



A taxonomy of clinical reasoning for pre-service teachers on professional experience

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Abstract

Clinical reflection with a focus on student impact is now a mandated attribute for graduate teachers across Australia via the capstone teacher performance assessment task. This policy move is forcing teacher educators to examine their programs to find space for activities that help pre-service teachers to develop the skills and dispositions required for the teacher performance assessment. Some of the best opportunities for clinical reflection occur after pre-service teachers teach lessons during their professional experience in schools. The data for this study were generated during the trial of a lesson feedback and reflection form for pre-service teachers in NSW, Australia. This study examined 13 pre-service teachers' responses in 134 lesson feedback and reflection forms. A phenomenographic analysis was conducted on the responses to produce an inclusive and hierarchical four-level taxonomy of clinical reflection. These data showed that although all levels of the taxonomy were present in post lesson feedback and reflection forms, clinical reflection was less frequent than other categories of reflective practice such as causal. These findings have clear implications for the precision of the learning protocols deployed in professional experience experiences in teacher education for the purpose of fostering clinical reflection.

Keywords Clinical reflection · Professional experience · Critical reflection · GROW model

Introduction

Clinical practice in teacher education has been appropriated from the medical profession. Clinical practice in teacher education settings has many variants but at its core it involves pre-service teachers examining and interrogating their developing practices through the framework of rigorous educational research (Kriewaldt & Turnidge, 2013).

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Developing clinical practice skills is a necessary and vital component of initial teacher education because it enables teachers to develop a process of critical reflection aimed at improving their teaching well beyond their teacher education programmes. This study does not focus on the merits of the clinical model but instead undertakes a closer examination of clinical reasoning (Delany et al., 2020) and the educative processes in teacher education that sustain it (Burn & Mutton, 2015).

Clinical reasoning is the thinking that pre-service teachers do when engaged in a clinical practice model of professional experience (Kriewaldt & Turnidge, 2013). Our interest in clinical reasoning emerged from a study that identified the lack of goal setting conversations by pre-service teachers and their supervisors on professional experience (Loughland et al., 2021). The post-lesson mentoring conversations that were analysed in that paper were predominately a monologue from the supervisor with little mention of the graduate standards as goals, or impact of the lesson on student learning (Loughland et al., 2021). The evidence from this earlier work suggested that the graduates from our own teacher education programs may struggle with clinical reasoning and reflection because these post lesson mentoring conversations do not often provide ample opportunities for students to truly reflect on or even participate in these conversations. Without substantial opportunities to hold a dynamic discussion with supervising teachers at this critical point in their professional development, students are left to develop these skills on their own. However, it is critical for students to develop these skills in a timely and efficient manner. Indeed, meeting clinical reasoning benchmarks is required by the compulsory capstone teacher performance assessment task (Australian Institute for Teaching & School Leadership, 2017) and has been shown to be a useful component in long term teacher professional development (Thompson et al., 2020).

The findings of the previous study and our specific interest in clinical reasoning prompted us to design a structured lesson feedback and reflection form for our pre-service teachers to use during their professional experiences. This design process was motivated by a commitment to provide more explicit scaffolding of our students' clinical reasoning. The aim was to help students to move beyond descriptive reflections of their teaching (e.g., 'what did I do') and into more targeted reflection about the ways in which their teaching impacted or did not impact student learning.

In this paper, we provide an initial report of pre-service teachers' use of this lesson feedback and reflection form. We analysed data from 13 students who submitted 134 forms during their professional experience placements. The analysis resulted in the creation of a taxonomy of clinical reasoning for pre-service teachers on professional experience. The purpose of the creation of the taxonomy was to provide a scaffold as well as exemplars of clinical reasoning for pre-service teachers and their supervisors on professional experience.

Literature review

This review begins with a critical examination of the antecedents of clinical reflection in the reflective practitioner model of teacher education that has been the dominant model over the past three decades (Connell, 2009). It then traces the evolution

of clinical reasoning in teacher education to the development of graduate teacher standards in concert with a growing emphasis on student impact in federal government policy regulation.

