). Wiley.