

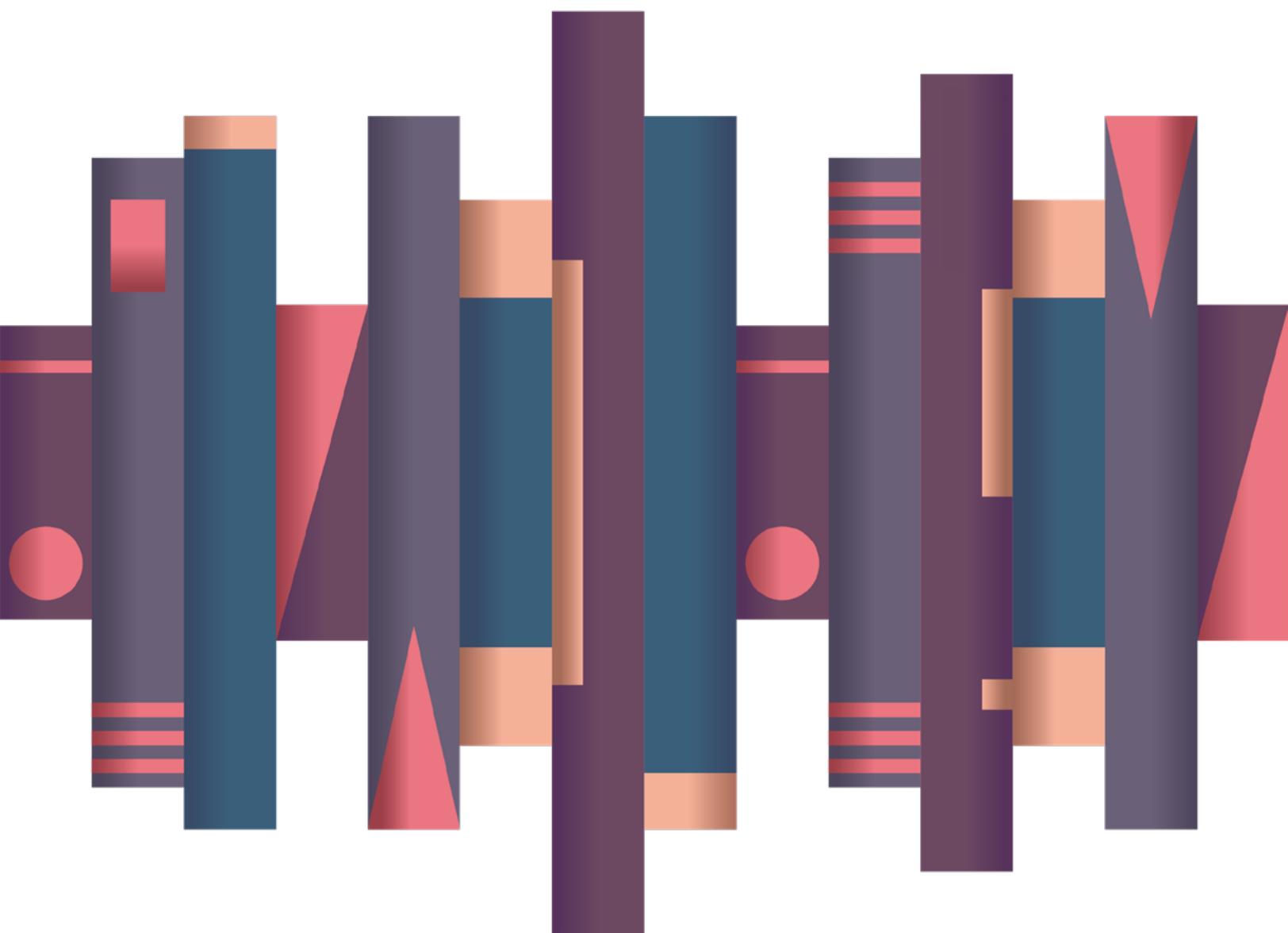
TPD@SCALE

Designing Teacher Professional Development with ICTs to Support System-Wide Improvement in Teaching

A Working Paper from the TPD@Scale Coalition for the Global South



Freda Wolfenden



Published by

Foundation for Information Technology Education and Development, Inc. (FIT-ED)

3/F Orcel II Building
1611 Quezon Avenue
Quezon City 1104 Philippines

TPD@Scale Coalition for the Global South
<https://tpdatyscalecoalition.org>

This work was carried out with the aid of a grant from the International Development Research Centre (IDRC), Ottawa, Canada. The views expressed herein are those of the author and do not necessarily represent those of IDRC or its Board of Governors; the members of the TPD@Scale Coalition for the Global South; or the Foundation for Information Technology Education and Development.



Foundation for Information Technology Education and Development, Inc., 2022.

Copyright by the Foundation for Information Technology Education and Development, Inc. *TPD@Scale: Designing Teacher Professional Development with ICTs to Support System-wide Improvement in Teaching* is made available under a Creative Commons Attribution 4.0 International License: <https://creativecommons.org/licenses/by/4.0/>.

Recommended Citation

Wolfenden, F. (2022). *TPD@Scale: Designing teacher professional development with ICTs to support system-wide improvement in teaching*. Foundation for Information Technology Education and Development.

Design and Layout by **Ideas We Form Studio**

Unless otherwise specified, photos in this publication are from www.shutterstock.com and www.unsplash.com

ACKNOWLEDGEMENTS

The author would like to express her gratitude to a core group of colleagues for helping shape this working paper: Victoria L. Tinio (Foundation for Information Technology Education and Development), Cher Ping Lim (Education University of Hong Kong), and Dante Castillo-Canales (SUMMA). She would also like to thank the authors of the briefing papers cited in this working paper for engaging with her on the core concepts of the TPD@Scale Framework: Pearl Boateng, Felicity Fletcher-Campbell, Janet Soler, and Susy Ndaruhutse. Finally, she would like to acknowledge and thank colleagues from the International Development Research Centre, SUMMA, the National Educators' Academy of the Philippines, the Tata Institute of Social Science Centre of Excellence in Teacher Education, and RTI International for providing helpful feedback on the working paper in the final stages of writing.

TABLE OF CONTENTS

<i>Acknowledgements</i>	<i>ii</i>
<i>Acronyms, Figures, and Boxes</i>	<i>iv</i>
Executive Summary	1
<hr/>	
I. Introduction	4
<hr/>	
II. Underpinning Conceptualizations and Principles	9
<hr/>	
A. Teacher professional development (TPD)	10
B. Potential of information and communications technologies (ICTs) to support TPD@Scale	13
C. Working at scale in TPD	16
III. The TPD@Scale Framework	19
<hr/>	
A. Core concepts: Equity, quality, and efficiency	20
B. Core components	27
C. TPD@Scale examples	31
IV. TPD@Scale Insights from the Field	35
<hr/>	
A. Design for scale, localize for inclusion	36
B. Match technology choice with professional learning needs	41
C. Act, evaluate, improve	44
V. Recommendations for Policymakers, Program Designers, and Funders	46
<hr/>	
<i>References</i>	<i>49</i>
<i>About the Author</i>	<i>52</i>

ACRONYMS

CD	compact disc
CLIX	Connected Learning Initiative
CPE	Computadores para Educar
ELLN Digital	Early Language, Literacy and Numeracy Digital
FIT-ED	Foundation for Information Technology Education and Development
GPE-KIX	Global Partnership for Education Knowledge and Innovation Exchange
ICT	information and communications technology
ICT4RED	Information Communication Technology for Rural Education Development
LAC	Learning Action Cell
LDM	Learning Delivery Modalities
MOOC	massive open online course
OER	open educational resources
PACD	Programa de Actualización Curricular Docente
PDSA	Plan-Do-Study-Act
PLE	personal learning environment
PRONIE	Programa Nacional de Informática Educativa
RAT	Readiness Assessment Tool
SD	Secure Digital
SDG	Sustainable Development Goal
SMS	short message service
SUMMA	Laboratory of Education Research and Innovation for Latin America and the Caribbean
TESSA	Teacher Education in Sub-Saharan Africa
TESS-India	Teacher Education through School-based Support in India
TLC	teacher learning centre
TPD	teacher professional development
TPD@Scale	teacher professional development at scale
VLE	virtual learning environment
ZEST	Zambian Education School-based Training

FIGURES

Figure 1. Adoption and use of ICTs for learning	16
Figure 2. TPD@Scale goal: To ensure high-quality, equitable, and efficient TPD towards achieving SDG 4	20
Figure 3. Core components of the TPD@Scale Framework	28

BOXES

Box 1. Needs assessment in teacher-managed TPD	21
Box 2. Assessing readiness for TPD@Scale	22
Box 3. TPD to support equity in classroom practice	23
Box 4. Teacher choice of activities to respond to teacher and student diversity	24
Box 5. Harnessing user-owned ICTs	25
Box 6. Using existing staff resource to optimize inputs	25
Box 7. Teacher-led assessment	26
Box 8. Realizing a shared vision	37
Box 9. Understanding the environment	38
Box 10. Centralized localization of ICT access for equity	39
Box 11. Decentralized localization for inclusion	40
Box 12. Practitioner-led localization	40
Box 13. Selecting ICTs for remote coaching	42
Box 14. Local choice of ICTs	42
Box 15. Modelling practice with ICTs	43
Box 16. Blending to increase reach	43
Box 17. Using improvement science approaches for continuous improvement	45
Box 18. Improvement science to inform scaling	45

EXECUTIVE SUMMARY

As teachers and schools emerge from the disruption of the pandemic and adjust to new ways of working, bringing quality teaching to scale is critically important in all public education systems. Teacher professional development (TPD) is a strong component in this sustainable transformation of teaching and learning to meet the targets of Sustainable Development Goal 4.

This working paper from the TPD@Scale Coalition for the Global South argues that harnessing the power of information and communications technologies (ICTs) is essential to address the challenge of providing equitable, quality TPD for all teachers. Drawing on scholarship and initiatives in diverse contexts, it proposes the TPD@Scale Framework to guide the design and implementation of high-quality, equitable, and efficient professional development at scale for teachers. The TPD@Scale Framework is specifically concerned with meeting the professional learning needs of large numbers of teachers with diverse characteristics and skills, many of whom have limited access to resources and poor social conditions of work.

Educators are already utilizing ICTs in TPD in resource constrained contexts but implementers often struggle with selecting appropriate ICTs to work efficiently at scale in ways that retain quality and attend to equity concerns. The TPD@Scale Framework responds to these opportunities and challenges: it combines a set of core components—ideas, practices, and tools—with local flexibility. This offers space for implementers and practitioners to exercise agency in using ICTs to adapt models of TPD provision for diverse professional needs and contexts within complex education systems.

This working paper is addressed to policy makers and funders involved in the design, planning, and implementation of large-scale TPD systems and programs. It aims to stimulate conversations on how TPD mediated by ICTs can be scaled across contexts

of the Global South as part of initiatives to strengthen the quality of teaching.

