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"It's important, but I'm not going to keep doing it!": Perceived purposes, learning outcomes, and value of pre-service teacher research among educators and pre-service teachers

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HIGHLIGHTS

- Both educators and pre-service teachers consider pre-service teacher research important.
- An inquiry habit of mind emerges as the most important purpose.
- Perceived learning outcomes match purposes, namely, to be open-minded, critical, and able to conduct research.
- Professional development and empowerment are perceived values.
- Pre-service teachers do not intend to conduct research in their future jobs as teachers.

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ABSTRACT

Attention to the role of pre-service teacher research in teacher education is growing worldwide. This study compares the perceptions of teacher educators and pre-service teachers about the purposes, learning outcomes, and value of pre-service teacher research in different contexts. Questionnaires and interview data from participants in the Netherlands and Australia, identify an inquiry habit of mind as the most important, valuable outcome of pre-service teacher research. Although pre-service teachers consider research frustrating and stressful, they also acknowledge its value as a communication tool and contributor to teacher identity. Yet few of them expect to conduct research in their future jobs.

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1. Introduction

Student research in higher education in general, and in teacher education in particular, represents a growing requirement worldwide, largely because research literacy constitutes an important foundation for teachers' professional development (BERA-RSA, 2014; Sachs, 2016). To meet twenty-first century education challenges, increase educational quality, and improve national economies, pre-service teachers need to learn how to conduct research (Aspfors & Eklund, 2017; Hökkä & Eteläpelto, 2014; Menter, 2015),

which in turn will grant them confidence, skills, and knowledge that will empower them as autonomous educators and also may increase their ability to innovate in their professional careers (e.g., Castle, 2006; Dunn, Harrison, & Coombe, 2008; Reis-Jorge, 2005).

As Darling-Hammond (2006) explains, expectations for teacher knowledge mean that programmes need not only to provide teachers access to more knowledge, considered more deeply, but also to help teachers learn how to continually access knowledge and inquire into their work.... Preparing teachers as classroom researchers and expert collaborators who can learn from each other is essential. (p.305)

A range of concepts in teacher education curricula have been designed to serve the concept of continuous professional renewal by educating students in the interpretation, execution, and use of research (Cooney, Buchanan, & Parkinson, 2001). By conducting

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research and practicing with a range of data-gathering methods, these students, or pre-service teachers, should be able to transfer into evaluative teaching practices more seamlessly (Dunn et al., 2008). However, the role of research in teacher education programmes is not yet clear and concepts such as research-driven, research-based, and inquiry-oriented, tend to be poorly defined or used interchangeably (Aspfors & Eklund, 2017; Gleeson, Sugrue, & O'Flaherty, 2017; Munthe & Rogne, 2015). Toom et al. (2010) suggest that research-based teacher education entails the study of research methods, conducting research, and writing a master's thesis (Hökkä & Eteläpelto, 2014; Maaranen, 2009), which in turn creates autonomous, reflective teachers who can base their pedagogical decision making on a theoretical foundation. By developing their knowledge of practice through research, pre-service teachers may "be empowered to make advancements in their professional, educational, and service provision" (Kilderry, Nolan, & Noble, 2004, p. 25). Research-oriented units in pre-service teacher education programmes accordingly may generate respect for the value of research and increase students' ability to evaluate research evidence more critically (Dunn et al., 2008). This paper focusses on pre-service teachers conducting research related to becoming a teacher, including literature reviews and research proposals, to demonstrate their knowledge of the content and methods of educational research.

In many teacher education institutes worldwide, including bachelor's as well as master's programmes, engaging with research, that may include learning to read and interpret published educational research or actually conducting research is a compulsory component (Dunn et al., 2008; Griffioen & de Jong, 2015; Van der Linden, Bakx, Ros, Beijard, & van den Bergh, 2015). However, while teacher educators endorse the need for pre-service teachers to engage in such research activities, many pre-service teachers seem to resist this component of their degree requirements (e.g., Krokfors et al., 2011; Ulvik, 2014; Van der Linden et al., 2015). Joram (2007) identifies one reason for this situation as emerging from clashing epistemologies between pre-service teachers and their educators, whereby educators typically consider research-based findings important for their students to learn, while pre-service teachers are not interested in this type of evidence and only want to learn how to teach, with the claim that "specific skills of teaching are the most important thing they should be learning" (p. 131). Other research affirms that pre-service teachers believe that conducting a research project takes time away from more practical aspects of the curriculum (Dunn et al., 2008). Pre-service teachers tend to be strongly influenced by the practicing teachers whom they meet during their in-school placements, and those practicing teachers often have little experience with conducting research, such that they may express apathetic or negative attitudes toward it (Dunn et al., 2008; Munthe & Rogne, 2015; Rinke & Stebick, 2013). Several studies conducted in Finland, where conducting research is required for bachelor's and master's theses, report that teacher candidates appreciate the research-based approach (Byman et al., 2009; Jyrhämä et al., 2008; Munthe & Rogne, 2015). However, Puustinen, Sääntti, Koski, and Tammi (2018) conclude that even if pre-service teachers recognise the programme goal to create "teachers as researchers," they are sceptical of the relevance of this goal for the teaching profession and do not always recognise a link between theory and practice. Newly qualified teachers in Finland and pre-service teachers in Norway find conducting research problematic, in that it interferes with their practice periods, due to time constraints (Ulvik, 2014), and they have difficulty identifying applications of research activities in their daily practice (Aspfors & Eklund, 2017).

Despite increasing attention to pre-service teacher research in teacher education programmes, reflecting its potential impact on

improving teacher quality and stimulating lifelong learning, resistance and negative attitudes toward research persist (Munthe & Rogne, 2015; Puustinen et al., 2018; Rinke & Stebick, 2013). Many reports rely on existing assumptions about the purpose and value of pre-service teacher research; few empirical studies explicitly investigate what teacher educators and pre-service teachers perceive as the purpose, value, and learning outcomes of such research requirements in teacher education programmes. Therefore, the aim of this study is to investigate the contributions of pre-service teacher research to the professional learning and development of pre-service teachers, by gathering insights into their perceptions and those of teacher educators of the purposes, learning outcomes, and value of pre-service teacher research.

