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Imagination as a source of professional practice change: A cultural-historical study of the unique characteristics of early childhood teacher professional development

Highlights

- Imagination created the motivating conditions for practice change
- Imagining ‘as if’ in a mature form of a Conceptual PlayWorld was core to the PD
- Problem solving through multiple imaginings of a Conceptual PlayWorld was identified
- Imagination as a psychological function resourced teacher learning

Abstract

The **purpose** of the research was to investigate how early childhood teachers create new practices as a result of participation in a 10week professional development program of a Conceptual PlayWorld. When seen through the lens of cultural-historical theory, the **study** identified a set of unique characteristics for early childhood teacher professional development, where the motive orientation of play practice was core. The **major** conclusion was that imagination as a psychological function resourced teacher learning in the motivated conditions of a Conceptual PlayWorld for practice change.

Keywords: early childhood; teacher development; cultural-historical; STEM; Professional Development

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1. Introduction

Historically the literature on the professional development (PD) of teachers and the respective quality of teaching measured in practice has been limited (de Groot-Reuvekamp et al., 2018). A link between classroom practice and the nature and impact of the PD program is not well understood (Egert et al., 2018; Lauer et al., 2014). Correspondingly, an absence of research into teacher PD programs and student outcomes is also evident (Gore et al., 2017). It is argued that “the question of how teaching can be improved remains one of fundamental significance internationally” (Gore et al., 2017, p. 100).

The purpose of this paper is to present the findings of a study that sought to understand how early childhood teachers in play-based settings engage in professional learning through being involved in a PD program of a Conceptual PlayWorld. In so doing, the paper seeks to contribute to better understanding the unique nature of early childhood practices and specific PD of early childhood teachers. To achieve this goal, the paper begins with an overview of what is known about early childhood PD, followed by a discussion of cultural-historical concepts that guided the research, the study design, and the findings. The paper concludes by discussing the unique nature of professional learning and early childhood teacher development in the context of previous studies, where the implications and contribution to early childhood education are given.

2. What is known about professional learning and teacher development?

What is known about professional learning and practice change has come from the studies of PD programs where an array of models (Stewart, 2014), elements (Schaap & de Bruijn, 2018), and more recently, differing technologies and platforms (Lantz-Andersson et al., 2018; Parsons et al., 2019; Powell & Bodur, 2019; Shannon et al., 2015) are evident. The diversity in PD can be captured through terms such as, co-teaching (Murphy et al., 2015), coaching (Elek & Page, 2019), mentoring (Trevethan & Sandretto, 2017), lesson studies (Vermunt et al., 2019), professional learning communities (Schaap & de Bruijn, 2018) and more. Some of the PD programs and the respective studies have looked at short term outcomes (Lauer et al., 2014) and others longitudinally in terms of teacher practice change (Kaderavek et al., 2020). There is also a mix of terms to describe the area, with the dominant name being PD or PL (Stewart, 2014). This presents an interesting context in which to understand how teachers in early childhood settings grow their practices and develop as teachers.

Internationally, there are studies which have specifically examined the PD of early childhood teachers. In the US Gomez, Kagan and Fox (2015) have shown three pathways through which PD of early childhood teachers can happen 1) upgrading qualifications in a university, 2) competency based credentialing that is awarded based on pre-determined criteria, and 3) ongoing experienced-based PD, such as, communities of practice, modules, onsite coaching or mentoring, and portfolio with demonstrated experience for college credit/credentialing. The latter third area appears to be widely undertaken in many countries (Egert et al., 2018). It is argued by US Gomez, Kagan and Fox (2015) that a combination of these approaches is used by early childhood workforce, and as noted by Hadley, Waniganayake and Shepherd (2015) in Australia, and Thornton and Cherrington (2019) in New Zealand, innovations through the use of technologies and digital forums are emerging in many of these PD programs. Relevant to the focus of this paper, are four key areas of understandings about

the nature of PD and PL of early childhood teachers that come from these studies and the broader literature.

First, an emerging research theme in the early childhood PD literature is the sustainability of professional learning communities (Thornton & Cherrington, 2019). Thornton and Cherrington (2019) studied early childhood teachers over a 2.5 year period in order to understand how professional learning communities (PLC) improve teaching and enhance learning. Rather than critical reflection as the core activity, PLC embedded critical reflection into an inclusive and mutually supportive group who shared leadership, values and vision, and engaged in collective learning about individual practice. Importantly, Thornton and Cherrington (2019) identified that different to school PLCs, “The nature of ECE environments would seem to lend itself to collaborative practices as often teachers are working in the same physical space and interacting frequently throughout their working day” (p. 419). However, the policy context in New Zealand suggests that mentoring, coaching and giving time for professional conversations was not common. Consequently, Thornton and Cherrington (2019) investigated how best to build sustainable PLC in early childhood education on-line. Thornton and Cherrington (2019) used on-line activities to support teacher inquiries. Teacher inquiries were deemed core to their PLC design. The on-line forum was also the site where reflective questions were posted throughout the 2.5 year study. The study identified a maturing of the PLC over time because of 5 enablers specific to early childhood settings: clear membership and effective induction; shared focus, commitment and research orientation; clarity of roles including leadership roles; opportunities for dialogue and de-privatisation of practice; and the facilitation of new ideas. In addition, involvement of an outsider in the on-line forum supported the process of interrogating the practices discussed in the PLC. An outsider as an ongoing facilitator or an insider who acts as a critical friend has also been reported by Hadley, Waniganayake and Shepherd (2015) as one of four key spheres of PDL. In their study of

practitioner inquiry in Australia they used a conceptual model of PDL that included guided learning with a critical friend, self-directed learning, and collective learning in small groups as has been noted as effective by Thornton and Cherrington (2019) in New Zealand. *Increasing evidence of sustainability of PLC would appear to be supported through on-line forums of early childhood teachers engaged in individual inquiries, but with expert facilitation/support for critical reflection to build their professional community.*

Second, another common theme throughout the international literature is the effectiveness of PD programs which combine teachers' existing professional knowledge of their practice with critical reflection (Wingrave & McMahon, 2016). For instance, ongoing experienced-based PL has been the focus of research by Ingleby and Hedges (2012) who suggested that the standards driven approach as a driver for ongoing PD of early childhood teachers in England does not appear to support reflective practice. In contrast, Moran et al.'s (2017) 2 year cross-national study of video exchange process between Italy and the US, identified that early childhood teachers in toddler classrooms entered into dialogue exchanges and meaning making process of critical reflection when viewing videos of practices, re-encountered long-held beliefs, co- and re-constructed knowledge, and merged prior and new meanings. They argued that core for the "teachers' process of collaborative inquiry was their cycle of critical reflective practice as they viewed and re-viewed their own and the others' video recordings" (p. 10). The outcome of making explicit their own implicit worldviews emerged and this opened up a process of reflection on what they already knew and do in their practice, and in so doing, began to think in new ways about their own practice. This study of the PL of teachers foregrounds and positions teachers as competent in their practices and professional knowledge. It also identified that teacher knowledge as a resource for competently studying one's own practice in relation to others' practice. This research into critical reflection of early childhood teachers is in contrast to that of Ingleby and Hedges (2012). Moran et al. (2017) appears to begin with a

credit model of what teachers already know and do. This suggests a different approach to critical reflection of existing practice. In summary, teachers begin with what they know as a basis of reflection, rather than implementing something new, such as, teaching standards (Ingleby & Hedges, 2012) or competency-based credentialing that is awarded based on pre-determined criteria (Gomez et al., 2015), or new curriculum (Hadley et al., 2015). *Therefore, the digital video content and of existing professional practices in early childhood education across nations and the associated online forums appears to create positive reflective developmental conditions for teacher transformation.*