The paper starts by situating the TPD@Scale Framework in the global education ecosystem and the specific need it addresses—improving the quality of classroom interactions in under-served communities.

Section 2 presents succinct summaries of the key scholarship that have informed the conceptualization of the TPD@Scale framework: contemporary ideas on successful TPD; the potential of ICTs to support professional learning and TPD at scale; and what it means to work at scale.

Section 3 describes the TPD@Scale Framework based on the concepts of equity, quality, and efficiency. Use of appropriate ICTs enables the Framework to be operationalized at scale in ways that maximize equity and efficiency while maintaining quality in the conditions for teaching and learning in the Global South. Scale is a central concept of the TPD@Scale Framework, specifically scale in magnitude, depth, sustainability, and ownership.

Importantly, the TPD@Scale Framework supports TPD interventions that utilize and integrate within complex existing education systems. Examples from across the Global South provide rich illustrations of how the Framework might be realized in different contexts.

Section 4 outlines lessons and reflections from the work of the TPD@Scale Coalition in the form of **three key insights**.

1. Design at scale, localize for inclusion

The likelihood of TPD@Scale contributing effectively to improvements in the quality of teaching at scale is increased if the “core components” of the Framework are maintained while implementers or practitioners adapt the program in different ways to make it responsive to

the learning needs, values, contexts, and cultures of different communities or teachers. ICTs play a key role in this adaptation. Thus, a combination of fidelity to the core components and flexibility for local conditions is necessary to take account of diversity.

2. Matching technology choice with professional learning needs

ICTs are essential to scaling TPD. Achieving high-quality equitable TPD at scale is not possible without the use of ICTs. The affordances of ICTs enable efficiencies of scale in the overall design and equity through local adaptation or localization to enlarge and enrich opportunities for all teachers to engage in meaningful TPD. However, the choice of ICTs must be a local decision informed by the available infrastructure,

teachers' personal access (to devices and data), their level of digital competencies, and the goals of the professional learning activity.

3. Act, evaluate, improve

Large-scale TPD systems need to be responsive for resilience. This is achieved through frequent evaluation, learning from the results, and adjusting the next steps rather than implementing according to a set plan. These cycles of improvement are critical to achieving equity and quality at scale, and to efficiency and sustainability. Through collaborative working, these cycles generate shared working practical knowledge about what works better in some places than others. This evidence informs how the TPD@Scale program might need to be adapted to work under different conditions.



The working paper concludes with a set of **policy recommendations** drawing on this work.

1. Generate a renewed shared vision of TPD as career-long, situated in practice, and accessible to all teachers.

In many contexts this will involve a paradigm shift in how teacher education is conceptualized and designed: a move away from sporadic programs or initiatives to a set of regular practices that are personalized and integrated into teachers' professional lives in their place of work. In this it is essential to recognize that education systems are complex, with complicated patterns of multiple interdependent relationships, and to pay attention to the voices of teachers to understand their daily work conditions.

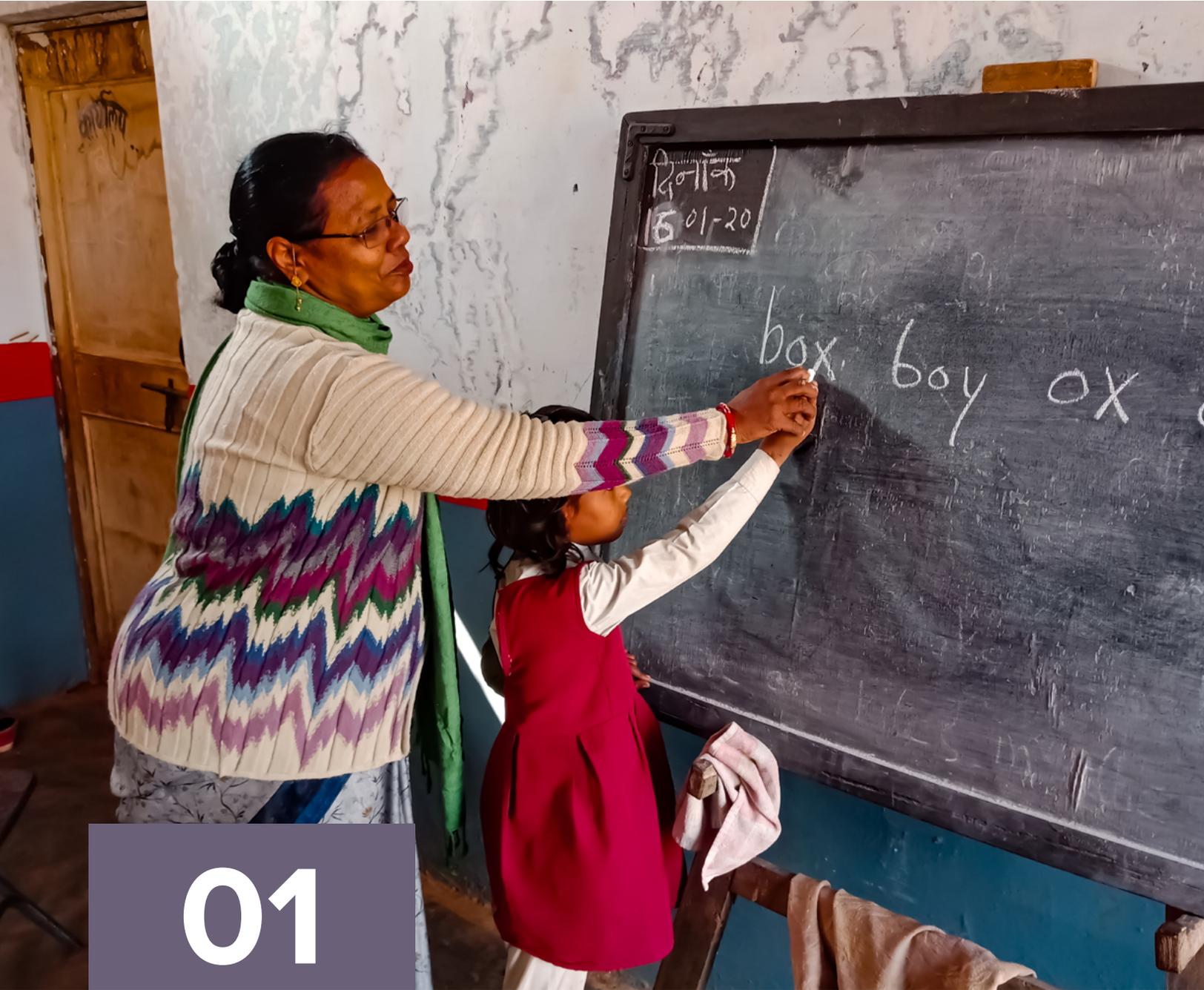
2. Use the TPD@Scale Framework to create models for TPD that contribute to realizing the vision for TPD.

The TPD@Scale Framework offers a guide to the design and implementation of high-quality, equitable, and efficient TPD for large numbers of teachers including those in low-resource contexts.

The resulting TPD@Scale model should align with existing structures and practices to help sustainability yet be sufficiently flexible to allow for adaptation, both centralized and decentralized (user-led), to meet diverse teacher professional learning needs in contextually appropriate ways at different times. This adaptation to local practices, knowledge, resourcing levels, and needs is critical for quality and equity in TPD.

3. Implement continuous or regular adaptive improvement of TPD systems or programs.

Design of TPD@Scale programs is important but it is necessary to pay equal attention to implementation of these programs: to understand what is working in a particular context and how different features of the program work together in diverse settings. This may be supported through constant cycles of improvement linked to the implementation outcome of improved TPD. Ensuring equity, quality, and efficiency in TPD requires continuous evaluation, learning, and adjustment undertaken in partnership with teachers and teacher educators and drawing on a range of data.



01

Introduction

Quality classroom teaching is critical to realizing improvements in student learning outcomes. Across the globe, good teaching is recognized to make an impact on student learning (Bau & Das, 2017; Bold et al., 2017; Bruns & Luque, 2014). Currently, large numbers of students attend school but find this is not a productive experience for them or their families. The headlines are well known: around 250 million children each year finish their fourth year of primary education unable to read, write or count at a basic level (UNESCO, 2016). Most of these students reside in low- and lower middle-income countries. The school closures of the COVID-19 pandemic have further perpetuated exclusion from learning particularly for the most disadvantaged students.

Sustainable systemic improvement in the quality of classroom teaching necessitates changes in the practices of existing teachers and those that work alongside them including teacher educators and school leaders. This is an ongoing process—every teacher in every classroom in every school becoming better at teaching. Good teaching needs teachers who are continuously improving, who are confident and skilled in effective pedagogies, and who have rigorous subject knowledge together with the values, knowledge, and attitudes that facilitate the successful participation of each and every one of their students in learning (UNESCO, 2020). This demands attention to how teacher professional learning is designed and implemented within and across education systems. All teachers, including those in community schools and in remote areas and refugee camps, alongside teacher educators, need sustained access to high-quality professional learning experiences. Teachers' professional learning needs are complex, diverse, and constantly evolving as they attempt to remain abreast of new developments and new demands

on them, including a stronger focus on student and teacher psychosocial well-being. But for many teachers working in low- and lower middle-income countries, opportunities to update their teaching competencies are irregular and sparse (UNESCO, 2020).

"ICTs offer tremendous potential to transform pedagogies within TPD as well as expand access to professional development opportunities and to enable professional learning to be truly context-specific to meet teachers' individual and collective professional learning needs."

A common policy response is to instigate a "top-down" determined series of workshops or short courses for teachers across the system. These often involve an "expert" disseminating ideas and "best practice" (Torrance et al., 2021) and harness cascade approaches despite longstanding evidence that these approaches are generally not effective in leading to pedagogic change (Elmore, 1999). Implicit in the "theory of change" of many such programs is the expectation that teachers will implement new practices in their classroom following the workshops, with little ongoing support or collaboration with peers or mentors. Furthermore, such programs are often designed independently of the specific multiple contexts in which the participating teachers' practice is situated—classroom, school, community, and national system—and pay insufficient attention to teachers' past and present experiences of practice that shape their individual professional learning needs and agency to adopt new classroom practices. Teacher professional development (TPD) programs must recognize the complex

contexts in which teachers work, the level of resources available to them, and the diversity of their students and their learning needs.

There are, however, promising signs of a paradigm shift in TPD programs across the Global South, drawing on the increasing availability and affordances of information and communications technologies (ICTs). ICTs offer tremendous potential to transform pedagogies within TPD as well as expand access to professional development opportunities and to enable professional learning to be truly context-specific to meet teachers' individual and collective professional learning needs. Many teachers, including those working in highly marginalized communities, have access to powerful and affordable handheld digital devices including smart phones and tablet computers. These devices enable teachers to

access resources, collectively create materials, interact with their peers and experts to share experiences and receive feedback, and engage in new forms of collaborative inquiries and problem solving. Through these ICT-mediated activities, professional learning experiences can become deeply personalized and teacher-owned. At a system level, ICTs are essential to providing TPD that is truly inclusive and to supporting rapid improvement in program design and implementation.