Specifically, this comparative study analyses key stakeholders' views of pre-service teacher research, required in teacher education programmes in four institutes across two countries (the Netherlands and Australia). This work responds to Darling-Hammond's (2017) call for educators from various countries, with their different contexts, to learn from one another about what matters and what works to meet the high expectations of learning for pre-service teachers and their students. Accordingly, two educators, one from Australia and one from the Netherlands, worked together to build a deeper understanding of the value of pre-service teacher research by comparing the perceptions of both educators and pre-service teachers in different contexts, using both focus groups and questionnaires.

2. Nature of pre-service teacher research

To obtain a clear definition of pre-service teacher research, we first outline its purpose, as described in prior literature. Then we integrate practitioner research and inquiry as examples of teacher research, which are generally consistent with the expectations of pre-service teacher research (Cochran-Smith, Barnatt, Friedman, & Pine, 2009).

A rich body of research that describes the nature and meaning of teacher research (e.g., Cochran-Smith & Lytle, 2009; Elliott, 2004; Kemmis, 2009, 2010; Smith et al., 2009; West, 2011; Zeichner, 2003) distinguishes three major goals: (1) innovation, with a focus on one's own teaching practice or school issues; (2) contribution to the content knowledge of educational research, by filling gaps between research and teaching and transferring and integrating research into complex problems and one's own practice (Hammerness, 2006); and (3) professional development. Teacher research also might contribute to lifelong learning efforts, because it implies continuous revitalisation and renewal of teaching practices (e.g., Cochran-Smith & Lytle, 2009; Day, 1999; Elliott, 2004).

In turn, practitioner research - or practitioner inquiry- "refers to a variety of educational research modes [...], including action research, teacher research, narrative inquiry, [...] and the use of teaching as a context for research" (Cochran-Smith et al., 2009, p. 18). It takes an insider perspective, unlike conventional education research (Cochran-Smith et al., 2009), such that it is more closely linked to professional development. Practitioner research aims to understand and improve practices within the teacher's own, local context (Borko, Liston, & Whitcomb, 2007). Although practitioner research mostly has served professional learning purposes, it offers a range of potential outcomes, such as increasing teachers' knowledge and understanding of students (Butler & Schnellert, 2012; Jacobs, Yendol-Hoppey, & Dana, 2015; Levin, 2013; Rinke & Stebick, 2013), improving teaching practice (Ermeling, 2010; Levin, 2013), and fostering teacher empowerment and transformation (Esposito & Smith, 2006; Merino & Holmes, 2006). Learning how to conduct practitioner research also can lead to a more critical, reflective habit of mind, increase understanding of

scholastic culture, support adaptations of teaching to pupils' needs, encourage innovative methods, and prompt participation in professional learning communities (Cochran-Smith & Lytle, 2009; Dobber, Akkerman, Verloop, & Vermunt, 2012; Zeichner & Noffke, 2001).

For this article, we focus on pre-service teacher research as a form of practitioner research; the pre-service teacher is a practitioner, who uses intentional, systematic methods and a specified learning strategy to inquire into and improve his or her own practice (Cochran-Smith et al., 2009), ideally driven by curiosity and knowledge of some educational problem in a particular context (Jacobs et al., 2015). For teacher education, practitioner research represents a professional learning strategy, in the context of becoming a teacher, that aims to focus pre-service teachers explicitly on setting and achieving goals for student learning and underpinning their own practice with scientific knowledge (Dana & Yendol-Hoppey, 2014). The presentation of pre-service teacher research in teacher education settings varies from programme to programme, as Munthe and Rogne (2015) show in their review of pre-service teacher research in Finland, Norway, the United States, and Scotland.

3. Framework of the study

We examine pre-service teacher research in two country contexts, the Netherlands and Australia, chosen because of their similarities in qualification level (i.e., Australian Qualification Framework, 2013, p. 51; European Union, 2016; Vereniging Hogescholen, 2016), standards for teacher education (Australian Institute for Teaching and School Leadership, 2011; Onderwijscoöperatie, 2014), curricula, and learning outcomes for pre-service teacher research (as reflected in handbooks and programme descriptions of the participating institutes that we reviewed in 2016). The participating institutes in the Netherlands list the following goals for pre-service teacher research: an inquiry habit of mind, knowledge about and use of educational research, and skills to conduct research. Similarly, knowledge and skills to understand and conduct educational research are the main objectives of the pre-service teacher research projects in the Australian institutes. In all cases, the pre-service teachers must write a literature review and a research proposal, before collecting data and writing a report. In both countries, the research projects also are connected to practice.

On the basis of prior literature (e.g., Aspors & Eklund, 2017; Cochran-Smith & Lytle, 2009; Munthe & Rogne, 2015) and the aforementioned goals and knowledge areas for pre-service teacher research, we distinguish four main aspects of pre-service teacher research:

1. Research knowledge, or a broad understanding of a body of knowledge about education and research, as well as underlying theoretical concepts (e.g., Dana & Yendol-Hoppey, 2014; Jacobs et al., 2015; Munthe & Rogne, 2015; Sachs, 2016). Aspors and Eklund (2017) describe this aspect as an element of research competence.
2. An inquiry habit of mind, defined by Earl and Katz (2006) as a way of thinking to gain profound understanding, being reluctant to conclude, tolerating contradictions, looking from different perspectives, and continuously asking questions. Cochran-Smith and Lytle (2009) refer to it as "inquiry as stance," which includes being open to learn from one's own professional environment, as well as a fundamentally critical attitude. Van der Rijst (2009), whose work is regularly cited in Dutch higher education policy, articulates six characteristics of an inquiry habit of mind: a

tendency to be critical as well as wanting to understand, to share, to innovate, to know, and to achieve.