Third, contextual leadership through expert input into practitioner inquiries within the early childhood centres has been consistently reported as a contributing factor in the PDL or early childhood teachers. Hadley et al. (2015) in their two study design investigated 25 early childhood teachers who had participated in PDL program using practitioner inquiry and who were given ongoing support from academic facilitator. Practitioner inquiries was found to be highly valued and preferred by early childhood teachers over other forms of PD for sustained engagement in PDL, such as mentoring, networking and conference attendance. In house training was less valued with only highly qualified staff valuing this form of PDL. A mixed response to reflective journals was identified and least popular was professional reading. Taken together, they found overwhelming evidence that “collaboration by academic experts and practitioner leaders can have a long-lasting impact on professionalisation and quality improvement” (p. 200) and this has been reported elsewhere (e.g., Giamellaro & Siegel, 2018; in coaching). *Therefore the early childhood teacher valuing of practitioner inquiries with expert input appears as key characteristic of successful PD.*

Fourth, important for the focus of this paper, is understanding the distinctive nature of early childhood education for the PD of teachers and how this plays out in relation to the broader research. Internationally, it is reported that the qualifications of the workforce are variable and

not universal as they are in schools, with many having a technically trained teacher rather than a university degree qualified teacher, and in most settings or classrooms, teachers work with an assistant (OECD, 2012; see Hadley et al., 2015). Meanwhile, many countries have changed their policies due in part to the evidence surrounding the link between qualifications of staff and outcomes for children (Hadley et al., 2015), and this has created a PD context that blurs the traditional boundaries between pre-service and in-service teacher PD as technically qualified staff upgrade their qualifications (Gomez et al., 2015). Moreover, the different professional factors, such as location, centre size, ethnicity, have also been reported by Hadley et al. (2015) to add to the complexity of researching PDL in early childhood settings. Like Thornton and Cherrington (2019) in New Zealand, Hadley et al. (2015) also draw attention to the specific nature of early childhood education in Australia by reporting that the resourcing for the participation of early childhood teachers in PDL is problematic:

Educators employed within schools have mandated four to five pupil-free days built into their annual training calendar. This contrasts with PLD options available to those who are not employed in prior-to-school settings. Typically they work longer days (seven to eight hours per day), without school holidays and with little or no respite from children to undertake professional learning regularly (p. 200).

Adding to this is the pedagogical nature of the play-based context in which early childhood teachers are located (rather than more formal classrooms) and the developmental period of the children whose leading activity is to play. Therefore, a recognition of the uniqueness of the practice conditions and the specific suite of expert knowledge and pedagogical practices of early childhood teachers must be considered when reviewing the PD literature, and this also means looking for other means of bringing communities of early childhood professionals together. However, an area that is silent in the literature is play. Both the pedagogical practice

of play and play as the source of development in early childhood do not appear to be explicitly foregrounded in the PD and PL literature. Closest to this has been the important research of Nuttall et al. (2015) who investigated the PD of early childhood teachers new to using digital devices in their programs. They identified that the motives of the teachers for improving their practices drove their participation in the PD. Specifically, they argued that knowing the object motive is key for the success of the PD of early childhood teachers. *In summary, what appears to emerge in the literature is a unique set of characteristics surrounding the context of early childhood education and the professional practices of the early childhood teacher, and this context must act as the beginning point for the design and delivery of PD for early childhood teachers where teacher motive is central.*

Taken together, the literature suggests that the most effective PD program designs for early childhood teachers include the following four characteristics:

- Recognition of the unique practice context of early childhood teachers
- On-line professional forums and digital videos to conveniently bring together and engage early childhood teachers
- Embedded critical reflection of existing professional practice as a key process for teacher transformation
- Practitioner inquiries with outsider expert input is the most highly valued PD approach for practice change by early childhood teachers

3. Methodology

3.1 Research questions

The empirical research question driving our study was: How does a PD program designed using effective change principles for early childhood teachers act as a source of practice change in a context of introducing a new model of practice known as Conceptual PlayWorlds?

3.2 Participants

A total of 28 early childhood teachers participated in the study. All were living in Australia and all were Australian citizens. One teacher identified as Aboriginal Australian. Of these teachers, one teacher taught children in outside care, 14 taught children aged 3-5 years, 2 taught children aged 4-5 years and 8 taught children in the first informal year of school. Four teachers did not specify the age groups they worked with. All teachers had between 5 and 10 years of experience, and all were degree qualified.

3.3 Professional Development Program Design

The PD program summarized in Table 1 was designed in relation to the what has been identified in the literature as successful PD for early childhood teachers (Column 1), the resources made available to the teachers as part of their participation (Column 2) and how the data was collected for this study (Column 3) and discussed in more detail below.

Table 1. Overview of the design of the PD program

Characteristic of effective PDL programs for early childhood teachers	Resources available to the teachers	Research process
Recognition of the unique practice context of early childhood teachers	Play-based program	Planning documentation
Developing practices unique to early childhood education acts	5 Characteristics of a Conceptual PlayWorlds	Digital video recording

as the motive for participation in PD		
On-line professional forums to easily and conveniently bring teachers from different sites together	1.82 hr on-line workshop with outside expert in Conceptual PlayWorlds - Zoom platform for sharing practices	Digital video recording Focus group interviews Stimulated recall
Practitioner inquiries with expert input is most highly valued process for PD by early childhood teachers	Facebook platform to share practices and email and phone support App to digitally record gather moments of everyday practices of Conceptual PlayWorld	
Embedded critical reflection of existing professional practice as a key process for teacher transformation (both of practice and for building learning communities)	3 hr face to face workshop on a Conceptual PlayWorld with support from outside expert in Conceptual Period 1: Workshopping in small groups PlayWorlds plans for a Conceptual PlayWorld Period 2: Whole group sharing of plans	Digital video recording

The teachers were brought together with an expert who stepped them through a new model of practice known as a Conceptual PlayWorld using video recordings as examples of the characteristics of the model of practice (Table 2 Column 2) and a workshop to design their own PlayWorld (Table 2 Column 3).

