# DISTANCE EDUCATION FOR TEACHER TRAINING:
## Modes, Models, and Methods

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# TEACHER PROFESSIONAL DEVELOPMENT

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**Best practice:** Distance models for pre- and in-service teacher learning must be governed by the same best practices that apply to face-to-face professional development.

## 9.1 Overview

Good teachers are not born—they develop.

Teachers must cultivate in students the skills, knowledge, and dispositions necessary to succeed in a world that increasingly demands workers who are creative, collaborative problem-solvers, and critical thinkers. They must help students in some of the most poorly resourced environments on earth master the basics of arithmetic, reading, and writing. On top of this, they must confront the learning loss resulting from educational disruptions due to the COVID-19 pandemic school lockdowns, affecting over 800 million students (United Nations Educational, Scientific and Cultural Organization, 2021).

Separately or cumulatively, none of the above tasks is easy. They are even more challenging for teachers in low- and middle-income countries who have often experienced poor pre-service preparation and an absence of ongoing professional learning opportunities (Lauwerier & Akkari, 2015; Popova et al., 2016; Tilak, 2009).

With this realization in mind, distance education programs must be cognizant of two truths. The first is that the distance education platform is not an instructional approach, a form of professional development, or a teacher education curriculum: It is a piece of software. It is what is in the platform—curriculum-based activities that reflect learning outcomes—that matter.

This leads to the second truth. At its core, distance education is teacher education, the ultimate goal of which is to *improve teaching quality to measurably improve students' knowledge and skills*. Minus this awareness and minus the high-quality professional learning opportunities grounded in evidence-based best practices, distance learning programs risk failing teachers and, ultimately, failing their students.

## 9.2 The Professional Development Conundrum

Across the globe, governments have expended enormous amounts of money on continuing teacher professional development (TPD)[1] (Loyalka et al., 2017). These investments often have varied purposes. They can be part of system-required continuing education credits to maintain licensure; certify and upgrade the skills of unqualified teachers or teachers teaching outside their content area; prepare teachers for new roles and responsibilities; help teachers meet new education system requirements (such as reporting or using a new curriculum); promote lifelong learning; move teachers along a career ladder; help teachers improve instruction; or help teachers develop confidence and proficiency with a new innovation, such as technology.

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[1] In England, the average cost of TPD for one teacher is £2,950. If all teachers participated in 35 hours annually of high-quality continuing professional development, the cost would be £210 million (US $241 million) per year (Van den Brande & Zuccullo, 2021).

TPD is not simply diverse in its *purposes and content*; it is diverse in its *forms* (Desimone, 2009; Kennedy, 2016). Teachers may participate in all or any of the above activities via courses (online, blended, or face-to-face). They may also read professional literature; attend a conference, a workshop, or lesson study; join professional learning communities, study groups, or peer learning groups; undertake an independent study; or engage in action research. They may use technology for their professional learning via apps such as *Duolingo*; *YouTube* videos; radio or TV broadcasts;  Internet research; or *WhatsApp* teacher groups.

TPD is diverse in its *focus.* Many professional development programs are *prescriptive*—demonstrating what they believe to be the best way for teachers to address a particular teaching problem—and often promote compliance and fidelity of implementation (Kennedy, 2016, pp. 10–11). Others concentrate on *strategies*—modeling intended behaviors to attain a particular goal and granting teachers the discretion to apply strategies as they deem necessary (Kennedy, 2016, p. 11). Some professional development programs focus on fostering *insights*—"raising questions that force teachers to re-examine familiar events and come to see them differently" so that their potential "alteration of behavior" is internally driven and based on choice (Kennedy, 2016, p. 11). And other types of TPD, such as online courses or summer seminars, focus on building *knowledge*, giving teachers "maximum discretion regarding whether or how to do anything with that knowledge" (Kennedy, 2016, p. 13).

TPD is diverse in terms of who "does" it. Universities, foundations, for-profit companies, content area experts, teachers' unions, industry partners, technology companies, media (radio and TV stations), ministries of education, agencies within ministries of education, school principals, non-governmental organizations, civil society organizations, other schools, principals, coaches, mentors, master teachers, teacher colleagues—and teachers themselves as part of self-learning—all provide TPD.

