

# **Professional Learning Modes Literature Review**

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*Professional Learning Modes. Literature Review*

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# Executive summary

Selecting high quality professional learning is a challenge for some teachers. Cohorts for whom this is a particular challenge can include teachers in early childhood, casual/relief (CRT) and rural/remote teaching contexts. For these teachers what help is available to answer the question: “What will be the most effective mode of professional learning to achieve my desired outcome and that suits my context?”

This literature review summarises evidence from education research to **describe** and **compare** different **modes of professional learning**. It applies the findings to the question: ‘**what works best, and for whom**’ in terms of modes of professional learning for Australian teachers, with particular **focus on early childhood teachers, casual relief teachers and teachers in rural and remote teaching contexts**. A key professional learning challenge common to these teachers is isolation – which can be physical, pedagogical, technological and/or social isolation.

The review sought to identify research on modes of professional learning and in particular any studies that compared different modes of professional learning. The reviewers were interested in evidence pointing to the circumstances in which a particular mode of professional learning might have the most impact on teaching practice or school culture, as well as whether particular modes, or combination of modes, had greater impact for specific cohorts of teachers.

A search of Australian and international education research published from 2012 onwards produced a set of 16 international and 22 Australian studies that were used to review and validate a taxonomy of professional learning modes. The resulting 12 modes fell into two categories. The first set relate to the focus of the professional learning: 1) classroom-focused observation of teacher practice and feedback, coaching and mentoring; 2) research-focused modes such as professional reading and inquiry or action research; and 3) community-focused modes involving teachers in a professional learning community or network. Collaboration as a mode of professional learning underpinned each of these focus areas.

What is the focus of this mode of professional learning?		
Classroom-focused	Research-focused	Community-focused
Observation of practice and feedback	Professional reading	Professional learning community
Coaching and mentoring	Inquiry and action research	Network
<b>Collaboration</b>		

The second category of professional learning modes concerned the mode of delivery, separated into 1) face-to-face: course or workshop, conference or school-based group learning event, 2) online: module or course, webinar or online forum; and 3) hybrid and blended professional learning mode. The hybrid and blended mode accommodate the trend for professional learning developers to intentionally design for synchronous and asynchronous, as well as face-to-face and online delivery, in order to realise the affordances of each.

In which mode is this professional learning delivered?

Face-to-face		Online	
Course or workshop		Online module or course	
Conference		Webinar	
School-based group learning event		Online forum	
Hybrid and blended			

The main body of the literature review presents findings related to each of these modes of professional learning, including the purpose, pros and cons, and factors that can influence the effectiveness of each mode.

There is little to report on the comparative effectiveness or impact of one mode compared to others, which also limits any response to the key question of 'what professional learning modes work best, and for whom? What can be concluded is that given isolation is a limiting factor for teachers accessing professional learning, a key requirement when considering different modes is which mode will provide the greatest sense of connection for these groups. Early childhood teachers, casual/relief teachers and teachers in rural and remote contexts will benefit most from modes that facilitate social presence, collaboration with peers and feedback on their practice.

This will only be realised if teachers can access high quality professional learning designed for their needs, and if employers, systems and school leaders create the conditions for effective professional learning. These conditions include:

- support from leadership
- targeted alignment to existing goals and structures
- flexible delivery
- understanding readiness to learn

What has been shown through this review is that each mode provides opportunities and features that can contribute to effective professional learning. The research reviewed at this point indicates that professional learning should be shaped by the environments and communities in which teachers work. Therefore, the modes of professional learning that can best accommodate a teacher's own context are the best modes for that teacher at that time.

# Introduction

*AITSL is scoping and developing content for an online toolkit to support teachers and school leaders in selecting effective high-quality professional learning. The toolkit will provide teachers and school leaders with a digital platform to guide decision-making when selecting professional learning. The aim of the platform is to enable uptake of professional learning, particularly for the cohorts for whom this is a challenge – teachers in early childhood, casual/relief (CRT) and rural/remote teaching contexts. From the user perspective, the toolkit should help answer the question: “What will be the most effective mode of professional learning to achieve my desired outcome and that suits my context?”*

This literature review summarises evidence from education research to **describe** and **compare** different **modes of professional learning**. It applies the findings to the question: ‘**what works best, and for whom**’ in terms of modes of professional learning for Australian teachers, with particular **focus on early childhood teachers, casual relief teachers and teachers in rural and remote teaching contexts**.

The review sought to identify research on modes of professional learning and in particular any studies that compared different modes of professional learning. The reviewers were interested in evidence pointing to the circumstances in which a particular mode of professional learning might have the most impact on teaching practice or school culture, as well as whether particular modes, or combination of modes, had greater impact for specific cohorts of teachers.

The initial search of literature considered Australian and international education research published from the year 2012 onwards. Reviewers scanned the results of this search and selected and classified relevant studies by mode of professional learning. This served to validate the initial working taxonomy of professional learning modes and to confirm that there were no significant gaps in the taxonomy. The selected studies were also scanned to identify the type of teachers participating in the professional learning, looking specifically for programs involving early childhood teachers, casual/relief teachers and teachers working in rural and remote areas. When this failed to identify significant findings relating to effective professional learning modes, a supplementary search set out to identify any literature beyond the education sector that might address this question.

Professional learning is a complex topic to study. It involves multiple factors related to the target audience for the professional learning, the pedagogical and content knowledge addressed, and the form the professional learning takes. These are all inter-related factors that are difficult to isolate – both in terms of research design, and in structuring a literature review.

This review starts out with discussion of research relating to **participants**: that is the professional learning needs and challenges faced specifically by **early childhood, casual relief and rural and remote teachers**. This is followed by a summary of the literature on what constitutes effective professional learning and how this can be measured. Against this background, the main body of the literature review presents findings related to **modes of professional learning**, including the purpose, pros and cons and factors that can influence the effectiveness of each mode. Finally, the review compiles the limited research that directly compares the impact of different modes of professional learning, and responds to the key question of ‘**what professional learning modes work best, and for whom?**’

# Professional learning participants

Previous Australian research identifies groups of teachers that experience particular challenges in accessing relevant high quality professional learning. These groups include early childhood teachers, casual relief teachers and teachers working in rural and remote contexts (AITSL 2019a). This review commences with an overview of the literature relating to the needs of these teacher cohorts and the challenges they face in accessing high quality professional learning. This prefaces consideration of professional learning modes that may prove effective for these groups.

## Early childhood teachers

Early childhood teachers are educators who are university trained, registered teachers who hold a recognised specialist qualification in early childhood education. Early childhood teachers work across childcare, preschool and the early years of schooling, in a range of different education and care settings, including childcare services, preschool, and early school years. The number of educators in the Australian early childhood and care sector is significant and growing although there is currently a shortfall of teachers (Jackson 2021).

### Professional learning challenges for early childhood teachers

Key government reports point to the qualifications, professionalism and quality that early childhood teachers bring to the teaching profession (Pascoe & Brennan 2017) although early childhood teachers report that they experience barriers to this recognition (Gibson & Gunn 2020). While professional learning for early childhood teachers is touted as a priority, there is concern about limited programs and opportunities for this cohort of teachers (Tayler 2018). “Ratio requirements and the cost of backfilling staff make it difficult for educators to leave services for professional learning, especially in rural and remote areas. Staff turnover means that induction activities may be prioritised over continuous improvement, and essential compliance activities (such as first aid refreshers) can also crowd out deeper professional learning activities (Highfield, Wallis, & Stockman, 2017).

Finding professional learning that was relevant or appropriate to their context was an issue for 35 per cent of respondents to an Australian survey of early childhood educators (Pinchas 2019). Furthermore, many relatively inexperienced Australian early childhood teachers have stepped into a new, poorly defined position of early childhood educational leader, established to drive quality improvement requirements (Sims, Waniganayake & Hadley 2018). AITSL recognises that professional isolation is a challenge faced by many early childhood teachers along with funding and time constraints, shortage of casual and relief teachers, lack of tailored professional learning, and lack of collegial interaction (AITSL 2019a). Early childhood teachers in Foundation to Year 2 school settings may be less socially and professionally isolated than their preschool counterparts, but in Australia they contend with two curriculum frameworks and can be at odds pedagogically with other teachers in their school (Boyd & Newman 2019). Qualification requirements in the National Quality Framework (NQF) have made it more difficult for services to attract and retain sufficient staff and have created staff shortages in parts of Australia (CESE 2018; Productivity Commission 2014). Early childhood education in Australia is coming out of long history of low status within the education sector, due in part to its predominantly female workforce seen as childminding (Irvine et al. 2016; McDonald, Thorpe & Irvine 2018). The professional learning challenge is exacerbated by the diverse workplaces and wide range of employers of early childhood teachers, many of whom are private and for-profit providers.

## Professional learning modes for early childhood teachers

The *Victorian Advancing Early Learning* (VAEL) study assessed the effectiveness of in-service training for improving the quality of educator-child interactions. Educators were trained and coached by their educational leader in the use of an evidence-based teaching strategy and implemented this strategy in their daily interactions with children within a play-based program. The study concluded that coaching was the most effective strategy for changing teacher practice, noting that coaching requires that the educational leader has time to spend with staff, rather than being consumed by administration. Consistent staffing was also found to contribute to enhanced professional learning outcomes (Pilsworth et al. 2017). Professional associations such as Early Childhood Australia provide a range of professional learning for early childhood teachers, including events, publications and an online learning hub offering self-paced online learning modules that include video and written resources for subscribers (ECA 2021). Four of the studies identified through the initial search for this review investigated professional learning programs for early childhood teachers and in each case these programs used coaching as the mode (Ebbeck & Geok Lian 2018; Howard et al. 2014; Page & Eadie 2019; Shannon et al. 2020).

A significant section of the Australian early childhood workforce is currently involved in formal tertiary courses, as national quality standards require employers to increase the ratio of professional staff. The impact of formal qualifications is recognised as contributing directly to improved student learning into their primary years (Warren & Haisken-DeNew 2013), and early childhood teacher education programs have seen enrolments increase by 61% from 2,753 in 2006 to 4,438 in 2017 (AITSL 2020a, p. 16).

## Casual relief teachers

Casual/relief teachers (CRTs) are a vital part of the teaching profession, stepping in to teach students when their regular teachers are not available. CRTs are a diverse group. Some teachers choose casual teaching as their career, others choose it as an activity in retirement, or alongside a parenting or caring role, while others do not want to be a CRT and are looking for a permanent teaching role.