3. Applying research in practice, which Earl and Katz (2006, p.18) cite as being capable of "evidence-informed decision making" that requires not conducting research per se but rather making use of data available in previously published research (Imants, van Veen, Pelzer, Nijveldt & Van der Steen, 2010). Aspors and Eklund (2017) also mention "research-related teaching."
4. To conduct research, using skills such as analysing a problem related to practice, undertaking a literature review, formulating a research question, choosing and using research methods, collecting and analysing data, drawing conclusions, and writing a research report (Aspors & Eklund, 2017; Hökkä & Eteläpelto, 2014; Munthe & Rogne, 2015).

With the exception of some studies of research-based teacher education in Finland (e.g., Aspors & Eklund, 2017; Jyrhämä et al., 2008; Krokfors et al., 2011; Puustinen et al., 2018) and Reis-Jorge's (2005) contribution, few studies empirically investigate how teacher educators and pre-service teachers perceive and value pre-service teacher research. Moreover, recent findings suggest some ambiguous views among pre-service teachers (Puustinen et al., 2018). Therefore, the current study seeks to address the following research questions, applying the four main aspects of pre-service teacher research identified above, as a framework.

How do pre-service teachers and educators from Australia and the Netherlands perceive:

1. The purposes of pre-service teacher research?
2. The learning outcomes of pre-service teacher research?
3. The value of pre-service teacher research in teacher education programmes?

4. Method

4.1. Study design

We used a mixed methods approach, with emphasis on the qualitative data collected in focus groups with additional data from questionnaires, which are complementing as well as confirming (Small, 2011). This combination of qualitative and quantitative approaches provides a more complete understanding of the research problem than either approach alone (Creswell, 2014, 2016).

We used a comparative, multiple-case replication design, with eight cases: Four cases from Australia and four from the Netherlands. The cases consisted either of pre-service teacher or teacher educators. We believed two $\times$ four cases to be literal replications, such that we predicted similar results (Yin, 2014), due to their similarities in focus, structure, and culture, in terms of pre-service teacher research across the four Dutch cases and the four Australian cases. However, acknowledging the aforementioned differences, we also considered the Australian and Dutch cases theoretical replications and predicted some contrasting results. In line with prior studies (e.g., Joram, 2007; Munthe & Rogne, 2015; Puustinen et al., 2018), we also expected differences in perceptions between teacher educators and pre-service teachers. We have chosen for focus groups to gain a deeper understanding of the various perceptions of and experiences with pre-service teacher research, because semi-structured focus group interviews can provide insights into how people think (Puchta & Potter, 2004). The group interactions among members encouraged participants to speak candidly and make connections with various concepts through discussions, which might not have occurred during

individual interviews (Vaughn, Schumm, & Sinagub, 1996). The questionnaire was meant supplementary and served four purposes: (1) to prepare participants for the content of the focus group, (2) to compare individual answers of participants, (3) to compare individual answers with the answers gathered in the focus group, and (4) to take along perceptions from eleven pre-service teachers, who were not able to attend the focus group (see Table 1).

4.2. Institutes and participants

We invited four institutes of teacher education to participate in this study: two from Melbourne, Australia, where the first two authors collaborated and the second author resides, and two from the Netherlands, the home country of the first and last two authors. In all four participating institutes, pre-service teacher research is a substantial requirement, accounting for 17%–25% of the credits of the final year of the teacher education course to meet graduation requirements. In all these institutes, the final research project is connected to the professional experience or practicum and divided in two parts: the first focussed on writing a research proposal, including a literature review, and the second dedicated to the collection of data and writing and presenting the research.

The programme descriptions published by the four institutes also reveal some differences. The Dutch students spend more time in school than the Australian students. In their final year, the Dutch pre-service teachers teach their own student group autonomously, for three days a week for 20 weeks, and during this period, they also spend an additional day in the school for their pre-service teacher research. In contrast, the Australian pre-service teachers spend three to six weeks full-time in the school, combining teaching and data collection efforts. All descriptions of pre-service teacher research in the participating programmes emphasise to conduct research most out of the four main aspects, mentioned in the theoretical framework. Characteristics of an inquiry habit of mind are mentioned explicitly in the Dutch programmes, while in the Australian programme this aspect gets less attention.

We invited teacher educators from the four institutions to participate. These informants were directly involved in teaching, supervising, or designing the programme for pre-service teachers that included a component of pre-service teacher research in the final part of the teacher education course. All twenty-six educators, directly engaged with pre-service teacher research in the four institutes, agreed to join the study, by participating in the focus groups (see Table 1). The participating teacher educators in each institute invited pre-service teachers to participate in this study about pre-service teacher research, requiring that they were in the final part of their initial teacher education and had finished their pre-service teacher research course requirements. We requested to use no other selection criteria. Information about the amounts of invited pre-service teachers is not available. Seventeen pre-service teachers across the two countries participated in the focus groups

(Australia = 6; Netherlands = 11) and another eleven pre-service teachers across the two countries, who were not able to join the focus groups due to the planned times of the meetings, completed the questionnaire. Table 1 provides a summary of the study methods and numbers of participants in the eight cases. All educators and pre-service teachers participated voluntarily and gave informed consent. Throughout this article, we use pseudonyms for all participants.

4.3. Data collection

4.3.1. Focus groups

In each of the four institutes we organised one focus group interview with the teacher educators and one with the pre-service teachers (see Table 1 for the number of participants). We started each of the focus groups with an explanation of the study, an overview of the theoretical background, and the meaning of a focus group. Participants were invited to introduce themselves and, in case of the pre-service teachers' focus groups, each participant briefly explained the topic of their own teacher research. The central question for discussion in the focus groups was: "Why do you think pre-service teacher research is part of your programme of initial teacher education?" In the Dutch focus group of teacher educators with 12 participants, we invited each participant to first make some notes about their own perceptions before the collective oral exchange. During discussions of the central question in the focus groups, we directed the conversation toward participants' perceptions of the purpose of pre-service teacher research (RQ1). To prompt statements about learning outcomes (RQ2) and the value of pre-service teacher research (RQ3), we either relied on the initial, central question or asked other, in-depth questions, such as "What did you learn from conducting research?" with gentle follow-up probes, such as "Why do you think so?" to fully explore participants' ideas. In all focus groups, we emphasized that we would prefer a discussion rather than question and answer session, and that the participants should not hesitate to voice their possible different viewpoints.