And TPD also is diverse in terms of who "gets" it. Professional development opportunities may include all teachers at a school, one teacher at a school, permanent teachers, permanent teachers and long-term substitutes, all teachers plus their assistant teachers or para teachers, teachers from certain grades or subject areas, department heads, school leadership teams, new teachers, "at-risk" teachers, "champion" teachers, or the same set of teachers who are almost always chosen to attend every professional development session.

Given such diversity, it is not surprising that researchers often have struggled to identify the effectiveness of teacher professional development programs, who does them, the various strategies or components that are comprised by them, and the role that individual programs play in improving both the quality of teaching and student achievement (Desimone, 2009).

Connecting teacher effectiveness to improved student learning outcomes has been a significant challenge generally but demonstrating convincing evidence of the impacts of teacher professional development at scale has been particularly vexing in the world's poorest contexts (Popova et al., 2016; Reid & Kleinhenz, 2015, p. 15). This challenge arises from several possible causes:

- **Methodological issues regarding research,** such as design issues, insufficient samples, measures that are not comparable across sites, and issues of external validity (Burns, 2021)

- **A lack of generalizable knowledge** about the specific features of such programs that effectively improve student learning (Audisio et al., 2022, pp. 2–3; Hill et al., 2022)

- **A relative dearth of research** on how to prove the effect of particular teacher professional development programs in challenging contexts, such as conflict and crisis situations (Burns & Lawrie, 2015)

- **Design and delivery issues in TPD programs in the Global South**—primarily a program's theory of change and program delivery mechanisms—

often asynchronous online courses or, in face-to-face settings, the "cascade" or "train-the-trainers" approach (discussed below)

- Concerns about the quality and experience of teacher educators and professional development providers (Kennedy, 2016; Ono & Ferreira, 2010). There is also little research on "the qualities that constitute expertise in terms of teacher professional development providers and how they are selected, prepared and their efficacy assessed" (Kennedy, 2016, p. 29).

## 9.3 High-Quality Professional Development

One way of navigating the complexity and diversity of teacher professional development is to focus on the "measurable critical features" of teacher professional development (Desimone, 2009, p. 183). The previous chapter, "Developing 'Good' Teachers," identifies a core set of competencies needed for good teaching—strong content knowledge, content-specific pedagogical, and general instructional skills along with an understanding of child and adolescent development and a strong sense of efficacy. Professional development programs that positively affect student learning to successfully prepare teachers in these areas typically include the following programmatic features: (a) content focus, (b) active learning, (c) coherence, (d) duration, (e) collective participation, and (f) continuous support (Kennedy, 1999; Loucks-Horsley et al., 2010; Shulman, 1986). Each is discussed below.

### 9.3.1 Focus on Curriculum and Instruction, Not Just Content

As discussed in the previous chapter, teachers' content knowledge is significantly linked to *student* content knowledge (Heller et al., 2012). Thus, over the years, most research has suggested that professional development activities focus on teachers' knowledge of content and how students learn that content (Darling-Hammond et al., 2017b; Darling-Hammond et al., 2009; Desimone & Stuckey, 2014).

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**Figure 9.1**
**Standards for Professional Learning Across the Globe**

Standards for teacher professional development are far less common than the teaching standards discussed in Chapter 8 or the standards for quality online instruction discussed in Chapter 13. Many nations use their own national teaching standards to frame the contours and content of teacher professional development. Others may use international standards. Below are a few examples of standards for TPD:

Learning Forward's 2022 *Standards for Professional Learning* focuses on conditions for success, rigorous content, and transformational processes (Learning Forward, 2022).

The United Kingdom's *Standards for Teachers' Professional Development* establish *the minimum requirements for teachers professional development* (Government of the United Kingdom Department for Education, 2016).

Singapore's *Teacher Education Model for the 21st Century* focuses on the values, skills, and knowledge that guide the design and delivery of teacher professional learning at the National Institute for Education, which is responsible for all teacher formal learning in Singapore (National Institute of Education, 2010).