The historical provision of teacher education in Australia occurred through teacher colleges with only a few universities offering education degrees. The universities with education degrees prepared their graduates through a strong foundation in the allied disciplines of psychology, philosophy, history, and sociology. This has been termed the scholar teacher model (Connell, 2009). A move away from this scholar teacher model towards an emphasis on the development of pre-service teachers as reflective practitioners coincided with the incorporation of teacher colleges into the universities in 1991. At the same time there was a reflective turn in practice-based courses across higher education (Boud et al., 1993) where practice was deemed to be insufficient without the reflection that turned the experience into learning.

The prevalence of critical reflection in teacher education programs is often attributed to the foundational work of Schon (1983) with their typography of reflection in and on action. Critical reflection soon become critical reflexivity (D’Cruz et al., 2005) as the field of sociology reached its apogee of influence on the teacher education curriculum within Australia. This influence began its slow decline with the advent of the clinical practice model at the University of Melbourne in 2008 (McLean Davies et al., 2012). Clinical practice has slowly become a prominent strategy in professional experience in teacher education in Australia through the introduction of the compulsory teaching performance assessment capstone task for all Initial Teacher Educator providers in Australia (Australian Institute for Teaching & School Leadership, 2017). In our view, clinical practice has not replaced but subsumed critical reflexivity into a process of reflection for pre-service teachers. Included in this reasoning is an account of impact upon student learning as well as achievement of graduate standards.

The creators of the clinical practice model at Melbourne traced their lineage to the Teachers for a New Era project in the USA (McLean Davies et al., 2012). A review of clinical practice models in initial teacher education programs in 2015 supports this genealogical claim but also traces the history back to the earlier Scottish Teachers for a New Era project, the Oxford Internship programme, the authentic teacher education movement in the Netherlands, the Finnish teacher education system and Professional Development Schools in the USA (Burn & Mutton, 2015). The focus of the Burn and Mutton review on *research-informed* clinical practice is interesting as it puts the emphasis on graduate teachers as informed and systematic users of research evidence in their clinical decision-making (Burn & Mutton, 2015). The Melbourne model of clinical practice gave this decision-making process the elegant title of clinical reasoning (Kriewaldt & Turnidge, 2013). Clinical reasoning is the focus of this study albeit within the narrower frame of the graduate standards and the graduate’s impact on student learning.

In current accreditation policies for teachers in Australia (Brett et al., 2018), there is a substantial emphasis on the alignment of teaching with the graduate teaching standards and teaching that leads to student impact. Developing clinical reflection skills is an important component for each of these areas in the accreditation process.

Thus, the development of the lesson feedback and reflection form that is the focus of this study tried to accommodate these policy emphases, particularly regarding student impact. In line with findings from previous research, the aim was to provide a structured process that facilitated student teachers' thinking and reflection about their teaching. As pre-service teachers may not recognise that the dual purpose of professional experience is firstly for them to learn to teach and secondly, for their students to learn (Soslau, 2012) it was important for this form to offer more structured opportunities to explore these ideas (Loughland & Ellis, 2016).

The focus on student impact in our lesson feedback and reflection form reflects the turn towards assessment-centric teaching. Assessment-centric teaching involves monitoring the impact of the teacher's behaviours on the learner (DiRanna et al., 2008). This is different from focussing solely on the actions of the teacher (teacher-centred) or the students (student-centred). It is understandable that pre-service teachers teaching their first lessons on professional experience would focus on their teaching behaviours but the large shadow of the teaching performance assessment means that teacher educators need to move them quickly to a consideration of their students' learning (Cavanagh et al., 2019). In professional experience, the ranks of teacher educators include the supervising teachers in schools who do the work of teacher education with little training, recompense, or support.

A recent study found that supervising teachers were more adept at providing feedback on the inputs of teaching than the impact of the teaching on students (Brett et al., 2018). The explanation for this was that the relatively new language of student impact is not in the lexicon of the graduate standard descriptors nor does it have currency with either the novice pre-service teachers or their more experienced supervisors (Brett et al., 2018). The lesson feedback and reflection form used in this study provided prompts for pre-service teachers to promote the use of the graduate teaching standards as professional learning goals as well as scaffolds to assist them to include evidence of student achievement in their reflections.