The literature on relief teachers is limited and difficult to find given the varying terminology used to describe casual relief teachers around the country and internationally: casuals, relief teachers, emergency relief teachers, substitute teachers (US), and supply teachers (UK). They are often excluded from school sample surveys of teacher professional learning such as TALIS (Thomson & Hillman 2020). It is also difficult to accurately ascertain the total number of CRTs in Australian schools due to differing state and territory policies and lack of systematic national data collection (McKenzie et al. 2014). Recent estimation is that 30% of early career teachers are working as CRTs halfway through their first year of teaching (Preston 2019). According to the NSW Department of Education (2019), “the majority of teachers commence their careers in the NSW public education system as casual or temporary teachers.” In the Victorian government sector, casual/relief teachers are employed by the school council as and when the need arises (DET Victoria 2021).

Australian casual relief teachers must hold teacher registration and meet local conditions in each jurisdiction in which they work. This includes a requirement that professional learning, referenced to the Teacher Standards, can be demonstrated (100 hours over 5 years, or equivalent)” (AITSL 2018b, p. 16). Providing CRTs with ongoing access to high quality professional learning opportunities does not appear to be similarly enforced.



## Professional learning challenges for casual relief teachers

Having a flexible and mobile teacher workforce is a benefit to Australia, but casual relief teachers report confusing differences between schools, jurisdictions and states in terms of registration and professional learning requirements. As every relief teaching placement is different, casual relief teachers require a breadth of knowledge, skills and experience, and an agile approach to their work. However, the transient nature of work for CRTs means that access to support for accreditation, professional learning and mentoring can be limited (Uchida, Lane & Cavanagh 2021).

A national survey undertaken by AITSL in 2018 provides a clear set of professional learning challenges faced by CRTs. It is difficult for these teachers to access professional learning and to meet the annual hours required to renew their registration. More than half of those surveyed were never included in school-based professional learning and had to meet the full cost of professional learning as a personal expense (AITSL 2019b). This is not a new issue. The Victorian Auditor-General reported in 2012 that few schools supported CRTs to participate in professional development activities or receive performance feedback, and that while the Department at that time had a program to support CRTs access professional learning, “funding is not effectively targeted and often left unspent” (p. 19). CRTs also could not access online resources and professional learning opportunities if schools did not provide email or login access to online platforms.

State registration agencies are beginning to recognise the issues faced by casual relief teachers in undertaking relevant professional learning. The Victorian Institute of Teachers (VIT 2020) notes that it is difficult for early career casual teachers who work across multiple schools to find mentors. Similarly, Western Australia has had to allow CRTs to submit evidence for registration directly to the Board, instead of to a school-based mentor as originally specified.

DET Victoria’s (2021) policy makes the point that “principals are encouraged to include regular casual relief teachers in whole-school professional development opportunities where possible.” New South Wales has a recent initiative to address the shortage of relief teachers in rural and remote schools using a “hub and spoke pilot that provides two teachers, employed in a ‘hub’ school, who can also address the needs of nearby ‘spoke’ schools” (NSW DoE 2020). While this is primarily a staffing initiative, it may provide greater opportunity for those relief teachers to be considered as member of the school’s staff and be included in school-organised professional learning.

## Professional learning modes for casual relief teachers

The AITSL (2017b) survey showed that 27 per cent of casual or relief teachers reported having done no professional learning in the previous 12 months, whereas this applied to only 3 per cent of teachers who held a permanent position in a school. All modes that work for teachers and school leaders apply to casual relief teachers, but they need support to engage in professional learning.

CRTs may be particularly interested in self-directed, easy-to-access and easy to document professional learning activities. The Australian Primary Principals Association submission to the National Review of Teacher Registration (AITSL 2018b) highlighted that “professional learning requirements can reduce the willingness of experienced teachers to engage in casual/relief work after they retire from full time employment, and... onerous conditions around renewal of registration can lead to casual/relief teachers (which many non-metropolitan schools/services heavily rely on) opting out of teacher registration and the profession” (p. 19).

The need to meet registration requirements is a key motivation for CRTs when considering professional learning, combined with access, cost and relevance of the program's content. AITSL (2019b) found that the most popular professional learning modes for CRTs were online learning and professional reading, raising questions about whether CRTs were selecting on practical and convenience criteria rather than to improve teaching practice. Casual teachers find professional learning more accessible and more affordable when they are invited to participate in an activity offered by a local school (TRB SA 2016).

## Rural and remote teachers

In Australia, the terms 'rural and remote' cover areas outside major cities that are classified as inner regional, outer regional, remote or very remote (ABS 2016). International research on supporting rural and remote teachers through professional learning is often not comparable to the Australian context, for example in relation to professional learning and Indigenous education. However, there are a small number of studies focused on connecting rural and remote teachers through professional learning processes, which are discussed in the section below.

### Professional learning challenges for rural and remote teachers

Working in a rural or remote setting can involve numerous challenges. Not only are resources and access to colleagues often heavily reduced in such settings, but students often have lower access to family resources, or belong to marginalised cultural or family settings. Mental health and wellbeing challenges, both for students and staff, are also often more pronounced in rural and remote school settings (Willis & Grainger 2020).

Disparity between rural and remote and urban schools include the ever-present challenge of staffing, both in terms of recruiting, supply of qualified and experienced teachers in specific learning areas, and the retention of staff. Rural schools also have higher proportions of early career teachers working than in city schools (Thomson & Hillman 2019). This can all combine to produce staff with little time and lots of stress who may be hard to engage in professional learning (Broadley 2012). The most effective professional learning is focused on supporting teachers to work collaboratively to improve student opportunities to learn. Yet this can be challenging when time and resources are scarce, and the opportunity to work collaboratively has not been readily facilitated thus far in online professional learning programs.

However, working in a remote or complex school setting can provide new and exciting opportunities for teachers to progress into leadership roles. Thus education systems need to consider strategies to identify, develop and support professional learning for leadership in remote and complex environments. Each remote community is different. The importance of culture, particularly in the context of remote and complex environments, cannot be underestimated. Cultural sensitivities, and training teachers through targeted professional learning in the areas of culturally responsive teaching, is crucial to ensure the needs and backgrounds of students are supported as a condition for learning.

### Professional learning modes for rural and remote teachers

Quality education in rural and remote spaces is supported by purposeful educational practices that engage students, and by teachers who have been trained appropriately. Much of the literature examines ways in which professional learning can support engagement and connectedness between rural and remote teachers, and teaching peers in other parts of Australia (Maher & Prescott, 2017; Stack et al, 2011; Trinidad & Broadley, 2010). A study comparing professional learning available to teachers in urban and rural Oklahoma found

that a similar range of modes was available in both settings, but a lower percentage of rural schools than non-rural schools offered each mode of professional development. The largest gap between rural and non-rural schools was in access to collaborative learning activities and formal coaching or mentoring (Peltola et al. 2017). Support for teachers working in regional, rural and remote areas of Australia often focuses on access, rather than impact, particularly because of the geographic and social isolation that can impact on teachers in these contexts. It is worth noting a finding that self-study and autonomy can be higher in rural and remote teachers (Kenny, Harreveld & Danaher 2016).

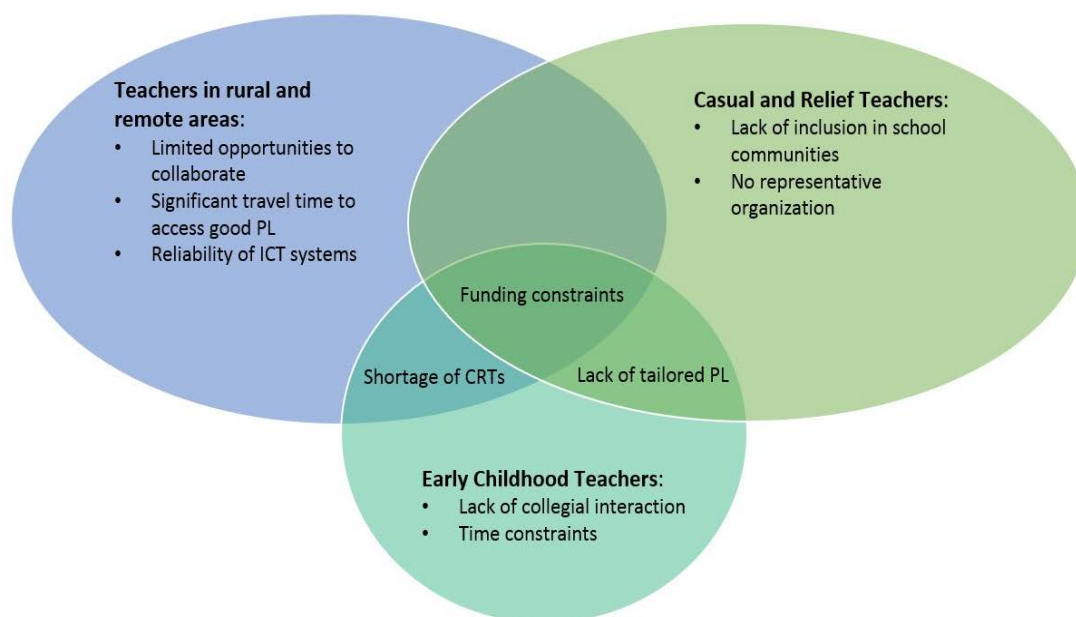
Professional learning focused on wellbeing and trauma informed practice is seen as a priority for building capacity in rural and remote spaces, starting with levelling the field before focusing too heavily on achievement. Online interventions have shown that rural and remote teachers benefit from wellbeing interventions as professional learning (Dabrowski 2019). Ultimately, as Broadley (2012) notes, the most effective professional learning for rural and remote teachers is that which promotes connectedness. Several studies have investigated the role of technology in fostering connection (Trinidad & Broadley 2010; Maher & Prescott 2017; Main & Slater 2021). As these authors acknowledge, a lack of access to quality professional learning can be overcome with access to technology, which can allow rural and remote educators to understand ways to improve their teaching and learning practice, but importantly, to consider the inherent needs of students as a key focus of professional learning.

Halsey (2018) identified that teachers outside metropolitan schools were being excluded from professional learning activities such as state-wide examination marking and moderation of student work. Halsey points to a NSW Rural and Remote Marking Program that is addressing this through targeted opportunities including marking in regional centres, online NAPLAN marking, and visits to Sydney to work with senior markers (p. 35).