While not a set of teacher standards, *per se*, Boston College's Trends in International Mathematics and Science Study (TIMMS) & Progress in International Reading Literacy Study (PIRLS) Education Center includes a searchable database of 70 countries with information on professional development for math and science teachers (Mullis et al., 2016). Search for "teacher professional development" or use the dynamic menu to access this information.

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Yet both established and recent research suggests that teacher subject matter proficiency—while important—is not enough to affect changes in student learning (Ball et al., 2008). Nor do modest improvements in teachers' content knowledge result in meaningful improvements in instructional quality or student outcomes (Hill et al., 2022).

What matters more appears to be a focus on knowledge *for* teaching, pedagogical content knowledge, and how to integrate these skills to advance curricular goals (Ball et al., 2008; Heller et al., 2012, p. 337; Hill, 2020; Shulman, 1986). TPD programs that help teachers understand why and when to apply certain content-specific instructional approaches, that combine content with an analysis of how students learn, and that focus on curriculum and instruction result in more positive student learning outcomes than professional development that focuses on higher-level content alone (Heller et al., 2012; Hill, 2020; Hill et al., 2022).

### 9.3.2 Active and Reflective Learning

When professional development efforts fail to bear fruit, as is so often the case, it is often because the professional development is overly theoretical and thus difficult for teachers to implement, or that the delivery is rote and passive, thus failing to engage teachers—or both (Loyalka et al., 2017, p. 7).

Thus, to be effective, professional development must provide opportunities for teachers to engage in active learning. This can involve teachers observing one another teach and giving and receiving feedback, analyzing student work, designing learning activities, or simulating the role of students as they learn a new technology tool or instructional approach. Professional development that is active provides teachers with time to work on the craft of teaching—time for modeling, design, practice, and revision of activities and strategies that teachers will incorporate into their daily routines (Darling-Hammond et al., 2017a; Desimone & Stuckey, 2014; Joyce & Showers, 2002; Kraft et al., 2018).

But professional development also must combine this action with reflection, by incorporating metacognitive and reflective strategies (Boethel & Dimock, 1999). The active element of learning, particularly when teachers assume the role of students in more experiential professional development activities, should be accompanied

by teachers reflecting on learning from the point of view of a student, examining which strategies best help students learn, linking this information to their own practices, and thinking through how to more closely align their instruction with optimal learning (Dimock et al., 2001; Education Development Center, 2014; Orr et al., 2013; Timperley et al., 2007).

### 9.3.3 Coherence

The third core feature emphasized in the literature on quality teacher professional development is coherence. Coherence refers to teacher professional development that is (1) aligned with standards designed to promote the beliefs, knowledge, and skills that teachers should possess (See Figure 9.1); (2) grounded in the latest research in a domain; (3) focused on addressing teachers' knowledge and beliefs; and (4) consistent with larger district, state, provincial, and/or national educational regulations, goals, policies and priorities (Darling-Hammond et al., 2017b; Darling-Hammond et al., 2009; Desimone & Stuckey, 2014).

### 9.3.4 Sufficient Duration

Episodic professional development often fails to lead to changes in teachers' beliefs, practices, and effectiveness (Darling-Hammond et al., 2017b; Darling-Hammond et al., 2009; Kraft & Blazar, 2018; Orr et al., 2013; Yoon et al., 2007). Research has typically shown that behavioral and pedagogical change require professional development activities of sufficient duration, including both the span of time over which they occur (e.g., one day or one semester) and the number of hours spent in the activity. For example, Darling-Hammond et al. (2017a) note the effectiveness of 20 hours or more of professional contact time per year. Yoon et al. (2007) report TPD that offered an average of 49 hours of development per year had an associated average boost in student achievement of 21 percentile points. Other research corroborates this, suggesting that professional development spread over a long duration (a semester or intense summer institutes with follow-up during the semester) appears to be more effective than

shorter episodes of professional development (Desimone & Stuckey, 2014; Hennessy et al., 2016; Yoon et al., 2007; Hennessy, et al., 2022).