Table 2. Summary *Conceptual PlayWorld planning proforma*

	Characteristics of a Conceptual PlayWorld	Small group or team planning space
1	<i>Selecting an engaging story</i>	
2	<i>Creating an imaginary Conceptual PlayWorld space</i>	
3	<i>Teachers and children entering and exiting the Conceptual PlayWorld together</i>	
4	<i>Problems arise in the Conceptual PlayWorld that need to be solved</i>	
5	<i>Teachers take different roles in the Conceptual PlayWorld to actively support children's play development—subject positioning</i>	

In preparation for the PD the teachers had been asked to bring their favourite children's book. They chose the story of *The Magic Hat* by Mem Fox. This rhyming storybook is centered around a Magic Hat which moves from the head of a Wizard and onto a series of animal characters before being re-united with the Wizard. All teachers developed their own plans and also used the proforma (Table 2) to support their work.

3.4 Data collection

Data collection was organised over four periods. Period 1 was the presentation to teachers of a Conceptual PlayWorld (Table 2). Period 2 digitally captured an outside expert supporting teacher planning in small groups of a Conceptual PlayWorld. In Period 3, the teachers shared their planning with the whole group. As part of Period 3, the teachers returned to their centres and implemented their Conceptual PlayWorld, which they then later shared via zoom with each other. In Period 4 the outside facilitator asked a set questions to promote critical reflection, as well as to generate data on practice change.

3.4.1 Digital video recording

A total of 598 minutes of digital data were collected over four period. Periods 1-3 included a total of 326 minutes and in Period 4 a total of 272 minutes of zoom data were recorded.

3.4.2 Focus group interview questions

Period 4 of the data collection was guided by a set of interview questions. The interview began with questions inviting all the participants to talk about their chosen story and the Conceptual PlayWorld they had undertaken between Period 3 and Period 4. Examples of questions were: What were the challenges? What worked well? Some of the teachers

showcased their plans, the resources they had prepared, and examples of children’s models associated with the story they had chosen.

3.5 Analysis

We drew upon the four characteristics of successful PDL identified in the literature that were unique to early childhood teacher development to design and deliver a PD program on a Conceptual PlayWorld (Table 1). These characteristics acted as a beginning point for our analysis. They have been included in our analysis frame in Table 3 below (Column 1). We wanted to ensure we had successfully incorporated these into our PD program design so that we had created the best developmental conditions possible for the early childhood teachers. We also drew upon the cultural-historical concepts that emerged in the PDL literature (Table 3, Column 2) which researchers had used to frame their studies of PDL generally. Whilst we paid attention to these concepts, there were only some that we used to guide our analysis.

Table 3. Characteristics and concepts as background for the design of PDL

Characteristic identified in the literature specific to early childhood teachers	Cultural-historical concepts used generally in PDL studies generally relevant to the characteristics and closest to Vygotsky’s conception of development	Researcher using cultural-historical concepts related to the Vygotskian concepts (and related)
Recognition of the unique practice context of early childhood teachers	Vygotsky’s (1966) conception of play as a psychological function of the preschool child Social situation of development (Vygotsky, 1994)	Edwards et al. (2019)
Developing practices unique to early childhood education acts as the motive for participation in PD	Relations between motives and motivation (Hedegaard, 2014)	Nuttall et al., (2015)
On-line professional forums to easily and conveniently bring teachers from different sites together	Dialectical relations between everyday and scientific concepts in practice (Vygotsky, 1987)	Eun (2008, 2011) Shabani (2016)

	Higher mental functions: Relations between inter and intra psychological functioning (Vygotsky, 1987) Collective/individual tensions Communities of practice	
Practitioner inquiries with expert input is most highly valued process for PD by early childhood teachers	Relations between mature and real form of development Zone of Proximal Development Apprenticeship – legitimate peripheral participation (Lave & Wenger, 1991)	Johnson et al., (2020) Grimmett (2014) Shi (2017) Tasker et al., (2010) Brown & Mowry (2017) Ellis (2007)
Embedded critical reflection of existing professional practice as a key process for teacher transformation (both of practice and for building learning communities)	Drama and contradiction for creating conditions for development Perezhivanie – affect and intellect Consciousness as a double move – theory into practice and practice into theory Everyday and scientific concept formation	Grimmett (2014) Hoffman-Kipp et al., (2003) Ebadi & Gheisari (2016)

We used three iterative steps of analysis originally described by Hedegaard (2008) where all data sets were analysed through the lens of a common sense interpretation, a situated practice interpretation and a thematic or theoretical interpretation. At the common sense interpretation we organised the data into the 3 period and digitally copied each (keeping an original raw file) and looked for the actions of the teachers in relation to each of the characteristics of the Conceptual PlayWorld (Table 2) and tagged these each time they arose during each period of data collection. That is, we looked for all the moments in the data where teachers were given content related to the Conceptual PlayWorld and also at each moment where teachers sought to or did plan/share their own version of the Conceptual PlayWorld. At the situated practice level, we noted how the teachers were discussing each characteristic (Table 2, Column 2). For example, we tagged data in terms of how teachers were presenting ideas to each other in the group (small and whole group). We then transcribed the actions and expressions of the teachers in relation to the characteristics. This supported the clustering of common data, in order to begin to identify a density of data around how the teachers were discussing practice change in relation to the characteristics of the Conceptual PlayWorld.

Finally, we drew upon theoretical concepts to help us with answering the research question of the study. For instance, we noted in the data sets created across the three periods and which were tagged in relation to the characteristics of a Conceptual PlayWorld, how the teachers created new practices, concepts or resources. We also looked closely for points of contradiction and tagged these video clips and transcribed the dialogue surrounding the contradictions. We paid special attention to when teachers projected characteristics without using words. To achieve the latter theoretical analysis, we used the dialectical concepts of imagination and creativity because the gesturing of teachers could not be explained by any of the concepts shown in Table 3 Column 2.

3.5.1. *Imagination and creativity*

Imagination and creativity are often researched as individual psychological functions in traditional psychology literature. One of the fundamental insights of Vygotskian approach to researching imagination and creativity has been sociogenesis of human mental functions. Instead of individual creativity Vygotsky's work points to the collective creative work. His argument has been to conceptualise imagination and creativity not as an exception or reflection of individual brilliance but rather as a rule where "creativity is seen as essential condition for existence" (Vygotsky, 2004, p. 11). Seen from this lens imagination and creativity are central to any professional practice. Three aspects of Vygotsky's conceptualisation of imagination and creativity are presented here which could help to understand it in the context of present research on teacher's professional development:

- i) Dialectical relationship between imagination and reality

- ii) Intellectual interdependence of the imaginative process (especially narration of other person for the practice which you haven't experienced directly)
- iii) Combinatory nature of creative process and imagination

Imagination is often defined in contrast to reality. Vygotsky (2004) argued that “imagination always builds using materials supplied by reality” (p. 14). Experiences of reality are necessary building blocks that adds richness to imagination. Imagination thus is not an open-ended endeavour away from the real world but a goal-directed meaningful action that engages with the concrete challenges of the practice in the real world. Thus imagination develops in the dialectical process of engaging with the real. Intricately related with this nature of imagination is the collective or social aspect of creative and imaginative processes. As it has been argued in the previous section Vygotskian approach highlights the sociogenesis of human mental functioning. Synthesising Vygotsky's understanding on Van der Veer & Valsiner (1991) have argued “the messages located in the cultural environment are not merely “accepted as they are” by creative individual, but rather, analysed and “reassembled” (in one's system of “personal sense”) in novel ways” (p. 395). The intellectual interdependence creates motivating conditions under which novel ideas are actualised. Institutional demands and social discourse play an important role in development of new ideas of practice in individual's mind. Participation in social discourse around their practice broadens person's experience. It offers possibility to engage with something s/he has never experienced directly. These narrations of other's experience could be an important force for rethinking of one's practice or developing a new collective practice. The third related aspect is combinatorial nature of creative process and imagination. Vygotsky (2004) argued that the new or transformative action visible because of imagination could be new combination of already existing (old) elements of practice. This is

not mere imitation of the observed practice but a creative reworking of the acquired impression in a different context while responding to a complex reality.