The studies above demonstrate that given appropriate resources, online learning can be a powerful tool for engaging rural and remote teachers, and motivating teachers to participate in long term professional communities of practice. It also allows rural and remote teachers an opportunity to build connections beyond their contexts, enhancing their aspirations and levels of knowledge and understanding by learning through peer engagement and support.

## **Summary of challenges by specific participant groups**

In summary, the discussion in this section reveals there are common themes in the professional learning needs and challenges experienced by casual and relief teachers, teachers in rural and remote contexts, and early childhood teachers. Through stakeholder consultations, AITSL (2019a) identified a set of unique and overlapping high-level challenges these teacher cohorts face in terms of accessing and undertaking professional learning. There may also be naturally occurring intersections between the cohorts, when for example a casual, relief teacher is working in early childhood settings in a rural area.



*Figure 1 High level professional learning challenges faced by early childhood teachers, teachers in rural, regional or remote (RRR) areas; casual/relief teachers (CRTs). Source: AITSL 2019a*

The literature reviewed in this section provides some additional factors related to similarities and differences in the professional learning needs profiles of these groups of teachers. For example, there is an indication that both early childhood teachers and teachers employed in rural or very small schools tend to have leadership opportunities presented earlier than teachers in larger, metropolitan schools (Downes & Roberts 2018; Sims & Waniganayake 2015). This is not the case for casual relief teachers who are rarely offered this chance.

Engagement with parents, carers and community, and cultural responsiveness are professional learning priorities common to the work of rural and remote teachers, and early childhood teachers (Campbell-Evans et al. 2014; Gibson & Gunn 2020). A common theme across the three groups that comes through strongly is isolation. In some cases this is a physical isolation as in rural and remote areas. For early childhood teachers it may be a form of pedagogical isolation, and casual relief teachers may experience social isolation. For each group, this isolation can mean reduced access to relevant professional learning, and less opportunity to engage in professional learning with colleagues in a similar educational context to their own. The shortage of casual/relief teachers identified in the AITSL study will make it more difficult for teachers to be replaced to undertake professional learning during the school day.

This section has summarised the specific professional learning needs and challenges faced by three cohorts of teachers: early childhood teachers, casual relief teachers and teachers working in rural and remote areas. This informs the key focus of the literature review which is to consider the evidence related to the impact of particular modes of professional learning. The key challenges of **opportunity**, **access** and **isolation** that have been discussed in this section must be part of the equation when considering which modes of professional learning have most impact in which contexts.

# Professional learning purpose

Professional learning for teachers is recognised as a vital component of policies to enhance the quality of teaching and learning in Australian schools. Consequently, there is increased interest in research that identifies features of effective professional learning, and considers which professional learning modes are most effective in different contexts. As Ingvarson, Meiers and Beavis (2005) have noted, considerable school resources and funds continue to be dedicated to both internal and external professional development programs. Thus, there continues to be policy interest in understanding the effects of participation in professional learning on both teaching and classroom practice, but also on student learning outcomes, particularly outcomes that enhance student opportunities to learn.

As part of the scoping of this review, a scan of professional learning models was undertaken to assist in identifying and defining how modes of professional learning might contribute to high quality professional learning. Figure 2 shows a simple logic model for teacher professional learning (Desimone 2009; Van Veen, Zwart & Meirink 2011).

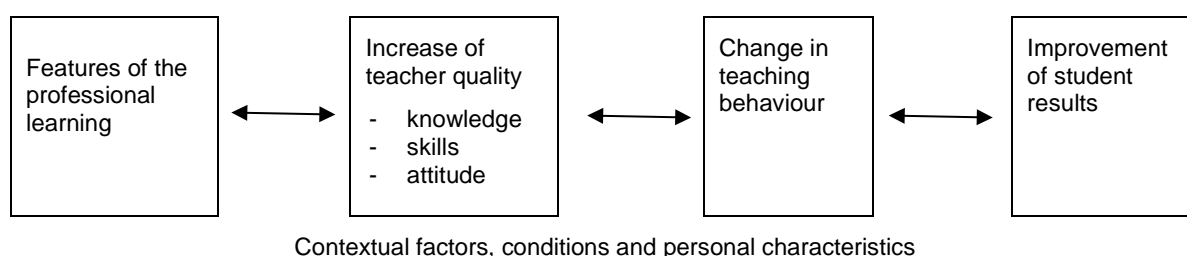


Figure 2 Teachers' professional development (based on Desimone 2009; Van Veen, Zwart & Meirink 2011)

Within this model, 'mode' forms one of the features of professional learning, noting that there are many features of professional learning to be considered in the first box of the model. Desimone (2009) sees five features of teachers' learning experiences as critical. These five features are:

1. content focus
2. active learning
3. coherence
4. duration
5. collective participation


While mode does not appear in Desimone's top five features, it may be useful to consider the extent to which different modes can enable each of these features, in particular the capacity to facilitate active learning and collective participation.

There are other models of professional learning that move away from the simple and linear approach to teacher learning, viewing it from multiple, interconnected perspectives and acknowledging teachers as active and reflective learners (Clarke & Hollingsworth 2002).

Kennedy's (2014) model shown in Table 1, focuses on the outcome of professional learning, in other words its purpose, and then correlates this with the form of delivery and the degree of participation. Three categories of professional learning purpose result from this, namely transmission, transitional, and transformation. While there are certainly topics and situations in which transmission of knowledge and a training model is an appropriate and necessary form of professional learning (such as first aid, new software or curriculum program), the focus for this review is on high quality professional learning which is seen to sit within the transitional and transformative purposes in Kennedy's model.

Table 1 Model and purpose of professional learning (Kennedy 2014, p, 349)

Model of continuing professional development	Purpose of model
The training model The award bearing model The deficit model The cascade model	<b>Transmission</b>
The standards-based model The coaching/mentoring model The community of practice model	<b>Transitional</b>
The action research model The transformative model	<b>Transformative</b>



Increasing capacity for professional autonomy

One of the key areas of interest for this review is the relative effectiveness of different modes of professional learning. In order to measure the extent to which professional learning is effective, researchers require a framework for evaluation. Evaluation models generally note particular factors before, during and after the professional learning, taking into account contextual factors that might influence effectiveness. Guskey's (2000) adaption of Kirkpatrick's model (1994) describes five hierarchically arranged professional learning 'evaluation stages' that could be considered, being:

- participants' reactions
- participants' learning
- organisational support and change
- participants' use of new knowledge and skills
- student learning outcomes

There is quite a body of research on professional learning that relies on self-report by teachers about professional learning they have undertaken, and its impact on their practice. A challenge for this review lay in the difficulty of finding research that isolated mode of professional learning as a feature of the study, and that evaluated the effectiveness of that professional learning at a higher level than the participants' reactions.

# Professional learning modes

The initial scoping and search for this literature review was informed by Kennedy’s models of continuing professional development from Table 1, a question from the TALIS 2018 survey on participation in continuous professional development (Thomson & Hillman 2019, p. 102), and a set of modes found in *Enabling High Quality Professional Learning: A practical guide for leaders* (AITSL 2017a, p. 9) shown in Figure 3. Note that the AITSL taxonomy is not exhaustive, neither are the modes discrete. In particular, there is overlap between the top row of boxes which categorise modes by the *focus* of the professional learning (ie classroom-based, research-based or community-based), compared to the bottom row which refer to the mode of *delivery* (face-to-face versus online).



Figure 3 Professional Learning Approaches (AITSL 2017a, p. 9)

In classifying studies of professional learning it is clear that many professional learning programs are designed to be multimodal. For example, professional learning communities might involve observation of practice and feedback as well as professional reading. Many courses offer blended or hybrid options combining online and face-to-face modes. While recognising the value in multi-dimensional professional learning programs, this review intentionally treats each of these modes independently. This is to examine specific elements of each mode that may prove more effective for specific teachers or contexts.

Table 2 and Table 3 provide a slight re-working of Figure 3 to separate the categories into professional learning focus and professional learning delivery mode, and also to include the definitions of each mode that were used to classify the research. The original AITSL model was revised in a number of other ways for this review.

Firstly, in the ‘Communities of practice’ box in Figure 3, the third approach labelled as ‘Collaboration based on student work samples’ could be interpreted and categorised in a number of ways. For this review it was broadened to ‘Collaboration’ to reflect the large body of evidence on the impact of teacher collective efficacy (Donohoo 2017; Kim & Shin 2015). This mode is described in as ‘collaborative moderation of assessed work and use of student assessment data by teachers and leaders to improve understanding of student progress and to inform planning’. This ‘Collaboration’ mode was then incorporated across the three columns reflecting its classroom-focus (relating the moderation of student work links directly to the teacher’s day-to-day work in the classroom), as well as the potential for collaborative research and the collaboration inherent in school-based professional learning communities.

Finally, the additional modes in the final box of Figure 3, namely 'learning journeys' and 'ad-hoc professional conversations' were set aside for the purposes of this review, with attention restricted to intentional, planned approaches to professional learning.

*Table 2 Modes related to the focus of professional learning*

<b>Classroom-focused</b>	<b>Research-focused</b>	<b>Community-focused</b>
<b>Observation of practice and feedback</b>	<b>Professional reading</b>	<b>Professional learning community</b>
Examination of teachers in situations or in the classroom (via live or recorded observation) & applying a response to this, evaluating and giving back and influencing future teaching	Reflection on reading and academic texts to enhance teaching skills and student performance and understanding	Communities engaging together to promote a culture of shared learning, either face-to-face or online, with the goal of learning or improving on a skill
<b>Coaching and mentoring</b>	<b>Inquiry and action research</b>	<b>Network</b>
Instructional training or guidance designed to improve teacher/s performance, site based, from a knowledgeable professional, or support from trusted and experienced supervisors or advisors who are invested in the development of the teacher/s	The process of actively seeking knowledge, understanding, or information and/or the systematic investigation, collection, and analysis of data to reach conclusions, estimate effects, or test hypotheses	Professional groups, whether formally constituted or organic/ad hoc, that connect for professional networking and events
<b>Collaboration</b>		
Collaborative moderation of assessed work and use of student assessment data by teachers and leaders to improve understanding of student progress and to inform planning		

In Table 3, hybrid and blended was added as a mode of delivery in its own right to accommodate the trend for professional learning programs to intentionally design for blended face-to-face and online delivery, and the unique affordances of this as a mode.