More recent research calls this belief into question, suggesting that there is no optimal duration, and that program duration does not explain differences in the magnitude of TPD's impact on student learning (Audisio et al., 2022; Didion et al., 2019; Hill et al., 2022). Hill et al. (2022), marshalling evidence from a series of studies, suggest that time-intensive TPD programs that lead to modest improvements in teachers' content knowledge do *not* result in meaningful improvements in instructional quality or student outcomes. Thus, it is not the amount of time teachers have; rather it is what they do with the time they have (Burns & Lawrie, 2015; Hill et al., 2022). Simply extending the period of TPD implementation is no guarantee for greater program impact; rather, there should be more sustained efforts over the time allotted (Kraft, 2020, as cited in Audisio et al, 2022).

### 9.3.5 Collective Participation

A fifth critical feature is collective participation. This can be accomplished through involvement of teachers from the same school, grade, or department. Such arrangements set up potential interaction and discourse, which can be a powerful form of teacher learning. Teacher collaboration has long been recognized as a crucial element of high-impact professional development (Organisation for Economic Co-operation and Development, 2019). By including a critical mass of teachers from the same school in collaborative TPD, teachers can begin to identify and address problems and create communities that positively change the culture and instruction of their entire grade level or school, thus promoting school change (Darling-Hammond et al., 2017b, p. v; see also Dimock et al., 2001). A corollary of collective participation is that the professional development is school based, with teachers working together on problems of practice in their places of practice (Ball et al., 2008; Kraft et al., 2018).

### 9.3.6 Ongoing Support and Follow-up

Evidence regarding the importance of school-based follow-up support as part of continuing teacher professional development is extensive, although not without limitations (Loyalka et al., 2017). Research from both the Global North and Global South, and from refugee settings, consistently indicates that follow-up support can improve teachers' fidelity of implementation and transfer of learning (Burns, in press; Burns & Lawrie, 2015; Darling-Hammond et al., 2017b; Didion et al., 2019; Dimock et al., 2001; Fixsen, et al., 2005; Education Development Center, 2014; Hill, 2020; Hill et al., 2022; Kraft et al., 2018; Mendenhall et al., 2017; Orr et al., 2013; Popova et al., 2016; Reid & Kleinhenz, 2015; Timperley et al., 2007).

Popova et al. (2016) report that supportive follow-up improves program impact on learning by a 0.26 standard deviation versus follow-up for monitoring and accountability or no follow-up (Popova et al, 2016, p. 19). Without this logistical, conceptual, technical, and instructional support, teachers abandon innovations and new methods in favor of "reversion to traditional teaching methods" (Tatto, 2004, as cited in Burns, in press).

Thus, high-quality professional development that embodies the above characteristics can improve teachers' knowledge and skills and change their attitudes and beliefs. Together, such improvements in turn, influence and change their instruction, which has in many cases resulted in measurably improved student learning outcomes (Blank & de las Alas, 2009; Desimone, 2009; Hill et al., 2022; Kraft et al., 2018).

High-quality teaching demands high-quality professional development. And high-quality professional development demands time and resources. Education systems that are recognized for having high-quality teachers and high student achievement levels typically also offer teachers extensive and rigorous professional development opportunities. They also provide teachers with the release time and support necessary to enhance their qualifications. For example, the

Singaporean government pays its teachers for 100 hours of professional development each year, in addition to granting them 20 hours per year to visit one another's classrooms to observe lessons and to work with other teachers on lesson design (Darling-Hammond et al., 2017a). South Korean teachers are required to take 90 hours of professional development courses every three years, most of which they do online (95% of primary school teachers participate in online courses or seminars annually) as well as via other formats. Additionally, 84% of South Korean primary school teachers participate in coaching and observation annually (Organisation for Economic Co-operation and Development, 2022).

