Research Bank
Journal article

Researching teacher educators' preparedness to teach to and about diversity : Investigating epistemic reflexivity as a new conceptual framework

Lunn Brownlee, Jo, Rowan, Leonie, Ryan, Mary, Walker, Sue, Bourke, Terri and Churchward, Peter

Researching teacher educators' preparedness to teach to and about diversity:

Investigating epistemic reflexivity as a new conceptual framework.

Jo Lunn[1], Leonie Rowan[2], Mary Ryan[3], Sue Walker[1], Terri Bourke[1] & Peter Churchward[1]

[1]QUT, [2]Griffith University, [3]Macquarie University

Jo Lunn. (Corresponding author) Queensland University of Technology.

Post: Victoria Park Rd Kelvin Grove QLD 4059. Phone: +61 7 3138 3333.

Email: j.lunn@qut.edu.au

ORCiD ID: https://orcid.org/0000-0003-2929-4770

Leonie Rowan. Griffith University. Post: School of Education and Professional Studies, Gold Coast campus, Griffith University, QLD 4222. Phone: +61 7 5552 8144.

Email: l.rowan@griffith.edu.au

ORCiD ID: https://orcid.org/0000-0001-7017-0492

Mary Ryan. Macquarie University.

Post: Macquarie University NSW, 2109, Australia. Phone: +61 2 9850 8059.

Email: mary.ryan@mq.edu.au

ORCiD: https://orcid.org/0000-0003-2237-9368

Sue Walker. Queensland University of Technology.

Post: Victoria Park Rd Kelvin Grove QLD 4059. Phone: +61 7 3138 3195.

Email: sue.walker@qut.edu.au

ORCiD ID: https://orcid.org/0000-0002-7267-9978

Terri Bourke. Queensland University of Technology.

Post: Victoria Park Rd Kelvin Grove QLD 4059. Phone: +61 7 3138 3289.

Email: theresa.bourke@qut.edu.au

ORCiD: https://orcid.org/0000-0001-7298-9637

Peter Churchward. Queensland University of Technology.

Post: Victoria Park Rd Kelvin Grove QLD 4059. Phone: +61 7 3138 2000.

Email: pg.churchward@qut.edu.au

ORCiD ID: https://orcid.org/0000-0002-1592-1836

Researching teacher educators' preparedness to teach to and about diversity:

Investigating epistemic reflexivity as a new conceptual framework

Jo Lunn[1], Leonie Rowan[2], Mary Ryan[3], Sue Walker[1], Terri Bourke[1] & Peter Churchward[1]

[1]QUT, [2]Griffith University, [3]Macquarie University

Abstract

There is growing international concern about the extent to which teachers are prepared to work with an increasingly diverse student (and community) population. To date, research into the relationship between teacher preparation and preparedness to teach diverse learners has not focused on teacher educators' understandings about teaching to/about diversity. Such understandings can be informed by epistemic aspects of professional work. Epistemic cognitions (cognitions about knowledge and knowing) allow professionals to generate perspectives necessary to tackle new and old challenges.

The social lab reported in this paper investigated 12 Australian teacher educators' perspectives about teaching to/about diversity using the 3R-Epistemic Cognition (EC) framework. The findings showed that the 3R-EC framework could be useful for capturing epistemic reflexive dialogues about teaching to/about diversity, although some aspects of the framework were identified by the teacher educators as challenging. On the basis of these identified challenges, refinements concerning communication and use of the 3R-EC framework were identified. The feedback also led to some refinements of the social lab methodology for use in the larger national study.

Keywords: epistemic cognition; epistemic reflexivity; teacher education; teacher educators; teaching to diversity.

Introduction

Research has shown that Australian graduate teachers feel under-prepared to work with the full range of learners who comprise the contemporary school classroom (Mayer et al., 2017). Rowan, Kline, and Mayer (2017) have demonstrated that, relative to other dimensions of their work, Australian graduate teachers felt less prepared to work with students from culturally, linguistically and economically diverse backgrounds, students with a disability, and those from Aboriginal and Torres Strait Islander families. This Australian phenomenon of teacher graduates' lack of preparedness to teach to and about diversity has also been reported internationally (UK: National College for Teaching and Leadership, [NCTL], 2015; Canada: Campbell, Osmond-Johnson, Faubert, Zeichner, & Hobbs-Johnson, with Brown, DaCosta, Hales, Kuehn, Sohn, & Steffensen, 2017).

Teachers' self-reported levels of preparedness in these areas sit alongside data related to achievement patterns of various groups of learners. In 2016, national and international benchmarking data (National Assessment Program—Literacy and Numeracy [NAPLAN], Program for International Student Assessment [PISA] & Trends in International Mathematics and Science Study [TIMSS]) again showed a 'long tail' of Australian students who underperform compared with their peers (Organisation for Economic Cooperation and Development [OECD] 2016b). The value of NAPLAN and PISA data has, of course, been the subject of much debate with questions raised about the extent to which these tests actually favour already advantaged students (Thompson, 2016). Nevertheless, patterns relating to success and failure within these particular and narrow measures of achievement are consistent with decades of research into student achievement more broadly: research which has consistently demonstrated a link between academic achievement, school retention, post-school options and variables such as socio-economic status, language and Indigeneity (Apple, 2015; Teese, 2000).

Concerns about these persistent patterns of underperformance have led to many claims—largely by political figures—that Australia's teacher workforce lacks sufficiently robust understandings relating to generic teacher competencies (such as designing curriculum or implementing assessment); foundational skills sets (personal literacy or numeracy ability) and specific disciplinary knowledge (in mathematics, or science, or literature for example). These claims have been accompanied by highly publicised demands that initial teacher education must become more accountable and more effective in terms of ensuring teacher graduates are appropriately prepared—or 'classroom ready' (DET, 2014) in government discourse—for the heterogeneous contexts they may be asked to work in.

A close reading of student achievement data over time, however, suggests that teachers' lack of curriculum and/or disciplinary knowledge are not, in fact, the variables most in need of further attention. Most students, after all, appear to be achieving very well against key performance benchmarks while the same groups of students remain at risk of under-performance. This raises the possibility that the real challenges facing today's teachers are not a lack of knowledge about a particular subject but, rather, an inability to effectively teach a specific subject to all of the diverse students in real, complex, classroom contexts.

This possibility is, of course, directly related to teacher education. Although initial teacher education has repeatedly been reviewed and critiqued, relatively little attention has been focused on how teacher education programs respond to the diversity of the student population. Similarly scant attention has been given to how teacher educators' own understandings of, and beliefs about, contested terms such as 'quality teaching' and 'diverse learners' impact upon graduates' understandings of, and competencies regarding, teaching to and about diversity. By extension, little is known about how well equipped teacher educators actually are when it comes to the challenge of supporting the development of future teachers'

knowledge and understandings in these areas of national and international significance (Cochran-Smith et al., 2009; Francis, Mills, & Lupton, 2017).

When considered alongside research cited earlier that demonstrates the seemingly intractable nature of educational disadvantage, these interrelated gaps in knowledge about teacher educators' knowledge and skill sets point to the need for new research within teacher education: research that contributes to the ongoing project of addressing patterns of student achievement by focusing not on what happens in schools and not on the beliefs and attitudes of teachers but, rather, by turning the focus on teacher educators. The questions that then emerge are: how can research best be conducted, and how can the research contribute to the ongoing improvement of teacher education nationally and abroad?