Conceptualised from the position of intellectual interdependence, combinatory process and in dialectical relationship with reality; in the Conceptual PlayWorld imagination is seen as a conceptual tool that sees teachers existing professional expertise from a credit perspective rather than alienating teacher's existing practices as deficient. The professional development workshop thus is a collective space for imagining a new future of the practice that could respond to the current challenges of the practitioners. The role of teacher educator or expert is also to share their personal narratives and experiences of the imaginative practice which teacher have not experienced yet. The professional development program designed on the basis of Conceptual PlayWorld responds to the present challenges of the practices and combines teachers' existing competence to create new practice. Being located in teachers' past and present capabilities to design the future of practice is important for developing a professional practice where teacher is trusted.

4. Study findings

In order to answer the central empirical question posed in this paper, we followed one group of early childhood teachers as they entered into the practices of a PD program over four periods.

One of the central findings of this study was teachers' imagining and dramatization of the new practices of a Conceptual PlayWorld through words and gestures. A range of collective imaginings emerged as teachers sought to explain their ideas of designing and implementing a Conceptual PlayWorld of the Magic Hat. In this section we showcase how teachers meet the new demands of planning and implementing a Conceptual PlayWorld. The findings are shown

as an iterative process of *imagination and creativity in professional practice*, where teachers are:

- Imagining a new practice and problem solving through multiple imaginings of the characteristics of a Conceptual PlayWorld
- Imagining ‘as if’ in a mature form of a Conceptual PlayWorld where the transformation of children through participation in a Conceptual PlayWorld is also imagined
- Engaged in distributed collective imagining of a Conceptual PlayWorld where a form of affective imagination in practice emerges

We begin this section with typical extracts from the data set of the multiple imaginings of different characteristics of a Conceptual PlayWorld as an imagined problem solving process (Table 4 Vignettes 1). This is followed by a vignette (Table 5 Vignettes 2) and field notes of imagined mature forms of a Conceptual PlayWorld in action where teachers are acting ‘as if’ in the Conceptual PlayWorld of the Magic Hat, whilst in dialectical relations with the outcomes for children (Table 6 Vignette 3). Finally, a distributed collective imagining of the practices already implemented (Table 7 Vignette 4) are showcased to illustrate practice change in the context of the unique social situation and motive orientation of early childhood teachers.

4.1 Imagining a new practice: multiple imaginings of the Conceptual PlayWorld [characteristics]

The study found that imagination as a psychological function is important for practice change for early childhood teachers. In Table 4 Vignette 1 the teachers are trying to solve the pedagogical practice challenge of how to build a narrative from the children’s book in order to

introduce a dramatic problem situation for children to solve (Characteristic 4). As might be expected in the first period, the teachers struggle with how to set the scene for the problem through imagining different ways to enter (Characteristic 3) the Conceptual PlayWorld space (Characteristic 2) of the Magic Hat (Characteristic 1) (see Table 2 for details). The typical vignette in Table 4 that follows shows in quick succession four of the 5 characteristics of a Conceptual PlayWorld (Column 3) at a beginning level. Importantly, the example illustrates the multiple imaginings of basic practices ‘as if’ implemented, in order to determine as a group, the best way to bring into their centre the new practices of the 5 characteristics of a Conceptual PlayWorld.

Table 4. Vignette 1 (extract): Period 1 – *small group sharing*

Teacher	Exchange	Characteristics
<i>T1:</i>	<i>The problem comes next</i>	<i>Characteristic 4</i>
<i>T3:</i>	<i>So how do we do that?</i>	
<i>T1:</i>	<i>I would initially do it on the mat.</i>	
<i>T3:</i>	<i>On the side...</i>	
<i>T4:</i>	<i>[Motions with hands as though orchestrating a moment in play]</i>	<i>Characteristic 2 & 4</i>
<i>T3:</i>	<i>Do you know how you can do that, so they come and want to do that [Characteristic 4: problem], and next go into an imaginary space [Characteristic 2], look up and see all the trees (gestures as though she is in imaginary space), how to watch...</i>	
<i>T4:</i>	<i>(interrupting) I think so to enter the play space...</i>	<i>Characteristic 3</i>
<i>T2:</i>	<i>I think like being the magic hat, that's how they enter to play space, maybe you have a magic door that opens and shuts, so that they know it's the beginning of that, I have no idea, somehow they the magic door opens and you enter with the magic hat on?</i>	

T1:	<i>She [Outside expert] said you can have clues</i>	
T3:	<i>Yes</i>	
T4:	<i>So, like [role-playing] “You’re the first one”, “you’re the first person with the hat one” ...</i>	
T3:	<i>You could introduce the wind</i>	
T2:	<i>The doorbell could ring, a delivery, someone could deliver the hat in a box, covered in glitter, and that’s how they know it’s magic!</i>	
T3:	<i>Then they get to set the scene, like she said [outside expert], you are not just doing it, someone delivers it, it might be the kids, or it might be [begins role-playing actions of the imagined scene], I can feel some wind, can you feel it in your hair? Or it might be that you look up [looks up], and Ah look the trees, they are swaying [begins swaying], I wonder why they sway? Building that sense of wonder. So, that you build the conceptual part without them even moving [from the mat]. I love this idea, where you have the bell ringing or the toy dingo or you are teaching them to imagine those things...</i>	
T2:	<i>But eventually, you could then to do it outside [Characteristic 2], leading into the outside area [Characteristic 3], moving about and looking for animals around [Characteristic 4: problem] ...</i>	<i>Characteristic 2, 3 & 4</i>

The vignette (Table 4) shows that first, imagining the Conceptual PlayWorld means the teachers can collectively problem solve a range of solutions quickly into how to implement the new practices into their centre. For instance, T3 bring attention to the outdoor area and the wind when she says, “*and next go into an imaginary space, look up and see all the trees*”. A different imagined scenario of a magic door opening and closing is introduced by T2 when she says, “*maybe you have a magic door that opens and shuts*”. These 2 examples illustrate how the teachers offer imagined solutions and problem solve through their imagination what each

of the characteristics could look like in practice – as *thought experiments*. This finding has not been reported in the PD literature before. This imagining of multiple solutions was common across all of the teachers. In Table 4 Vignette 1 we see that after a few imagined scenarios, the teachers settle on the doorbell acting as a way of introducing the problem to be solved within the narrative of the Magic Hat.