In educational jurisdictions noted for quality teaching—Alberta (Canada), Australia, Austria, Latvia, Lithuania, and Shanghai (China)—99% of teachers participated in professional development in the 2017–2018 school year (Organisation for Economic Co-operation and Development, 2019). Many of these countries also provide time for teachers' professional development by integrating it into the workday and providing class coverage from other teachers. Even in countries like Saudi Arabia and France, which have traditionally had low levels of teacher participation in professional development, 86% and 83% of Saudi and French teachers, respectively, participated in TPD in the 2017-2018 school year (Organisation for Economic Co-operation and Development, 2019).

## 9.4 Models of Professional Development

As previously discussed, teacher professional development varies greatly in how learning is organized for teachers and the methods employed to develop teacher skills. On average, the most common forms of professional development in which teachers participate in OECD countries, according to teachers themselves, are "courses/seminars attended in person" (76%); "reading professional literature" (72%); and "education conferences where teachers, principals, and/or researchers present their research or discuss educational issues" (49%) (Organisation for Economic Co-operation and Development, 2019).

The choices are even more constrained for non-OECD teachers, particularly in low- and middle-income countries[2] and especially in bilateral or multilateral donor-funded programs. In these contexts, teachers often experience one model of teacher professional development—the workshop or "training" model, often as part of a "cascade" or "train-the-trainers" approach.

### 9.4.1 Workshops

Workshops (or trainings or seminars) typically take place in some central location, in a facility with relatively good infrastructure and amenities, and occur once to several times per year. Workshops are useful in exposing people to the latest ideas and techniques and to colleagues; they attempt to promote standardization, uniformity, and equity of access to learning; and, as a one-to-many form of teacher professional development, they promise scale (Burns, 2018). Workshops also can be presented online, as in the proliferation of live *Zoom* webinars or trainings.

They also have multiple drawbacks. They are short-term and episodic, turning learning into an event versus a process. They are often *in vitro* versus *in vivo* forms of TPD—occurring in hotel conference rooms or on *Zoom* versus in the teacher's workplace. They can promote a didactic and hierarchical form of learning—an expert (often international) transmits professional learning as part of a larger cascade approach (discussed next). Research on workshops, particularly single workshops, shows limited effectiveness (Blazar et al., 2022; Didion et al., 2019). A workshop does little to help teachers at the most critical juncture in their learning—the point at which they return to school to implement

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[2] The OECD is an intergovernmental organization comprising 38 mostly high-income countries.

what they learned. This failure drives the high degree of latency and leakage, failure of learning transfer, and poor fidelity of implementation that are associated with workshops (Burns, 2018).

### 9.4.2 Cascade or Train-the-Trainers Approach

Because of the need to address the skills of so many teachers, build capacity throughout the education system, and "scale" innovations, government and donor-funded teacher professional development initiatives often employ a cascade or train-the-trainers approach. Popova et al. (2016) found that half of the TPD programs they studied in the Global South used the cascade delivery model. This approach is also used online.

Conceptually, the cascade has an intuitive, even seductive, logic. Those who are trained train others, who then train others, and so forth. As a purely theoretical model of diffusion and capacity building, the cascade has much to commend it. It promises *scale*—an exponential increase in the number of teachers trained. It promises *sustainability*—leveraging local resources to increase human and social capital in a cost-effective manner. It promises *equity*—democratizing access to learning for the greatest number of recipients across a system. It promises *quality*—training occurs in stages so outcomes can be analyzed, and inputs improved stage-wise. Its most seductive feature is that it is viewed as *cost-effective*—a small amount of investment in initial training yields a higher rate of return on initial investment (Burns, 2014[3]).

However, the train-the-trainers model has consistently been shown to suffer from a host of design and delivery flaws—a trickle-down, one-size-fits-all approach favoring quantity over quality. As research makes clear, this quality degrades as it spirals down from one level of the cascade to the next. Piecemeal or *ad hoc* transfer

of the innovation, a complete lack of transfer of learning, and poor fidelity of implementation are all associated with the cascade approach and far outweigh any perceived benefits (Gathumbi et al., 2013, pp. 8, 11; see also Bett & Boylan, 2016; Burns, 2014; Dadds, 2014; Dichaba & Mokhele, 2012; Turner et al., 2014).