Part of the challenge of the induction of pre-service teachers to the language of student impact is the conflation of it with an objective analysis of a student score (Raffe & Loughland, 2021). An alternative conception of impact is a clinically reasoned and contextualised discussion of student learning that involves teachers bringing their full professional knowledge and that of the research base to bear on the analysis (Kriewaldt & Turnidge, 2013). The clinical reasoning model of the evaluation of student impact informed the development of the lesson feedback and reflection form that is the focus of this study. Thus, in the current study, we examined the types of reasoning students used when reflecting on their teaching in professional experience placements.

Methodology

This study used a phenomenographic approach in the analysis of the data. Phenomenography is used to identify people's different conceptions of reality (Marton, 1986). It was originally deployed as a method to identify students' existing views on key concepts (Marton, 2006) in disciplines taught in higher education. The

methodology is now used across a diverse range of fields, but the original outcome criteria pertain:

1. that each category in the outcome space reveals something distinctive about a way of understanding the phenomenon;
2. that the categories are logically related, typically as a hierarchy of structurally inclusive relationships; and
3. that the outcomes are parsimonious—i.e., that the clinical variation in experience observed in the data be represented by a set of as few categories as possible. (Åkerlind, 2005, p.323)

Phenomenography is more commonly deployed with transcripts from interviews, but it has also been used with data from open-ended questions on surveys (Loughland et al., 2002, 2003). In this study, phenomenographic analysis was used to examine the variations on how pre-service teachers reflect on the lessons they teach whilst on professional experience. These reflections were recorded on a Lesson Feedback and Reflection Form based on the GROW protocol that is explicated below.

Purposive sampling was employed to recruit the sample for the study. All the students in each cohort were invited to participate in the study and only those students who accepted the invitation were included. Informed consent was sought by email from each of the students who accepted the invitation. The ethical protocols used to recruit the sample and gain informed consent were consistent with the approval granted by the chief investigator's university ethics committee (HC190939).

Method

A total of 134 lesson feedback reflection forms was collected from 13 different pre-service teachers at a university in New South Wales, Australia. Students were enrolled in different teacher education programs, including a Bachelor of Education (5 students) and a Master of Teaching programme (8 students). At this university, students complete two professional experiences during their teaching programme. Two participants submitted feedback reflection forms from their first professional experience, eight submitted forms from their second professional experience, and three students submitted forms from both experiences that they had completed in 2020.

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The lesson feedback reflection forms analysed in this study were a standard form based on the GROW protocol that was used by all pre-service teachers enrolled in professional experience courses. Students were asked to (a) state their goal for the lesson (i.e., Goal), (b) for them or their supervisor to describe what happened during the lesson (i.e., Reality), (c) state if they achieved their goal and to cite evidence of student learning as well as to brainstorm some alternative pedagogical practices that

could have been used during the lesson (i.e., Options), and (d) to state a new goal for the next lesson (i.e., Where next). Of relevance to the current study, a subsection of the 'Options' portion of the GROW form asked students to:

Examine the evidence from the previous reality section as well as looking at student work samples if they are available. Use the following questions as a scaffold for the discussion.

Did you achieve your goal? Cite evidence of student learning.

This subsection was used as the source of data for the current study as it particularly targeted getting students to reflect on and analyse their own teaching and impact on student learning. It is important to recognise here that the authors believed that a dialogic conversation with their supervising teacher was the best way for this reflection to occur. However, we could not mandate this dialogue so we cannot claim that the data analysed in this study were a product of such dialogues.

Two coders examined the data in the current study. The coders engaged in a "dialogic reliability check, where agreement between researchers is reached through discussion and mutual critique of the data and of each researcher's interpretive hypotheses" (Åkerlind, 2005, p. 331). The first coder examined a random selection of lesson feedback forms to formalise the taxonomy of evidence given by students to support their teaching goals. The second coder then re-examined the same selection to determine if there was agreement among coders. Any discrepancies in this initial stage were resolved with discussion among the coders. The second coder then coded all other lesson feedback forms and flagged forms that were ambiguous or fell between two categories. The two coders then discussed all unclear forms and resolved these discrepancies.

Findings

Four categories of evidence emerged in the initial coding of the data: descriptive, instructional, causal, and clinical. Below, each category is described and examples from the feedback lesson forms are provided. A summary of these categories is provided in Table 1.