*Table 3 Modes related to the delivery of professional learning*

<b>Face-to-face</b>	<b>Online</b>
<b>Course or workshop</b>	<b>Online module or course</b>
A set of education and training activities designed to achieve a specific vocational outcome	Online units of subject-related teaching materials containing objectives and learning outcomes
<b>Conferences</b>	<b>Webinar</b>
A meeting to discuss a common concern, in particular larger gatherings of professional organisations, typically at a site other than the person's workplace.	An online event/meeting that is broadcast to a group of individuals
<b>School-based group learning event</b>	<b>Online forum</b>
Once-off, single dose presentation to whole-school, year-level or department-level	Online forums where members or participants can share information and promote discussion
<b>Hybrid and blended</b>	



# What works best, and for whom?

It should be acknowledged that collecting evidence on the impact of professional learning modes is not without challenge. Indeed, the majority of research into the impact of professional learning is based upon teacher perceptions of experience, and the subsequent knowledge, attitudes, and practices that are cultivated during professional learning experiences (Vescio, Ross & Adams 2008). While teachers' perceptions about the value of professional learning activities are important, there remains a need to understand other impacts of professional learning modes as direct and indirect indicators of improved student engagement and learning. Therefore, the following section examines the research base related to professional learning that inform discussion on the appropriateness - and effectiveness - of different modes of professional learning for teachers.

When considering the following review of literature, it is important to emphasise that the Australian education context is distinct to other systems, and may not reflect research in professional learning and development in other contexts. For example, in the United States, and to a lesser extent, the United Kingdom, apprehension around professional learning can be influenced by teacher evaluation policies that can inform hiring and redundancy within the education profession. Considering contextual challenges for teachers is therefore important when evaluating the relevance of research into professional learning mechanisms, particularly qualitative research which relies on teacher perceptions and attitudes.

The following section provides a discussion of modes of professional learning, as outlined in AITSL's established HQPL framework (AITSL 2017a). Where possible, research into the efficacy and usefulness of each mode is presented, as well as a discussion of barriers to impact, bearing in mind that some modes and terms are used interchangeably in the established literature. In cases where modes or professional learning terms have been superseded by enhanced approaches to professional learning, acknowledgement is made. High quality, recent research is presented wherever possible, reflecting current practices and areas of innovation in the professional learning realm.

## Classroom-focused professional learning

Classroom-focused learning, including classroom observations and targeted mentoring or coaching, allows for educators to participate in a learner-centred approach that focuses on growth. Classroom-focused learning has been widely investigated with teachers at all stages of their careers (Lieberman & Miller 2011), and in different sectors including early childhood (Wood & Bennett 2000), primary, and secondary (Bruce et al. 2010). While the beginning years in a classroom offer the greatest chance for skill development to occur (Rivkin, Hanushek & Kain 2005), classroom-focused learning can be impactful across career stages.

### Observation of practice and feedback

Perceived impacts of classroom-focused observation include both improved teacher practice and student achievement (Shaha, Glassett & Copas 2015). However, teacher observation and feedback processes can also create unwanted impacts. Classroom-focused observation can often be perceived as punitive in nature (Huber & Skedsmo 2016; Myung & Martinez 2013). Classroom observations are often administered to teachers by either school leaders or more experienced teachers or mentors, and are commonly perceived to be linked to teacher performance management mechanisms, and such emphasis on teacher evaluation and continual improvement can undermine teacher observation as a growth mechanism.

Teacher perceptions of the observation process are widely reported in the literature, and are often described as processes that can create disempowerment or fear (Donaldson 2016; Papay 2012; Range, Young & Hvidston 2013) amongst observed teachers. Therefore, teacher perceptions around classroom observation and evaluation must be managed in order for professional learning to occur. Additionally, if cultural conditions, such as adequate trust between the teacher and their mentor/manager do not exist or are not fostered, feedback can threaten teachers and lead to anxiety and defensiveness (Myung & Martinez 2013), rather than creating opportunities to learn and grow. However, as Myung and Martinez note when done well, and in an environment where feedback is supportive rather than punitive, classroom observations and classroom-focused feedback can promote teacher growth through ongoing self-reflection and development, even in the context of accountability or compliance (Groundwater-Smith & Mockler 2009). In this context, some studies have shown positive outcomes generated through observations. However, in cases where observations have generated positive outcomes, teachers have been encouraged to focus on continuous improvement (Ellett & Teddlie 2003), which appears to result in increased overall impact upon student engagement and learning (Jacob & Lefgren 2008).

Despite a lack of quantitative evidence, research continues to focus on the potential for classroom observation to increase teacher capability and performance (Gordon, Kane, & Staiger 2006; Rockoff 2004). Yet perhaps due to an ongoing perception that teacher observations are linked to compliance and accountability, research shows that teacher evaluations have not proven to be consistently effective (Hazi & Rucinski 2009). There is a limited amount of quantitative research that has been undertaken on the efficacy of teacher evaluation as a form of professional learning, and contested evidence that impacts of observations result in higher student achievement (Darling-Hammond 1986; Jacob & Lefgren 2008). As a result, observations as a form of professional learning continue to yield inconsistent impacts in studies of the topic (Donaldson 2016; Shaha et al. 2015).

There are now many different approaches and models used in classroom-focused professional learning and observation (Range, Young & Hvidston 2013). Research acknowledges that the success of classroom-focused professional learning is largely dependent on practices that promote and encourage different models of formative feedback and reflection (Myung & Martinez 2013). A further impediment to implementing effective feedback as part of classroom-focused professional learning practice is the narrow understanding of the concept of feedback, and subsequent misapplication of the concept. It is important to consider that feedback should not only be directed from school leader to teacher, but also encouraged across other levels of the school. Recent research undertaken by Brooks et al. (2019) demonstrates that it is crucial to consider the value of different feedback types within the classroom. It has also been suggested that peer observations and different forms of classroom feedback (Jones & Gallen 2016), are more likely to be successful and impactful than traditional, hierarchical, compliance-focused observation.

### **Coaching and mentoring**

Coaching and mentoring are other forms of classroom-focused professional learning. Coaching and mentoring are often treated as interchangeable in education focused research. However, there is a clear distinction between the process of coaching and mentoring (Ali, Wahi & Yamat 2018; Koopman et al. 2021), particularly within schools. There also appears to be different outcomes attached to each form of professional learning, though the research is emerging (Cornelius, Rosenberg & Sandmel 2020).

Mentoring refers to the process of a more experienced educator (such as a school leader) sharing their established skills with a less experienced educator (Ali et al. 2018). Mentoring seeks to develop the individual professionally with the ability to apply skills, knowledge and

experience to new situations and processes (Moyle 2016). Providing emotional support is also a key element of mentoring, so as to build capacity to change practice based on the shared skills of mentors (Premkumar & Wong 2007). Mentoring can involve both formal and informal processes, and as a form of professional learning, usually involves some level of performance review or evaluation. In many contexts, such as China and Singapore, teachers are expected to assume the role of mentor to support beginning teachers (Ali et al. 2018), which can enhance modes of distributed leadership (Harris 2001). More recently, the concept of 'self mentoring' has also gained attention, which is the process of an individual developing skills and strategies self-mentoring that can guide later choice and control over one's life (Carr, Holmes & Flynn 2017).

Although similar to mentoring, coaching is quite a different process as it focuses on the coachee, or the person being coached being the one driving the relationship. Like mentoring, coaching is used to help another person achieve their goals. However, in a coaching relationship, the coachee develops solutions to their own problems, through a process of conversations designed to increase self awareness and understanding around behaviours and associated practices (Passmore & Sinclair 2020). While coaching approaches in education can vary in focus, duration, and setting (Aikens & Akers 2011), Cornett and Knight (2009) identified four approaches to educational coaching that remain strong in the broader research body: 'peer-coaching', 'cognitive coaching', 'literacy coaching', and 'instructional coaching'. Forms of coaching include executive coaching between external coaches and school leaders (Olivero, Bane & Kopelman 1997), principal to principal coaching, or peer coaching between educators (Hagen, Bialek & Peterson 2017). Peer coaching allows teachers to take theoretical practices learned in traditional workshops or face-to-face professional learning and explore practical applications with peers (Cassidy et al. 2009).

Some research indicates that coaching is more effective than mentoring (Hakro & Mathew 2020), attributable to the empowerment developed by coachees who are in control of their own goal setting and learning. However, in studies of coaching in educational spaces, research reports that many coaches dominate discourse (Heineke 2013; Hunt & Handsfield 2013), confusing the role of coach with that of mentor. This is unsurprising, given how often the terms mentoring and coaching are collated as a form of professional learning. Thus, for coaching to be successful, coaches must respect and listen to teachers (Heineke 2013), while respecting boundaries of this form of collaboration. These relationships can have a profound impact on school culture, where the adoption of coaching, mentoring and peer networking can become normalised. However, true reciprocity of relationships and collaboration is not common in all schools (Harris 2001). Thus, for coaching to be truly impactful, coaches themselves require quality professional development opportunities that allows individuals being coached to take charge of their goals, and their learning (Ali et al. 2018).

While certain models and approaches have been more widely implemented than others, such as instructional coaching (Knight 2018), research into the impact of coaching and mentoring is again often based on teacher perceptions of impact, which can be both positive and negative, particularly when teachers are coached by senior members of their school (Yirci et al. 2014). Here, the research base appears to support coaching and mentoring as an effective mechanism for supporting beginning teachers (Bond 2014; Carr, Holmes & Flynn 2017; Lambert 2003), as well as reducing teacher turnover in established workplaces. Research suggests coaching and mentoring practices in isolation or in combination with other professional learning mechanisms can reduce teacher attrition significantly when implemented effectively (Barnes, Crowe & Schaefer 2007; Kaiser 2011). Coaching and

mentoring have also been reported to increase teacher knowledge, the ability to collaborate, job satisfaction, personal efficacy, career progression, and personal ambition (Carr, Pastor & Levesque 2015).

However, both coaching and mentoring can only be impactful when implemented in structured ways, and is often dependent on the support of school leaders (Knight 2021). Yet for school leaders, supporting high quality mentoring can be a challenge (Ingersoll 2003; Sutchter, Darling-Hammond & Carver-Thomas 2016), due largely to a lack of time for classroom-focused mentoring between staff, or the need for resources for professional coaching and mentoring. This becomes compounded when coaching and mentoring is targeted at school leadership level, despite research indicating that leadership coaching for principals can have a great impact on the career trajectories and ambitions of both emergent and established school leaders (Wise & Cavazos 2017).