This working paper from the TPD@Scale Coalition for the Global South responds to these opportunities and challenges in TPD with a TPD@Scale Framework. This Framework aims to strengthen TPD systems to improve teachers' classroom practices. It is conceptualized as a guide for the design and implementation of high-quality,



equitable, and efficient professional learning for large numbers of teachers. The Framework utilizes the power of ICTs to enable local adaptations in service of equity and efficiency in different contexts while retaining quality. This interplay of strong core components (ideas and practices) with local flexibility is an affordance of the Framework that enables it to be successfully implemented across contexts. It disrupts many existing TPD practices through eschewing the idea of “best practice” and a one-size-fits-all approach. Instead, it encourages TPD designers and implementers to develop agency to mediate the Framework for multiple contexts and diverse professional needs. Critically, the Framework recognizes that current practices are historic, social, and deeply embedded in complex systems, and as such are not easily altered. Achieving sustainable system-level change in TPD involves engagement with all the many interrelated subcomponents of the education ecosystem—continuing professional development policy, teacher standards, specified pedagogies, teacher accreditation, teacher education curricula, and teacher career pathways—and is an ongoing process. The TPD@Scale Framework is intended to utilize and integrate with existing systems; ultimate success will depend on how the Framework is configured to national or local systems, conditions, and professional practices and social realities.

It bears underscoring that the focus of the TPD@Scale Framework, and of the TPD@Scale Coalition as a whole, is on improving the quality of teachers’ classroom competencies and skills. *Teaching quality* is the central focus, not the individual teacher and their personal traits. Making the individual teacher central tends to position the teacher as the “problem” and to reflect a view of education as a “quasi-causal” process where the teacher is the input

and student performance is the output (Biesta, 2015). The TPD@Scale Framework prompts TPD designers to consider both school and classroom settings in which teachers work and which mediate policy intentions, and the wider setting in which the school is positioned, i.e., the political, social, cultural, and economic environment (Rogoff, 1995).

In the TPD@Scale approach, teachers are recognized as respected professionals who are socially, culturally, and linguistically literate. Teaching quality is highly complex and understood to be impacted by multiple factors including but not only TPD; it will also be influenced by subject knowledge, teaching experience, resourcing levels, accountability practices, inspection regimes, school leadership, individual teacher motivation, etc. (Naylor & Sayed, 2014). Furthermore, how quality teaching is understood is itself context-dependent or grounded in different assumptions. There is no one universally accepted definition of quality teaching; rather, it is defined within each particular system and context (Fenstermacher & Richardson, 2005) and moderated by factors such as who the students are, their developmental stage and what they bring into the learning context, and subject discipline. Changes in TPD can only ever be one component of the changes that are required to lead to improved student learning outcomes. But across all systems, robust, equitable professional development is recognized to comprise an important component of the teaching quality agenda (Schwille et al., 2007).

This working paper assumes that improvements in classroom teaching can contribute to improvements in student learning outcomes while recognizing that this is a complex relationship and good teaching does not automatically lead to improved student learning;

successful student learning is influenced by multiple factors such as the specified curriculum, assessment regimes, goals of education, student motivation, support for the student from family, availability of resources, etc. Hence, TPD@Scale research and the associated evidence base is focused on teacher-level outcomes—changes in classroom behaviors and relationships—and does not engage directly with the longer-term impact on students' learning achievements.

The conception of the TPD@Scale Framework as a new approach for design and implementation of TPD in resource-constrained systems draws on global research on effective TPD, working at scale, the affordances of ICTs relevant to TPD, and the Global South context, together with analysis of evidence from recent work studying the design and implementation of large-scale ICT-mediated TPD across the Global South.

The purpose of this working paper is to inform the design, planning, and implementation of large-scale TPD programs in support of sustainable transformation in teaching and learning in countries of the Global South. It is primarily concerned with professional development for teachers working in public systems.¹

¹ Across low- and middle-income countries, less than 20% of primary education and less than 30% of secondary education are provided privately (World Bank Group, 2020).



02

Underpinning Conceptualizations and Principles

The TPD@Scale Framework is firmly grounded in scholarship and research on TPD, understandings of the conditions of the Global South, the process of scaling, and emerging literature on how ICTs can support large-scale TPD. In this section, the key ideas that inform the TPD@Scale Framework are outlined. These key ideas are discussed in greater depth in a series of accompanying background briefing papers prepared for the TPD@Scale Coalition.²

A. Teacher professional development (TPD)

TPD is defined here as embracing both specific programs, which cover a wide spectrum from formal courses with accreditation to informal learning opportunities, and ongoing responsive pedagogical support for teachers. These two dimensions may be either highly integrated or separate. The overarching aim is always to support teachers to improve the quality of classroom teaching.

Quality teaching is technically sophisticated. It requires secure subject knowledge and knowledge of effective pedagogy transformed by imagination and deep knowledge of the students to guide and facilitate complex interactive processes of joint meaning-making with students (Murphy, 2008). Professional expertise is critical for these interactions to be effective (OECD, 2005) particularly in connecting theory and practice. But how quality teaching is defined and understood is always context-dependent. It is specified in policies that are heavily informed by the “values and history of the society and community in which it is situated” (Alexander, 2008, p. 173) and mediated by the values, goals, and practices of the

school and community in which the classroom is situated.

Professional learning for teachers that aims to improve the quality of teaching is similarly complex and increasingly influenced by socio-cultural approaches to learning. This emphasizes the socially negotiated and embedded nature of meaning-making through which professionals become expert. Teachers learn to become competent with the cognitive tools of their community through co-participation with other people in authentic practice-based activities in their context (Rogoff, 1995; Cobb, 1999). The interactions in these activities generate new forms of knowledge and knowing for teachers (Cook & Brown, 1999).

"[H]ow quality teaching is defined and understood is always context-dependent."

But simply doing new things in a classroom is not sufficient to improve teaching quality. Teachers need to be provided with opportunities, and prompted, to reflect on the issues that mutually confront them, i.e., problems of practice. The presence of an expert is often helpful in this process. The expert can direct attention to issues and areas that might otherwise be overlooked, challenge assumptions, and disrupt embedded habits. Professional development is thus not merely the individual acquisition of skills and knowledge but a deepening understanding of a relational theory of action through active collaboration and cooperation with other people—colleagues, experts, and their students—on shared tasks (Lave & Wenger,

² There are four briefing papers covering assessment (Boateng & Wolfenden, 2022a), cost-effectiveness (Ndaruhutse, 2022), equity (Fletcher-Campbell & Soler, 2022), and successful TPD (Boateng & Wolfenden, 2022b).

1991). This is not to suggest that all other forms of professional learning, i.e., those outside the routines of practice, are redundant; rather, their purpose and form need to more clearly link to teachers' situated practice.

This leads to a focus on two key interrelated ideas pertinent to the design of TPD. Firstly, it is imperative to *situate professional learning in teachers' ecology of practice*, specifically in their classrooms and schools, and to center this professional learning on the implementation of new practice in the classroom, reflection on the new practice, and subsequent adjustment in the interlinked domains of knowledge, attitudes, and beliefs. New practices are fostered by direct participation in these practices (Lave & Wenger, 1991). It is also important that the underlying theory or principle of the new practice is made available to teachers. Without both practice experience and meta-knowledge, there is a likelihood that teachers will enact practices in superficial ways or reject them after experiencing difficulties (Kennedy, 2016). By contrast, traditional approaches to professional learning have started with attempting to change teachers' attitudes and beliefs, usually in external workshops divorced from the site of their practice.

Secondly, sociocultural approaches emphasize the *centrality of social learning to professional learning* (Boud & Brew, 2017). Collective actions, both informal and formal, in professional meetings, learning communities, action research inquiries, peer observations, and mentoring, support professional learning in which new "know how" is developed. Through these activities, professional learning is situated and embedded in the beliefs and values of the schools in which teachers practice. School-level professional interactions give teachers access to techniques that are relevant to their context. They model practice, enable continuous support and reinforcement,

and increase lateral accountability. Through these interactions, teachers make connections with other's ideas and understandings to develop and evolve practice (Wolfenden et al., 2015). Teachers learning with and from each other in these various local arenas challenges the idea that professional practice is private practice (Elmore, 2008). Teacher professional networks reinforce the idea of teaching as a collective activity in a school and strengthen community accountability through positioning teaching as a public activity. In many education systems, however, school structures require teachers to work in relative isolation in their own classroom, making developing genuine teacher collaboration a challenge (Hargreaves, 2010).

These ideas are often summarized in lists of the *salient design features and operational processes of effective TPD* (Darling-Hammond et al., 2017):

- Focus on subject-specific content knowledge
- Opportunities for active learning
- Collegial or collaborative culture
- Classroom-based and integrated into the daily life of teaching
- Coherence with other professional activities
- Focus on student work and student outcomes
- Opportunities to reflect on professional practice
- Targeted to the explicit needs of individual teachers

Such lists are useful to inform TPD design but can focus attention on visible superficial features (Brodie et al., 2002) rather than on the underlying conceptual frameworks and theories of learning that are operationalized through these processes (Opfer & Pedder, 2011). Emphasizing these features can also deflect attention away from the *importance of context* and the way

teachers' practice is nested within the culture and embedded practices of the school, community, and system.

"TPD design needs to recognize the resources and experiences all teachers bring to their professional learning."

Contexts can act to enable or limit teachers' ability to develop agency with respect to practice changes in their classrooms (Priestley, Biesta, & Robinson, 2017). What teachers are able to be and do, both individually and collectively, arise from the interplay between their individual and group capabilities and the environmental conditions—resources, affordances, and constraints—in which they work (Pyhalto, Piertarien, & Soini, 2014). How they are able to move away from embedded practices will be "rooted in past experiences, orientated to the future and located in the contingencies of the present" (Priestley et al., 2015, p. 20). Thus, in designing TPD that enables teachers to develop agency in their classrooms, it is necessary to look not just at individual teachers and what they are able to do or not do, but also at the cultures, structures, relationships, and resourcing levels that shape the conditions in which teachers work.

In the contexts of the Global South, there are multiple aspects of the current conditions that pose challenges to teachers' agency to change their classroom practice and which need to be considered in the design of TPD@Scale programs (Boateng & Wolfenden, 2022b). Key issues include:

- Access and quality issues with initial teacher education such that for many teachers it does not provide a secure basis for further professional learning.