We held these focus groups in the Netherlands in June 2016 and in Australia in November 2016. The focus groups with pre-service teachers lasted approximately one hour, whereas those with teacher educators averaged one and a half hours. We video recorded, transcribed, and analysed all focus groups with the help of Atlas.ti. To establish consensus, the first three authors discussed the coding of the Australian focus groups. After general consensus was reached, the codes were applied to the Dutch transcripts correspondingly.

4.3.2. Questionnaires

One week before each focus group, all participants received a questionnaire that contained items asking about their perceptions of pre-service teacher research. All pre-service teachers in the focus groups completed the questionnaire. Nine participating educators (35%) did not complete the questionnaire, because of a lack of time.

The questionnaire is based on a validated Dutch instrument (Mathijssen, Joosten-ten Brinke, Krol, Kools, & Bolhuis, 2012), developed to evaluate the attitude of pre-service teachers toward student research. This instrument refers to four broad perceptions: (1) attitudes toward pre-service teacher research (14 items), (2) the perceived purposes of pre-service teacher research (5 items), (3) the perceived ability of pre-service teachers to conduct research (6 items), and (4) the expectation that pre-service teachers will conduct research in their future profession (7 items). Twenty-six percent of the items were negatively formulated and therefore reverse scored, for example: "Conducting research is a compulsory component of the degree programme but I do not understand how

Table 1
Methods and number of participants.

Focus	Method	Australia	The Netherlands
		Case AU 1 & AU 2	Case NL 1 & NL 2
Perception TEs	Focus group	AU 1: 5 TEs	NL 1: 7 TEs
		AU 2: 2 TEs	NL 2: 12 TEs
	Questionnaires	AU 1: 3 TEs	NL 1: 6 TEs
		AU 2: 2 TEs	NL 2: 6 TEs
Perception PSTs	Focus group	AU 1: 3 PSTs	NL 1: 8 PSTs
		AU 2: 3 PSTs	NL 2: 3 PSTs
	Questionnaires	AU 1: 6 PSTs	NL 1: 8 PSTs
		AU 2: 10 PSTs	NL 2: 4 PSTs

Note: TEs = teacher educator; PSTs = pre-service teachers.

it is useful for a teacher”.

For RQ1, we used measurement items from the second area; for RQ2, we relied on the efficacy items from the third category. Finally, for RQ3, we linked seven attitude items from the first area with four items about future predictions from the fourth area, as well as four other items (e.g., “Research fits naturally into the work of a teacher”). The instrument provides six-point Likert scales, so participants must choose positive or negative responses (i.e., fully disagree to fully agree). Three open questions also asked about the most important learning outcome, the value of pre-service teacher research, and other terms that come to mind about conducting research.

4.4. Data analysis

We began this study with within-case analyses, observing consistency in the formulation of the purposes for pre-service teacher research, according to the results from both the focus groups and the questionnaires. The questionnaires were meant to provide additional data and low numbers led us to use only descriptive statistics in SPSS. Next, we conducted cross-case analyses to enhance the generalizability of our findings about the perceived purpose, learning outcomes, and value of pre-service teacher research, as well as to look for potential transferability to other contexts (Miles, Huberman, & Saldana, 2014).

In the exploration phase of the analysis, we started inductively and separately coded quotes related to the purpose, learning outcomes, and value. For example, we applied a “value” code when direct quotes explicitly mentioned value, as well as to answers to the question “What do you think about pre-service teacher research?” or perceptions not directly related to the purpose or learning outcome, such as the following excerpt: “It was a way to connect on a professional level and she [the mentor teacher] was able to see what kind of a learner I am and what I am interested in” (PST AU1).

For the cross-case analysis, we used a replication strategy (Yin, 2014), beginning with two Dutch cases from the same institute; one case with pre-service teachers and one with teacher educators. Then we examined the other six cases to look for similar and different patterns in perceptions of purposes, learner outcomes, and value of pre-service teacher research, ultimately ending with a list of codes related to one or more of the cases. In the second cycle, we refined our pattern codes by using the code co-occurrence tool and various codes from primary document tables in Atlas.ti (Friede, 2014) to look for similarities and differences and address the research questions. Subsequently, to connect our data with prior literature, we moved from an inductive case-oriented approach to a more deductive, variable-oriented approach (Miles et al., 2014), using the four aspects related to pre-service teacher research: (1) research knowledge, (2) inquiry habit of mind, (3) applying research in practice, and (4) conducting research. We analysed the qualitative data from the focus groups and quantified them to a certain extent, to be able to “discern and to show regularities or peculiarities in the qualitative data we might not otherwise see, or to determine patterns or idiosyncrasy” (Sandelowski, Voils, & Knaf, 2009, p. 210). We calculated the relative frequencies of the codes referring to purposes within the cases, to specify the distribution of attention to various purposes of pre-service teacher research in the focus groups. We acknowledge the limitations of these “quasi-statistics” (Becker, 1990) but regard such quantitative information as a necessary complement to the qualitative information gathered from the data (Maxwell, 2010). First, the quantitative information about percentages of code frequencies increases internal generalizability and comparability between the focus groups with different numbers of participants; second, with these quantitative data, we

can identify and characterize diverse perceptions in the groups/cases studied; and third, we can show that we were not “cherry-picking our data for instances that support our interpretations” (Maxwell, 2010, p. 478). Finally, we analysed similarities across all cases and sought to explain the differences, using quotes from the participants, the case contexts, and our theoretical background.

5. Results

We present the results, according to our study design (Table 1) and research questions. That is, we start by describing the cross-case analysis of the perceived purposes (RQ1), followed by the attained learning outcomes (RQ2). We end with findings about the value of pre-service teacher research (RQ3). The similarities between pre-service teachers and educators within each country are greater than the similarities between countries. Therefore, we merged the quantitative data from the Australian institutes, and then the quantitative data from the Dutch institutes.