Second, as the teachers introduce each imagined scenario to each other, they become animated and role-play the actions ‘as if’ they are in the Conceptual PlayWorld of the Magic Hat. Gestures such as pointing, looking towards an imagined area as though it were there, and animated expression were common. For instance, slowing speech to emphasize something being imagined in practice, and high-pitched singsong cadence to amplify something important, were common amongst all of the teachers. Therefore, we identified that *imagined solutions as thought experiments were being accompanied with miniature dramatizations of practices*. This was not something we found in the PD literature.

Third, the teachers regularly used the term ‘so’ in order to add to the imagined scenario being offered by other group members, as though they were collectively building the imagined Conceptual PlayWorld. For instance, T3 says, “*So, that you build the conceptual part without them even moving [from the mat]*”. The term ‘so’ appears to validate imagined solutions (*So, like “You’re the first one”*), to extend ideas, to invite more suggestions (*So how do we do that?*), and to articulate more concretely the implication for practice for the imagined solution being presented. Other terms that appeared regularly across all the teachers was ‘I think...’ and the use of the term ‘And’ at the beginning offering an imagined solution. However, “so” was the most common term used. These terms appear to be used **to collectively build the imaginary practice situation**, allowing multiple suggestion to be considered for problem solving the collective imagining of the new practices. Once again, we did not see references to this kind of language in the PD literature.

Taken together, imagination as a psychological function enabled thought experiments, imagined solutions as miniature dramatizations, and an ongoing building of a collective imaginary situation to emerge in the PD program. Imagination appeared to act as resources for early childhood teacher practice change.

4.2 *Imagining 'as if' in a mature form of a Conceptual PlayWorld*

Imagination as a resource for practice change could also be seen in dynamic relations between the teachers' initial imaginings of a Conceptual PlayWorld (Table 4 Vignette 1) and the mature form of a Conceptual PlayWorld introduced through the videos ([app URL here](#)), the planning proforma (Table 2), and the input from an outside expert in Conceptual PlayWorlds.

First, reference to the imagined mature form of the Conceptual PlayWorld could be seen embedded in the small group discussions through teacher references to 'she', the outside expert. For example, this is shown in Table 5 Vignette 2 below when T3 says, "*Then they get to set the scene, like she said [outside expert]*". This was common throughout the small group discussions. The teachers regularly made references to the outside Conceptual PlayWorld expert.

Second, in Vignette 2 (Table 5) we see a more mature form of the Conceptual PlayWorld than the thought experiments of Vignette 1 (Table 4). Read in relation to the characteristics of the Conceptual PlayWorld summarised in Table 2, all five characteristics are evident in Vignette 2 (Table 5). Teacher referencing to each of these characteristics as a mature form of a Conceptual PlayWorld appeared to be important part of the process for practice change.

Table 5. Vignette 2 (extract): Period 2 - *Whole group sharing*

Teacher 4 reported on behalf of the group	Characteristics
<i>Like most people, starting with the stories and the characters, and initially exploring at group time how those particular animals [in the story], the sounds that they make, and having a bit of fun with it, just so they start understanding the characters, and getting associated with them; we could play games like, as we do with getting to know each others' names at that beginning bit; so we can do like "Magic Hat, Magic Hat, moves like this and moves like that", and all the rhymes they enjoy.</i>	Characteristic 1
<i>We thought the Wizard could arrive at the door [Characteristics 2 and 3]. The [Wizard] could be quite upset because the hat had gone missing. Ask the children, "Where did the hat go?"; "How did it become lost?". The Wizard could suggest that the wind may have taken it [Characteristics 4].</i>	Characteristics 2-4
<i>Then we explore the wind and that. That would be the problem. Where has it gone?</i>	Characteristics 4
<i>We thought perhaps everyday, we could have Wizard arrive, the doorbell rings [Characteristics 3], and there could be a clue [Characteristics 4].</i>	Characteristics 3- 4
<i>Ms Lucy is very keen to be involved and we don't want to exclude her [Characteristics 5]. She is in the office and could deliver the clue. This would introduce us to the next animal in the story[Characteristics 1]. We may find the bear and bear may have the clue. The bear says, "There was a wild storm, and I saw it go this way and to get to that you are going to have to cross the river; there is rapids and how are we going to cross that and what are we going to do?" [Characteristics 4].</i>	Characteristics 1, 4 & 5
<i>We thought at the end we could, because it is close, we could make our Easter hats, and leave them at the Kindy rather than they go home. The Easter Bunny helps us finally in the end. The hat could be delivered in a glitter box. It opens up and there is a special hat inside, and this leads on to them creating their own hats for the Easter Hat Parade.</i>	

What is evident in Table 5 Vignette 2 is that Characteristic 5 is the least developed. However, the links between the problem and the science concepts are successfully brought into the narrative of the story. Importantly, the teachers have found a way of bringing their imagined Conceptual PlayWorld of the Magic Hat into their existing planned Easter Hat Parade (and designing and wearing of hats) – as noted when they report: “*The Easter Bunny helps us finally in the end*”. The relations between the mature form of a Conceptual PlayWorld introduced in the PD program and the teachers’ real form of imagining the new practices in their centre can be observed as a process in development. This sharing with the whole group is suggestive of

imagined practice change because the teachers have successfully imagined how the Centre tradition of the Easter Hat Parade can be brought into the new practice of a Conceptual PlayWorld.

Third, it can be argued that the imagined mature form of the practice could also be seen embedded in the teachers’ collective imagining and problem solving as they act ‘as if’ in the new practice through sharing the results of their thought experiments and the miniature dramatization of the characteristics of the Conceptual PlayWorld as worked through in Vignette 1 (Table 4), and as shown in Vignette 2 (Table 5) in a more complete form. However, as would be expected, development of the practice matures after implementation. In Period 4, the dynamic between the mature form (Table 2) and real form of the teachers’ actual practices are shown in Table 6 (Vignette 3). In Vignette 3 is an extract of the characters in the story, the dramatic problem, and the entering into the Conceptual PlayWorld and not surprisingly, they were all more developed than in Vignettes 1 and 2.