This brings us to the focus of this paper which reports on a pilot study as part of a broader, Australian Research Council (ARC) Discovery project. This ARC project is focused on the role of teacher educators in preparing teachers to work with diverse learners. Rather than revisiting *teachers'* sense of preparedness to teach diverse learners, this project investigates *teacher educators'* understandings of diversity and teaching to/about diversity and how they make decisions about teaching in teacher education programs using a new conceptual framework based on epistemic reflexivity. This framework draws upon a growing body of research which has demonstrated that key to understanding teachers' decision making are the beliefs, dispositions and skills they hold related to the nature of knowledge and processes of knowing, otherwise known as epistemic cognition (Green & Yu, 2016).

The pilot study using social lab methodology, will address two research aims. The *first, and most significant, aim* is to explore the 3R-EC framework for understanding teacher educators' epistemic reflexivity and for designing future research. The *3R-EC* (*E*pistemic *C*ognition) framework of epistemic reflexivity (Lunn Brownlee, Ferguson & Ryan, 2017) is

characterised as an internal conversation that includes *R*eflecting on epistemic aims about nature of knowledge, *R*eflexively weighing up personal and contextual concerns including reliable processes for achieving epistemic aims and *R*esolved action. It is expected that the first research aim will lead to two outcomes: a) an understanding of how teacher educators engage in epistemic reflexivity for teaching to and about diversity in initial teacher education and b) insights into the effectiveness of the 3R-EC framework for capturing reflexive dialogues about teaching to/about diversity in future research. To a lesser extent we also explore a *second aim* which is with respect to the usefulness of social lab methodology for working with teacher educators. It is expected that the outcomes of this pilot study with regard to the second aim would lead to a modified research approach to underpin the ongoing ARC research into teacher educators' understandings of teaching to/about diversity.

To address these aims the paper is divided into six sections. The *first* section provides a background to the conceptual framework. The relevance of the framework to the study of teacher educators is also outlined. In the *second* section we describe our national study of teacher educators' epistemic reflexivity for teaching to and about diversity (ARC Discovery Project), in which the pilot study is embedded. This provides the rationale for the pilot study. The *third* section is an overview of the pilot study methodology. Drawing upon a data collection strategy known as social labs, this pilot study provided data relating to teacher educators' understandings about teaching to/about diversity and epistemic reflexivity (both explicitly and implicitly communicated), and also teacher educators' perspectives about the effectiveness of the framework. In the *fourth* section, we draw upon the findings from the pilot study to report teacher educators' perspectives of epistemic reflexivity and the extent to which the *3R-EC* framework is 'fit for purpose'. In the *fifth* section we outline a refined conceptual framework to guide the next phase of research in the overarching national project. And finally, in section *six*, we articulate some concluding comments about our findings with

regard to epistemic reflexivity for teaching to/about diversity and the way forward with our ARC Discovery research.

Conceptual framework: an overview of epistemic reflexivity

The research that this paper emerges from is based upon two key issues: first an awareness that Australia's educational system is consistently linked to patterns of educational achievement and, of course, underachievement; and second, an increasingly acknowledged perception that teachers are not sufficiently equipped to be able to interrupt these patterns. This combination has been described as a classic example of a wicked problem, which is a problem whose "solution is bound up in its formulation and the context of the problem militates against its formulation" (Sailor, 2016, p. 1). A recognition of the need to find new ways to deal with such intractable problems has seen Australian education laureate, Peter Goodyear, argue the need for all professionals to be/come flexible in their ways of knowing so that they can be in a position that will allow them to create new professional knowledge to deal with persistent professional challenges (such as, for example, student under achievement and links to teacher education). Advocating for the value of epistemic fluency Markauskaite and Goodyear (2017) argued the need to investigate the epistemic aspects of professional work—including teacher education (Markauskaite & Goodyear, 2017)   if professionals are to generate the new perspectives necessary to tackle new and old problems. Such flexibility or "adaptivity in epistemic thinking" is also proposed by Barzilai and Chinn (2018, p. 356) to support what they describe as epistemic education. Epistemic education is "education for critical thinking, inquiry and argumentation yet extends these by considering the metacognitive aspects of epistemic thinking more fully and explicitly." (p. 354).

The field of epistemic cognition variously involves a focus on the "dispositions, beliefs, and skills regarding how individuals determine what they actually know, versus what they

believe, doubt or distrust" (Greene & Yu, 2016, p. 2) and thus, by extension, what individuals decide to do, and how action (or inaction) is justified. However, identification of epistemic aims and ideals is not in itself sufficient for generating new professional knowledge. People can, after all, have an epistemic aim that leads back to entrenched pathways or actions. Rather, it is epistemic *fluency* or adaptivity which supports the ability to think about our epistemic aims in ways that do not automatically reproduce or naturalise existing, familiar or powerful ways of knowing in professional contexts (such as initial teacher education in Australia). Specifically, Barzilai and Chinn (2018) argue that epistemic meta-competence or reflective competence is necessary in order to be adaptable. Epistemic meta-competence is "competence for assessing whether judgements can be made reliably enough under current conditions" (Barzilai & Chinn, 2018, p. 362). So, an individual who can discern when it is better to evaluate competing perspectives, or accept the opinions of others, or simply make no judgement at all shows epistemic meta-competence or what Sosa (2011, in Barzilai & Chinn, 2018) refers to be as being meta-apt. We argue that epistemic meta-competence is operationalised in our epistemic reflexivity framework by supporting teacher educators to be reflexive about in situ decision making processes and epistemic cognitions that are inherent in those teaching decisions.

Reflexivity is different from the more familiar concept of 'reflection'. Drawing upon Margaret Archer's work, we argue that reflexivity relates to both the social and psychological nature of decision making. Archer contends that humans make their way through the world by identifying personal concerns upon which to act, yet these concerns are always influenced by, and have an influence on, social and cultural concerns. For Archer, reflexivity is characterised as an internal conversation that includes discernment (*reflecting* on a key issue or aim), deliberation (*reflexively* weighing up personal and contextual concerns) and dedication (*resolved action*): the 3*D*s (Archer, 2012).

In 2015, the relationship between Archer's 3Ds and contemporary thinking about epistemic cognition (EC) became the subject of an intensive 4-day Advanced Study Colloquium (ASC) funded by the European Association for Research in Learning and Instruction (EARLI). Twelve international researchers in the field of epistemic cognition and teaching were invited to participate in the ASC with the purpose of critiquing Archer's 3R framework from a standpoint informed by knowledge of epistemic cognition. As a result of these collaborations and discussions, researchers articulated a new framework for thinking about epistemic reflexivity: the 3R-EC framework. This framework is illustrated in Figure 1, and involves a three-step process.

[Insert Figure 1 here]

Step 1 Reflect-discern. In the context of initial teacher education, the first step of engaging in reflection (discernment) can be exemplified when teacher educators reflect upon their epistemic aims for supporting preservice teachers to teach diverse groups of children. According to Chinn, Rinehart and Buckland (2014) "epistemic aims are goals to achieve epistemic ends" (p. 428) and are "related to finding things out, understanding them, and forming beliefs" (Chinn, Buckland, & Samarapungavan, 2011 p. 146). These might include aims related to the development of "knowledge, understanding, explanation, justification, true belief, the avoidance of false belief, useful scientific models, and wisdom" (Chinn et al. 2014, p. 428). Chinn argues the core distinction between knowledge and understanding (or explanation), drawing on the work of Kvanvig (Chinn et al., 2011).