- Limited opportunities for regular TPD for many teachers. TPD opportunities may not be made available to all teachers or may be absent completely.
- A failure of many TPD programs to address teachers' prior professional experiences, diverse professional learning needs, and their classroom and social realities including their social status and the level of resources available to them (World Bank, 2016).
- School monitoring and inspection regimes often inhibiting teachers from experimenting in their classrooms and limiting practice innovation.
- Misalignment of teacher education curricula, student curricula, promoted pedagogies, and assessment systems. These are all highly interrelated and inconsistencies can lead to teachers sticking to their own "tried and tested" classroom approaches to cover the syllabus. For example, there are cases where TPD does not utilize learner-centred approaches even as teachers are encouraged to use such approaches in their own classrooms (Varvus & Bartlett, 2012).

Recent analysis of the literature from studies of TPD suggests effective TPD in these conditions has the following characteristics (Boateng & Wolfenden, 2022b; Popova et al., 2018):

- *Recognizes teachers as professionals with experience.* It is not uncommon in the Global South for teachers to be untrained or to have experienced poor quality teacher education programs but they are not without some understanding of their role, their classrooms, and their students. TPD design needs to recognize the resources and experiences all teachers bring to their professional learning. They should not be treated as beginning

teachers. Doing so is neither motivating nor respectful towards these teachers as professionals.

- *Supports teachers to move toward equity in classroom learning.* TPD needs to support teachers to devise and evaluate teaching approaches that offer opportunities to participate in learning for all their students. This would enable teachers to respond effectively to marginalization.
- *Is situated, authentic, and practice-based.* Numerous studies highlight the importance of TPD being focused on teachers' classroom practices and conditions. It needs to offer guidance for experimenting with new practices and provide support to analyze and evaluate these experiences.
- *Includes opportunities for social learning through peer communities.* Teacher collaboration is a key factor in successful professional learning. However, this needs both time and space and is often found to be enhanced by the presence of rules or norms to structure participation. It also requires a balance between connections to outside experts to prompt with new ideas, on the one hand, and close connections with peers to engender relational trust and exchange of complex, tacit, and sensitive knowledge, on the other.
- *Is sustained over time.* Teacher practice is difficult to change and takes time to embed. One or two workshops are not sufficient to embed change in teaching practices. This also has implications for teachers' long-term developmental trajectories: TPD needs to be career long. Teachers who are engaged in cycles of effective professional learning take greater responsibility for the learning of all their students as they find that their changed professional practices have a positive impact

on their students. This in turn enhances their identity as effective teachers.

Finally, the constraints of the pandemic have promoted reconfiguration of many TPD programs. Much TPD has moved online or been disseminated via phone, TV or radio applications or in hybrid form, and reports indicate potential for much greater use of blended TPD moving forward (OECD, 2021). But the reach of this TPD has been far from inclusive. Many teachers have not been able to access TPD opportunities for multiple reasons: no access to digital devices or infrastructure to support use of digital devices; low levels of skills with digital devices; lack of time to engage in TPD; and little support for their learning (OECD, 2021). On the other hand, the pandemic has also seen a proliferation of both self-organized and government-supported professional communities, many of which operate in virtual spaces. Although such professional practitioner communities existed prior to COVID-19, their value was rarely recognized by governments (Wolfenden, 2021). Now they are rapidly becoming an established feature of the professional support ecosystem.

B. Potential of information and communications technologies (ICTs) to support TPD@Scale

ICTs can offer new opportunities for professional growth and identity formation for teachers. There is now an emerging body of knowledge on how different forms and formats of these digital technologies can add value to the learning and teaching process (Scalon et al., 2013). However, this evidence is far from widespread and many teachers have "domesticated innovative technologies by incorporating them into their existing repertoire of teacher-directed practices"

(Cuban, 2013, p. 114). There are also deep concerns that the use of digital technologies often exacerbates educational inequalities (Burns, 2021). While the pandemic confirmed that large numbers of teachers have access to handheld digital devices through which they can interact with others as well as share and create content in multiple formats using social messaging and social media platforms, universal access to power and connectivity, essential pre-requisites for realizing many of the benefits of ICTs, has yet to be delivered.

ICTs in TPD@Scale are defined here as any digital technology tool used to support teacher professional learning. ICTs may be used directly by teachers in any convenient physical space—their classroom, school, home, local teachers' center or an internet café—or may be part of the system infrastructure, e.g., a database of learning materials. ICTs are understood to include hardware, software, and digital content, including user-generated content, recognizing that these are increasingly integrated. *Blended learning* refers to the use of ICTs together with conventional face-to-face learning experiences. The balance of the blend will depend on contextual factors—geography, infrastructure, resources, and the digital competencies of teachers and other educators working with them, among others.

It is important to emphasize that TPD@Scale, and this discussion, are concerned with the *use of ICTs to mediate professional learning*. TPD@Scale is not concerned directly with how ICTs can be used in school classrooms in support of improved student learning nor with how they might enable new classroom pedagogies or identities for students.

The functionality of many contemporary ICTs is vast. ICTs may act as an *educational delivery tool* to support and expand the reach of existing TPD practice in ways that are not possible through conventional means. But the sheer ubiquity of devices makes it possible to consider that ICTs can be applied in qualitatively different ways in TPD—not merely making existing processes more efficient, but making available new and better ways to enable professional learning. Use of ICTs can change the focus of what is being taught and how it is taught (Twining et al., 2013). They can be a *catalyst for transformation of TPD practice*. The networking affordances of ICTs offer new ways to support learning that are more aligned with new understandings of the importance of relationships in learning: ICTs can facilitate new forms of collaboration and joint construction of new professional knowledge.

Integrated virtual learning platforms able to accommodate many hundreds of thousands of



learners concurrently are now easily available to TPD designers and implementers alongside MOOC (massive open online course) platforms such as edX, Coursera, and FutureLearn. Teachers are able to access the same professional learning experiences regardless of their location. With these tools, those working in remote areas or who are unable to travel (e.g., for financial, security or family reasons) are able to connect with peers and experts in synchronous and asynchronous interactions, overcoming the problem of professional isolation. In many contexts this is particularly important for female teachers (Crisp et al., 2017).

ICTs facilitate sharing of both professionally developed and user-generated content in multiple modes, e.g., text, video, audio, virtual reality, augmented reality, etc., across large numbers of teachers and geographical areas through generic channels such as YouTube and educationally specific initiatives such as the Diksha platform in India. For those without stable connectivity, accessing such opportunities and resources is increasingly possible through the use of mobile hotspots with devices such as the Raspberry Pi and offline apps that update when the user has connectivity.

"ICTs can facilitate differentiated TPD provision to respond to diverse professional learning needs and enhance inclusion within programs."

As yet there are relatively few studies evaluating how ICTs improve professional learning at scale in the Global South. There is some evidence from high income contexts that when teachers are supported by the use of contextually appropriate technology, the pedagogy in online

and distance programs is equivalent, or in certain scenarios more effective, than traditional face-to-face classrooms (Siemens, Gašević, & Dawson, 2015). More recent scholarship, also from the Global North, points to online and blended TPD supporting superior achievement and self-efficacy outcomes for teachers (Schmid et al., 2021). Given the paucity of evidence from the Global South, it is perhaps more useful to consider the specific ways in which ICTs add value as a *learning tool* in service of teachers' professional learning and new pedagogic possibilities within these experiences, namely:

- extending conversations and facilitating new conversations with fellow professionals through professional learning communities, communities of practice, and similar collaborative communities in ways that enhance social and professional capital and overcome professional isolation (Hargreaves & O'Connor, 2017; Tarisayi & Manhibi, 2017);
- enabling and enhancing expert support, such as mentoring and coaching, both through offering mediating objects, such as video, to improve interactions (Wolfenden et al., 2015) and by making it possible to engage in these activities when not geographically co-located; and
- supporting sustained professional learning, such as digital resources and peer networks available on demand to support "just-in-time" learning, and a culture of ongoing continuous professional development that is not limited to attendance at workshops.

Within each of these components, ICTs can facilitate differentiated TPD provision to respond to diverse professional learning needs and enhance inclusion within programs. ICTs

can be used to localize or personalize TPD for different groups of teachers, including teachers with mobility, auditory, and visual challenges, and teachers working in extremely difficult contexts such as refugee camps. In high-tech environments, learning analytics and machine learning can devise and constantly adapt personal plans for individual or groups of teachers and enable teachers to track their progress towards learning goals (Siemens et al., 2015). But even without high-end tools and fast connectivity, ICTs are able to offer teachers choice and differentiated learning pathways (Cross et al., 2019).

Finally, the use of ICTs enables TPD program designers and implementers to adapt rapidly to user feedback and system change in continuous cycles of improvement. They can access “real time” feedback from teachers on particular aspects of a program and make adaptations or adjustments rapidly while the program is running. For example, additional specific guidance in the form of materials or access to experts can be easily integrated into a program. The timing of sessions or their content can also be quickly amended. Traditionally, program evaluation occurs at the end of a program, with changes implemented for the next cohort or in the next academic year. ICTs enable more responsive provision, essential in complex systems.

However, *what works with ICTs in one context may not work in another*. Teachers in different contexts may use the same ICTs or combination of ICTs in very different ways. How the digital technology is used and the possibilities for action that this creates will lead to different effects (Wegerif, 2007). ICT use will depend both on teachers’ own competencies with the ICT and the context in which they are working including infrastructure issues of power and connectivity as well as culture, politics, and social practices.

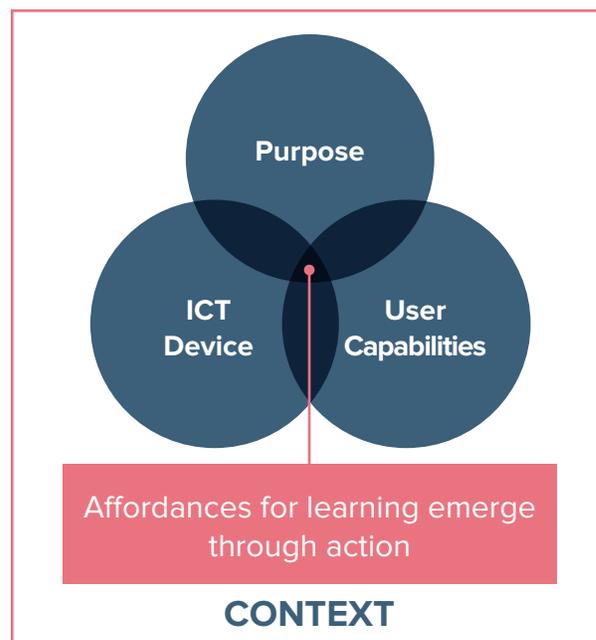


Figure 1. Adoption and use of ICTs for learning

Virtual spaces always interact with the physical space, thus activities in the virtual space depend crucially on the resource and conditions in the physical space (Glassman & Burbidge, 2014). Teachers’ prior orientations towards ICTs and beliefs about their own capability with ICTs will also play a role, as shown in Figure 1. *There are no golden rules: specific technologies can enhance learning if used in specific ways in particular settings* (Passey, 2014).