Table 6. Vignette 3 (extract): Period 3 - Zoom sharing post implementation

Teacher	Exchange	Characteristics
<i>TL:</i>	<i>I was lucky enough to be with TL at the start, although it was not quite then, as she had already done those motivating things before I got there. And the children were so EAGER to get into the playworld, and told me all these things that happened before. And they used the Magic Hat, and about the Wizard coming. I was eager to join in and I hadn't been in when the Wizard had left a letter and things like that. Lucy can you tell us yours?</i>	<i>Characteristics 1-5</i>
<i>TL:</i>	<i>Sure no worries [all laugh].</i>	
<i>TL:</i>	<i>I loved it so much. I was so excited?</i>	
<i>TL:</i>	<i>That's nice. Alright, so bring this along to share [holds up planning]. We had done a lot beforehand. We read the book about 2 or 3 times. Lots of families are saying "Rrrr, the Magic Hat! That's all they are asking for at home. We done transition games with them. We really played with the characters. By the time we entered the Conceptual Play</i>	<i>Characteristic 3</i>

<p><i>there was really good understanding, they kind of played with it a lot more, I think. But the Wizard delivered our letter. Then they had all sorts of questions. Where does he live? Why does he need our help, and someone suggested that we could use sparkles to get through, and how are we going to get, that kind of became our gateway, the gathering or having an entrance to the conceptual Play [Characteristic 3]. The next day I got a magic box that was delivered, and that particular day we had the magic box delivered sparkles inside the box. So, when I throw sparkles over them, then we jump into the book, you know.</i></p>

When we take just two characteristics of a Conceptual PlayWorld - concepts linked to the story, and the problem to be solved - we can see the early forms of teachers' development of conceptualising the new practices. For instance, in Vignette 3 the excitement of the drama that brings out both the story and the developing narrative of solving problems become crystalised and more succinct in the description, such as, "*Where does he live? Why does he need our help, and someone suggested that we could use sparkles to get through, and how are we going to get*". But also we can see how the story ignites the passion within the new practice for the children and the teachers, which appear to be mutually spiralling, such as, "*The next day I got a magic box that was delivered, and that particular day we had the magic box delivered sparkles inside the box. So, when I throw sparkles over them, then we jump into the book, you know*". The emotional engagement of the teachers with their implementation of the Magic Hat Conceptual PlayWorld during Period 4 is suggestive of positive practice change.

The real form of teachers' development of their practices was initially only stepped (Table 5), and teachers only appeared to functionally populate the proforma 'as if' in the Conceptual PlayWorld of the Magic Hat. Whilst after implementation (Table 6), the real form of practice was met with a charged and dynamic explosion of emotions by the teachers, as noted when Teacher L said, "*And the children were so EAGER to get into the PlayWorld, and told me, all these things that happened before. And they used the Magic Hat, and about the Wizard coming. I was eager to join in and I hadn't been in when the Wizard had left a letter and things like*

that” The drama of the problem was enthusiastically felt by the children, and this created motivating conditions for the teachers, which in turn appeared to deepen the question asking of the children and generated a need for continuing the Conceptual PlayWorlds so that solutions to the problem could be found in play.

We bring this together in Table 7, as the mature form of the Conceptual PlayWorld showcased through the videos of practices, the planning proforma (Table 7 Column 1), and the real form of development identified in the workshopping (Table 7 Column 2).

Table 7. Mature and real form of a *Conceptual PlayWorld of The Magic Hat*

Characteristics of a Conceptual PlayWorld	Activity setting of a Conceptual PlayWorld of the Magic Hat
Selecting an engaging story	The teachers chose the story of <i>The Magic Hat</i> by Mem Fox
Creating an imaginary Conceptual PlayWorld space	The teachers reserved the inside mat area known as circle time for the Conceptual PlayWorld of the <i>Magic Hat</i>
Teachers and children entering and exiting the Conceptual PlayWorld together	Door bell rings. A Magic Box with sparkles inside it is delivered to the centre. When sparkles are thrown over the children this acts as the gateway into the Conceptual PlayWorld of the <i>Magic Hat</i>
Problems arise in the Conceptual PlayWorld that need to be solved	Problem: <i>Wizard had left a letter</i> - The Wizard has lost her/his Magic Hat Everyday concepts: <i>Where does the Wizard live? Why does the Wizard need our help?</i> Scientific concept: Not presented Concepts act in service of the children’s play.
Teachers take different roles in the Conceptual PlayWorld to actively support children’s play development—subject positioning	Teachers and children are characters in the story.

4.3 Distributed collective imagining of new pedagogical practices in a Conceptual PlayWorld

It was reported in the literature that early childhood teachers' motive orientation is to their practice (see Nuttall, et al., 2015) and that their professional knowledge of their practice includes understanding children's development. Building on Vignette 3, we showcase in Vignette 4 the teachers collectively sharing of an emotionally charged incident in their professional practice of implementing a Conceptual PlayWorld that the teachers had to solve. It was not a problem introduced in the PD but arose from practice.

In Table 8 (Vignette 4) the teachers appear to be imagining the details of particular moments when they and the children were inside of the Conceptual PlayWorld of the Magic Hat where a practice problem arises. Two children from one of the rooms in the centre become anxious inside of the Conceptual PlayWorld of the Magic Hat. The teachers bring a form of affective imagining into their descriptions of how they found solutions (thought experiments) to the practice problem.

Table 8. Vignette 4 (extract): Period 3 – Zoom sharing post implementation

Teacher	Exchange
<i>TS:</i>	<i>I had a couple of kids that were really anxious, and as soon as the Wizard dropped off the letter, they burst into tears, they didn't want to see the Wizard, and they were all really upset when they came to kindy, so we back peddled in our group a lot, and so we wrote books about imagination, so we wrote books and wrote books and pictures where there was trees, and the kids were in the trees, and then the next page they were in the jungle. So we compared that, what we were doing, and so our play has been a lot slower, because we had to deal with our anxieties...</i>
<i>TL:</i>	<i>So, I would kind of like, not make it boring, but we had to cater for both. They were so interested in that book. So, they just needed a bit of, what could perhaps happen...</i>
<i>TS:</i>	<i>I was focused on what the people coming into it, and what I as the teacher was going to change into. He didn't like that, that I was going to change. That the Wizard was coming into the house, and things like that. But we have been working through it, and he is making progress. He loves the Magic Hat. We are working through it, He has gone home and says he loves the magic hat. He hasn't stopped talking about it. Initially was so stressed.</i>
<i>TR:</i>	<i>Sometimes the high emotions, is showing high engagement does it.</i>

<i>TS:</i>	<i>Yes, and for children like that, to give them a different role, for those children.</i>
<i>TL:</i>	<i>The great idea, was giving a different role, when children</i>
<i>TR:</i>	<i>So it sounds like it is important to talk about, I don't know if you do this, but to talk about your routine, so in the morning you will be doing PlayWorld together but after the PlayWorld that you will have lunch, so it sounds like some children need some assurance that they are coming back.</i>
<i>TS:</i>	<i>Nodding in agreement</i>
<i>TR:</i>	<i>Talk about the routines, First, we are in the PlayWorld, and then we go off to music, or whatever you want to do [both teachers nodding]. We spoke really briefly on the PD about the different Subject positioning, you could be above, with, or below – do you remember vaguely? [teachers are nodding], we did a lot that day, but one of my positions was the primordial we, and that's where you are with the child, almost as if you are one; So you could even ask, for example, a child who is a bit nervous about the Wizard, you would ask if they wanted to be the wizard with you, literally with you, holding your hand or doing it together. You could ask them, who they would like to be, be in that role together, comfort that you're participating together. Is that something you could try with some of those children?</i>

A double form of emotional imagining seemed to emerge. One of the emotional moves was in relation to worrying about the children's emotions in the Conceptual PlayWorld of the Magic Hat, whilst the other was in relation to thinking about the problem and working out a way to 'back pedal'. The double move of affective imagining and problem solving acted in unity and propelled the teachers forward in designing new practices, as they had to deal with the children's worries and anxieties of imagining being in the Conceptual PlayWorld of the Magic Hat.