In a highly feminised profession, women are particular beneficiaries of coaching and mentoring, though research into the topic remains limited. Research indicates that women are less likely to have female mentors and role models (Bellibaş, Gümüş & Kılınç 2020) than their male peers, access which can impact on both attrition and career progression. Yet it is well established that aspiring leaders need role models with whom they can identify and who will encourage and champion their career path. Women continue to be underrepresented in school principal positions, and it is much more difficult for women to find suitable female mentors (Pietsch & Tulowitzki 2017). While enhanced flexibility and the provision of resourcing to engage in external mentoring and coaching is cited as an effective mechanism to supporting the needs of female leaders (Topliss 2020), internal support from colleagues and female role models is more likely to build communities of connection (Rhode 2017; Rymarz 2018) that can empower female educators and leaders. Networking, mentorship and sponsorship also offer ways to learn and grow, but must be offered in a way that is flexible and acknowledges these teachers' work and family responsibilities.

**Works best for: *Beginning educators; experienced educators and school leaders; schools with access to high quality coaches or mentors, schools with high levels of trust; schools with established mentoring and peer coaching frameworks.***

## Research-focused professional learning

The focus on building research capacity in teachers, including skills in professional reading, data literacy, and action research and inquiry is a recent development. Yet developing learning capacity through the ‘teacher as researcher’ model (Souto-Manning 2012) is now evident at different educator career stages, including at initial and early career teacher level. Professional reading and inquiry/action research are key forms of research driven through targeted professional learning (Broemmel et al. 2019), designed to enhance teachers’ content knowledge and increase student learning as a consequence (Kitchen, Jeurissen & Gray 2015).

### Professional reading

Professional reading relates to the reading of evidence-based texts as a form of professional learning for teachers. However, as a form of research-focused professional learning, professional reading is not well defined in the literature, and is often confused or substituted with inquiry-based forms of professional learning. Although much of the literature is now dated (George & Ray, 1979; Stopper, 1982; VanLeirsburg & Johns, 1994) and focused on teacher engagement in reading, there are several studies that have focused on the use of teacher reading as a form of professional development (Broemmel et al, 2019; Kitchen, Jeurissen & Gray, 2015; Rudland & Kemp, 2004).

In the Australian context, the TALIS 2018 report shows that 92% of primary and 84% of lower secondary teachers indicated that reading professional literature formed part of their professional learning (Thomson & Hillman 2019). Rudland and Kemp’s study examines the professional reading habits of teachers, particularly those teachers working with students with additional needs. It offers insight into the extent to which teachers engage in professional reading, with findings demonstrating that teachers in Australia and overseas do not engage widely in professional reading, particularly when compared to those in other professions. The authors note that teachers would benefit from extending their reading of practical subjects to more theoretical concepts in nature. In another study from the United States (Powell, 2006), teacher professional reading is noted as being widely dependent on support from school leadership, similar to other forms of research. However, due to the paucity of research into this topic, it is challenging to determine whether professional reading is a meaningful form of professional learning without the context of collaboration or professional learning community engagement.

### Inquiry and action research

Research indicates that to engage in professional inquiry and research that has an impact on student engagement and achievement, it is important for research-focused professional learning to focus on building teacher capacity in self-assessment and self-regulation, as well as creating opportunities for collaborative research and inquiry. In this context, studies indicate that in order for professional learning to cultivate effective research skills, teachers need to develop the ability to identify and cultivate skills that can help them- and their teams collaborate effectively to achieve student outcomes (Butler et al. 2004). The outcomes of such collaboration can lead to both enhanced agency and collective teacher efficacy (Donohoo, 2017). Action research can also play an important role in fostering teacher identity formation, but can also be constrained by educational structures such as curricula and assessment, as well as teacher’s own ability and confidence to engage in critical reflection and inquiry of their practice. As Davis, Petish and Smithey (2006) explain, understanding their place in the school, and the extent to which identity can shape teaching practice, can be particularly problematic for beginning teachers.

While many studies look at the impacts of action research and inquiry upon student teachers (Davis, Clayton & Broome 2018; Ostorga & Estrada 2009; Price & Valli 2005), research has also been undertaken into the benefits of engaging in action research for beginning and early career teachers (Goodnough 2011), as well as established teachers and school leaders (Gilles, Wilson & Elias 2010). Goodnough's examination of the longitudinal impacts of professional inquiry demonstrated a number of impacts for beginning teachers, including enhanced confidence in teaching, higher levels of self-efficacy, shifts in perceptions and understanding of student need, and enhancement of pedagogical content knowledge, and teaching practice. In addition, the teachers examined in Goodnough's study, as well as teachers who participated in action research or inquiry in other studies (Price & Valli 2005) began to view themselves as critical learners, and as problem solvers who employed inquiry in their ongoing teaching practice. Furthermore, research indicates that teachers who participate in collaborative action research and collectivist inquiry can build individual and collective efficacy (Kim & Shin 2015).

However, despite the highlighted impacts of identity and professional growth, other studies of action research as a form of professional learning focus on the aim of practitioner inquiry as a defining factor in its success (Jasper & Taube 2005; Mertler 2009). These studies demonstrate that for research or inquiry to have an impact on student learning, teachers must develop the necessary problem-solving skills to participate in sophisticated needs analysis and assessment of where students are currently at in their learning journey. However, as Black & Wiliam (1998) acknowledge, most models of school-based research or professional inquiry continue to focus on content, structures, and processes, instead of providing an opportunity for examination of the skills that teachers need to develop and refine in order to understand their influence over student outcomes. Therefore, for research and inquiry based professional learning to be successful, capacity building and focused professional development on problem solving skills can greatly enhance the likelihood of teachers improving their practice (Jasper & Taube 2005).

**Works best for: *Student teachers and early career educators; established educators with strong reflection capacity, content knowledge, and assessment skills; schools with access to research partnerships and quality mentors.***

## Community-focussed professional learning

In the context of professional learning focused on communities of practice, much research focuses on the impacts of professional learning through the lens of networks, professional learning communities, and classroom collaboration. The level of collaboration and engagement afforded by different models and modes of professional learning is a key consideration according to Kennedy (2011).

*Table 4 Type of engagement in collaborative professional learning (Kennedy 2011)*

Type of engagement	Extent of shared concern	Exemplification
Being beside others ( <i>Co-location</i> )	Common location	Colleagues in a staffroom Participants at an in-service course
Talking with others ( <i>Co-operation</i> )	Common interests	Stage partners (primary) or subject teachers (secondary) discussing curriculum
Engaging with others ( <i>Collaboration</i> )	Common problem or task	Colleagues involved in school-based action research project to address a shared problem

### Networks

Professional networks function as a structure of social connections and interactions that are used to exchange learning resources and support the teaching-learning process (Trust 2017). Such networks provide links to educators and researchers beyond a single school, state or country and create opportunities for support, feedback, and collaboration. Through professional associations, regional or subject networks and professional learning networks teachers can be exposed to new resources and new thinking on teaching (Beach 2012). These can be effective mechanisms for engagement and connections across and within schools.

Social media platforms such as Twitter, Facebook and LinkedIn also allow teachers to connect globally and are used as professional learning networks to offer 'just-in-time' access to information on evolving technologies through social media live features (Jones & Dexter 2014). Research suggests that the Twitter platform in particular has filled the gap in face-to-face professional learning, providing opportunities for collaboration and reflection with other educators and for sharing information, knowledge, resources, and classroom experience (Ross et al. 2015; Trust 2017).

Online and external networks are particularly important for teachers without broad access to professional learning opportunities in their own schools. Here, as Jackson and Timperley (2007) argue, both networks and professional learning communities are needed, that "the school as a unit has become too small scale and isolated to provide scope for professional learning for its adult members in a knowledge-rich and networked world" (p. 45). However, for networks to be effective, there must be sustained efforts to engage teachers with targeted goals in mind. For this reason, networks are often confused with professional learning communities in the existing literature, although they deserve to be treated as distinct modes.

## Professional learning communities

Professional Learning Communities (PLCs) tend to be more narrowly focused on specific goals and objectives for sharing resources and support for a particular topic or skill. Such communities engage to promote a culture of shared learning, with the goal of learning or improving their practice.

In recent years, research into the impacts of professional learning communities has become increasingly common (Stoll et al. 2006). Within professional learning communities, individual teachers' qualities can provoke both success and failure in outcomes generated in a community of practice. Here, as Armellini and De Stefani (2016) outline, teaching, social, and cognitive presences are central to successful professional learning experiences. Indeed, teacher traits and dispositions can lead to both individual and collective efficacy, however it is shared teacher practice and commitment to supporting the needs and goals of students that have been shown to impact most heavily upon student achievement (Bandura 1997; Goddard, Hoy & Hoy 2004; Thompson, Gregg & Niska 2004).

However, as DuFour notes, "the term [PLC] has been used so ubiquitously that it is in danger of losing all meaning" (2004, p. 2). DuFour recommends that in order for professional communities of practice to be effective, schools must continually reflect on ways in which teacher collaboration focused on student learning is integrated into the culture of schools. As Vescio, Ross and Adams (2008) highlight, understanding the extent to which participation in a professional learning community has an impact on student outcomes remains elusive, despite much research indicating that participation in a professional learning community improves teaching practice.

Therefore, investment in the professional development of individuals within a school is critical (Vescio, Ross & Adams 2008), as is continual focus on cultivating trust and a shared commitment to students. Collective learning through communities of practice can build trust and shared experiences between colleagues, both which are significant predictors of collective efficacy, shifts in school culture, and enhanced student outcomes (Lee, Zhang & Yin 2011). As Bandura (1997) notes, when a team of individuals share the belief that by working together, they can overcome challenges and achieve their goals, groups are more effective. This is particularly true in schools, as when teachers believe in their ability to influence student outcomes by working together, academic achievement in students improves. A synthesis of studies cited in Vescio, Ross & Adams 2008 support this insight, linking student achievement outcomes to the strength of professional learning community participation in a school. Thus, professional communities of practice have the potential to operate as important sites for educational reform and change (Coburn & Stein 2006).