An epistemic aim related to gaining *knowledge* "might consist of a collection of disconnected facts" (p. 147) while an aim to develop understanding would explore relationships between indicators of academic achievement and data such as student diversity, economics, and gender. In other words, the identification of the epistemic aim of *understanding* would

support preservice teachers to see relationships between forms and origins of various forms of educational injustice or exclusion. If an epistemic aim is related to *justification* then teacher educators might support preservice teachers to go beyond seeing the relationships between ideas (understanding) to evaluating and adjudicating on approaches to teaching to/about diversity that interrogate forms of injustice and social exclusion in the classroom.

Step 2 Reflexivity / deliberate. Step 2 is about evaluating multiple, potentially competing perspectives on an issue through internal dialogue or deliberation. This deliberation is core to the process of reflexivity as articulated by Archer. In the 3R-EC framework, we have extended Archer's notion of reflexivity to include internal dialogue that attends to epistemic cognition in the process of discernment and deliberation, specifically epistemic aims and reliable processes for achieving epistemic aims. Once an epistemic aim has been identified, teacher educators might decide on a reliable process for achieving that particular aim. For example, the epistemic aim of *justification* would require the processes related to evaluation and adjudication of multiple teaching processes in the light of contextual conditions (e.g., program accreditation requirements). These are evaluative processes which according to Barzilai and Chinn (2018) include evaluating "judgments, explanations, arguments and models" (p. 367). As described earlier, such deliberations need to engage epistemic meta-competence to decide which epistemic aim and reliable processes might be more productive under the conditions in which they find themselves (Sosa, 2011, in Barzilai & Chinn, 2018). For example, are they supporting preservice teachers to maintain (supports an epistemic aim of developing facts as knowledge) rather than contest (supports an epistemic aim of *justification*) covert and overt practices that perpetuate educational injustice and under which conditions is it best to do one or the other?

Step 3 Resolved action / dedicate. This final step describes the need for decision making to lead to action. An essential characteristic of reflexivity is its transformative quality. We also argue in the 3R-EC framework that epistemic reflexive processes need to lead to dedicated action in teaching practice. In the context of teacher education this would ensure that teacher educators take actions which impact upon how preservice teachers learn to teach to/about diversity as a complex and contested concept. Thus, the framework can be used to not only change practice for teacher educators but to also change teacher educators' epistemic cognitions as they explore multiple ways of knowing about diversity, diverse learners and justice (leading back to Step 1).

A national study of teacher educators' epistemic reflexivity for teaching to and about diversity

While the 3R-EC framework has influenced theorisation about teachers' work by advocating for a focus on teachers' epistemic cognition (Lunn Brownlee, Schraw, Walker, & Ryan, 2016; Lunn Brownlee, Ferguson & Ryan, 2017; Lunn Brownlee & Schraw, 2107), there has been no research to date that has explored how the 3R-EC framework might be applied to the teaching practices of teacher educators. By extension, there has been no work that explores the relevance of the framework to those who are preparing preservice teachers to teach diverse groups of children. Recognising this gap, in 2017-2018, the authors of this paper applied, and were successful in receiving funding, for an Australian Research Council (ARC) Discovery Project.

The ARC project focusses on how teacher educators' epistemic cognitions —and the broader environments in which they work—support their reflexive decision making and teaching practices relating to teaching to and about diversity in teacher education programs. Overall, this national project is designed to explore relationships between epistemic cognition,

epistemic reflexivity and how teacher educators actually approach teaching to/about diversity across three phases. In phase one, teacher educators will be involved in a social lab designed to elicit their understandings about the 'state of teacher education' in regards to teaching to/about diversity by investigating the relationship between teacher educators' epistemic reflexivity—and how they actually go about teaching to/about diversity. The next two phases involve a national survey of teacher educators, and a series of case studies respectively. While different in terms of methodological design, these three phases are bound together by a focus on the issues prioritised within the 3R-EC framework: epistemic aims; epistemic cognition; epistemic fluency; and epistemic reflexivity. Given this, it was necessary to conduct a pilot project to ensure that the framework and methodology being proposed for phase 1 were 'fit for purpose.' The social lab methodology and conduct of this pilot study is the focus of the next section.

The pilot study and social lab methodology

The pilot study sought to investigate the extent to which the first phase of the ARC project— the social lab—could most effectively be organised around the 3R-EC framework in order to capture teacher educators' epistemic reflexivity in the context of teaching to/about diversity and provide sufficiently robust data to inform the design of a subsequent survey. According to McKenzie (2015) the term social lab is used to "describe the process of bringing together a diverse group of stakeholders to create new insights and to collaboratively explore, frame and co-create solutions to complex challenges" (p.3). The concept is based on the idea that there is an abundance of energy, ideas and untapped potential among stakeholders that can be leveraged to address such challenges. Social labs commonly proceed through five stages including: mapping the system; questioning our knowledge stances and understandings; identifying points for intervention; producing a hypothesis about intervention; and translating

a hypothesis into actionable goals (McKenzie, 2015). There is an emphasis on dialogue, active listening and the interchange of ideas as well as proposing and/or contesting responses to diverse contexts, cross pollination of ideas and prototyping solutions (McKenzie, 2015). Thus, social labs have the potential to allow for genuine participation by multiple stakeholders. A social lab was therefore deemed suitable for the proposed research because of the capacity to allow participants to collaboratively explore, frame and co-create solutions to the complex problems associated with teaching to/about diversity. Nevertheless, the extent to which the social lab was able to facilitate engagement with the 3R-EC framework and epistemic reflexivity remained unclear.

Social lab participants and teaching contexts

Participants were recruited from one large metropolitan university in Queensland, Australia and consisted of three professors, one associate professor, three senior lecturers, five lecturers and a doctoral student. Ethical approval was granted by the participating university's ethics Committee (Approval Number 1700000105), and participants gave informed consent. All participants had links with a four year Bachelor of Education (BEd) program which includes early childhood, primary and secondary pre-service teachers. Units within these courses were classified as core, curriculum and practicum. Core units include studies in child development and socio-cultural studies. Some of these units are specifically designed for educating preservice teachers about how to teach diverse learners such as Aboriginal and Torres Strait Islanders, English as an Alternative Language/Dialect (EAL/D) students, or students with additional needs. Curriculum units are discipline-specific and develop knowledge and skills for teaching practice in, for example, English or Science. As part of these curriculum units, tutors have to address various standards related to diverse learners, for example Standard 1.3, "demonstrate knowledge of teaching strategies that are responsive to the learning strengths

and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds" (AITSL, 2011). Practicum units have a practical emphasis where theory is translated into practice during professional experiences in schools. Seven of the 12 participants were involved in curriculum/practicum units and the other five taught into the core units.