C. Working at scale in TPD

Making available quality TPD opportunities to large numbers of teachers is critical to achieving the targets of Sustainable Development Goal 4 (SDG 4).³ This represents a considerable challenge. It also prompts us to consider what is meant by scale. Contemporary scholarship argues that *scale is both dynamic—the conceptualization of scale may shift over time as*

3 Sustainable Development Goal 4: Quality Education <https://sdgs.un.org/goals/goal4>

a program or innovation is implemented—and multi-dimensional (Coburn, 2003). This moves scale beyond a conceptualization focused solely on quantitative indicators such as the number of teachers involved, to consider issues of *depth of implementation, ownership of the innovation, and sustainability* (Morel et al., 2019).

Implementation of programs on a large scale poses numerous challenges. It may be difficult to secure sufficient resource, e.g., number of mentors, to ensure quality across large areas, to localize for different contexts, and to be sufficiently adaptive to respond rapidly to changing conditions (Stone Wiske & Perkins, 2005).

Recent scholarship from the international development community also points to a shift away from the idea of scaling as creating larger organizations or structures towards a sharp focus on scaling impact, defined here as “a coordinated

effort to achieve a collection of impacts at optimal scale that occurs if it is both morally justified and warranted by the dynamic evaluation of evidence” (McLean & Gargani, 2019, p. 9). This prompts interrogation of the impacts of the program or innovation to be scaled. Are impacts equitably distributed? What is the quality of the impact? Is it sustainable? Is it valued by participants and stakeholders? etc.

Impacts in TPD are linked to a set of new shared classroom practices where practices are understood as “actions informed by meaning drawn from a particular organised context” (Cook & Brown, 1999, p. 386). These new practices will often involve changes in the way teachers relate to learners, and hence to their individual identities. There may also be new or enhanced engagement of their community in lifelong learning, which may in turn lead to changes in collective identity.



Photo credit: Putera Sampoerna Foundation

The exact nature of these impacts will vary across contexts depending on the prior conditions, the goals of education, and prevailing equity issues.

Scaling impact is a highly complicated process particularly in complex education systems in which there are multiple, interconnected sub-systems and large numbers of stakeholders. Work practices are particularly challenging to scale because the development of new knowledge, skills, and professional identities requires favorable organizational conditions.

One useful typology of *pathways to scale* comprises four models (Coburn et al., 2013):

- *Adoption.* More individuals/institutions/groups embrace the ideas and practices being spread. Here scale is equated with widespread affiliation or use but the exact nature of the affiliation is not specified.
- *Replication.* Widespread use of the product/practice with fidelity to the intent of the designers of the original product/practice.
- *Adaptation.* Widespread use of the product/practice but through modification of an original design. Adaptations hold true to the original underlying set of ideas, practices or principles but incorporate local perspectives and needs.
- *Reinvention.* The original ideas are used as a starting point for innovation. In this model, the core ideas, practices or principles are not necessarily maintained.

Each pathway to scale requires different conditions to enable or encourage spread. Implementers need to devise different strategies to foster and maintain momentum with scale in each pathway. The detail of these strategies will also depend on features of the context such as individual and collective capacities, organizational conditions, and policy priorities. Implementers may also need to consider whether one pathway is appropriate for all contexts included in an innovation, for all stages of the scaling implementation or when environmental and policy conditions change (Kim et al., 2017). For TPD@Scale, adaptation is the most common pathway; this allows for modifications to accommodate diversity in different contexts within the education system.



03

The TPD@Scale Framework

The TPD@Scale Framework offers a guide for the design and implementation of high-quality, equitable, and efficient professional learning for large numbers of teachers working in complex education systems particularly in the Global South. It draws on the areas of scholarship discussed in Section 2.

This discussion starts with the core underpinning concepts of equity, quality, and efficiency with examples of how these are being understood in various current programs. Drawing on these concepts leads to the ideas and practices within the TPD@Scale Framework and illustrations of how these can take different forms in different contexts.

A. Core concepts: Equity, quality, and efficiency

Central to the TPD@Scale Framework are the concepts of equity, quality, and efficiency. These interlinked concepts exist in a delicate balance that is both dynamic—shifting over time—and unique to each context and its current priorities. Each concept is recognizable to both teachers and policy makers and combines the experiences of specific classrooms with perspectives across many thousands of sites of professional learning. Responding to current needs may demand compromise or prioritization of one concept over the others. For example, ensuring equity for all teachers might require higher investment for some groups in order for them to experience the same level of TPD quality.

Equity in TPD@Scale is fundamentally concerned with recognizing the diversity of teachers' prior experiences, current practices, and professional learning needs; the range of settings in which teachers are working; and the goals of education in these contexts. TPD experiences must then be designed accordingly

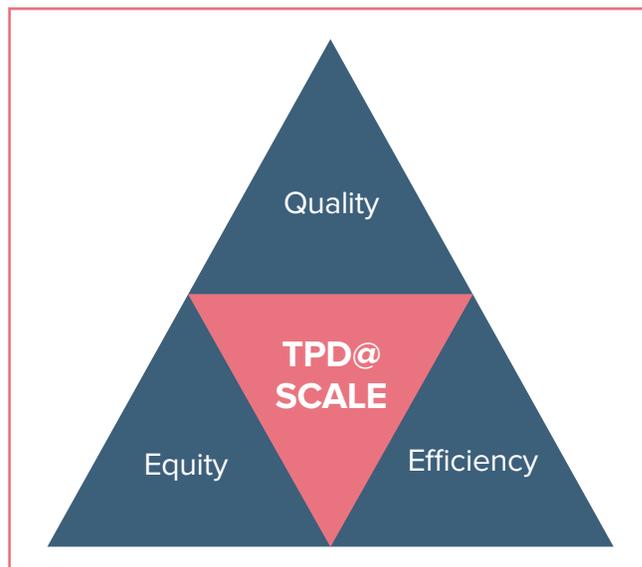


Figure 2. TPD@Scale goal: To ensure high-quality, equitable, and efficient TPD towards achieving SDG 4

and experienced fairly (Fletcher-Campbell & Soler, 2022) to support quality. Equity in TPD@Scale is not static or fixed. It is constantly needing to be re-imagined as social and economic conditions change. Furthermore, it needs to permeate all layers in which teacher professional learning is embedded—classrooms, schools, and systems (Fletcher-Campbell & Soler, 2022).

"Equity in TPD@Scale is not static or fixed. It is constantly needing to be re-imagined as social and economic conditions change."

For TPD@Scale to be equitable, it should be participative and should accord teachers agency to respond to their own specific professional learning needs and the learning needs of their students. Teachers must be treated as partners in the joint endeavor of improving classroom

teaching. They should have opportunities to identify and respond to their own professional learning needs in ways that are helpful to them and what they are trying to achieve in their classroom (Timperly & Alton-Lee, 2008). This

suggests a dialogic approach to TPD in which access to, and opportunities to fully participate in, quality TPD are available to all teachers regardless of their personal and social circumstances (Fletcher-Campbell & Soler, 2022).

Box 1. Needs assessment in teacher-managed TPD

Teacher Learning Centres (TLCs) in Indonesia ([Project Profile](#))

TLCs in Indonesia are structured independent learning organizations supervised by local government but *managed by teachers* from schools in the locality. TLCs facilitate collaborative partnership and cultivate local leadership to develop TPD opportunities that are *tailored to the professional needs of teachers in the community* established through annual surveys.

Equity in TPD@Scale requires that a range of opportunities in multiple forms adapted for local contexts be made available to all teachers including those with disabilities. Teachers working in remote areas, for example, have historically often had few opportunities for TPD because it was almost always conducted through in-person workshops. Likewise, female teachers in multiple contexts may have had fewer opportunities

to access TPD workshops because they were unable to travel due to safety concerns or family commitments, or because they were not selected for such opportunities by senior teachers and school leaders. Teachers from minority groups have experienced similar discrimination. Selection can be further influenced by age, perceived career ambitions or other grounds (UNESCO, 2018).



Box 2. Assessing readiness for TPD@Scale**Early Language, Literacy and Numeracy Digital (ELLN Digital) in the Philippines**
(TPD@Scale Compendium Profile 17)

Readiness for participation in the ELLN Digital course for K to 3 teachers is assessed at the school level. Participating schools are given a School Readiness Assessment Tool (RAT) to determine if their teachers are ready to take the ELLN Digital course. The School RAT lists 14 readiness criteria in four categories—Resourcing (8), Administrative Support (4), Learner Attitudes and Practice (1), and Learner Support (1). All 14 criteria must be met for a teacher to be considered 100% ready. The RAT is administered at three points—at the start of preparations for the course (Baseline), right before the course starts (Pre-Implementation) and right after the course ends (Post-Implementation) to assess progress of the cohort. Those teachers who were not able to complete the course are then assessed for inclusion in the next cohort. At each of these points, the school head and a designated assessment team determine how many and who among the school’s teachers are ready to take the course and, crucially, the *actions that need to be taken by the school to provide for and support the course-taking of each teacher*—a focus on equity. For example, a school head may request assistance from Division-based ICT personnel to secure copies of the courseware for school- and teacher-owned devices (Resourcing) or hold meetings with the teachers to work out a coaching plan (Learner Support).

Equity in TPD@Scale is also concerned with enabling teachers to respond to the learning needs of all their students including those with disabilities, vulnerable students, and those who have historically been marginalized such as indigenous groups, internally displaced children, and refugees. To be equitable, TPD@Scale must promote more inclusive practices in the classroom and break cycles of education exclusion for some children and their families; in many classrooms, teaching practices exclude groups of students from full participation in learning. Through TPD experiences, teachers need to become competent with conceptual tools that support them to develop pedagogic practices that are socially and culturally responsive, i.e., that recognize and value the diversity of experiences, languages, and knowledges brought by their students to the classroom. Only then will they be able to respond effectively to the learning needs of all their students and reduce education inequalities.



Box 3. TPD to support equity in classroom practice**GPE-KIX TPD@Scale Ghana** ([Project Profile](#))

This project is a research and development collaboration between the National Teaching Council of Ghana, World Reader, and the University of Ghana, funded by the Global Partnership for Education Knowledge and Innovation Exchange (GPE-KIX). The aim of the project is to explore factors that influence the ways in which the TPD@Scale Framework can be adapted and scaled for Ghana. The pilot module is concerned with early literacy practices and encourages teachers to use digital resources, accessed through their mobile phones, with their students. A central objective is to improve the teaching of literacy in ways that offer opportunities for literacy learning to all students, recognizing and valuing the resources each student brings to the classroom.

Quality in TPD@Scale is about adhering to characteristics of successful TPD, drawn from rigorous research, in a manner which pays attention to the conditions of the Global South, in particular the fragility of many education systems, the form and quality of initial teacher education programs, the social conditions under which teachers are working, their status within communities, and the level of resources, including ICTs, available to them.

Consideration of these characteristics suggests the following are important for teachers: access to new ideas and practices; designing and trying out activities in their classroom; peer collaboration; access to coaching or other forms of expert support; and reflection and feedback.