**Works best for: *Beginning and experienced teachers; school leaders; schools with high levels of trust; schools with clear strategies and collective approaches to learning***



## Face-to-face professional learning

Perhaps the most widely used form of professional learning is what is termed ‘traditional’ face-to-face learning. Face-to-face learning is often offered in an effort to connect staff (Fernández-Balboa 2001) and provide opportunities to learn within a group. The format of most face-to-face professional learning is a group setting, in which teachers are directed by their school leader to participate in a shared experience, based on one central topic of focus (McConnell et al. 2013). Face-to-face learning is defined in different ways, including courses and workshops, attendance at conferences, or school-based learning events. Although each of these modes is distinct in its format, there is an interplay between the design of each; that is, most face-to-face learning is one off, or short term, and designed to be delivered to a group of participants instead of focused on individual teachers. The taxonomy of professional learning modes used in this review makes a distinction between face-to-face professional learning that is conducted away from the teacher’s own school, typically courses and conferences; and school-based group learning events.

### Face-to-face workshops and conferences

While the COVID-19 pandemic demonstrated that many workshops and conferences that had previously been held in face-to-face mode could be translated in some form to an online mode, it is worth considering what the research says about effectiveness of face-to-face workshops and conferences. Particularly as, according to the TALIS 2018 survey, courses or seminars attended in-person were by far the most common mode of professional learning experienced by Australian teachers at that time, with 92% of primary teachers and 93% of lower secondary teachers attending such programs (Thomson & Hillman 2019, p. 106). Education conferences in which teachers and/or researchers presented their research or discussed educational issues were attended by 63% of lower secondary and 56% of primary teachers according to TALIS 2018.

A question that was not answered in the literature reviewed is why these two modes of face-to-face professional learning are so prevalent, and whether this popularity provides any indication of effectiveness? While some of the papers identified in the literature search had been presented at a conference, none of the studies measured effectiveness of the conference as a mode of professional learning. A number of the studies did review face-to-face workshop programs with a focus on content knowledge and teacher perceptions of their learning. Contrary to the idea that face-to-face workshops are single-dose, short-term activities, two of the STEM workshops reviewed were in fact sustained models: a one year-long approach (Murcia & Pepper 2018) and a 7-day intensive workshop (Shuster, Glazewski & Villa 2020).

### School-based group learning events

School-based group learning is likely to be a traditional one-shot/single dose presentation to the whole-school or a learning team or department-level. Face-to-face delivery remains the preferred mode of professional learning in many schools. While research indicates that teachers prefer face-to-face PL, there is little evidence to suggest that face-to-face learning is more impactful than online or blended learning (McConnell et al. 2013; McCray 2018).

While research has described efforts to enhance effective opportunities for teacher learning in face-to-face settings (Huebner 2009), most research continues to examine the impact of once-off workshops or presentations (Kesson & Henderson 2010; Wei et al. 2009a). While this approach can be helpful for building knowledge, genuine interactions between participants remain constrained by the group focus, versus investment in the individual needs of teachers. Further, the extent to which most face-to-face professional learning is

driven by schools and school leaders on behalf of teachers (Stoll et al. 2006), compounds the challenge of face-to-face activities resulting in high quality and targeted professional learning. Not only are these types of activities unlikely to have an impact on teacher practice, but school leader led professional learning is also viewed as inadequate for bringing about change in either teacher practice or student learning (McConnell et al. 2013; Wei et al. 2009).

For face-to-face professional learning to have an impact, professional learning activities need to align to the daily practices and goals of individual teachers. While teachers benefit from increasing their understanding around generalist education topics, meaningful face-to-face professional learning should help teachers to understand ways to enact theories or ideas in practice, particularly in the context of application in specific subjects, or as ways to recognise and respond to the challenges students face (McConnell et al. 2013; Putnam & Borko 2000). Effective professional learning in a face-to-face setting should also provide opportunities for critical thinking and problem solving (Yoon et al. 2007), as well as the chance for teachers to make sense of practical dilemmas that could apply to their own contexts (Wilson 2013).

For face-to-face professional learning to be effective for teachers, face-to-face activities should also involve ongoing opportunities to analyse and practice high impact strategies for teaching and learning in their own context (Fishman et al. 2013). Building reflective capacity but also the potential to practice new ideas and strategies in teachers' everyday lives can greatly enhance the usability of professional learning tasks (Ball & Cohen 1996; Wilson 2013). Finally, effective professional learning should foster capacity for monitoring and evaluation of individual practice (Darling-Hammond 1995; Darling-Hammond & Richardson 2009; Putnam & Borko 2000), so teachers can recognise change and growth, and share these learnings with others through collaborative teaching and learning strategies (Fernández-Balboa 2001; McConnell et al. 2013). Collaborative application and sharing of practice will support face-to-face professional learning to retain relevance in educational spaces that are increasingly digital.

**Works best for: *Beginning and experienced educators; educators new to the school; educators who can dedicate time; schools with high levels of resourcing and access to high quality professional learning providers; schools that can offer targeted in hours learning opportunities to staff.***

## Online professional learning

While advocates of face-to-face learning note that online learning can impact on the connections formed between participants in online settings (Carey et al. 2008), a growing number of recent studies have demonstrated that teacher participation in online professional learning approaches can be linked to impacts on both teaching and learning (Harlen & Doubler 2007; Laurillard 2016). Online teacher professional development has improved greatly over time, moving from translating face-to-face into digital formats to a targeted and sophisticated approach to adult learning. When compared to traditional face-to-face learning, online professional learning appears to yield similar outcomes in relation to teacher skills or knowledge (Vaona & Kh 2018). It is therefore important for policy makers to consider the effectiveness of online learning compared to traditional face-to-face format (Blitz 2013), in light of the factors that influence the effectiveness of online courses.

Online professional learning has grown in appeal, largely due to an increased desire from both schools and teachers, to engage in flexible opportunities for participants in different locations and contexts. However, online teacher professional development has experienced such explosive growth in the last decade that the production of teacher professional development programs has outpaced research exploring its effectiveness.

There is a well-used framework in the online learning literature that assumes that learning occurs in a community and requires interaction of three elements (Garrison 2013):

- *Cognitive presence*: the ability of participants to build meaning through continuous dialogue and reflection to solve a problem or take a decision
- *Social presence*: the focus on developing relationships in the learning community
- *Teaching presence*: the leadership of the learning, including design and facilitation of activities and social and cognitive processes.

This is a useful framework against which to evaluate online professional learning programs, and can equally be applied to face-to-face and hybrid or blended modes. In comparing online professional learning, teachers should recognise that the potential for social presence will be enhanced if a program is offered in a synchronous mode with participants gathering in real-time. Another much more detailed framework compares four types of technology-mediated professional learning against facets of structure, focus, platform, learning principles and teacher emphasis (Vivian, Falkner & Falkner 2014, p. 5).

### Online modules and courses

Online modules or courses can take numerous forms. Online units of subject-related teaching materials, and resources containing objectives and learning outcomes are a common mode that has evolved from online higher education courses. These may be delivered through a learning management system or the learning programs may host the resources and tools on their own website. A key consideration is the level of teacher presence included in the module or course. An asynchronous, self-paced online module may meet criteria of flexibility and affordability, but is less likely to engage a teacher in deep cognitive work or reflection.

It is interesting to note that in the responses to TALIS 2018, participation in online courses or seminars was one of only a few forms of professional learning in which primary teachers tended to participate to a greater extent than lower secondary teachers. This was 82% of primary teachers compared to 71% of lower secondary teachers (Thomson & Hillman 2019).

Massive Open Online Courses (MOOCs) are used as a form of online professional development in many fields, including for teacher professional development (Castaño-Muñoz et al. 2018; Koukis & Jimoyiannis 2019; Laurillard 2016). MOOCs are usually designed with free and open registration, a publicly shared curriculum, open-ended outcomes and open access online resources. When facilitated by leading practitioners in the field of study they provide a strong teacher presence that comes close to that of a face-to-face conference (McAuley et al. 2010). MOOCs are typically scheduled weekly and cover specific learning areas, skills, activities and learning resources that the participants can use in a self-directed way.

*Box 1 CSER Digital Technologies MOOCs (Vivian, Falkner & Falkner 2014)*

### CSER Digital Technologies MOOCs

The CSER MOOC was designed as online professional learning to support the implementation of the Australian Digital Technologies curriculum. This MOOC aims meet teacher needs whilst allowing for flexibility, ad-hoc interactions, support, as well as the open sharing of resources. It is supported by expert facilitators and coordinators in each state and territory. A key element in the MOOC design was incorporation of social media tools for knowledge exchange and networking. Completion rates for the MOOC were low. The designers recognised the participants would be predominantly female, middle-aged, time-poor teachers. Feedback included appreciation from rural teachers about the professional learning being accessible. Two assessment tasks were included in the MOOC, a peer assessment task based on the creation of a teaching resource and the second, a lesson plan portfolio. Teachers shared their tasks on the community page for the course.

<https://csermoocs.adelaide.edu.au>

### Webinars

An online event or meeting that is broadcast to a group of individuals, webinars are usually conducted live, with all participants present and interacting in real time, and they are facilitated. This provides teacher presence via a presenter and can be an effective way to transmit defined training on a topic to a large number of listeners. If the webinar also encourages teachers to participate rather than leaving them on mute for an hour, then with small numbers and good facilitation of discussion, a webinar can go some way to meeting the social presence criteria. Research shows that participants perceive feedback and timely response to questions as strategies that enhance teacher engagement in this kind of environment (Martin et al. 2018).

### Online forums

Online forums where members or participants can share information and participate in discussion are features of online learning that aim to enhance the extent to which a person feels 'socially connected' to others in their online environment (Stone & Logan 2018). Collaborative learning through online forums appears to be positively linked to participants' learning outcomes (Hilli 2020; Tekkumru-Kisa & Schunn 2019) and contributes to participant satisfaction, motivation and retention. Forums have been used across subject areas and for teacher collaboration on general topics such as using ICT or collaborative reasoning, and such forums enhance reflective practices and group problem-solving (Bradshaw, Twining & Walsh 2012; Chitanana 2012). Active facilitation training for facilitators and moderators is highly recommended to develop skills in nurturing group engagement (Jaques & Salmon 2007).

Effective examples of online learning have demonstrated an impact on student learning (Magidin de Kramer et al. 2012; Rienties et al. 2013; Shaha & Ellsworth 2013; Wasserman & Migdal 2019), as well as improvements in teacher attitudes and efficacy (Annetta & Shymansky 2008). A review of more than seventy empirical studies examining the impact of online professional learning programs (Lay et al. 2020) noted that embedding independent learning within communities of practice was essential in helping teachers engage in shared meaning making, co-construction of knowledge, and peer-to-peer coaching.