The teachers had to create new play scripts to support the development of imagination of the children as a new psychological function. It was reported that whilst most children appeared to demonstrate that play was their leading activity, two of the children had difficulties with transitioning into imaginary situations, and therefore the teachers needed to consciously teach the children about pretending and imagining. This was an unexpected result and is suggestive of how teachers using a Conceptual PlayWorld model can draw on their professional knowledge of child development to build new practices to create new conditions for children

in play. It is also suggestive that the Conceptual PlayWorld PD program appears to give possibilities for teachers to be imagining new practices, and imagining a range of pedagogical solutions, when introducing children to a Conceptual PlayWorld.

5. Discussion

This study of the PD of early childhood teachers during a process of practice change brings forward not only the motives of the teachers towards the unique characteristics of early childhood professional practice (Nuttall et al., 2015), but the significance of imagination as a psychological function to resource practice change. No study could be found in the literature on PD (empirical or theoretical) that discussed imagination as a resource for practice change. This finding adds to what is known about the design of PD programs for early childhood teachers engaged in practice change.

5.1 *Personal practice change*

Illustrated through the PD of teachers being introduced to a Conceptual PlayWorld, we identified that the imagining of new practices as part of the PD program facilitated early childhood teachers to imagine practice change and to collectively problem solve through a series of thought experiments. Practice change was the object of the teachers' attention and imagination was a resource they used when *problem solving multiple imaginings of a Conceptual PlayWorld* into their practice. This finding builds on the research of Nuttall et al. (2015) and gives more detail into how early childhood teachers work on their professional practice during PD.

5.2 *Unique institutional practices*

According to Hadley et al. (2015), early childhood education PD contexts are different to the school sector, and because of the diversity of qualifications and the ongoing upgrading process, there is also a unique fuzzy zone between in-service and pre-service programs (Gomez et al., 2015). Therefore, the concept of early childhood practice needs to be uniquely defined, but not in isolation. Practice and practice change must be located within the societal values, institutional practice traditions and personal motives of the teachers (Hedegaard, 2014). Chaiklin (2011) notes that at the societal level, “Practices arise to produce objects that satisfy societally-meaningful needs” (p. 243). In Australia where this study took place, the curriculum invites teachers to bring play and learning together in ways that are personally meaningful to children. Known as intentional teaching for play-based programs, early childhood teachers’ have had to expand their practices through PD so they can introduce intentional teaching into their play-based programs.

The expected dominant practice tradition of early childhood education in Australia has been to create play conditions with preschool teachers correspondingly making available to children time, resources and teacher supported interactions. Intentional teaching has created an institutional need for practice change in preschools and this has placed new demands upon teachers. It is within this more complex framing (societal, institutional and personal motives and demands) that it becomes possible to conceptualise early childhood practice change more scientifically. This study found that imagination as a psychological resource contributes to better understanding what are effective PD conditions for developing professional knowledge for practice change.

5.3 *Scientific problem – why imagination?*

The synthesis of the PD literature presented earlier brought forward a number of key features of successful PD for early childhood teachers. But imagination as a psychological resource did not feature. It is in this context that we have to understand theoretically how imagination appeared to so effectively resource teachers' practice change.

Scribner (1997) in her practice research has given some direction on this problem, stating that "If skill systems are activity or practice-dependent, one way to determine their characteristics and course of acquisition is to study them as they function in these practices" (p. 299). But in PD programs where new practices for practice change are the object of the activity, teachers are not physically located in their everyday practice. This means that practice change must initially be imagined in the PD program. This could explain why imagination featured so prominently in this study.

The literature gave some important directions for thinking about effective PD for early childhood teachers, but it did not give directions for theorising the ideas together as a system of practice change where imagination was brought out in some way.

Chaiklin (2011) theorised that the "problem is to articulate the system of ideas being defined, rather than trying to find the true meaning of *practice*" (p. 231). In line with Chaiklin (2011), the outcomes of the study reported in this paper have to be seen as part of a system of concepts that together make up the whole process of practice change. Consequently, the essence of practice change has to be realised through imagination as a psychological function that resourced practice change. But to understand practice change, we have to also bring out what is unique about imagination and to theorise this relationally. Vygotsky (1987) said that the task is to study the whole in order to determine its characteristics. Not as elements, but rather as a relational unit that makes up the whole. When considering the relations and interaction of the whole, the task is then to find the smallest unit that is representative of the whole. For example,

a human cell contains all of the DNA of what makes up the whole human being. In line with this Vygotskian (1987) idea, we theorise what was learned in this study on imagination as a resource for practice change, by determining what might be the essence or unit of practice change for early childhood teachers. The outcomes of our study are brought together as a relational unit, as shown in Figure 1.

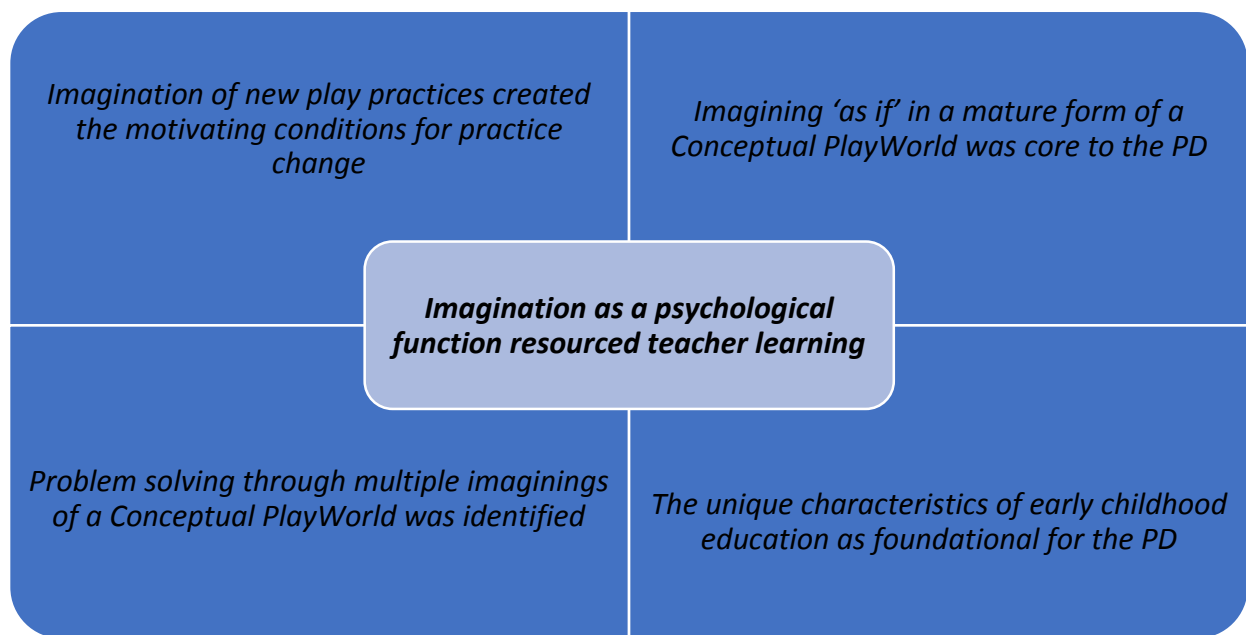


Fig. 1 Relational unit of practice change for early childhood teacher PD

In keeping with Chaiklin (2011), we begin by asking how does this unit of imagination as a psychological function support teacher practice change? Our findings suggest that the germ cell of early childhood PD has at its core the psychological function of imagination (Shown in the centre of Figure 1). But in teacher transformation, imagination cannot be static. Rather imagination must act within a system of practice change. This suggests that the unit must be dynamic, and this was indeed what came through the findings of this study. Teacher motives (quadrant 1), imagining ‘as if’ in the practice (quadrant 2), thought experiments of multiple imagined practices (quadrant 3), and finally the unique practice context of early childhood