Facilitation of social lab, research aims and expected outcomes

Ethical considerations led the research team to conclude that an external consultant should facilitate the social lab so that participants could contribute to the dialogue without any sense of being judged by any member of the research team: several of whom work at the same university as the participants. Across two separate meetings the consultant was given background information about epistemic reflexivity and guidance in social lab protocols and, in collaboration with the researchers, a social lab agenda was established. The agenda was designed to ensure participants worked through the five phases of a social lab (as described earlier), as they explored the 3R-EC framework. This agenda addressed two research aims and expected outcomes:

Aim 1: to explore the 3R-EC framework for understanding teacher educators' epistemic reflexivity and for designing future research.

> Expected outcomes**:** a) an understanding of how teacher educators engaged in epistemic reflexivity for teaching to and about diversity in initial teacher education and b) insights into the effectiveness of the 3R-EC framework for capturing reflexive dialogues about teaching to diversity.

Aim 2: to explore the usefulness of social lab methodology for work with teacher educators.

Expected outcome**:** a modified research approach to underpin the ARC Discovery

Project research into teacher educators' understandings of teaching to/about diversity.

The three hour social lab progressed through several stages, each one structured to reflect the language and concepts embedded in the 3R-EC framework, and consistent with the design of social labs. We outline the five steps and how they correspond to both the social lab design, and the 3R-EC framework, but note, as well, that there was no intention to have hard or rigid lines dividing each step with participants able to move backwards and forwards from consideration of, for example, their specific context, and their epistemic aims, and possible responses.

Step 1: Mapping the system

The social lab commenced with background explanations from one of the authors with expertise in epistemic cognition. This introduced the participants to concepts integral to the 3R-EC framework including epistemic cognition and epistemic reflexivity. This was the only part of the social lab attended by the research team members and was included to allow the research team to assess the appropriateness of this explicit theoretical introduction at the beginning of the lab. The moderator than engaged the participants in warm-ups and ice-breakers, using a provocation "the most important thing that children learn in school is conformity". These responses were later echoed in discussions relating to diversity and the framework. This session was included to allow participants time to begin to feel comfortable in the group and to become more acquainted with the moderator.

A small number of questions were then used to encourage discussion. The first was "What are the givens in the initial teacher education system around teaching diverse learners?" which was designed to open discussion about assumed knowledge and tacit expectations, to achieve the goal of 'mapping the system', and to identify the extent to which this question

allowed participants to name enablements and constraints. The next question was "What do you do in your classes to cater to that diversity or teach to that diversity" to prepare participants to examine the 3R-EC framework. This was designed to collect data relating to epistemic aims.

Participants were then asked to use the steps outlined in the 3R-EC framework (see Figure 1) to answer the following questions (presented in a series of four squares/boxes drawn on a piece of paper). This moved participants through steps 2 and steps 3 of the social lab:

Step 2: Questioning our knowledge stances & identify points of intervention

The first question, "What do I want diverse learners to know, understand and explain about diversity?", provided a way to reflect on epistemic aims. The next question, "How do I know learners are meeting these epistemic ideals?", enabled participants to reflect on epistemic ideals (criteria for establishing what constitutes knowledge) in reflexive thinking.

Steps 3, 4 and 5: Produce a hypothesis for intervention and translate hypothesis into actionable goals

In these final steps, the questions "What reliable processes can I put in place or continue to use?" and "How do I implement my resolved action and know I'm meeting my epistemic aims?" were used to consider a way forward in their teaching practices.

A deliberately collegial and collaborative structure was fostered throughout each of the 5 steps in the social lab with individual, small and whole group contributions audio recorded and later transcribed verbatim.

Data analysis and data checking

Thematic analysis, as an "accessible and theoretically flexible" method (Braun & Clarke, 2006, p. 77) for analysing data in qualitative research, was chosen as the analytical technique for this study. Thematic analysis is often used to identify, consider and report on trends and ideas as they emerge from qualitative data. Given that both the emerging ideas (through the use of social lab questions) and the analysis of these themes were informed by the 3R-EC framework and related literature, the thematic analysis was more focused or deductive in nature. All of the authors participated in the analysis of the data over three two-hour sessions using Zoom video conferencing technology. The group followed the guidelines and terminology of Braun and Clarke (2006), allowing complex thoughts to emerge from the data, albeit through the deductive lens of epistemic reflexivity. This whole of research group approach to analysis provided a robust methodology for ensuring data credibility across the whole data set.

There were four data analysis/data checking points. In the *first* data analysis session, all of the research team collaborated in looking for patterns in the data, specifically in regards to the project's overarching focus on epistemic cognition. Through a constant viewing and reviewing of the entire data set, 12 codes were established and recorded in an excel spreadsheet. The large number of codes reflected the fact that the research was operating at multiple levels including teacher educators' views about the definition of teaching to and about diversity and pedagogies for diversity. Participants had been asked explicitly to comment on the 3R-EC framework and to identify, for example, their epistemic aims. Over the course of the social lab, however, the participants also made comments that provided insight into their epistemic aims, or their understanding of epistemic terminology, even when this may not have been their explicit intention.

During the *second* whole of research group data analysis session, the researchers collapsed the original 12 codes into six main themes. Of these six themes the following two were specific to the current paper's focus on epistemic reflexivity: 1. Relevance of epistemic reflexivity and the 3R-EC framework to teacher education and 2. Recommendations concerning improvements for the framework in regards to future data collection processes.

In the *third* whole of research group analysis meeting, the research team collaboratively checked the themes and codes. *Finally*, the first author of this paper examined the codes related to epistemic reflexivity and the 3R-EC framework and re-checked the data that were used to support each code. The other authors then reviewed these codes and exemplary quotes to ensure further credibility of the data presented in this paper.

Exploring the 3R-EC framework with teacher educators

This section of the paper reports on the findings that address Aim 1 which is to explore the 3R-EC framework to understand teacher educators' perspectives of epistemic reflexivity and the extent to which the 3R-EC framework is 'fit for purpose' in regards to ongoing investigation of teacher educators' understandings of teaching to and about diversity. First, findings are reported that show teacher educators' perspectives of epistemic reflexivity and the 3R-EC framework. These responses identify if and to what extent the participants could respond to questions that were framed in the language associated with the 3R-EC framework. Second, findings that explore the extent to which the 3R-EC framework is 'fit for purpose' for ongoing research are explored. Taken together, these findings identified how and to what extent participants believed teacher educators could engage with the 3R-EC framework in order to achieve specific goals relating to teaching to/about diversity in teacher education.

Exploring the 3R-EC framework for conceptualising epistemic reflexivity

The discussion that follows identifies the way participants responded to, and made sense of, the various key concepts associated with the 3R-EC framework: specifically epistemic aims and reliable processes (discernment), reflexivity (deliberation) and resolved action (dedication).

Reflecting on epistemic aims and reliable processes (discernment)

Across the duration of the social lab, the participants referred to two main epistemic aims in the context of supporting preservice teachers to teach to/about diversity in classroom contexts. These aims were related to developing *understanding* and *knowledge*. With regard to the first aim, one participant described how preservice teachers needed to show understanding (being curious and reflexive) rather than simply following 'recipes':

> So if I am introducing the educational standards for teachers, for example for this group who are about to do their first prac, they'll feel confident because they'll have some professional language but they will tend to cling to it like a recipe. But I want them to be curious about their students and to be reflexive with that so some of my deliberations is how will they be able to be curious if they have actually never engaged with children on prac before; what would I need to do in order to set that up for them? (473[1])

This quote suggests that an epistemic aim of *understanding* is more likely to support preservice teachers coming to terms with forms and origins of educational injustice or exclusion (cf. Chinn et al., 2014). Bråten, Muis and Reznitskaya (2017) defined

---

[1] Refers to the social lab transcript line number that appears at the beginning of the participant's response

understanding as both making meaning and assessing competing perspectives to arrive at an informed perspective.