In a study of rural and remote teachers, the establishment of a virtual community of practice was a key contributor to the success of the program, providing support to isolated teachers and a way to build understanding of best practice (Erickson, Noonan & McCall 2012). In a rare comparison of the impacts of professional learning between rural and non-rural educators, Erickson et al.'s research indicates that both rural and non-rural teachers experienced gains as a result of participation in online learning, resulting in teaching participants in urban spaces developing meaningful relationships with rural colleagues across the country. Furthermore, the study demonstrated that another teacher population underrepresented in the literature- rural special education teachers - who participated in online professional development demonstrated growth in knowledge, as well as increased capacity to develop and apply evidence in their teaching practice.

Indeed, studies of online learning demonstrate that online professional learning modes are at least as effective as traditional face-to-face formats (Blitz 2013; Nguyen 2015). However, for online professional learning to be effective, a number of elements must be present. These include opportunities for collaboration (Porcaro & Carrier 2014), and strong instructor presence (Banerjee, Wolf & Chalasani 2020; Klein & Mendenhall 2018). As Klein and Mendenhall explain, asynchronous videos and videoconferencing can promote social, teaching, and cognitive presence in the online classroom. Instructor presence can be found in both live online programs, and pre-recorded videos. Online programs can also provide accessible, flexible, and cost-effective opportunities to learn. The most effective online professional learning programs are not tokenistic one-off short courses, but instead, extended professional learning experiences (O'Dwyer et al. 2010; O'Dwyer 2018). These immersive experiences can yield positive effects on teacher knowledge and behaviours, as well as student achievement. However, in order for online professional learning to be most helpful for participants, integrated coaching and mentoring should also be included (Lay et al. 2020).

Teachers cannot engage in successful professional learning without appropriate access and proficiency in technology themselves. Educators need to be able to access professional learning, regardless of access to materials or irrespective of distance. It should therefore be acknowledged that most forms of online professional learning are dependent on access to online resources, including internet access and devices in the home. With access to appropriate technology, there are a number of possibilities for leveraging existing teacher professional learning practice focused on student outcomes, however, the research is still emerging. Thus, while online professional learning is not always possible for educators in rural, remote, or disadvantaged schools, it provides a much-needed mechanism that makes cost effective professional learning possible across contexts.

**Works best for: *Beginning and experienced educators; educators with high levels of autonomy and self-regulation; educators with technological proficiency and access, educators require additional flexibility; schools with low-high levels of resourcing***

## Hybrid and blended professional learning

Hybrid or blended learning is most commonly described as a mix of synchronous and asynchronous mechanisms – yet the definition remains contested (Torrison-Steele 2011). Blended learning has been described as a context-dependent system in which appropriate mixed modes of delivery integrate both theory and practice (Hrastinski 2019). Blended learning is now widely used in situations where participants are separated by distance (Onwusuru & Ogwo 2019). Blended learning has been outlined as the blending of different traditional and technological components (Dziuban et al. 2018), such as the integration of conventional face-to-face learning methods with digital or online learning methods (Garrison & Kanuka 2004; Graham 2013).

Although blended learning is not traditionally conducted within school environments, its applicability in emergent pedagogical approaches has also been discussed (Dziuban et al. 2018). Blended learning draws upon a mix of face-to-face and online practices (Bains et al. 2011), and as a professional learning strategy, combines appropriate teaching and learning methods with technology or online resources to provide dynamic learning experiences (Mirriahi et al. 2015). However, the contested definitions and disparate applications of blended learning models make this learning approach one of the hardest to implement effectively. One of the challenges, like in face-to-face practice relates to the opportunity for participants to practice what they learn. In this context, as Torrison-Steele (2011) argues, it is crucial that blended learning approaches are not tokenistic but draw upon reflective pedagogy. Accordingly, blended learning should not be only an exercise in technology use but rather a problem-solving activity that supports differentiated approaches to learning, reflective practice, and enhanced outcomes for all staff who participate in it.

*Box 2 Example of a hybrid program for early childhood teachers (Melhuish et al. 2016)*

### Fostering Effective Early Learning (FEEL)

FEEL was designed as a 9-month extended professional learning program to support the collective participation of early childhood teachers. It covered eight core content areas, delivered across three phases:

1. **Intensive:** A 2-day, intensive, face-to-face training delivered within 1.5 hours travel zone, providing an overview of national and international research; an introduction to key concepts and ideas; as well as strategies for teachers to use in their work.
2. **Follow-up:** Five half-day, face-to-face sessions, delivered every 2 weeks, beginning 2 weeks after phase 1. The sessions include time for reflection, planning and critical analysis, as well as the introduction of knowledge and pedagogical content on areas not covered in phase 1.
3. **Model for sustainability:** PD support provided for the full 9-month intervention through online modules or e-books with activities and resources to promote staff engagement and establish an online community of educators. Each e-book combines video-streamed content with questions and text, including links to activities and a discussion forum. Staff participation and discussions feed into a learning portfolio, tracking and reflecting how their ideas about pedagogy, children, families and communities have changed.

When compared to traditional mechanisms, research consistently indicates that blended learning is more likely than either face-to-face or online mechanisms to be perceived as both effective and acceptable (Bains et al, 2011). In health contexts, which are often comparable to education, blended learning approaches to professional learning also report higher knowledge outcomes when compared with traditional learning mechanisms (McCutcheon et al. 2015; Vallée et al. 2020). This is encouraging, particularly for participants in rural and remote spaces who cannot readily access professional learning within their school settings.

It is likely that further research into the impacts of blended learning will become available as professional learning and teaching continues to evolve during the Covid-19 pandemic.

**Works best for: *Beginning and experienced educators; educators with high levels of autonomy and self-regulation; educators with technological proficiency, educators require additional flexibility; schools with low-high levels of resourcing.***

## Comparison of professional learning modes

Returning to the key question for this review, what does the literature say about whether particular modes, or combination of modes, have greater impact for specific cohorts of teachers?

In looking for evidence pointing to the circumstances in which a particular mode of professional learning might have the most impact on teaching practice or school culture, there was a concerted effort to identify studies that compared different modes of professional learning. One way of doing this was to identify studies that used multiple modes or a combination of professional learning approaches, then to review the research design to analyse the extent to which the modes were compared.

In the Australian literature as identified through the search of A + Education, analysis of coded studies illustrates that 12 out of the 20 studies included reported using multiple professional learning approaches. Of these, one study reports using five different approaches and 6 varied modes of delivery (Sheffield, Blackley, & Moro 2018). Another study has listed as many as 8 different modes for conducting the professional learning using a combination of four approaches (Fentie 2019). A third study reports using three varied approaches and 8 delivery modes (Carson & Dawson 2016). Analysis of the coded studies from literature through the search of the internationally focussed ERIC database, suggest that 14 out of the 20 included international studies reported using multiple professional learning approaches. Not one of these studies set out to directly compare the effect size of different modes of professional learning. As noted previously, studies that asked questions about different modes of professional learning surveyed teachers as to their preferences or on their perceptions of their learning, rather than measuring effectiveness in terms of teacher and/or student learning.

One example of early childhood teachers self-reporting the effectiveness of three types of professional learning: (1) conference presentations, (2) 1-day or multi-day workshops or (3) intensive in-service training (weeklong institutes or on-site training in their own classroom) (Dunst & Raab 2010). They rated the intensive in-service training as more effective than either conference presentations or workshops, and the on-site training as more effective than weeklong institutes (p. 239).

The discussion of the literature on online professional learning, and particularly hybrid and blended learning, points to a limited number of studies comparing online modes of professional learning with face-to-face delivery. Comparison of online and face-to-face teaching is a popular topic for research although primarily in the higher education sector, or when comparing virtual schools with traditional schools. A rapid evidence review on remote professional development conducted by the Education Endowment Foundation (EEF) in 2020 analysed the evidence available on the effectiveness of remote professional development modes when compared to face-to-face and blended approaches. While not many of the meta-analyses and systematic reviews used in this review compared modes of professional learning, and many were from outside the school context, it does provide a useful commentary on online modes that are likely to be effective. The three areas that were

reviewed as effective or promising were remote mentoring, interactive content with spaced delivery, and the use of video that enables teaching staff to review their own and reflect on others' actions in the classroom.

One study was identified that compared the effectiveness of online reading, workshop attendance and peer coaching as modes of professional learning for a group of speech therapists. Looking to improve the quality of Individualised Education Plan objectives, 14 participants were assigned to read training content on a website, 17 attended a workshop, while 18 attended the workshop followed by 2 months of peer coaching conducted online. No follow-up support was provided to the web-based and workshop groups. While all groups improved, the workshop and peer coaching groups made significant improvements compared with the online reading group. Surprisingly, the peer coaching group did not demonstrate continued improvement (Lowman 2016).

It is clear from this literature review that further research is needed before educators will be in a position to compare the effectiveness of these modes of professional learning. When this evidence is available, another consideration will be how to translate knowledge of effectiveness into adoption of a particular mode. For example, in this snapshot of the literature there is some research indicating the effectiveness of coaching and mentoring programs, in particular for early childhood teachers and early career teachers. It is interesting to note the findings of the TALIS 2018 survey that although most principals recognised this evidence, just over one in three early career teachers and one in 10 more experienced teachers in Australia reported that they had received mentoring (Thomson & Hillman 2019, p. 95). A stronger body of evidence regarding high quality professional learning will only be of benefit if the teachers, leaders and school systems create the right conditions for effective professional learning.



# Creating conditions for effective professional learning

Regardless of the professional learning mode used, there are a number of key factors that must be considered in understanding what works, and for whom. Particularly in light of the Covid-19 pandemic, it is likely that the Australian education system will see periods of stop-start learning in certain states and territories, in which school closures and remote learning are the norm, and which will likely continue for the foreseeable future. Ensuring students remain supported is dependent on the resources of schools, but also the readiness and skill of educators. Upskilling time-poor educators, particularly in the use of educational technology and ways to support families and students during periods of remote schooling, will likely remain a challenge for all professional learning providers. Thus, there is a need to adapt both the goal and formats of professional learning.

Much of the established research indicates that the success of professional learning is predicated on targeting teachers' content knowledge, teachers' knowledge of how students learn, alignment to individual and school learning goals, and support by school leadership (Ball & Cohen 1999; Guskey & Sparks 2004; Richardson & Placier 2001; Spillane 2000). However, several recent studies have also offered insights into enhancing professional learning during the pandemic and beyond (Reeves 2021; Haßler, Khalayleh & McBurnie 2020). Drawing upon lessons from the higher education and health sectors, suggestions have been made that can improve professional learning for educators (Allen & Seaman 2011; Keramidis 2017). Reeves (2021) offers three helpful ideas for reforming professional learning: 1) replace short workshops or presentations with longer professional learning events that are sustained over a long period of time; 2) personalise and target professional learning activities based on need, and 3) place greater emphasis on effort over inspiration.