There are some ways in which the cascade can be made more effective: designing support at each level of the cascade—focusing on simple, easily replicable innovations versus complex ones; relaxing expectations about fidelity of implementation and allowing modification and adaptation of an innovation (which as Chapter 1 notes, carries its own risks); diffusing expertise throughout the cascade versus concentrating it more narrowly at the top among master trainers; and involving a cross-section of teachers from all levels of the cascade to participate in the development of materials (Burns, 2014; Turner et al., 2014).

### 9.4.3 School-Based Models of Teacher Professional Development

The variation of different models of teacher professional development makes it difficult to identify the effect of specific features of professional development interventions on particular aspects of teacher or student outcomes, or to advocate for the superiority of one model of professional development over another (Desimone, 2009). There are, however, numerous school-based professional development models to complement or supplant workshops. These teacher-driven, interactive models allow teachers to deeply explore their craft and wrestle with problems of practice (Blank & de las Alas, 2009; Didion et al., 2019; Dudley, 2019; Loucks-Horsley et al., 2010; McAleavy, 2021; Organisation for Economic Co-operation and Development (OECD), 2009). For example, coaching and mentoring, which will be discussed in Chapter 16, have a robust evidence base both in supporting standard forms of professional

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[3] This is taken verbatim from Burns, M. (2014). A Tale of Two Teachers. *Global Partnership for Education, Education for All Blog*: https://www.globalpartnership.org/blog/tale-two-teachers. Used with permission from GPE.

development and as a stand-alone form of professional development (Burns, 2013; Cilliers et al., 2021; Desimone, 2009; Fixsen et al., 2005; Hill, 2020; Ingersoll & Strong, 2011; Kraft et al., 2018).

Figure 9.2 examines five of these school-based models of professional development—lesson study,

open classrooms, case studies, Looking at Student Work (LASW), and study groups. These professional development examples have been selected because they have data supporting their efficacy. Although primarily conducted in face-to-face settings, these also can be carried out as part of an online or blended professional development offering.

**Figure 9.2**
**Models of Teacher Professional Development**

| Professional Development Model | Activity Phases | Results |
|---|---|---|
| **Lesson Study** | Lesson Study involves groups of teachers collaboratively planning, teaching, observing, and analyzing learning and teaching in "research lessons." Lesson Study involves:<br><br>• Goal setting and planning—including the development of the lesson plan<br><br>• Teaching the research lesson; enabling the lesson observation and the post-lesson discussion<br><br>• Consolidation of learning (Doig & Groves, 2011)<br><br>Over this cycle of research, teachers innovate or refine a pedagogical approach or lesson that they share with colleagues (Dudley, 2019, p. 1). | • An examination of Lesson Study activities in Zambia reports that it helped teachers to develop their ideas and experiences of different approaches to teaching; think deeply about specific and general aspects of teaching; "learn to see children; "and develop professional communities of inquiry (Doig & Groves, 2011).<br><br>• After 3 years of Lesson Study in Zambia's Central Province, students' pass rates were 12.4% higher in physics and chemistry and 19.2% higher in biology versus students in other provinces. After 5 years, the Ministry of Education found continued improvement among students' science pass rates (from 53% in 2009 to 63% in 2013), as well as in mathematics (from 40% in 2009 to 49% in 2013) (Jung et al., 2016).<br><br>• Higher levels of Lesson Study practice in schools were correlated with higher student achievement on national exams (Jung et al., 2016). |
| **Open Lessons/ Classrooms**<br><br>**("Peer Lessons")** | • A "sharing teacher" designs a lesson and invites other teachers ("observing teachers") to attend.<br><br>• Observing teachers focus on the sharing teacher (not on learners). This in part distinguishes Open Lessons from Lesson Study.<br><br>• After school, or the next day, all teachers—observing teachers and sharing teachers—meet. Observing teachers ask questions about the lesson (for their own benefit) and provide feedback to the sharing teacher. | • Where there is structured feedback, time for discussion, and teacher incorporation of feedback into a future lesson, Open Lessons can help teachers build on and refine skills (Loucks-Horsley et al., 2010).<br><br>• Teachers must observe another teacher engaged in *successful* performance (Loucks-Horsley et al., 2010).<br><br>• Observations and modeling are more effective for observers when the model being observed is similar to themselves (Hendry & Oliver, 2012). |