We argue that this epistemic aim related to deep understanding might be similar to Chinn's epistemic aim of *justification* (Chinn et al., 2014) in which competing perspectives are evaluated and adjudicated on. However, in the data collected in the pilot study there were no responses that explicitly identified epistemic aims related to *justification*. This epistemic aim would be evident in responses that advocated for preservice teachers to go beyond simple meaning making about forms of injustice to engage in critical reasoning, evaluating and making decisions based on varied perspectives related to social inclusion.

Some participants identified an epistemic aim related to developing *knowledge*. For example, some responses suggested that preservice teachers needed to develop knowledge or true beliefs relevant to teaching to/about diversity such as knowledge about policies regarding legislation. One participant indicated simply (in reference to these policies) "I want my pre-service teachers, who are diverse learners, to know." (384). This focus on wanting preservice teachers to *know* suggests an epistemic aim related to developing knowledge about teaching to/about diversity rather than understanding forms and origins of educational injustice or exclusion.

There was less evidence about how teacher educators would ensure preservice teachers were engaged in reliable processes for achieving epistemic aims related to *understanding*. It may reflect participants' difficulties in understanding reliable processes and the need to connect these with epistemic aims. Participants sometimes seemed confused about the relationship between reliable processes and resolved action, for example: "When I originally wrote these questions, I had 'what reliable processes can I put in place in the resolve action box?'" (435).

This seems to be a feature of the framework that may require strengthening when used in research that is focussed on initial teacher education.

Reflexivity (deliberation)

The participants believed that reflexive deliberation was about challenging themselves to think deeply and transparently about teaching to/about diversity in initial teacher education as well as providing a mechanism for the sharing of ideas:

> So if I'm really hoping for this, well what ... I think we don't often have spaces to sort through our thinking and I think that is what that middle box ... that reflexive, inner dialogue is making that more visible. That is what that opportunity is for. (470)

The concept of reflexive deliberation also helped the participants to reflect on their own epistemic aims for teaching to/about diversity:

> So I've got an epistemic aim but to think of it from my learner's perspective; what would they need, what are some assumptions I'm making about them and then, yes, unpacking that a bit more rather than just going idea, practice but being a little bit meta. And trying to record some of that because I think we often inherit units from other people and that design thinking isn't recorded anywhere or made evident unless you get the opportunity to have a conversation. A reflective conversation with the person who designed it, but that often does not happen. (476)

The participants also described how reflexive dialogue is "about us and changing what we do" (599) and "changing our own thinking, so that we can become better teacher educators of/for/with diversity" (601). Others argued that rather than being a planning tool, deliberative reflexivity is "a head tool…" (607). Along these same lines, some comments related to the notion of critical thinking about teaching practice, for example "I think to look critically at

our own practice is good." (617). This reflexive deliberation, some argued, enabled teaching to/about diversity to take place:

> … I think that that first box [step] is probably a chance to go, "Well, what do I believe?" Because we often talk about strategies or practice but not why we do it or what's driving it. So, I think it really is just a process of surfacing some of those deep, important things that we don't get to talk about. (616)

> The final step ensures that teacher/educators' decision making leads to action in which pre-service teachers learn about teaching for diversity... We learn about teaching for diversity, as well as about diversity as a complex and contested concept. Thus, it not only changes practice. Once we learn about it, it changes our practice that can then change teacher/educators epistemic cognitions as they explore multiple ways of knowing about diversity and those signs of injustice." ... (598)

In the latter quote, the participant was not only aware of the impact of reflexive deliberations on teaching actions but also how it might influence teacher educators' epistemic cognitions through accessing multiple ways of knowing about diversity.

Some participants believed that thinking reflexively also involved a type of sorting and prioritising process:

> So weighing up how much of myself can I give to this, what's the cost if I go this way. I'm being told to be more digital by the university, but this is really hard when they don't all have devices ... All that kind of ... Working through the multiple layers of stuff that comes at us, to go, "What can I prioritise, and what will I put into action?" It's the sorting hat, from Harry Potter. The internal dialogue. (518)

Resolved action (dedication)

Participants appeared to be unclear about how they could implement the 3R-EC framework in terms of resolved action:

> I'm just struggling with the resolve to action. How do I implement my resolve to action? See I've talked about what I've done. I haven't really thought about what I could do better. That kind of made sense to me. (434)

One participant argued that "resolved action is the teaching. It's like not turning up five minutes before, and doing what comes off the top of my head, but it's that resolved action. It's really informed by this reflexive process" (562). A lack of data identifying resolved actions indicates that the majority of the participants, overall, found the concept of 'resolved action' difficult to work with.

Summary

To summarise the responses related to exploring the 3R-EC framework for conceptualising epistemic reflexivity, participants could identify epistemic aims of promoting understanding and knowledge but did not articulate reliable processes and resolved actions that needed to flow from identifying an epistemic aim. Participants showed a much stronger awareness and appreciation of the role of reflexive deliberation as an holistic concept and the significance of such processes in supporting epistemic aims, reliable processes and resolved action for teaching to/about diversity. This suggests that the overall premise of the framework, reflexive deliberation, was better understood by the participants than the individual components although the extent to which they could identify specific epistemic components of aims, processes and actions is less clear.

We turn now to a discussion of the challenges participants and researchers identified when responding to the framework within the social lab and suggestions for refining the framework for future research.

Exploring the 3R-EC framework for designing future research

This section of the findings explores the suitability of the 3R-EC framework for designing future research that would ultimately allow researchers to examine how teacher educators' epistemic cognition —and the broader environments in which they work—support their reflexive decision making and teaching practices for teaching to/about diversity. Participants in the social labs were challenged by the 3R-EC framework in a number of ways that have relevance for its use as both a device for structuring data collection and a data analysis framework. These challenges related to the language and conceptualisation of epistemic cognition, internal dialogue, the linearity of the framework, and the role of action and social contexts in the framework.

The language and conceptualizations of epistemic cognition

First, researchers and participants noted that the framework was perceived by several participants to be conceptually challenging with some arguing that the language of the framework needed to be more accessible.

> I think the language should be more accessible. I think that language out there is quite confusing, because we're all struggling with it, we are all taking our own interpretations of what it all means, and when we look at your questions as well, which for me were quite helpful, but I don't know whether that's what the authors intended. So, I change the questions to the top one on the left, I wrote: What do I want my students to know and do? (499)

For the researchers, this highlighted the need for future projects to ensure that language is understandable. This may necessitate further description of each of the dimensions of the framework in future social labs.

Findings also identified some confusion amongst participants regarding what they were meant to be doing with the framework and why it was relevant to their work as teacher educators. This conceptual challenge seemed to also extend to the overall intention of the framework which was to help teacher educators develop the kind of epistemic reflexivity that is necessary to solve complex problems. Some social lab participants interpreted the framework as a lesson planning tool rather than as a framework for promoting epistemic reflexivity. This can negate the potential of the framework to lead to reflexivity "So, in my mind, and I may be completely off track here, I was thinking about it as a planning tool and ..." (498). This and other comments suggested that future use of the framework as a data collection device, needs to highlight further the role of epistemic reflexivity in assisting to identify epistemic aims and reliable processes needed for lesson planning.