Teachers need guidance to make incremental changes in their classrooms, moving beyond the familiar. This is usually in the form of activities in the TPD content. These activities need to be designed in ways that recognize and draw on the local context including available resources and expertise and, critically, the prevailing understanding of quality teaching as instantiated in curricula, teacher assessment, promotion, and accountability frameworks. At times these structures may be in tension with evidence from contemporary literature on professional learning. Nonetheless, for equity purposes, teachers need activities that are tailored to their professional needs.



Box 4. Teacher choice of activities to respond to teacher and student diversity

Teacher Education in Sub-Saharan Africa (TESSA) (TPD@Scale Compendium Profile 2)

TESSA offers a wide range of highly structured open educational resources (OER) to support school-based teacher development. The OER are directly linked to the student curriculum, allowing teachers to develop their skills within their usual classroom professional practice. The OER have been translated (into Arabic, Kiswahili, French, and English) and adapted for multiple contexts. There are a range of technology access pathways to the OER reflected in the diversity of technologies available to teachers (online/offline/ through SD cards, apps, DVDs, etc.) and their familiarity with these technologies. Teacher educators and teachers select from the OER according to the demands of their different settings and their own professional experiences and learning needs.

Efficiency in TPD@Scale. Efficiency in education programs is the optimization of inputs to achieve desired outputs and outcomes in any one context. It is not about comparisons across contexts (Walls et al., 2020)—there will be significant variations in efficiency in different contexts of the same program. It is about achieving the optimal balance between cost, participation, and educational quality in the program (Ndaruhutse, 2022).

TPD@Scale inputs. For TPD@Scale programs, inputs include both operational and initial or set-up costs. While programs that utilize ICTs can often have higher set-up costs, these can be run multiple times at little additional cost through avoiding the need to spend on venues, travel, and residential costs (Ndaruhutse, 2022). On the other hand, purchasing hardware for individual teachers specifically for TPD is rarely seen to be cost efficient in conventional studies (Piper et al., 2016), although this is partly because such calculations ignore how the affordances of the ICT devices can support multiple changes beyond those explicitly promoted in the program such as gains in teachers' digital literacies, strengthening teacher identity as "modern" professionals,



and use of the devices for organizational and management purposes. Many TPD@Scale programs use digital devices that are already in the hands of teachers and other education staff, either owned personally such as mobile phones, or available to them through their schools. In Ghana, for example, the Government is providing all teachers with a laptop to be used for multiple purposes including TPD.

Box 5. Harnessing user-owned ICTs

Teacher Education through School-based Support in India (TESS-India)

(TPD@Scale Compendium Profile 1)

In the TESS-India program, very little funding was invested in ICT devices. A small number of tablets and phones were purchased for piloting but the TESS-India MOOC was designed so that teachers could access it through whatever digital devices (phones, tablets, and laptops) were available to them—their own, borrowed from family members or shared with colleagues. Teachers were creative in getting online to access the course. Some made use of the connectivity at local teacher education institutes (DIETs) when this was available or at secondary schools or neighborhood internet cafés. Local teacher educators were seen to travel to schools in remote areas with dongles and a laptop to facilitate teachers' access to the course.

As the cost of technology devices decreases, the biggest cost driver is not the technology hardware or infrastructure but the time for designing and creating the learning, particularly if these are interactive and/or include multimedia or video assets, and support for teachers throughout the program (Laurillard, 2007, as cited in Ndaruhutse, 2022). The re-use of OER can lead to cost savings although the process of localization—often translation as well as adaptation—is complex and can be resource intensive if undertaken in a participatory manner involving potential users of the OER (Butcher & Hoosen, n.d.; Wolfenden & Adinolfi, 2019).

Similarly, support costs for large programs can be reduced through the use of peer support or by re-directing the time of educators who are already in post.

"As the cost of technology devices decreases, the biggest cost driver is not the technology hardware or infrastructure but the time for designing and creating the learning... and support for teachers throughout the program."

Box 6. Using existing staff resource to optimize inputs

GPE-KIX TPD@Scale Honduras ([Project Profile](#))

In this program (*see Section 3C*), staff at regional centers who have responsibility for TPD have been up-skilled to work on the ICT-mediated program. This avoids the creation of a new cadre of teacher educators and limits any additional costs to the education system.

Equity should be given consideration in all input decisions. Will all teachers be able to participate in a fair manner? How easy will they find it to use the ICT tools? Does the model respond to diverse professional needs? This in turn leads to considerations of the balance of the blend of ICT use and face-to-face interaction within the program; the extent of localization, e.g., provision in multiple languages or through multiple modalities; educators' current levels of digital literacy; and the nature of the monitoring and evaluation framework (type and frequency of data being collected and whether this involves additional activities or can be collected through the TPD system, e.g., analytics data from an online learning platform) to inform improvements in equity, quality, and efficiency of the program (Ndaruhutse, 2022).

TPD@Scale outputs and outcomes. Outputs in TPD are usually targets for the number of teachers who enroll and for successfully completing courses. The optimization of these outputs needs to consider appropriate aspects of equity and ask questions such as: Were teachers with disabilities able to participate? What about teachers working in under-served communities? Do completion rates in the program reflect the demographic composition of the teaching workforce?

Outcomes will usually be concerned with changes in classroom behaviors that contribute to improved quality of classroom teaching, e.g., the way in which a teacher deploys different types of questions with her class or utilizes ICTs in student activities. The exact nature of these changes and hence the way the outcomes are framed and understood will be context-dependent (Boateng & Wolfenden, 2022b). Assessment of outcomes needs to involve meaningful tasks situated in teachers' historical and social contexts, such as learning portfolios and peer observations (Fenwick, 2009), as in the example from Colombia in Box 7.



Box 7. Teacher-led assessment

Computadores para Educar (CPE) in Colombia (TPD@Scale Compendium Profile 3)

CPE offers a 92-hour blended diploma course (65 hours face-to-face, 31 hours online) on teachers' ICT competencies called "innovaTIC." Consisting of four modules of progressive complexity, it requires that a knowledge test be passed at the end of each module. The capstone assessment asks the teacher-learner to make a video documenting their personal learning journey and change across the four modules (the final product). The video is kept as evidence in the teacher-learner's personal learning environment.

However, there are presently significant gaps in our understanding of how such assessment can be operationalized at scale in TPD programs in ways that are equitable, that promote career-long professional learning, and that are not too resource intensive. Much current assessment focuses on the short term and can be overly reliant on checking what teachers know rather than supporting them to become self-regulating professionals (Wolfenden and Boateng, 2022a; Boud, 2000).

Thus, there remain a number of related challenges in ascertaining the efficiency of TPD@Scale models, most critically the absence of a robust body of work in this area either in TPD@Scale programs or in comparator programs (Global Education Evidence Advisory Panel, 2020; Popova et al., 2018).⁴

B. Core components

The TPD@Scale Framework comprises an integrated system of ideas, practices, and tools underpinned by the concepts of equity, quality and efficiency outlined above. The TPD@Scale Framework is sufficiently flexible to work within very different policy environments with different school curricula and prescribed pedagogic approaches. It does not promote a specific classroom teaching style but rather, it works with the idea that most teachers will draw from a range of approaches depending on their context, resourcing levels, and the characteristics of their students.

There are **six core components** to the Framework (see Figure 3):

1. **Access to external sources of new ideas** concerned with pedagogy or curriculum and the possibility of change in teaching practices. These ideas are often reified in learning materials. These serve multiple functions including offering suggestions for classroom activities and sensitizing teachers to the possibility of introducing new practices into their classrooms whether in conventional schools or virtual spaces. This is particularly important for teachers who historically have been marginalized from TPD activities.

"The TPD@Scale Framework is sufficiently flexible to work within very different policy environments with different school curricula and prescribed pedagogic approaches."

2. **Trying out these new ideas in their classrooms—professional experimentation.** In this, teachers are guided by explanations of how the approaches support student learning and case study examples from similar authentic contexts, including video. These activities may be concerned with the teaching of new topics in the curriculum (such as climate change) or suggestions for new approaches in the teaching of a topic or ways to provide psychosocial support to students. They might be short activities or longer projects such as the use of problem-based learning. Importantly, the activities will always be relevant to the student curriculum and teachers will be encouraged to make

⁴ The GPE-KIX TPD@Scale projects plan to start to address this gap through the use of the Brookings Cost Calculator in Honduras and Ghana.

close observations of engagement of all their students to understand the consequences of these new actions. In some contexts, this may take the form of teacher inquiry but this is complex: the level of inquiry encouraged will depend on teachers' prior experiences, what is permissible in the context, and the level of support available.

- 3. Focused collaboration** with peers to share and actively reflect on their classroom experiences to generate new professional knowledge and understand how that knowledge functions in the world of their classroom. Collaboration may include opportunities to practice together and to support each other in classroom experimentation. It needs to be purposeful and dialogic rather than merely the exchange

of classroom "war stories." The collaboration may take place in scheduled professional learning community meetings either in-person or on social media platforms or be much more informal in nature. It may be facilitated by a tutor, mentor, master trainer or school leader, or the group may choose a peer teacher to take on this role.

- 4. Access to expert support** from mentors, tutors or facilitators to support the new or strengthened practices. This role may be undertaken by peer teachers, school leaders or educators whose role includes support for TPD, such as district officers or staff from teachers' centers or from colleges of education. The support may involve traditional in-person classroom observation or remote observation and coaching using video. It may take the