5.1. Perceived purposes of pre-service teacher research

5.1.1. Perceived purposes in focus groups

The key question in the focus groups was: “Why do you think pre-service teacher research is part of your programme of teacher education?” We also asked participants to elucidate what they thought to be the most important purpose/s of pre-service teacher research. Table 2 categorizes their answers according to the four aspects of pre-service teacher research we described earlier (research knowledge, inquiry habit of mind, applying research in practice and conducting research), as well as some other mentioned purposes. Most focus group responses about the purpose of pre-service teacher research match the four purposes mentioned previously. For example, responses such as “to solve problems,” “to connect theory and practice,” and “to improve own practice” fit the purpose of applying research in practice. Some answers did not connect with any of the four aspects but still seemed relevant for the perceived purpose of pre-service teacher research, such as “to use it as a learning strategy,” “to innovate education (incl. To construct knowledge),” and “for academic qualifications.”

In general, the similarities in perceived purpose among teacher educators across the four institutes are high. An inquiry habit of mind (or its synonyms) is mentioned most frequently, sometimes combined with the purpose of connecting theory and practice. For example, Ethan (TE AU2) explained, “I think the research project and the inquiry nature of it ... deepened their thinking. I think that might stay with them in practice.” Similarly, Jan (TE NL1) noted, “It’s a great tool to connect theory and practice. To push students into a thinking mode. The critical disposition is very important.” In the focus groups, the educators and pre-service teachers rarely mentioned gaining research knowledge as a purpose, with the exception of a few educators from Australia. The pre-service teachers noted that they use it as a learning strategy and mentioned being able to conduct research, but they pointed to an inquiry habit of mind as the most important purpose. For example, Jack (PST AU2) reflected, “The main purpose? It’s supposed to give us a critical thought process what we do as teachers.” Similarly, Els (PST NL1) noted the most important purpose was “to learn to look critically and to take a step backwards.”

An interesting difference between the educators of the two countries is that the Australian educators mentioned that pre-service teacher research is designed to be a learning strategy; for example, Ella (TE AU2) commented: “What I wanted – hoped – this project would do is to give people the opportunity to bring together some aspects of the programme in a way that helps them to move

Table 2

Perceived purposes of pre-service teacher research (percentages, based on number of codes).

	Teacher educators		Pre-service teachers		TOTAL # codes about purpose
	AU	NL	AU	NL	
	N = 7	N = 19	N = 6	N = 11	
Inquiry habit of mind	28%	32%	24%	15%	60
To apply research in practice					
• To improve own practise	12%	10%	19%	4%	25
• To connect theory and practice	9%	5%	5%	6%	15
• To solve problems	0%	5%	0%	6%	7
To be able to conduct research	12%	16%	19%	23%	39
To gain research knowledge	13%	7%	5%	0%	16
Other:					
• To use it as a learning strategy	18%	4%	14%	25%	33
• To innovate education	4%	18%	12%	8%	25
• Academic qualifications	4%	3%	2%	13%	12
Total # codes	100%	100%	100%	100%	232
	68	74	42	48	

Note: The percentages of the two most frequent mentioned purposes per case are in **bold**.

forward. And thinking about this move forward, they might use some of it into their teaching itself." In contrast, Dutch educators aimed to innovate in education through pre-service teacher research, such as when Roel (TE NL1) expressed "that schools notice the value of practitioner research. We would like to develop learning communities with teacher educators, pre-service teachers and teachers who deal with research questions and burning issues connected to the school practice. Innovative."

5.1.2. Perceived purposes in questionnaires

In the questionnaires, respondents provided their perceptions of the purposes of pre-service teacher research. As Table 3 shows, responses to the questionnaire items related to perceived purposes all show a mean of 4.2 or higher on the six-point Likert scale. That is, educators and pre-service teachers both acknowledge the cited purposes of pre-service teacher research.

5.2. Perceived learning outcomes

5.2.1. Perceived learning outcomes in focus group

In the focus groups, both Dutch and Australian pre-service teachers clearly identified a range of learning outcomes gained from conducting research. The Dutch pre-service teachers mainly mentioned aspects that have to do with conducting research, such as writing a proposal and using a research cycle. Both Australian

and Dutch pre-service teachers emphasized how much and what they have learned regarding an inquiry habit of mind, as illustrated in the following excerpt from a focus group with pre-service teachers from AU1, in which Zoe and Lilly describe looking more critically at practice and the drive to improve their own practice:

Zoe: "I just know that, when I go into a classroom, I can't stop my mind thinking. I think all the time things like: why is she doing that, I would have done it like this, I wonder if this is a different approach. I feel, after I have done this [research] course, I can't go into a classroom without trying to improve things."

Lily acclaims: "Yes!"

Interviewer: "Because of this research course?"

Both pre-service teachers: "Yeah, pretty cool."

Lily: "Critically think ...."

Interviewer: "And that wasn't before?"

Zoe: "No."

Lily: "Well I think it was there before, but now we've got more knowledge, more tools. This went more in depth."

Joost, a Dutch student (PST NL1), mentioned similar learning outcomes: "I did this pre-service teacher research to tick the last box, to graduate, but I know I have learned a lot! For example, this inquiry habit of mind. I have become a better teacher, because I have conducted research; I think more critically."

Table 3

Responses to "What do you think about pre-service teacher research?" (Means in six-point Likert scale, 1 = "I fully disagree" to 6 = "I fully agree").