Category 1: descriptive

At the most basic level of the taxonomy was the descriptive category. This category constitutes participants' use of descriptions of the classroom activity as evidence of their teaching goals. In this category, participants primarily focussed on describing what they did in the classroom independently of student learning. In some cases, participants also described activities that they asked students to do, but there was no discussion of the extent to which students engaged with the material, learned the content, or enjoyed the lesson. Overall, these forms focussed solely on detailing the reality of the classroom experience, rather than how it contributed to better outcomes for teachers themselves or student learning. Of the 134 forms coded,

Table 1 The four categories of reflection

| Category | Description |
|---------------|---|
| Descriptive | Participants primarily focussed on describing what they did in the classroom independently of student learning |
| Instructional | Participants described an instructional strategy used during the lesson |
| Causal | Participants linked instructional strategies to students' behaviour and learning in the classroom |
| Clinical | Participants understand the need to apply different pedagogical strategies in different contexts and for different students |

21 forms (15.7%) were categorised as descriptive. Examples of descriptive evidence from the dataset include:

initially wanted students to complete work mostly in silence but then realised it isn't really feasible during a practical lesson, so I just wanted to focus on keeping the noise level down [Participant ID 178]

It is not unusual for novice pre-service teachers to focus on keeping the noise down but their reflection is descriptive of what the students did without reference to any instructional strategy related to or evidence of the students' learning. The next quote is another example of a student describing what the students did in the lesson:

Yes, the lesson ran very smoothly, students actively participated in discussions, responded to questions on their mini whiteboards and engaged with storybook reading. Students accurately wrote tally marks on the board with one to one correspondence. Students converted their tally information into a column graph. [Participant ID 135]

The final quote in this category is descriptive as it refers to completing the lesson plan and checking students' answers with no link to an instructional strategy:

Yes. I finished the required content in accordance with my lesson plan on time. Also, I walked around the classroom to check their answers. [Participant ID 130]

Category 2: instructional

The next level of evidence was instructional. In instructional evidence, participants described an instructional strategy used during the lesson. This is considered more complex than descriptive because it demonstrates students' thinking about different instructional strategies learned in their teacher education programs and how they are applied in classroom settings. However, like descriptive, instructional evidence still heavily focusses on what happened in the classroom rather than how these instructional practices are linked to better teaching or better learning outcomes for students. Of the 134 lesson forms, 24 forms (17.9%) used instructional evidence. Examples included:

Use a range of teaching strategies: Applied the following: -Better use of modelled, guided and independent teaching. -Visual and audio stimulation for student engagement - Differentiation used for Year 1 and 2 students. The correct conjunction was provided for Year 1 and Year 2 were set... [Participant ID 179]

This pre-service teacher provides a clear explication of the teaching strategies employed in the lesson without reference to their impact on student learning.

Yes. I walked around the classroom and checked the worksheets completed by all the students. The majority of students answered all the questions on time, only a few of them did not complete the questions. In this case, students have time to do the formative assessment in class to assess what they have learned by themselves. Also, they have the opportunity to practice HSC exam-style short answer questions and check their answers using the marking criteria provided (self-reflection). Participant ID 130]

This quote mentions strategies such as formative assessment and practice questions and student participation in these activities without reference to the quality of their learning.

Not entirely. There were a number of factors during the lesson that made behaviour management difficult. The class was in a different room, last lesson of the day, sitting at high tables and not in their usual seating plans. I thought this would be a good opportunity to assess how I manage challenging behaviour. I implemented the use of a quiet signal, and returned to this throughout the lesson. I reminded students of their expectations in a positive way. However, this did need to be done a number of times. [Participant ID 191]

This quote refers to classroom management strategies employed in the lesson. They are not instructional strategies but are included here due to the importance of behaviour management skills to pre-service teachers,

Achieved. A range of different activities were conducted in class to engage students' learning. Teacher was giving explicit instructions by giving examples etc before activities. Understanding was checked such as thumb up/ down after explanation. [Participant ID 142]

It is clear in the above quote that the pre-service teacher equates achievement of their goals to the execution of their planned strategies such as giving examples and checking understanding through thumbs up/ down signals from the students.