Internal dialogue

Participants also displayed a lack of understanding about one key aspect of Step 2 (reflexivity). This step involves internal dialogue which for some teacher educators seemed to suggest a focus on a monologic approach to reflection.

> That was one of the problems I had with the term 'internal dialogue' because I don't see how you can do it internally. You know? It has to be interactive learning (192).

On the other hand, some participants saw internal dialogue as a discussion between parts of self, as indicated in the following quote:

So, one side of yourself poses the question that you're being asked and the other side

is supposed to respond to that question so it's that questioning part that is involved

[crosstalk 00:50:43] dialogue … (206)

Archer's (2012) concept of the internal conversation involves a reflexive process of

discerning what is important; deliberating about possible (personal, structural and cultural)

reasons for the way things are and different options that could be taken, at this time, in this

place; and dedicating a course of action. More recent use of Archer's work (see Willis,

Crosswell, Morrison, Gibson, & Ryan, 2017) has shown that making this inner dialogue

social or sharing it with others, has a more transformative effect on practice. While the

original notion of dialogic reflexivity is not represented by a monologue, we have adapted the

framework by inserting the words "group dialogue" to highlight more clearly the nature of

group interactions in the reflexive process (See Figure 2 Step 2). This focus on collaboration

is also evident in Barzilai and Chinn's (2018) APT-AIR framework that focuses on epistemic

education.

Beyond linearity: A spiral, interactive framework

There were some suggestions that the framework might be better presented as something that

was less linear and more interactive in nature. While we had always intended the framework

to be recursive, this feedback led us to change the visual presentation of the framework to

accentuate the links between each of the steps using a spiral image that was less linear in

appearance (see Figure 2).

This spiral approach was also reflected in the following suggestion:

So I've kind of ditched all that although I did come up with a three C's framework.

Only because I was kind of teasing it out, for example I like to go and talk reflection,

you know this sort of notion of critical reflection and then I was sort of getting the

notion of **calibration** that you were talking about and reflexivity. And then change

and action kind of link together so they're my C's. But that model there also ... I look

at it and I just see an action learning model. I mean obviously the different bits reflect

the thinking that has gone into this but, you know, the spiral notion of action learning

is really what this is about, that it doesn't stop when you get to three you use that and

you come back and you reflect and you keep building your own ideas, your own

epistemic ... (565)

The focus on calibration is also an interesting aspect of this quote because it alludes to the

need to align aims and reliable processes. This language of calibration was also included in

the original Framework under Step 2 to strengthen the importance of relating aims with

processes.

[Insert Figure 2 here]

The role of action and social contexts in the framework.

There was a clear understanding that action was a significant component of reflexivity. This

was also described earlier in the comment by one participant who talked about the spiral

approach to the framework. A stronger focus on action was also evident in the following

suggestion to include a fourth box related to action and pedagogy:

Is the model missing a fourth part which is the action at the front and what they've

called resolved action is just the resolution? Like, after you've given up this reflexive

> ... what have you resolved? After you've sorted everything out ... This is what I need
> to do and change and go back and put it into practice. (571)

This comment drew our attention to representing the framework as a spiral. Although the original framework clearly acknowledged the role of action in Step 3, the spiral visualization potentially provides a clearer indication that action is continuously considered as part of epistemic reflexivity.

Some participants also believed that the framework needed to pay closer attention to social contexts. In response to this feedback, while the framework is specifically focused on addressing teaching and learning in specific initial teacher education contexts, we have added more description to Step 1 to show that the selection of epistemic aims relates to specific teaching and learning contexts in initial teacher education, therefore reinforcing the significance of contexts.

Refining the social lab methodology to guide future research

In this section we outline an updated, refined research framework to guide the next phase of research in the national ARC Discovery project. This addresses the second research aim which was to explore the usefulness of social lab research methodology for work with teacher educators.

An external consultant facilitated the social lab so that participants could contribute to the dialogue without any sense of being judged. We acknowledge that the use of an external consultant was helpful for maintaining anonymity of responses. However, it became apparent, that despite intensive workshopping with the consultant around the original framework, some key epistemic concepts might have been followed up better in the social lab discussions by the moderator. We think it might be better to engage facilitators with expertise

in epistemic cognition in future social labs to enable clarity of discussion around epistemic reflexivity theorisation. The findings from this pilot study with respect to the use of a moderator led to a modified social lab approach to underpin Phase 1 of the ARC Discovery Project research. In the Phase 1 social lab for the ARC project we will ensure that the researchers are present in the workshops to clarify such concepts as the discussions proceed.

It was also apparent that the social lab process would benefit from further structure and specific tasks to engage the participants. It may be that, moving forward, a scenario based approach might assist participants to engage with epistemic aims and reliable processes in situations with which they are familiar thus enabling a more robust discussion around teaching to/about diversity in teacher education.

Concluding comments

The focus of this study has been twofold. First we explored the 3R-EC framework for understanding teacher educators' epistemic reflexivity and for designing future research. This led to an understanding of how teacher educators engaged in epistemic reflexivity for teaching to and about diversity in initial teacher education and insights into the effectiveness of the 3R-EC framework for capturing reflexive dialogues about teaching to diversity. Second, and to a lesser extent, we explored the usefulness of social lab methodology for work with teacher educators which led to a modified research approach to underpin the ARC Discovery Project research into teacher educators' understandings of teaching to/about diversity.

The focus of this study has been on exploring the potential value of using the 3R-EC framework in a social lab context in order to investigate teacher educators' understandings of diversity and teaching to/about diversity in teacher education programs. A focus on epistemic

reflexivity has enabled teacher educators in the social lab to consider their epistemic aims for teaching to/about diversity in initial teacher education. The 3R-EC framework is intended to make the epistemic aspects of teacher educators' reflexive decision making clear. This creates a type of metacognition (see Barzilai & Chinn, 2018), which is considered important for promoting epistemic fluency and adaptability.

Our focus on teacher educators identifying epistemic aims for teaching preservice teachers about teaching to/about diversity reflects a type of epistemic fluency (Markausaite & Goodyear, 2016) because epistemic aims will vary according to teaching contexts, leading to different epistemic outcomes. Unlike the process of *reflection*, where an individual contemplates an idea, *reflexivity* leads to context specific decision making, and informed behaviour or *resolved* action within that particular teaching and learning context (Archer, 2012; Ryan & Bourke, 2013). Our framework advocates for informed behaviour to be underpinned by epistemic fluency (Markauskaite & Goodyear, 2016) and epistemic meta-competence (Barzilai & Chinn, 2018) for adaptive professional knowledge.

The findings showed that while epistemic aims of *understanding* (encouraging preservice teachers to see relationships) and *knowledge* (knowing "facts") were evident during the social lab, teacher educators did not identify *justification* as an epistemic aim (Chinn et al., 2014). This has implications for teacher educators identifying reliable processes to support preservice teachers to go beyond understanding forms of injustice to engaging in reasoning, evaluating and making decisions based on varied perspectives related to social inclusion. We argue that such epistemic aims related to *justification* are necessary for teacher educators to support preservice teachers to be able to work with diverse learners and so improve outcomes for heterogeneous, and differently advantaged, school populations.