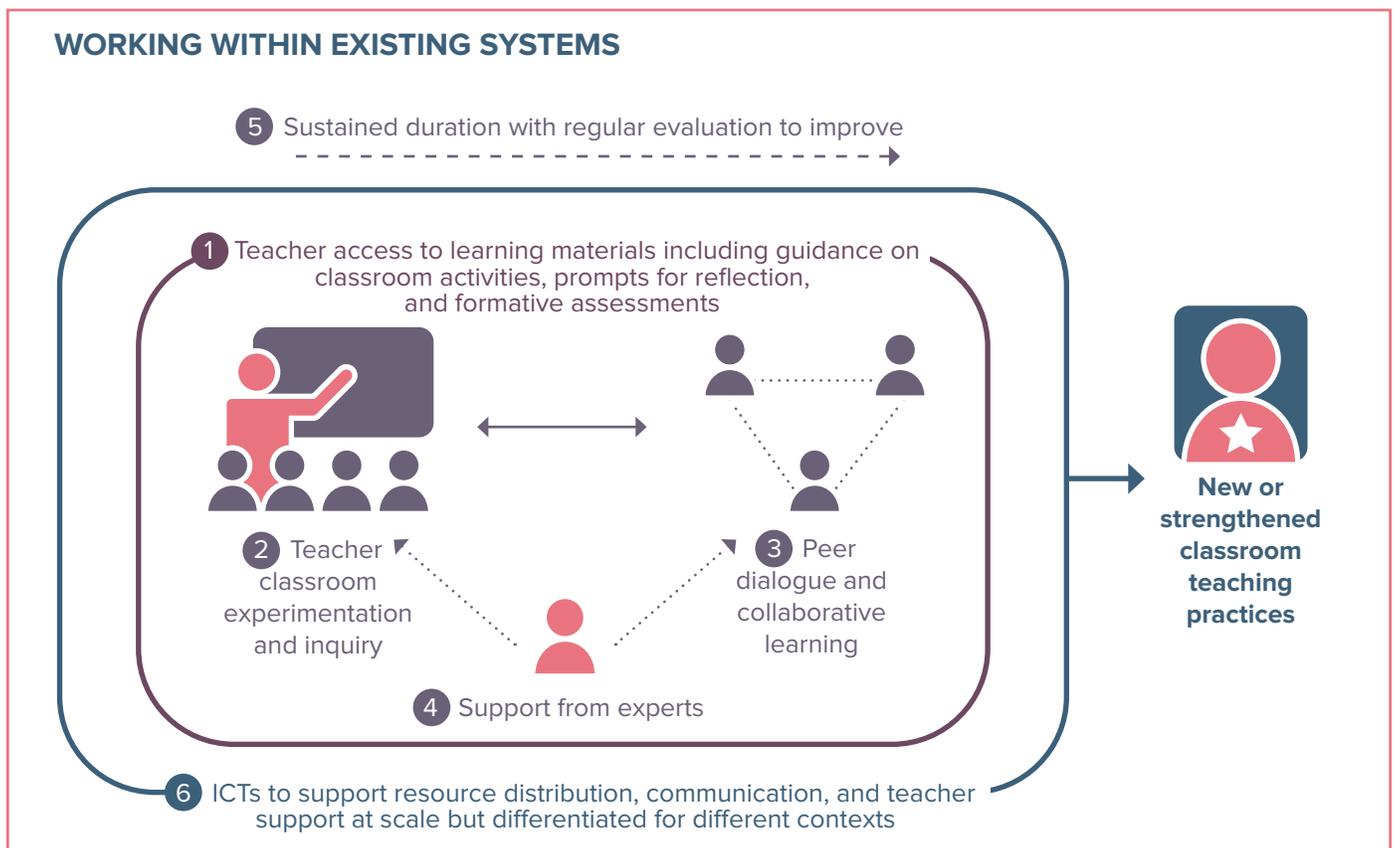


Figure 3. Core components of the TPD@Scale Framework

form of dialogic feedback on formative assignments. The expert may be co-located or remote.

- 5. Sustained activity over time with regular evaluation and adaptation of the TPD process.** Change in teachers' practices takes time and is not a linear process. Rather, it involves a continuous interplay between practice and knowledge, beliefs, and attitudes. Therefore, the TPD needs to be extended over time—a short episode every week through a term rather than consolidated into a week, and ideally offered in a flexible manner to accommodate teachers' professional and family commitments.

Education systems are complex. They comprise multiple interconnected elements that are constantly changing. But they have the capacity to learn from experience. Hence, it is usually better to find ways to constantly evaluate the TPD intervention, learn from the results, and adjust the TPD.

- 6. Use of ICTs to support Components 1-5 in contextually appropriate ways at scale.** ICTs may be used to offer teachers access to materials (Component 1) through online courses or through sharing ideas on social media platforms or it may be more appropriate to distribute materials in print form for some groups of teachers. Similarly, collaboration (Component 3) may be supported by sophisticated online tools, such as Zoom or Microsoft Teams, or collaboration may be in-person supported by SMS. In all cases it is important not to start with the ICTs but with the activity or practice that they will support, and then select the ICTs that are most contextually appropriate. Importantly, within any one program there may be a range of ICTs for different groups of teachers.

Ideally, teachers have access to Components 1-4. In some contexts, however, it may be that access to resources is the highest priority while in other contexts the key need may be the provision of professional learning communities to complement existing provision of resources. Critically, these activities are made available and participated in at scale. *Scale is the central concept of the TPD@Scale Framework.* Working at scale in terms of magnitude, depth, sustainability, and ownership (Coburn, 2003) is made possible by *harnessing the power of ICTs*. ICTs enable the Framework to be operationalized at scale in ways that recognize diversity in contexts, teachers, priorities, and so on, to maximize equity and efficiency while maintaining quality.

Central to the TPD@Scale Framework is the idea that the core components can take multiple forms within and across sites of TPD depending on multiple contextual factors at different levels of the education ecosystem—educational policies and priorities, digital technology infrastructures, funding levels, organizational and individual capacities, the nature of school leadership, and so on. There is no defined model but rather a set of ideas and working practices that can be adapted.

This flexibility and adaptability of the Framework means it is *appropriate for multiple and diverse contexts*. Designers working with it are encouraged to exercise agency to mediate the Framework in ways that are appropriate for their context. The Framework disrupts the idea that “one size fits all” (Crossley, 2019) and eschews the idea of “best practice” or reference examples (Sellar & Lingard, 2013). Use of the Framework is not about replicating a model, i.e., simply doing the same thing in many different places. Rather, it is about adaptation: TPD@Scale programs or initiatives are true to the core components of the Framework but operationalize them in ways

that are contextually appropriate. Ultimately, quality in TPD@Scale is about localizing the offer for different groups of teachers. It supports inclusion in TPD by recognizing the reality of different classrooms and the diversity of teachers' experiences and professional learning needs.

A key characteristic of the Framework is that TPD@Scale models are always *situated and aligned with—and integrated into—education ecosystems*. TPD@Scale is not about replacing key structures; rather, it is focused on incremental change in the education systems of the Global South. It takes into account the difficulties in providing conditions in which teachers can more fully experience the satisfaction of seeing their students learn and achieve goals. In this it attempts to bring together approaches that give primacy to institutions—the norms and rules of schools and districts—and situated learning approaches that give primacy to the lived realities of teachers' work and their relationships (Cobb et al., 2003).

"A key characteristic of the Framework is that TPD@Scale models are always situated and aligned with—and integrated into—education ecosystems."

Thus, operationalization of the Framework in any context needs to take account of other related dimensions of the education ecosystem instantiated in current or planned future policy such as career pathways for teachers, annual requirements for TPD completion, organizational structures, and teacher accreditation. At the school level, this includes the conceptual tools and material resources available to teachers (McDonald et al., 2006; Ferrer-Wreder et al.,

2012), their culturally embedded ways of being as teachers including their social status, and the ways in which policies are mediated by their school environment. It is critical to establish teachers' access to ICTs and their familiarity and competency with such tools as well as their professional habits to inform adaptations that improve equity in access and participation.

However, the Framework is not a panacea for improved teaching quality; teachers may have little interest in participating in TPD and/or no agency to change their practice. While the aim is always to enable teachers to gain greater fulfilment in their role (Clarke & Hollingsworth, 2002), resources may be so constrained that teachers feel change is not possible; they may have no time to engage in TPD due to other demands; or there may be an absence of support to move away from accepted norms of classroom behaviour. Expectations need to be realistic and aim for incremental change that is embedded within these complex systems.

Early iterations of the TPD@Scale Framework have been implemented in multiple contexts, such as the Philippines, Indonesia, Ecuador, India, and Rwanda, and evidenced through movement in teacher practice towards improved classroom teaching. In each case, TPD designers and implementers have worked in partnership with governments and multilateral agencies, civil society organizations, non-governmental organizations and, importantly, teachers themselves. This ensures the critical alignment with the lived reality of teachers' professional lives, education systems and future priorities, and supports the idea of professional learning as integral to teachers' identity as professional educators rather than something undertaken sporadically.

C. TPD@Scale examples

The following four examples illustrate how the core components of the TPD@Scale Framework have been interpreted and operationalized in different contexts to support improvements in classroom teaching.

1. Honduras: GPE-KIX TPD@Scale ([Project Profile](#))

This is an ongoing research and development collaboration between the Education Secretary of Honduras, regional teacher education centers, and the Laboratory of Education Research and Innovation for Latin America and the Caribbean (SUMMA) funded by the Global Partnership for Education Knowledge and Innovation Exchange (GPE-KIX) program. The aim of the collaboration is to investigate how the TPD@Scale Framework can be adapted for Honduras. Prior to the pandemic, ICTs were only occasionally used for TPD in Honduras. But the recent restrictions on face-to-face activities have opened up opportunities for the use of ICTs in TPD.

This pilot adaption of the TPD@Scale Framework is based on an online course created on the ministry virtual learning environment (VLE) available to all teachers. The course comprises approximately five hours of activity each week including active classroom experimentation. The model incorporates key TPD@Scale components as follows:

- *Access to study materials:* Teachers access and participate in a course through different modalities depending on their access to digital devices and connectivity (*equity*). Teachers with connectivity access the course online, those with sporadic connectivity access the course through an offline Moodle app, while

those with very limited connectivity use offline WhatsApp (*contextually appropriate use of ICTs*).

- *Encouragement to experiment in lessons with students:* The online course supports teachers to experiment with new ways to teach a mathematics topic.
- *Collaboration with peers:* Small groups of teachers share experiences, provide mutual support, and engage in collective reflection in WhatsApp groups.
- *Access to expert guidance and support:* Aside from peer teachers, two tutors—one for pedagogic support and one for technical support—also provide expert guidance either through WhatsApp or the VLE. Tutors are drawn from regional teacher education centers to support distributed ownership and *sustainability*.

“Teachers access and participate in a course through different modalities depending on their access to digital devices and connectivity.”

The first iteration of this Honduras model is currently being evaluated using an improvement science approach and will be further refined for wider field use later in 2022.

2. Philippines: Early Language, Literacy and Numeracy Digital (ELLN Digital) (TPD@Scale Compendium Profile 17)

This large-scale program implemented by the Department of Education for over 250,000 teachers is designed to improve the quality of literacy and numeracy teaching in the first three years of primary school. It utilizes ICT structures

within schools to enable each teacher to engage in independent study of the ELLN Digital Course in an offline mode. Key TPD@Scale core components are adapted as follows:

- *Access to study materials:* Each teacher receives a copy of the ELLN Digital Course Package on a CD (or, alternatively, the school loads the Course Package on teachers' devices from the CD) and studies each learning episode offline independently at their own pace to fit in with their commitments and habits (*equity*). For teachers who have good connectivity, supplementary online resources are available (*differentiation*).
- *Encouragement to experiment in lessons with students:* Learning episodes center on structured explanation of new ideas and encourage teachers to try out new approaches in the classroom with their students.

"Teachers or teacher educators construct their own learning pathways through the OER to meet professional needs."

- *Collaboration with peers:* Teachers meet with fellow teachers every two weeks in a school-based, face-to-face professional learning community called a Learning Action Cell (LAC) to reflect on their new classroom practices (*peer support*). LACs are led by designated LAC Facilitators who are teachers within the school.
- *Access to expert guidance and support:* Additional expert support is provided to teachers from Division Technical Assistance Providers who are part of the existing teacher support infrastructure, either face-to-face, by phone or online via Facebook, WhatsApp or Viber (*contextually appropriate use of ICTs*).