Category 3: causal

Level three of the taxonomy is causal evidence. Causal evidence demonstrates that participants can link instructional strategies to students' behaviour and learning in the classroom. Causal evidence is more complex than descriptive or instructional evidence because students see that their instructional strategies can impact students' learning. Thus, participants that use causal evidence are

demonstrating that they consider how students respond to their teaching to assess their goal progress, rather than focussing solely on how a lesson was implemented or how students acted independently of lesson contents. Importantly, however, this evidence focusses on how instructional strategies impact students overall. The largest portion of lesson forms used causal evidence, with 63 of the 134 forms (47.0%) using this type of evidence:

Yes, despite this lesson being planned as team-teaching it flowed well and the students engaged appropriately with required activities. I definitely improved my time management although it would have been nice to have more time at the end for the sharing circle. While some students struggled to choose a place, after discussion and modelled examples, everyone was able to choose a place, draw it and most were comfortable sharing with the group although we ran out of time. [Participant ID 135]

There is a connection in the above quote to the instructional strategies of team teaching, discussion and modelled examples to student engagement and learning in a general sense such as sharing in a group and completing the task set.

Yes. I selected 'assesses student learning' because it was very important for the students to gain a clear understanding of the content/concepts covered in this lesson. After the first write now, some students offered to share their responses, which demonstrated to me they had a good initial understanding of the ideas of moral dilemmas. Through class discussion and questions I assessed that students had understood the concepts of 'tragedy' and 'Shakespearean tragedy'. Students engaged with the idea that humans are not perfect and good people can make bad decisions, like the characters in Shakespeare's plays. I circulated and read their final writing responses and again, they discussed moral dilemmas. [Participant ID 191]

This is a very clear explication of the instructional strategies employed in the lesson, but impact is assessed through generic students rather than an explanation of individual student progress.

Achieved. Lesson was sequenced from revision of relevant vocab to get students prepared for the harder content. Following up students showed high level of accuracy... [Participant ID 142]

Again, this quote labels the instructional strategy but the impact is limited to students in general.

I think this was achieved to a certain extent; the activity requiring everyone to get in a circle in the correct order ensured everyone was taking part in the lesson, and communicating effectively with one another. They worked well to make the patterns, helping each other when a student didn't respond. Having students work in pairs meant that there were not any students feeling left out of a group or sitting waiting for too long. [Participant ID 182]

You can sense the relief in this pre-service teacher's response as they reported all "students worked well to make the patterns, helping each other when a student didn't respond". There is no mention of the impact of the lesson on individual students.

Category 4: clinical

The most complex category of the taxonomy was clinical evidence. Clinical evidence demonstrates a participant's understanding of the need to apply different pedagogical strategies in different contexts and for different students. This is a more complex level of understanding than causal evidence because students are consciously considering how different students or situations may need different approaches. In this type of evidence, participants describe how some students may respond positively to the lesson or a strategy whereas others may have responded negatively. About a fifth of the lesson feedback forms used clinical evidence (26 forms, 19.4%). Some examples from these 19.4% are presented and explained here:

When students were answering questions with the mini whiteboards, I wrote down student names on a post-it note, noting those who were getting answers wrong and may need extra help. I also reviewed all answers, and if many students got the answer wrong, I reviewed the concept or question again. I also called on students who seemed distracted/daydreaming, to assess if they were listening and paying attention. [Participant ID 122]

We categorised this response as clinical because of the reference to different students and their learning rather than as an effect on a whole class. There is also a clear connection between an act of teaching, "I also reviewed all answers" and its impact upon students' learning, "and if many students got the answer wrong, I reviewed the concept or question again".

Every student was participating and engaged the whole of the lesson, so the goal was achieved in that regard. I wanted more specifically, however, to encourage faster working from the small handful of students still on the lino cutting stage. I was successful at stages, as I walked past their desks and made assertive comments ("staying on task please") whilst lightly knocking on their desks. I could have worked on this more though, as I felt I was easily taken away from this focus by assisting students with printing (and minor tasks such as reiterating the need for names on works). [Participant ID 176]

In this response, the pre-service teacher is also demonstrating a differentiated view of their students, "to encourage faster working from the small handful of students still on the lino cutting stage".