In interpreting the feedback provided on the 3R-EC framework itself, some key ideas were considered to be useful for re-thinking the framework. While the framework has already been scrutinised by key international scholars in the field of epistemic cognition (Advanced Study Colloquia, Cyprus, 2015; Lunn, Ferguson & Ryan, 2017 *Educational Psychologist* special issue), the current social lab analysis enabled refinement specifically for teaching to/about diversity in initial teacher education. The participants indicated that internal dialogues related to reflectivity were important to consider although it seemed particular aspects of epistemic cognition were sometimes challenging and may need to be addressed in more detail in future social labs.

The responses suggested that the framework needed to more clearly reflect a focus on social contexts and action. In response, further description was included in the first step, *Reflect - discern*, to include specific teaching and learning contexts. Next, in *Reflexivity-deliberate,* feedback highlighted teaching to diverse students to ensure that the framework did not lose sight of heterogeneous groups. This is evident in the first box as well. In the final box, *Resolved action – dedicate*, we return to our focus on supporting preservice teachers to engage with diverse learners. The wording has been changed to reduce jargon and increase descriptions to make the process more understandable. The overall spiral appearance of the framework addresses the concerns raised by participants that the framework was too linear in nature to fully support reflexive engagement with the ongoing challenges associated with teaching with teaching to/about diversity. The arrows demonstrate the recursive nature of the process rather than a linear process.

Finally, although not identified by the participants, we believe that further iterations of the framework might include what Chinn et al (2014) referred to as epistemic ideals. There is a need to ask teacher educators to focus on "criteria or standards that must be met for [people]

to judge that their epistemic aims have been achieved" (Chinn et al., 2014, p. 433). Such ideals might include "accuracy, adequacy of justification, and coherence" (Barzilai & Chinn, 2018, p. 367). For example, if teaching to diversity in initial teacher education courses requires evidence-informed practices to be implemented in classrooms, then teacher educators might articulate epistemic ideals or standards that relate to knowledge as justified through evaluation of competing claims. This may be part of reflexivity with regard to aligning epistemic aims with reliable processes for achieving aims and potentially epistemic ideals.

The second aim was to focus on the usefulness of social lab methodology for work with teacher educators. This paper points to the usefulness of using social labs to investigate various dimensions of epistemic reflexivity and identify areas where teacher educators are able to articulate how they make decisions, and how they enact those decisions with regard to teaching to/about diversity in initial teacher education. These data will now be used to conduct a larger, national project in Australia to explore further the issue at the heart of the paper: how to ensure that teachers are prepared to work with the full range of students in their changed and changing classrooms. In particular, we aim to explore how the 3R-EC framework might be used as a pre-post theoretical tool to explore changes in teacher educators' thinking about teaching to diversity.

References

Apple, M. (2015). Examinations, inequality, & curriculum reform: an essay review of Richard Teese's Academic Success & Social Power: Examinations & inequality (2nd Ed). *Educational Policy, 29*(7), 1076-1083.

Australian Institute for Teaching and School Leadership (AITSL). (2011). *National professional standards for teachers*. Melbourne, VIC: AITSL.

Archer, M. (2012). *The reflexive imperative in late modernity*. Cambridge: Cambridge University Press

Barzilai, S. & Chinn, C. (2018). On the goals of epistemic education: Promoting apt epistemic performance. *Journal of Learning Sciences, 27,* 353-389. doi:10.1080/10508406.2017.1392968

Bråten, I. Muis, K., & Reznitskaya, A. (2017) Teachers' Epistemic Cognition in the Context of Dialogic Practice: A Question of Calibration?, *Educational Psychologist,5*(24), 253-269. doi: 10.1080/00461520.2017.1341319

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Campbell, C., Osmond-Johnson, P., Faubert, B., Zeichner, K., & Hobbs-Johnson, A. (with Brown, S., DaCosta, P., Hales, A., Kuehn, L., Sohn, J., & Steffensen, K.). (2017). *The state of educators' professional learning in Canada: Final research report*. Oxford, OH: Learning Forward.

Chinn, C. A., Buckland, L. A., & Samarapungavan, A. L. A. (2011). Expanding the dimensions of epistemic cognition: Arguments from philosophy and psychology. *Educational Psychologist, 46*, 141–167.

Chinn, C. A., Rinehart, R. W., & Buckland, L. A. (2014). Epistemic cognition & evaluating information: Applying the AIR model of epistemic cognition. In D. Rapp & J. Braasch (Eds.), *Processing inaccurate information: Theoretical & applied perspectives from cognitive science & the educational sciences* (pp. 425-453). Cambridge, MA: MIT Press.

Cochran-Smith, M., Shakman, K., Jong, C., Terrell, D. G., Barnatt, J., & McQuillan, P. (2009). Good & just teaching: the case for social justice in teacher education. *American Journal of Teacher Education, 115*(3), 347-377.

Department of Education and Training (DET). (2014). *Action now: Classroom ready teachers*. Canberra: Teacher Education Ministerial Advisory Group (TEMAG).

Francis, B., Mills, M., & Lupton, R. (2017). Towards social justice in education: contradictions & dilemmas. *Journal of Education Policy*. doi:http://dx.doi.org/10.1080/02680939.2016.1276218

Greene, J. A. & Yu, S. B. (2016). Educating critical thinkers: The role of epistemic cognition. *Policy Insights from the Behavioral & Brain Sciences, 3*(1), 45-53. doi:10.1177/2372732215622223

Lunn Brownlee, J., Schraw, G., Walker, S., & Ryan, M. (2016). Changes in preservice teachers' personal epistemologies. In Greene, J. A., Sandoval, W.A., & Bråten, I. (Eds.) *Handbook of Epistemic Cognition*. Routledge, New York, pp. 300-317.

Lunn Brownlee, J., Ferguson, L., & Ryan, M. (2017). Changing Teachers' Epistemic Cognition: A New Conceptual Framework for Epistemic Reflexivity. *Educational Psychologist, 52*(4), 242-252, DOI: 10.1080/00461520.2017.1333430

Lunn Brownlee, J. & Schraw, G. (2017). Reflection & reflexivity: Higher order thinking in teachers' personal epistemologies. In G. Schraw, J. Lunn Brownlee, L. Olafson, & M. Vanderveldt (Eds.), *Teachers' Personal Epistemologies: Evolving Models for Transforming Practice*. Charlotte, NC:

Information Age Press.

Markauskaite, L. & Goodyear, P. (2017). *Epistemic fluency & professional education*. Dordrecht: Springer.

Mayer, D., Dixon, M., Kline, J., Kostogriz, A., Moss, J., Rowan, L., . . . White, S. (2017). *Studying the Effectiveness of Teacher Education: Early Career Teachers in Diverse Settings*. Singapore: Springer.

McKenzie, F., (2015). *The system shift initiative*. Australian Futures Project, Sydney.

National College for Teaching and Leadership [NCTL], (2015). *Newly qualified teachers: annual survey 2015*. Retrieved from http://dera.ioe.ac.uk/24752/1/Newly_Qualified_Teachers_Annual_Survey_2015.pdf

Organisation for Economic Cooperation and Development [OECD], (2016a) *Better life index*. Retrieved from http://www.oecdbetterlifeindex.org/#/11111111111

Organisation for Economic Cooperation and Development [OECD], (2016b). *PISA 2015: Australia*. Retrieved from http://www.compareyourcountry.org/pisa/country/aus

Rowan, L., Kline, J., & Mayer, D. (2017). Early career teachers' perceptions of their preparedness to teach 'diverse learners': Insights from an Australian research project. *Australian Journal of Teacher Education (Online), 42*(10), 71-92.