Reimagining professional learning based on both need and alignment to existing goals and structures provides opportunity for meaningful engagement in professional learning during periods of low time availability and resourcing. Further, by creating opportunities for flexible delivery and engagement invites more educators to participate in communities of practice that promotes a reflection on experiences and successful practice, which will ultimately lead to collective efficacy. However, it must also be acknowledged that the above suggestions assume readiness and willingness to engage, which are not always present amongst educators. The following section therefore considers the conditions needed to support and sustain impactful professional learning moving forward.

## Support from leadership

Promoting a challenging learning culture is a key part of learning professional learning, this can be fostered through personal involvement in the professional learning (Cordingley et al. 2015; Robinson et al. 2008), developing a range of professional learning activities that are appropriately spaced and aligned (EEF 2019; Sharples et al. 2019). The activities should allow for "frequent and meaningful engagement, and move away from a model of one day, one-off training" (EEF 2019, p. 5). The key driver for structuring activities is to encourage ongoing learning and application to practice (EEF 2019). To encourage meaningful changes in teacher practice, professional learning needs to span a minimum time frame of two terms and ideally involves repeated practice over the space of a year (Cordingley et al. 2015). The desired coherence across professional learning can be described as:

the content...should be aligned and purposeful, so that individual learning activities collectively reinforce on another and revisit the same messages. For example, in-school coaching activities should build on, and reflect, the ideas and strategies that are introduced in initial training (EEF 2019, p. 5).

Professional learning without context is highly unlikely to be impactful, and the success of any initiative depends on the mode of interpretation and use, within the school setting. Existing education policy and school leadership research suggests that the success of any reform depends on the ability of school leaders to clearly understand professional learning initiatives, shape a reform vision, establish clear goals for the school, and mobilise staff towards the achievement of set goals (Caldwell & Harris 2008; Elmore 2004). This is particularly important in supporting successful professional learning, which often relies on collaboration between educators.

Quality collaboration between leaders and teachers, focused on shared goals and knowledge lead to enhanced relationships, can enhance student outcomes and create opportunities for teachers to feel fulfilled in the work that they do (Fullan 2010). Yet in much of the research presented in this review, there remains little exploration into the impacts of teachers working together to build collaborative communities, particularly in collaboration with school leaders. Such collaboration between leaders and teachers is crucial, and is linked to student outcomes, reduced attrition rates, and a sense of professionalisation amongst teachers (Fullan, 2010).

Support from school leadership is a critical component in ensuring the success of any educational initiative or reform. However, in the context of professional learning, ensuring educator engagement through targeted and meaningful engagement can be made problematic by a lack of time and resourcing, particularly in low socioeconomic contexts or rural and remote settings. Teachers are often given responsibility over student engagement and achievement, yet there is suspicion around the role of teacher evaluation, and often linked to this, the focus of professional learning. Apprehension or fear amongst teachers can reduce the efficacy of any professional learning program, and progress of practice linked to constructive feedback. Therefore, it is important for school leaders to communicate professional learning in a way that creates a sense of aspiration, rather than compliance, amongst the teaching community.

## Targeted alignment to existing goals and structures

School leaders play a key role in ensuring that professional learning opportunities are targeted to support the individual needs of educators, but also to act as a conduit between structures and practices already focused upon with school and team goals. Alignment to existing programs can enrich the impact of professional learning programs, regardless of format. Ensuring that professional learning activities connect to an existing focus or strategic goal in the school is therefore important in ensuring meaningful learning and practical application is possible for teachers.

Teachers are often suspicious that professional learning may be tokenistic or compliance-focused, particularly in contexts where professional learning is seen as a form of accountability, rather than investment in an individual's growth. There is also a conception in much of the research, particularly into perceptions of efficacy around face-to-face learning, that short term professional learning that does not align to existing practices and goals can be perceived as a waste of time. Therefore, as the research presented in this review demonstrated, the most effective form of professional learning is that which engages teachers in locally situated and context-specific engagement, which in turn positions

teachers to become co-authors in a school's focus and goal setting. Existing education policy and school leadership research suggests that the success of any reform depends on the ability of school leaders to clearly understand policy initiatives, shape a reform vision, establish clear goals for the school, and mobilise staff towards the achievement of set goals (Caldwell & Harris 2008; Elmore 2002).

Here, Coburn and Stein (2006) identify teachers' professional communities of practice as important spaces for goals to be examined in light of professional learning targets. Similarly, drawing upon school based structures by engaging mid level leaders (such as heads of departments) as champions and participants in professional learning can help to support uptake, particularly in contexts where trust or relationship quality is not strong between educators and leaders. In this sense, middle level leaders can assist in the success of professional learning initiatives by engaging teachers, providing motivation and aspiration, and supporting collaboration between teachers based on student outcomes.

Ultimately, engaging teachers in professional learning that is relevant for their needs should be predicated on evidence, not only trends in current professional learning. At present, much research is focused on teaching centric topics such as technological proficiency, assessment development, data literacy for teachers, visible learning, and collective teacher efficacy. Yet educational research changes rapidly, and change fatigue amongst teachers can be a major barrier to engagement and uptake of professional learning programs. Thus, regardless of what is currently trending in international education research, it is important to assess what is most needed in a school, *for* staff, when selecting professional learning. If schools identify the unique needs of staff and attempt to support the individual goals of staff, impact is more likely to occur.

## Flexible delivery

In times of uncertainty, professional learning needs to be offered more widely and more regularly in order to respond to reform and create a culture of professional learning that recognises the unique challenges facing the teaching profession (Darling-Hammond & Lieberman 2012; Hargreaves & Fullan 2012). Innovation from within the education system, as teaching and learning practices continues to evolve as a result of increasingly blended learning models, and there is now a real chance to revisit the way professional learning is conducted within the Australian education system.

New approaches to professional learning, particularly online, provide opportunities which can reduce cost and increase access for Australian educators. While rural and remote participants, as well as casual and early childhood educators may not traditionally have as much access to formal face-to-face learning, there is now an abundance of free and low-cost interstate and international professional learning opportunities to engage in. For teachers with family responsibilities, particularly women, flexible delivery will open up a number of opportunities for ensuring continuity of professional learning continues.

With the ongoing popularity of social networking and developing professional online learning communities, it seems highly likely that online professional learning can offer teachers a valid alternative to traditional face-to-face formats. Yet some professional learning participants still prefer traditional face-to-face, or blended models of engaging with peers (Solimeno et al. 2008). Further, research continues to suggest that regardless of format, the best professional learning is contextually specific (Guskey 2014; Lynch, Madden & Knight 2014), with professional learning based on school and individual goals remaining the most impactful for educators and their students.

Although these new programs and opportunities are highly desirable, attention must be given to the evidence base that sits beneath new professional learning modes in order to ensure these experiences are impactful for both educators and their students. Given the complexity of the environments in which educators work, professional learning must continue to be both responsive and flexible, allowing educators in different contexts which to develop problem solving and self-regulatory skills is one of the most powerful determinants of ongoing professional improvement (Timperley, Eil & Le Fevre 2017).

## Understanding readiness to learn

Ultimately, as Timperley (2018) notes, “It is important to set up conditions that are responsive to the ways in which teachers learn” (p. 6). Although education providers and policy makers should continue to support provision of professional development to Australian teachers across schools and sectors, more needs to be done to motivate teachers (and leaders) to acquire new knowledge and sustain existing skills. Indeed, without understanding the extent to which educators are ready and willing to learn, any professional learning participation is unlikely to be impactful. Thus, to support high-quality practice, all professional development practices in Australia must continue to consider the changing needs of teachers and their students (Hargreaves & Fullan 2012).

Readiness is predicated on a deep understanding of teacher needs, drawing upon established evidence into effective modes and mechanisms of professional learning, as well as content that focuses both on collaboration and student learning. Research suggests the content and outcomes of what teachers learn is far more important than the form or structure of professional learning. Indeed, professional learning is far more likely to improve student learning outcomes if it increases teachers’ understanding of the content they teach, in a way that allows educators to support students in meaningful ways that recognises need and promotes opportunities (Timperley et al. 2007). Context matters, and professional learning is strongly shaped by the environments and communities in which teachers work. As the needs of teachers continue to evolve, professional learning should also be responsive enough to support educators from diverse backgrounds and contexts.

# Conclusion

The ultimate goal of this literature review was to identify effective modes of professional learning for Australian teachers, in particular for early childhood teachers, casual relief teachers and teachers in rural and remote areas.

In looking for effectiveness or impact, teachers, leaders and policy makers are looking for impact on teaching practice or school culture and thus researchers are looking to observe change of some sort that can be directly attributed to the professional learning activity. From the research reviewed, at this time it is not possible to quantify the impact of different modes of professional learning. Thus, there is little to report on comparative effectiveness or impact of one mode compared to others. This is due not only to a lack of studies addressing this question, but also to the trend for large-scale professional learning programs to be deliberately multimodal. Formal evaluation of effectiveness is most likely to be available for larger-scale programs.

At best, this review has been able to confirm a practical taxonomy of professional learning modes in two dimensions: focus of professional learning and mode of delivery of professional learning, and to provide definitions and descriptions of each mode from the literature. It has also mapped international research on each mode to provide pros and cons, and criteria teachers and school leaders could consider when selecting professional learning.

The mapping of literature from the systematic search showed that the two categories of professional learning focus and delivery modes were appropriate, and this exercise did not identify any gaps in the list of professional learning modes. An additional lens or category of professional learning mode that could be incorporated into this model for future development is the level of engagement of the participant. This has two components, one that is discussed in the literature is teacher agency in identifying their own professional learning needs and choosing where to 'spend' their professional learning time and dollar. Equally important is the opportunity for teachers to fully engage, both cognitively and professionally, in the selected activity, at a time and place that is optimal for learning. This assumes a professional learning mode that facilitates an appropriate level and mix of cognitive presence, social presence and teacher presence.

What this review has been able to confirm is that certain modes of professional learning are more accessible or feasible for certain purposes, and for teacher cohorts with specific needs. Thus, the challenge facing those responsible for provisioning high quality professional learning for teachers is to ensure that, regardless of the mode, the professional learning is designed to maximise access, affordability, time and connection between participants.

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