Pre-service teacher research	Teacher educators		Pre-service teachers	
	AU	NL	AU	NL
	N = 5	N = 12	N = 16	N = 12
... helps students acquire systematic insight into practical problems	5.0 SD = 0.8	5.2 SD = 0.8	5.3 SD = 0.7	5.0 SD = 0.6
... is a good way to increase their level of professionalism	4.5 SD = 1.3	5.0 SD = 0.7	5.2 SD = 0.8	4.8 SD = 0.6
... is a good way to improve pedagogical skills	5.0 SD = 1.2	5.3 SD = 0.7	5.2 SD = 0.8	4.8 SD = 0.9
... is a good way for students to demonstrate that they have acquired bachelor/master level skills	4.4 SD = 0.9	4.8 SD = 0.7	4.3 SD = 1.2	4.5 SD = 1.0
... increases the student's inquiry habit of mind	5.0 SD = 1.0	4.3 SD = 1.1	4.9 SD = 0.7	4.6 SD = 0.9
Conducting research is a compulsory component of the degree programme but I do not understand how it is useful for a teacher*	4.2 SD = 0.8	5.3 SD = 0.9	5.0 SD = 1.1	4.6 SD = 1.3

Note: * = reversed scored.

5.2.2. Perceived learning outcomes in questionnaires

Both educators and pre-service teachers reported a range of learning outcomes in the questionnaires and focus groups. One area of the questionnaire was devoted to the perceived ability of pre-service teachers to conduct research ($\alpha = 0.77$). All questionnaires completed by the educators from both the Dutch and Australian institutes ($N = 17$) reveal high scores in this area, with a mean of 4.4 ($SD = 0.63$). These educators believe students have learned to design and conduct practitioner research. They express positive ideas about the experienced learning outcomes of pre-service teachers in terms of their use of practical knowledge as a teacher, gained through their research. The questionnaires completed by pre-service teachers ($N = 27$) reveal very high scores on their perceived ability to conduct research ($\alpha = 0.87$), with a mean of 5.0 ($SD = 1.1$) on the six-point scale.

In terms of the most important learning outcome, the pre-service teachers' answers to the open question revealed several aspects related to how to conduct research, linking theory to practice, and an inquiry habit of mind, such as "learning how to be a reflective teacher" (PST AU) or "learning to be open-minded, without a tunnel vision" (PST NL). Multiple educators offered similar responses, including "to gain an understanding of the connection between theory and practice" or "to develop a critical disposition."

5.3. Perceived value of pre-service teacher research

5.3.1. Perceived value in focus groups

In the focus groups, pre-service teachers and educators explained why they thought pre-service teacher research was valuable. We can distinguish two main categories of value in these responses: as a tool for professional development and for empowerment. All participants identify pre-service teacher research as an adequate tool for professional development. For example, Ethan (TE AU2) explains, "I think a lot of them have actually never done something like this before. Learning by action. This is sort of what's learning's all about. Doing this and how exciting it is (that's why we all do it). And how that can sustain your professional work like teaching." Others regard pre-service teacher research as a professional development tool, not just for the pre-service teachers but for their mentors too. Ella (TE AU2) reveals, "Then it feels as a false idea about promoting research, ... and research-led things and evidence based and all that talk around that .... Research seems to be restrictive rather than expansive and so I wanted to have that teachers perceived the research that our students were doing, compared to their own experiences that they got an idea what research does, or is not, or what is possible." Some even note benefits for the teacher educators, as evidenced by Kees (TE NL 1): "If we start communities of learners about research, we can improve practice on the schools and feed our own professional development as well. That is our dream!"

Several responses from both educators and pre-service teachers identify empowerment as a second important perceived value of pre-service teacher research. For example, Andrew (TE AU 1) talks about a specific form of empowerment, namely, the ability to question standard procedures: "When I first started as a teacher educator, I thought that students didn't need to do or know too much research, they need to learn how to teach! Now, I am of the view that if we don't start helping them understanding the importance of research ... then at the time they learn to teach ... They will be all replicating the system, and that's not what we want." Similarly, Bram (TE NL 1) notes: "I can see the just-graduated students: embracing uncertainties with experience. They now do have the choice not to follow standards and methods slavishly." Zoe (PST AU 1) affirms this sentiment: "It stops teachers of getting into

this rut of staying the same, 'This is the way that we've always done it!' ... Now what we've got are basic tools, we're able to conduct research ... so I can provide it to the school and give a better example." None of the pre-service teachers use the term empowerment specifically, but they clearly refer to it; for example, Loes (PST NL 2) comments: "It's an eye-opener to look at different perspectives of one problem and think how I should ... use theoretical concepts. It develops my opinion and passion about [my] own topics!"

Both educators and pre-service teachers also mention a value of the pre-service teacher research that they experienced *during* the project, in that it provides a valuable communication tool. Chloe (TE AU1) explains: "It was also valuable, they [pre-service teachers] felt that they had to talk with teachers and principals about this research project. It made them feel that they had something to offer." Both Dutch and Australian pre-service teachers confirm this notion. As Els (PST NL 1) says, "Through the pre-service teacher research, I made a change from student teacher to colleague." Zoe (PST AU1) also notes, "It was a way to connect on a professional level and she [supervising teacher] was able to see what kind of a learner I am and what I am interested in."

Surprisingly, both Australian and Dutch pre-service teachers also indicate that they did not expect to conduct research in their future jobs — at least not in the way they learned during their teacher education course. As Lily (PST AU1) explains, "I don't want to go to a school where I have to do a research [project]. Then it will be a bit too much pressure." Zoe (PST AU1) adds: "Not this formal way, but I would like a kind of reflective practise about my own teaching in some areas to improve it." All the participating pre-service teachers in NL1 agree that they learned a lot and believed they were better teachers because of the pre-service teacher research, but none of them thought they would conduct research formally in the future. According to Pien, (PST NL1) "I would never conduct research again the way we did in teacher education," though Els (PST NL1) acknowledges, "I would like to work with colleagues with an inquiry habit of mind though and to share findings."

When we asked, "What makes pre-service teacher research in the programme valuable?" all the pre-service teachers mentioned the connection to practice. That is, pre-service teacher research is valuable because it is a way to learn to connect theory and practice. In the Netherlands, more assignments in initial teacher education link directly to the pre-service teachers' own practice than in the Australian institutes, but all participating pre-service teachers still appreciate the link between the pre-service teacher research and their practice.