Ryan, M. & Bourke, T. (2013). The teacher as reflexive professional: Making visible the excluded discourse in teacher standards. *Discourse: Studies in the Cultural Politics of Education, 34*(3), 411-423.

Sailor, W. (2016). Equity as a Basis for Inclusive Educational Systems Change. *Australasian Journal of Special Education, 41*(1), 1-17. doi: 10.1017/jse.2016.12

Teese, R. (2000). *Academic success & social power: examinations & inequality*. Melbourne: Melbourne University Press.

Thompson, G. (2016). Local experiences, global similarities. In B. Lingard, G. Thompson, & S. Sellar (Eds.), *National testing in schools: an Australian assessment*. New York: Routledge.

Willis, J., Crosswell, L., Morrison, C., Gibson, A., & Ryan, M. (2017). Looking for leadership: the potential of dialogic reflexivity with rural early-career teachers. *Teachers and Teaching*, 1-16. doi:10.1080/13540602.2017.1287695
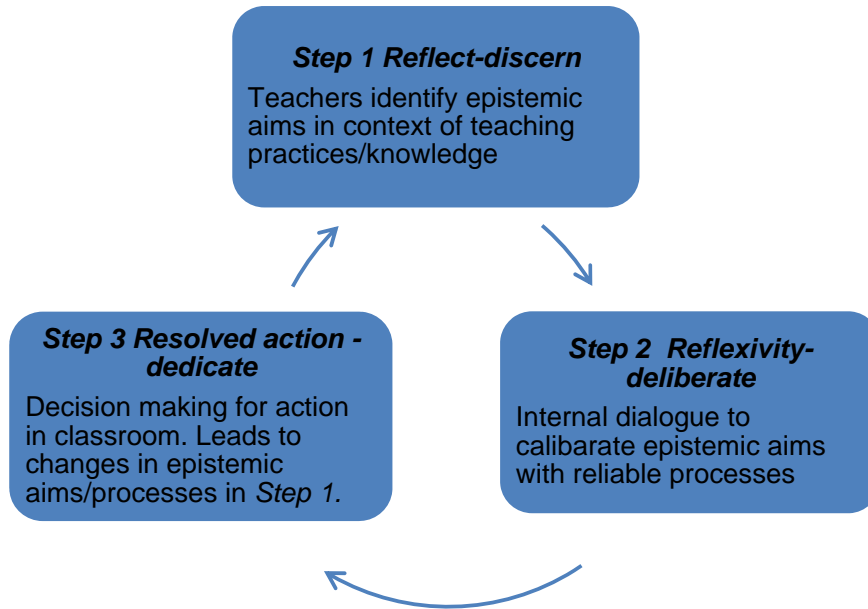
Figure 1. *3R–EC framework for epistemic reflexivity adapted from Author 1 et al, 2017; Author 1, Author 3, et al., 2017*

Step 1 *Reflect*-Teacher educators identify justification, understanding & knowledge as epistemic aims for teaching to/about diversity with preservice teachers in specific teaching and learning contexts

Step 2 *Reflexivity*- Internal and group dialogue to calibrate epistemic aims with reliable processes. Identify enablements and constraints.

Step 3 *Resolved action*- Decision making for action in initial teacher education with a focus on teaching to/about diversity. May leads to changes in epistemic aims/processes
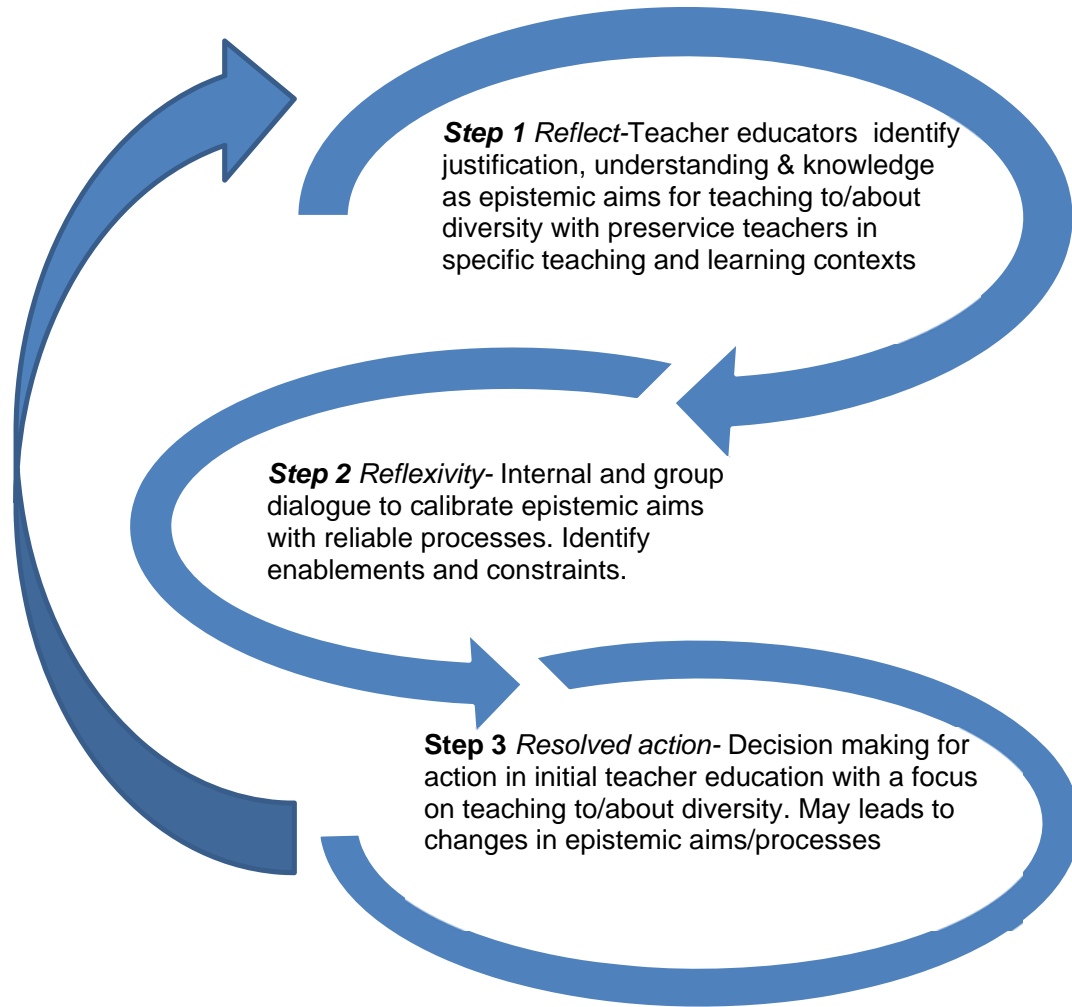
Figure 2. 3R–EC framework for epistemic reflexivity refined for teaching about diversity in initial teacher education (Author 1 et al., 2017; Author 1, Author 3,et al., 2017)