settings where teachers' professional practices are realised (quadrant 4), all acted together for practice change. There is a dynamic relation between quadrants, because when the content of the PD changes (quadrant 2), so does the imagined solutions (quadrants 1 and 2), and enacted new practices (quadrant 4). Resourcing this relational unit of practice change in the PD program was imagination, and therefore this psychological function must always be at the core of the system of practice change for early childhood teachers.

5.4 *PD as collective imagining*

Early childhood teachers participating in PD do so in groups, and these groups go back to centres where they enact practice change collectively with other teachers. In keeping with this reality of early childhood teacher professional practice, the study also identified that there was a dialectical relation between the individual and the collective. This finding has also not been identified in the PD literature focused on early childhood teachers' practice (Nuttall et al., 2015). In this study it was found that all of the teachers used the same book for Period 1 to 3 of the PD program and this gave a shared space in which common problems for practice change were identified – all the teachers struggled with how to use the story book of the Magic Hat to create a dramatic narrative in which problems arise that need solutions in order to amplify the play. This was the object to which the imagined practice was being directed across all the small groups, and where as Chaiklin (2011) suggests, “significant knowledge of a practice can often only be gained through an engagement in trying to develop the practice” (p. 243).

In our study the development of imagined practice was collectively oriented and became a collectively imagined activity of planning and later implementing a Conceptual PlayWorld of the Magic Hat (as an example of the content of the PD program related to play motives). But in tension, was how the same book could create individual pathways for practice change. That

is, the Conceptual PlayWorlds that were planned by each small group in relation to the same book, were all different. Whilst the literature identifies that individual practitioner inquiries are key for successful PD program for motivating early childhood teachers' engagement in practice change (Hadley et al., 2015), our study identified that it appeared that rather than individual practitioner inquiries, small group crises about practice change were held in dialectical relations with the collective actions in the whole PD which had an object motive for practice change using a common story and a common practice framework of Conceptual PlayWorld. That is, practices do not sit within the head of the person, but rather there is a relationship between the collective imagining of the early childhood teachers, the imagined new practices explored in the PD program, and the practice context. A dialectical relation between person, PD environment and practice must be theorised. Figure 1 captures how practices can be developed collectively to orient teachers into the development of practice. With the exception of Nuttall et al. (2015), the individual/collective dialectic for practice change appears to be missing from the literature on early childhood PD programs for practice change.

5.5 Ongoing practice change

In line with Chaiklin (2011) who said, 'Researchers have often only looked at the consequences of practices; the point is to develop them' (p. 242), the findings of this study captured as a dynamic unit of PD (Figure 1), could theoretically also act as a model for developing early childhood practices. It was the practices of the teachers in the PD which were studied, and their actions in the activity setting of the PD, not only led to the development of practice but also to the development of the model of practice change that is unique to early childhood teachers.

The findings were discussed in relation to better understanding the relations between the different characteristics identified in the research, where imagination as a psychological function was used by teachers to resource practice change. Rather than discussing the results as discrete findings, we have theorised the essence of the research as a unit of practice change for early childhood teacher PD, and then discussed the quadrants within the unit in relations with each other. As noted by Chaiklin (2011), we need to understand the dynamics of the concepts that are always in place in everyday practice. Even though teachers may not consciously realise these when developing their practice, the object of the research is to find and discuss these relationally. “The research problem is to better understand the principles of interaction among these relations in the production of the object” (Chaiklin, 2011, p. 224). Ongoing practice change captured in Figure 1 gives some directions to the field.

6. Conclusion

Societal values for greater child outcomes in preschool settings has emerged in recent times in a number of countries, including Australia where the research reported in this paper was undertaken. With societal changes has come new demands on early childhood teachers to introduce more conceptual content into their play-based programs. In line with these new demands, has been the need for ongoing PD to support teachers in meaningfully introducing the learning of concepts as part of children’s play. Whilst there have been many studies that have examined the outcomes of teachers’ PD (e.g., Getenet et al., 2013; Irvine & Price, 2014; Wingrave & McMahon, 2016), less attention has been directed to how to best support teachers with this practice change. To fill this research gap, the study reported on *the process of practice change* of a group of early childhood teachers introduced to a new model of practice known as Conceptual PlayWorld ([URL here](#)).

We identified through a synthesis of the literature that there is a need for a recognition of the unique practice context of early childhood teachers (Gomez et al., 2015), and that when teachers are developing practices unique to early childhood education this acts as the motive for participation in PD (Nuttall et al., 2015). In line with the literature, we found the teachers motive orientation for imaginary play was core for engaging early childhood teachers in practice change. But what was new, was how *practice change was resourced by the teachers through the psychological function of imagination*.

The literature also showed that practitioner inquiries with expert outsider input is most highly valued process for the PD of early childhood teachers (Hadley et al., 2015). Our study was able to add to the literature by theorising holistically how the relations between the mature and real form (Vygotsky, 1994) of the new practices being introduced in the PD program created the conditions for practice change. With the psychological function of imagination as core, we were able to show that the essence of practice change in the PD program as a relational unit of *imagination of new play practices creating the motivating conditions for practice change; imagining 'as if' in a mature deal form of the new model of practice; and problem solving multiple imaginings the new model in practice*.

Finally, to understand theoretically how practice change was realised through the psychological function of imagination, we return to Vygotsky's (2004) original writings on imagination and creativity. But rather than focus on the process of the development of imagination and creativity in childhood, as Vygotsky has written about, in our study the teachers drew upon their fully developed psychological function of imagination in support of practice change. We add to this theorisation by showing how teachers use and need imagination as a psychological function in their professional practice. This has not been discussed theoretically before. We also add to the cultural-historical PD literature (e.g., Edwards et al., 2019; Ellis, 2007; Eun, 2011; Grimmett, 2014; Shabani, 2016), by showing the importance of

imagination in the design and delivery of PD programs for early childhood teachers. Imagination in PD brings to the fore new directions in research. By being aware of this key psychological function for practice change, others may look more closely at not just changes in practice, but also how teachers bring into practice new models that are initially imagined in their mature form and problem solved as thought experiment as part of the process of practice change.

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