Most educators and pre-service teachers consider pre-service teacher research a valuable part of teacher education because they were allowed to choose their own topics, in which they were interested, which encouraged the development of their teacher identity. For the Australian students, these units were the first in which they had influence over the content. Zoe (PST AU1) explains, "It's important that we could choose our own topics, because we can also use it for job interviews. This is who I am. This is where I'm into and this is a proof; there's a whole thesis on it." Correspondingly, Nel (PST NL2) mentions, "Because we could choose our own topic, I was curious .... Then, you can get the best out of yourself and show the school who you are as a teacher and as a researcher."

5.3.2. Perceived value in questionnaires

In the questionnaire for pre-service teachers, 15 items were linked to perceived value ($\alpha = 0.87$), and the results reveal that they express positive attitudes toward pre-service teacher research; the mean is 4.4 ($SD = 0.63$) on the six-point scale. However, 9 of the 28 respondents do not agree with the statement, "I find conducting

research to be fun.” Five items linked to the future ($\alpha = 0.79$), such as “I would really like to conduct research in my future job as a teacher,” also evoked positive perceptions. The mean was 4.0 ($SD = 0.94$), though two Dutch and two Australian pre-service teachers scored 1 or 2 on these items.

For the open question about the value of pre-service teacher research, 10 of the 28 pre-service teachers completed it, offering answers that contained words such as “useful,” “very important, to improve practice,” and “crucial.” One Australian pre-service teacher wrote: “Research is an integral component of any profession, particularly in such a complex field as education” (PST AU2). The educators also indicated, in their responses to this open question, the value of pre-service teacher research, explaining the need for pre-service teachers to “see the link between practice and theory, the importance of inquiry, research and action” (TE AU1) and “That they think before they do, and ask critical questions to people and literature” (TE NL1).

Finally, the last open question (“Are there other terms, related to conducting pre-service teacher research, that come to mind? If so, which?”) prompted responses from half of the pre-service teachers, who offered answers such as “frustrating,” “stressful,” “exhausting,” and “indifferent,” but also “helpful,” “insightful,” and “mind-opening.” Thus, not all answers were thoroughly positive. As one educator wrote: “Without friction, no shine!” (TE NL1).

6. Discussion and conclusion

With this study, we sought to gain insight in the role of pre-service teacher research by mapping the perceptions of pre-service teachers and teacher educators in two different country contexts, reflecting on the purposes, learning outcomes, and value of pre-service teacher research. We mapped these perceptions against four aspects of pre-service teacher research derived from prior literature (e.g., Aspörs & Eklund, 2017; Cochran-Smith & Lytle, 2009; Munthe & Rogne, 2015): (1) research knowledge, (2) inquiry habit of mind, (3) applying research in practice, and (4) conducting research. All the pre-service teachers and educators in the investigated contexts stated their belief that an inquiry habit of mind is the main purpose of pre-service teacher research even though this aspect is not explicitly described in the Australian programmes. This finding is in line with Cochran-Smith and Lytle (2009), who cite the importance of a fundamentally critical attitude and an open mind to learn from one's own professional environment. We acknowledge that pre-service teachers in other institutes, involved in a programme that is just focused on research knowledge, might not have mentioned characteristics of an inquiry habit of mind as a main purpose.

Other important purposes that pre-service teachers mentioned were “to be able to conduct research” and “to improve [their] own practice.” The latter is a form of applying research in practice and is widely identified as a goal of practitioner research by teachers (Ermeling, 2010) and by doctoral students who plan to become teacher educators (Jacobs et al., 2015). Gaining knowledge about research is not explicitly mentioned by the participants as a purpose.

An interesting difference emerged in the perceptions of Australian and Dutch educators regarding the purposes of pre-service teacher research. The former group mostly emphasized the need to “develop a professional learning strategy,” while the latter indicated the need for “innovation of education,” though one teacher educator also acknowledged that such innovation remained a vision, or “our dream.” Penuel et al. (2017) make a distinction among different uses of research such as “conceptual” and “instrumental.” In this light, the Australian teacher educators seem to perceive pre-service teacher research more in an

instrumental way, while the Dutch teacher educators report a more conceptual use. Innovation of education is also cited as a key goal of teacher research by international researchers (e.g., Cochran-Smith & Lytle, 2009; Elliott, 2004; Kemmis, 2009), and recent studies in the Netherlands report a positive connection between practice-based research and school development (Schenke, 2015). Some participating Dutch teacher educators work with academic professional development schools, which are supported by the government. In these schools, university teacher educators, teachers, and pre-service teachers collaborate to conduct practitioner research projects. The aim of these projects is to improve educational practice by sharing results and creating a research culture in the schools (Schenke & Heemskerk, 2016). Within these projects though, the purpose for the participating pre-service teachers is not to become innovators or researchers but rather to use the research project as a learning strategy, in the context of becoming a teacher (cf. Cochran-Smith et al., 2009).

The perceived learning outcomes identified by pre-service teachers in both countries are in line with the perceived purposes of research as we described earlier. The most important outcomes they mentioned included various characteristics of an inquiry habit of mind (Van der Rijst, 2009), that is, to be open-minded and critical, wanting to share, trying to improve and innovate, and how to be a reflective teacher. Pre-service teachers reported that they are able to apply and conduct research after finishing their pre-service teacher research projects, have gained more knowledge about research (i.e., a broad understanding of a body of knowledge about education and research, and theoretical concepts), and are able to connect this research knowledge with practice. This outcome was also reported by the teacher educators in both countries. Interestingly though, across the multiple institutes, the participating pre-service teachers did not expect to conduct research in their future teaching jobs.

This study reveals similarities in the perceived value of pre-service teacher research among educators and pre-service teachers in four teacher education institutes across Australia and the Netherlands. All participants stated a belief that performing research is important, or even very important, in the process of becoming a teacher, even though one-third of the pre-service teachers indicated that they did not enjoy the research, and some cited negative feelings, such as frustration and stress. These feelings might have influenced their learning processes as well, congruent with findings in research about inquiry-based learning (Kuhn, Black, Keselman, & Kaplan, 2000). If pre-service teachers lack the necessary research skills, conducting a research project could be counterproductive, leading to frustration and a sense that educational practice is too hard or not worth trying to understand. But if pre-service teachers overcome these frustrations and are able to learn these skills, they “come to understand that they are able to acquire knowledge they desire, in virtually any content domain, in ways that they can initiate, manage, and execute on their own, and that such knowledge is empowering” (Kuhn et al., 2000, p. 497). This outcome corresponds with “wanting to achieve” as one of the characteristics of an inquiry habit of mind (Van der Rijst, 2009).