| Professional Development Model | Activity Phases | Results |
|---|---|---|
| **Open Lessons/ Classrooms**<br><br>**("Peer Lessons")**<br>*(continued)* | • A facilitator can use protocols to structure conversations around the lessons they observed to avoid evaluation or judgment and keep conversations more inquiry focused.<br><br>• Examples have been documented in Azerbaijan, the Russian Federation, Shanghai, and in many schools in Ireland and the United States (Burns, in press). | • The structure and execution of Open Lessons must be designed and executed in such a way that modeling teachers don't feel "judged" (Hendry & Oliver, 2012, p. 8).<br><br>• Open Lessons build social capital of the school by making private practice public (Burns, in press). |
| **Case Studies** | • The topic of study is identified (e.g., managing student behavior, asking probing questions) and cases identified (readings, scenarios, or videos) to study.<br><br>• Teachers view videos in small increments and discuss at length what they've viewed, using guiding questions. They also may view the video in its entirety and look for one element per viewing—for example, classroom organization strategies.<br><br>• The case can be hypothetical and inductive, since teachers are interpreting and inferring what they see and why they see it.<br><br>• The above sequence continues over a period of time until teachers finish with their case. At this point, they compile what they have learned for application to the classroom.<br><br>• Ideally, teachers should create an action plan for some new technique/strategy they will employ, and then be observed and provided feedback by a facilitator or other teachers.<br><br>• Case Study involves investigation, study, readings, reflection, journal logs, alternative scenarios, memoranda of understandings, or reflections based on what teachers have viewed and discussed (Loucks-Horsley et al., 2010; Hendry & Oliver, 2012, p. 264).<br><br>• Case Studies can use video observations to assess both classroom instruction and teacher learning experiences and have the potential to offer rich data that capture the complexity of interactions (Desimone, 2009). | • Students whose teachers participate in case studies of classroom teaching, followed by teaching based on these cases, achieved greater learning gains as determined by pre- and post-test science content exams than students whose teachers received content training only (Darling-Hammond et al., 2017a, p. 6).<br><br>• Statistical analyses linked these gains in student learning with "teachers' science content knowledge, pedagogical content knowledge about student thinking, and their ability to create a cohesive science content storyline" (Roth, 2011, as cited in Darling-Hammond, Hyler, & Gardner, Effective Teacher Professional Development, 2017a, p. 6).<br><br>• Professional development of moderate duration—in this case, one 24-hour course—can have considerable and lasting impact on teaching and learning in elementary science (Heller et al., 2012) |

| Professional Development Model | Activity Phases | Results |
|---|---|---|
| **Looking at Student Work** | • Looking at Student Work (LASW) is a model of teacher collaborative self-study and formative assessment that focuses on examining student work and assessing the way the teacher designed the particular activity being reviewed. It involves phases (e.g., presenting student work, posing guiding questions, receiving focus feedback, and reflection).<br><br>• LASW is designed to help teachers:<br>　◦ Examine students' ideas as they pertained to key concepts in the unit of study<br>　◦ Recognize evidence of incorrect mental models, foster correct understandings, and increase proficiency<br>　◦ Analyze tasks to identify characteristics that support formative assessment<br>　◦ Make instructional choices grounded in evidence of student thinking (Heller et al., 2012) | • Sizable content test score gains for teachers with effect sizes close to 2.0 and over 1.0 a year later (Heller et al., 2012).<br><br>• Students whose teachers participated in LASW showed significant increases in content test scores compared to control group students, both in the study year and for students in treatment teachers' classes a year later. Effect sizes ranged from 0.4 to 0.6 for students in the study year and were even stronger (0.5–0.8) the following year (Heller et al., 2012).<br><br>• Teachers with more experience attending to their students' scientific thinking began to use different assessments to gain better information about their teaching (Schneider & Plasman, 2011). |
| **Study Groups** | • Teachers agree to meet over a period of weeks or months to study a particular issue (for example, improving students' writing abilities).<br><br>• Teachers discuss chapters of a proposed book, Internet resources, or video selected to be the study "text" to address this issue.<br><br>• Teachers can prepare some classroom action (activity, a new strategy for teaching science, the use of new materials) and prepare to use this in their classrooms. Ideally, the facilitator and other Study Group colleagues could observe and offer feedback. Traditionally, teachers try the intervention alone and report on how it went.<br><br>• If teachers find common implementation problems, they may identify strategies to address these or identify a further topic to study. | • Less prescriptive interventions, such as teacher Study Groups, have a greater impact on learning than do those delivering a set of prescribed teaching behaviors (Kennedy, 2016).<br><br>• Firestone et al. (2020) cite a body of evidence-based research pointing to the direct effects of Study Groups on teacher knowledge, instruction, and improved student learning as measured by student test scores.<br><br>• Heller et al. (2012) show mixed results of Study Groups on student learning. |