... In the first half of the lesson, I provided a working example step-by-step. In this case, I asked the students if they understood the calculations, and they said yes. In addition, I asked a student to answer a similar example on the whiteboard. I repeated the calculating process to make sure that every student understands this important concept. After that, I designed a 3-page worksheet question. I checked their answers and provided constructive feedback. I real-

ised that the majority students understand the learning concept. Also, I will talk to some students who have made mistakes individually during the next lesson. [Participant ID 130]

This pre-service teacher demonstrates a clinical understanding of their practice through reference to their impact upon students on three occasions. Before this, there is a causal reference, “I asked the students if they understood the calculations, and they said yes”. The next response to the class is more differentiated when they “asked a student to answer a similar example on the whiteboard”. This is a teaching strategy that is more likely to yield formative assessment data than the generic question asked previously. The pre-service teacher then “checked their answers and provided constructive feedback” which demonstrates clinical reasoning, as does their projected behaviour of “I will talk to some students who have made mistakes individually during the next lesson”.

This was an overall successful lesson, and I’m stoked by the overwhelmingly positive response the students had for the activities. Differentiation was set for students who were ahead and for those that struggled I offered techniques to help break down complex problems, rather than handing out an alternative activity. [Participant ID 178]

Clinical reasoning is evident in the above response in the pre-service teachers’ different teaching response to their formative assessment of student learning, “Differentiation was set for students who were ahead and for those that struggled I offered techniques to help break down complex problems, rather than handing out an alternate activity”.

Given that participants are near the end of their teacher education programs, a relatively small proportion of only 19.4% of this sample of 134 forms demonstrated the use of what we judged as clinical reasoning in their lesson reflections. We discuss the implications of this finding for teacher education in the next part of this paper.

Discussion

The findings of the study present two challenges for teacher educators engaged in the work of fostering clinical reflection in pre-service teachers on professional experience. The first challenge relates to the low levels of clinical reflection evident in this sample and the second is the challenge to design and develop feasible and effective learning protocols that engender such clinical reflection in pre-service teachers on professional experience. Both challenges will impact upon pre-service teachers’ ability to complete sections four and five on their capstone Graduate Teaching Performance Assessment that involve both reflecting and appraising.

This study found that only 19.4% of this sample of students were using clinical reasoning in their lesson reflection. This is more concerning because most of the participants and their reflections included in this study came from their second professional experience placement, and thereby reflects students who are in the

very final stages of their teacher education programme. There are many possible explanations for this finding. It may be, for example, that the developmental phase of these students is relevant. If students tend to demonstrate more clinical reasoning in their second placement than their first, the current data may reflect an important learning process, even if the relative rates of clinical reasoning are quite low. Unfortunately, these data in the current study cannot directly speak to the developmental argument as only three students submitted these forms from both their first and second professional learning experiences. Future work should consider the development of clinical reasoning over time.

It is also possible that there are inadequacies in the lesson feedback and reflection protocol used in this study. As mentioned in the introduction, the development of the lesson feedback and reflection forms used in this study was based on previous research (Loughland et al., 2021) suggesting that a more structured approach to post-lesson mentoring conversations would help students to focus on their own development as teachers, rather than mere descriptions of the lessons itself. Here, we provide a discussion of some of the ways in which our lesson feedback and reflection form may be refined in future iterations of its use on professional experience, specifically with the aim of providing more opportunity for clinical reflection among students.

The challenge of the evidence of this study is that we have yet to implement well-designed learning protocols that make the practice and reasoning required in clinical reflection explicit for all pre-service teachers. We designed a feasible lesson feedback and reflection form to enhance the self-reflection of our pre-service teachers but may have inadvertently limited the opportunities for critical professional dialogue with the supervisor. Therefore, we can claim to have designed a feasible protocol but not one that engenders clinical reflection, given that only 19.5% could meet the clinical reasoning level even with the scaffold provided. The tension between the validity of such protocols and their feasibility is an ongoing challenge for schools of education. In times of budget constraints there are fewer trained teacher educators on the ground in professional experience whether these are university liaisons or properly supported supervising teachers in schools.

The answer to our challenge may well be to implement a model of clinical practice across the entire teacher education programme instead of just the professional experience components of these programs. This was the approach taken by the Melbourne Graduate School of Education (McLean Davies et al., 2012) albeit with support from federal government funding at the time. The Melbourne Clinical Practice model facilitated the development of clinical reasoning by ensuring that their pre-service teachers read the research, examined the empirical evidence, and learned to make reasoned judgments whether on-campus or at one of their excellent and well-resourced clinical practice schools. This model of teacher education may not be sustainable under current Federal Government funding but its legacy is an intellectually rich model of clinical practice and clinical reasoning that gives equal footing to both the professional judgment of teachers and the full repertoire of educational research (Kriewaldt & Turnidge, 2013). That is a legacy worth defending in the professional experience curriculum and teacher education programs at large.