Although in the questionnaires, the pre-service teachers were generally positive about the effects of conducting pre-service teacher research on their future jobs and indicated that they would prefer to work in school contexts where other colleagues share an inquiry habit of mind, in the focus groups, they admitted that they did not want to continue conducting formal research, similar to the results of a study by Griffioen (2018). This outcome might relate to the compulsory requirements for pre-service teachers to prove their research competency—for example, having to write a literature review, a proposal, and a report, which are time consuming and demanding (Maaranen, 2009; Reis-Jorge,

2007)—or to the lack of a research-oriented culture or knowledge at most schools (Gitlin, Barlow, Burbank, & Kauchak, 1999; Yuan & Burns, 2017).

This study also distinguishes two main categories of the perceived value of pre-service teacher research. The first, and most obvious, is that it is a professional development tool (BERA-RSA, 2014; Sachs, 2016). In this study, pre-service teachers and teacher educators confirmed that conducting practitioner research contributes to the development of reflective practice at the individual level, as well as more generally to the improvement of the teaching profession. This finding aligns with research by Dunn et al. (2008) and Reis-Jorge (2005) about perceptions of research from bachelor students. In this study, pre-service teachers in both countries indicated that they learned to think critically and to link theory and practice by conducting practitioner research. The second category of perceived value emerging from this study refers to empowerment. None of the pre-service teachers used the term empowerment itself, but they explained that by conducting research, they gained a sense of being able to make their own choices about various issues in their practice, use theory to support these choices, and share new insights with colleagues. This is in line with research of Penuel et al. (2017) about school leaders. Pre-service teachers have the perception that they have learned to use research in an instrumental way, which they do not expect to continue in their teaching profession, yet they do see the value of the conceptual use of research: “to expand their conceptions of problems and to persuade others of particular points of view” (Penuel et al., 2017, p. 14).

The teacher educators in both countries stated that pre-service teacher research provides a means for pre-service teachers to develop skills to think and act critically and independently and to communicate their thoughts and findings. As a result of this communication about education, pre-service teachers can feel more connected to their colleagues on a professional level, even as early as during their research project. Pre-service teachers also identified that choosing their own topic for their research project is important, because it gives them an opportunity to focus on their own interests and who they wish be as a teacher and researcher. In this sense, pre-service teacher research shapes pre-service teacher identity, and it seems that identity shapes research.

6.1. Limitations

Because of the small sample size in this mixed methods study, external validity is low, and therefore generalisations should be made with caution (Kirk & Miller, 1986). Only four institutes of teacher education (two Australian and two Dutch) participated. This sample is not meant to be representative of teacher education institutes in these countries, let alone teacher education institutes, teacher educators, or pre-service teachers in general. Although all of the participants in this study were involved in the type of programme in which it was feasible to conduct a research project, this may be difficult in some other types of teacher education programmes, in which academic training is not included. We addressed internal validity concerns through triangulation, such that we used questionnaires and focus groups with people from various contexts and with different perspectives, all focussed on the same research questions.

Regarding the teacher educators, all of those involved in supervising pre-service teacher research in the participating institutes were invited and agreed to participate in the study. However, while all pre-service teachers were invited, not all chose to participate, so these participants may represent a biased sample; they might have been more positive or more negative about pre-service teacher research than average. In any case, all participants

seemed to feel free to speak openly and truthfully; some of the pre-service teachers indicated that they did not like the pre-service teacher research, and all admitted that they were not looking for a job that required both teaching and conducting research.

Another possible limitation is the language used in the focus groups, especially for defining an inquiry habit of mind. In the participating Dutch institutes, an inquiry habit of mind is described in the learning outcomes of the programme, and pre-service teachers are familiar with this terminology. Although the Australian pre-service teachers had never used this term before, they spontaneously mentioned various characteristics of the inquiry habit of mind (Van der Rijst, 2009) in the focus groups and seemed to understand its meaning after the explanation in the introduction of the focus group.

6.2. Implications and further research

In contrast with previous research (e.g., Joram, 2007; Maaranen, 2009; Puustinen et al., 2018), all educators and pre-service teachers in our study perceived pre-service teacher research as very important. Attitudes towards research expressed in the focus groups also were mostly positive, though some pre-service teachers expressed frustration. Pre-service teachers mentioned that they thought it was valuable to choose their own topics and connect the research project to their practice (Maaranen, 2009). These findings identify an inquiry habit of mind as the most important purpose and learning outcome. Explicit attention to the inquiry habit of mind in teacher education might stimulate this stance of pre-service teachers in their future profession.

Because the pre-service teachers indicated in the focus groups that they did not expect to continue conducting research in their future job, continued research should seek deeper insights into their reasons. Follow-up studies with cohorts of pre-service teachers from the institutes could investigate when, how, and if they conduct research, as well as whether their views about research change as they enter the workplace or take over supervision of student teachers themselves. To build a research-oriented culture and to stimulate an inquiry stance among teachers, collaboration between teachers, pre-service teachers and teacher educators/researchers in schools might play an important role. Conducting practitioner research together, could be an appropriate form of lifelong learning and innovation of educational practice (e.g., Schenke & Heemskerk, 2016; Uiterwijk-Luijk, Krüger, Zijlstra, & Volman, 2017). This also could stimulate the effective utilisation of academic knowledge and the professional development of in-service teachers (Van Schaik Volman, Admiraal & Schenke, 2018). Future research into the impact of such activities on the inquiry habit of mind of teachers will be important to be able to prepare students, pre-service teachers and teachers for a changing world.

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