Format notwithstanding, the professional development in which teachers participate, whether in person or via distance, above all must be of the highest quality. While low-quality professional development may *slightly* help the least qualified teachers, it has a negative impact on more qualified ones[4] (Loyalka et al., 2017). Simply put, poor professional development can do harm.

However, no professional development format can be effective enough to redress weaknesses in overall teacher quality. As Schleicher (2012) notes, a strong professional development system can exist only within an education system that does the following:

- Emphasizes recruiting, preparing, supporting, and compensating teachers on the front end rather than reducing teacher attrition and firing weak teachers on the back end

- Provides teachers with regular and effective support that directly addresses the instructional challenges where they teach

- Evaluates teachers on a variety of indicators that provide formative feedback useful in improving instruction and on multiple indicators for summative performance evaluation

- Engages teachers in the design of curriculum, instruction, and assessment so that they are aligned, and strengthens teachers' understanding of how to reach agreed standards

## 9.5 Conclusion

Teacher education—both initial education and continuing professional development (CPD) throughout a teacher's career—has been lauded as the "most direct and effective approach to school improvement" (Fletcher-Wood & Zuccollo, 2020, as cited in Perry et al., 2021, p. 1).

But for this to be true, high-quality professional development must yield changes in three areas—teacher knowledge, teachers' instructional practices, and student achievement. It should address the five areas we know foster good teaching: content, instruction, pedagogical content knowledge, knowledge of learning and development, and efficacy. It must be grounded in evidence of what works; differentiated based on teachers' needs and realities; provide opportunities for teachers to view the intended practice, study it, plan, and design for application in the classroom; and encourage teachers to practice new behaviors or innovations and receive support and feedback so they can revise and improve implementation.

At its core, distance learning is not about the mode of delivery but about the quality of the learning opportunities provided to those who are, or wish to become, teachers. Distance learning for teachers *is* professional development—as such, it must be governed by the same high standards as in-person teacher professional learning. Developing, building, improving, or changing the skills of any professional is a complex and arduous task, but fortunately in the case of teachers, it is one that comes with some general guidelines outlining the contours for success.

The remaining chapters of this guide, from instruction to technology, lay out a path toward high-quality professional development in a distance environment. This path is not always straightforward, and some teachers and programs may not reach their final destination. However, distance education programs can help teachers reach this goal by:

- Designing high-quality learning experiences

- Employing evidence-based instructional practices and assessments for learning

- Creating and procuring engaging and well-designed content for learning

- Preparing instructors and learners to teach and learn via distance technologies

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[4] Mainly for students of qualified teachers, in part due to the negative impact of having their teachers absent from the classroom.

- Designing and nurturing communities of practice among learners

- Offering ongoing support to distance learners

- Evaluating distance education offerings and revising accordingly

- Ensuring quality

- Selecting appropriate technologies that promote high-quality learning

These methods are discussed in the remaining chapters of this guide.

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