A clinical reasoning model of teacher education would also align well with the reflecting and appraisal sections of the Graduate Teacher Performance Assessment (GTPA). One of the GTPA criterion for reflecting is “Identify and describe differences between planned and enacted teaching, and related pedagogical reasoning” (Australian Catholic University, 2022, p.1). This definition of reflection embodies clinical reasoning, as does another criterion for appraising, “Examine and discuss how teaching decisions were effective or not effective in progressing student learning and why” (Australian Catholic University, 2022, p.1). The reflecting and appraisal section of the GTPA operationalises the subsumption of critical reflection into clinical reasoning that we argued was the case in the literature review.

Areas for future research

The taxonomy needs to be investigated with further studies to see if this is a valid representation of pre-service teachers and the level of clinical reflection they routinely engage in. A possible focus for further research could be to see if the levels of clinical reflection are developmental in that pre-service teachers may need to move through the levels as they progress in their professional learning. To this end, future research could also investigate whether the different levels of reflection in this taxonomy are more akin to a model of learning transfer (Hattie & Donoghue, 2016) where it is necessary to build the surface level (descriptive and instructional) before moving to the deeper levels of clinical reflection (causal and clinical). Transfer could then be tested through longitudinal studies that follow pre-service teachers through their professional experiences in initial teacher education programs or in the early years of teaching.

Another research question worth asking in the light of our self-reflection protocol is who is doing the work of engaging the dialogue that will scaffold the development of clinical reasoning in our pre-service teachers. This echoes the provocation offered by Biesta when he asked who is asking the educational research questions that matter to the profession (Biesta, 2015). The part-time army of professional experience supervisors and university liaisons we employ in teacher education may be the expert others who are asking the educational questions to our students. These questions could form part of a professional dialogue guided by a well-designed protocol.

The allied field of teacher professional learning is replete with protocols that teachers have imbued with their hard-earned practical wisdom. Protocols for professional learning became part of the school reform movement in the USA in the 1990s (McDonald et al., 2013). The most prominent of these protocols were the tuning protocol, the consultancy and the collaborative assessment conference (McDonald et al., 2013). In Australia, the national schools network contextualised the tuning protocols that provided the framework for teachers to discuss their teaching plans in convivial ways that promoted their sense of collective efficacy (Sachs, 2000). Similar protocols could be developed by teacher educators to guide the learning of pre-service teachers on professional experience.

Unfortunately, funding cuts due to the COVID pandemic mean that there are less resources to train and support these people doing the critical work of teacher

education. This is going on whilst full-time tenured faculty pursue their own equally important psychological, sociological, and philosophical questions about education. These questions are more likely to receive funding and their answers published in the elite journals that are often tied to promotion and tenure. This is a philosophical and political dilemma at the heart of the disconnect between education researchers acting as teacher educators in the academy and the profession.

This disconnect is reflected in the many unfavourable reviews of teacher education cleverly depicted as the 101 damnations by Loudon (2008) that have continued apace since then with another, the Quality Initial Teacher Education Review (Australian Government Department of Education Skills and Employment, 2021) underway at present. As we move forward, it is important that researchers bring light to best practices in developing clinical reasoning within early career teachers alongside other research efforts focussed on aspects that improve school quality and student learning.

Conclusion

This study analysed the implementation of a lesson feedback and reflection form for pre-service teachers on professional experience in teacher education. The intention was to engender skills of clinical reasoning common to models of clinical practice in teacher education.

The analysis produced a four-level taxonomy of clinical reasoning. This taxonomy may be useful as a scaffold in future iterations of the employment of the lesson feedback and reflection form on professional experience. However, the low proportion of pre-service teachers (<20%) using clinical reasoning according to our framework suggests that the self-reflection protocols we used to deploy the form may not have provided the kind of critical dialogue with supervisors required to develop clinical reasoning skills. The original curriculum design challenge of building clinical reasoning among our students remains for us and unfortunately now under a more difficult and tightly funded operating environment. It is fortunate that teacher educators are not frightened of yet another challenge in an academy where they sometimes feel like a misfit.

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