3. India: Teacher Education through School-based Support India (TESS-India)

(TPD@Scale Compendium Profile 1)

TESS-India illustrates a very different way of adapting the TPD@Scale Framework, appropriate for working across highly diverse contexts. In this case, there is no central course but rather a large bank of small open study units—open educational resources (OER)—each representing approximately six to eight hours of TPD. Teachers or teacher educators construct their own learning pathways through the OER to meet professional needs. The OER are offered in multiple versions and languages appropriate to the different project sites across India, namely, Bihar, Uttar Pradesh, Madhya Pradesh, Odisha, Karnataka, Assam, and West Bengal. Core components of TPD@Scale are incorporated as follows:

- *Access to study materials:* TESS-India OER are available in five languages—English, Hindi, Assamese, Kannada, Odia, and Bengali. Created collaboratively with Indian and international teacher education experts, the OER cover teacher development in key subject areas, school leadership, and principles of effective pedagogy, which is exemplified with high quality videos of classroom teaching. The OER focus on pedagogy within specific subjects but are not grade specific. Teachers and teacher educators can further localize the OER for different classes and additional subjects (*equity*). The OER are available in print, online, and offline (on CD and USB drive); digital versions can be accessed on desktops, laptops, mobile phones, and tablets (*contextually appropriate use of ICTs*).
- *Encouragement to experiment in lessons with students:* Each TESS-India OER centers on three to four activities for the teacher. Most



are for the teacher to do in the classroom with their students but some involve working collaboratively with colleagues or preparing for classroom activities. The OER also include reflection prompts and case studies describing teachers undertaking the activities and the actions they take in response to student questions, behaviours, and developing understanding.

- *Collaboration with peers:* TESS-India OER can be used in different contexts in a variety of ways to meet teacher development needs (*differentiation*). For example, they may be used directly by teachers for independent, user-directed professional learning. Or their use may be mediated by teacher educators (*expert support*) who incorporate the OER into programs, sustainably strengthening existing systems at relatively low cost. Collaboration with peers is thus through a variety of formats including formal seminars, social media platforms, in-school staff meetings, and inter-school sessions.

- *Access to expert guidance and support:* This depends on the model of use of the OER. Guidance and support may be provided by more skilled peers within the school, the school leader, district tutors or coordinators, or teacher educators at local institutions.

To help teacher educators and teachers become familiar with the OER, TESS-India also offered a free, six-week MOOC in English and Hindi, “Enhancing Teacher Education through OER.” More than 50,000 educators registered for the course over its three iterations from 2015 to 2017, with a completion rate of 55%. Participants registered on the MOOC platform to access the course activities, case studies, readings, and assessments as well as to submit assignments and participate in the online discussion forums. Most teachers accessed the course through their mobile phones.

A key characteristic of TESS-India MOOC is the blend of flexible support. Each participant was assigned to a tutor or facilitator (*peer and expert*

support). These were senior teachers or teacher educators who had completed a previous version of the course and could support participants with their learning and assessments particularly with peer assessments. They supported participants through the course forums as well as through regular in-person classes. These classes were run by the facilitators and took many different forms. Some classes took place in formal lecture halls at teacher education institutions for up to 100 people. Other classes took place in school yards for 10 to 12 people. In some instances, facilitators took the class to individual teachers, using a laptop and dongle to link them into the platform (*differentiated and contextual use of ICTs*). The facilitators also set up social media platforms for their groups. Large numbers of teachers and teacher educators used these to share their challenges, successes, and ideas. Many of these social media groups are still active today.

4. Zambia: **Zambian Education School-based Training (ZEST)** (TPD@Scale Compendium Profile 13)

ZEST, like TESS-India, provides teachers with a resource bank of open materials to support collaborative school-based learning. But unlike TESS-India, ZEST supports groups of teachers—teacher study groups established in a previous TPD lesson study program—to collectively engage with the resources using a highly structured schema. The schema was co-designed with Zambian teachers and is integrated into existing systems of school support and oversight.

- *Access to study materials:* Each school is provided with a Teachers' Toolbox containing a variety of audio, video, and text resources. The latter are available in both print and

digital format from an SD card on a low-cost Raspberry Pi server (*equity and contextually appropriate use of ICTs*).

- *Encouragement to experiment in lessons with students:* Teacher study groups meet regularly to select a learning focus (*differentiation*), use the appropriate resources from the Toolbox to collaboratively plan classroom activities, carry these out, and reflect on their classroom experiences. They continue this cycle of collaborative planning, teaching, and reflection on the learning focus to deepen their understanding of the topic, approach or technique.
- *Collaboration with peers:* The frequency and size of the teacher study groups are decided locally in each school.
- *Access to expert guidance and support:* Teacher study groups are facilitated by the school in-service coordinator or a nominated member of staff. They are supported by a Zonal In-service Coordinator (zones comprise a group of schools) and by District Resource Center Coordinators. These roles are part of the Zambian education system.



04

TPD@Scale Insights from the Field

TPD systems do not exist in isolation from other parts of the education ecosystem; rather, they are an integral part of it. Thus, it is essential to understand the host education system when planning and implementing TPD@Scale—existing policies on TPD, teacher standards, teacher career frameworks, levels of resourcing including availability of ICTs, and the current status of teachers. This understanding is central to **three key insights** discussed below.

These insights are not discrete but highly interwoven to support movement towards equity, quality, and efficiency in TPD. They draw on multiple evidence sources from across the Global South including established TPD@Scale programs and TPD@Scale initiatives that are currently being researched.

"Localization of TPD@Scale to meet a variety of teacher needs is operationalized through attending to the types of digital technologies available to teachers and their affordances..."

The first insight—*design for scale, localize for inclusion*—is the core overarching insight for policymakers. To achieve this, attention needs to be paid to insights two and three. Localization of TPD@Scale to meet a variety of teacher needs is operationalized through attending to the types of digital technologies available to teachers and their affordances, i.e., what they enable TPD implementers to do effectively if used in context-appropriate ways to meet professional learning needs. Similarly, continuous improvement is necessary for ensuring that localization is meeting needs and that technology choices remain appropriate as the context changes.

A. Design for scale, localize for inclusion

Scale is both integral to TPD@Scale and its end state. Scale for TPD@Scale is conceptualized as widespread use across different education systems through modifications of the Framework to create new versions that incorporate perspectives and needs at the national or policy level.

The likelihood of TPD@Scale contributing effectively to improving educational outcomes at scale is increased if the “core elements” of the program are maintained as implementers or practitioners adapt the program to make it more responsive to the learning needs of particular groups of teachers in their context. *A combination of fidelity to the core principles and flexibility for local conditions is necessary to take account of diversity.*

Successful implementation of TPD@Scale initiatives starts with a *shared vision for TPD* to inform planning at scale. The magnitude of this scaling may embrace all the teachers in a country or be limited to a province or region. The process is identical for both. The first step in realizing the shared vision is for TPD designers and implementers to interrogate and understand existing education structures and practices, along with ICT plans and uses, in the context into which the TPD@Scale initiative will be introduced. This will include exploration of issues such as support mechanisms for teachers, including the availability of suitably experienced mentors; opportunities for teachers to engage in peer learning; teachers access to technology and their level of digital competency; their prior experiences of TPD; and time made available for them to participate in TPD. Alongside this,

designers and implementers need to recognize that teachers' professional learning takes place in a wider setting that includes regional and national policies, curricula (including those for teacher



education), pedagogic approaches, structures and regimes for teacher assessment, career pathways, and mechanisms for recognizing and valuing participation in TPD. Successful use of the TPD@Scale model will pay attention to conditions and issues at a high level as well as those that are shaped by local conditions. This process will involve extensive consultation with stakeholders at multiple levels within the system to ensure alignment and shared educational goals. This includes teachers, school leaders, local officials, and key actors in national agencies and ministries.

This attention to the conditions of the system and consideration of the whole process of implementation is essential if the TPD@Scale initiative is to become successfully embedded in the system. It leads to conceptualization of the form of the core elements that are critical for sustained quality TPD experiences in an adapted TPD@Scale model.

Box 8. Realizing a shared vision

Programa de Actualización Curricular Docente en Ecuador (PACD) (TPD@Scale Compendium Profile 16)

A new National School Curriculum was introduced in Ecuador in 2016. For the new curriculum to be implemented successfully, all teachers across the country—approximately 205,000—needed to become familiar with the approaches and topics in the new curriculum. Building on previous blended and online programs offered through a public VLE (Moodle), policy makers decided that there was sufficient experience of online learning within the teaching workforce to utilize a wholly online program across the national education system. This use of a MOOC for a nationwide TPD program represented a new approach by the government.

The MOOC employed online forums for peer interactions and embedded expert guidance in the materials themselves, both cost-effective measures for working at scale. Evaluation of the program conducted by the regional education innovation and research center SUMMA (2022) confirmed that over 90% of Ecuador's teachers participated while pointing out the need to nuance the design moving forward to recognize the diversity of teachers' digital competencies and their differing professional needs. This is being followed up by SUMMA working in partnership with the Government of Ecuador on future iterations of the MOOC.

Box 9. Understanding the environment

GPE-KIX TPD@Scale Ghana ([Project Profile](#))

Adaptation of the TPD@Scale Framework for Ghana (see *Box 4*) was informed by detailed prior consideration of the teacher education ecosystem in Ghana as well as teachers' access to ICTs and confidence with digital literacies. For example, recent national policy mandates each school to establish a professional learning community in which teachers engage with peers in planning and discussing teaching practices. This offers an ideal space for sharing experiences and generating reflections on TPD activities. In addition, teachers are now required to complete TPD activities worth a certain number of points over each three-year period; TPD points are associated with learning hours. It was essential that the TPD@Scale courses aligned with these criteria to be eligible for inclusion on the National TPD Portal.

But within any scaled system there will be multiple levels of diversity. At the school level, there will be variations in physical and digital infrastructure, in priorities and practices, in the resources available, and in the nature of the school leadership. At the level of the teacher, there will be variation depending on each teacher's previous experiences of professional learning and teaching, the characteristics of their students (e.g., displaced students, students with disabilities or students from highly marginalized communities), and their students' learning needs. This means that it would not be appropriate for the adapted TPD@Scale Framework to be implemented with fidelity for all teachers. Rather, achieving impact with TPD consistently across these dynamic and varied settings with different groups of teachers requires an approach in which implementers, or practitioners themselves, further adapt the model to better fit the context at different levels while adhering to the core principles. This is critical to moving towards operationalizing TPD@Scale with equity.

"[L]ocalization can be conceptualized as being centrally driven... or locally initiated..."

Localization can be concerned with any of the core components of the Framework. It may relate to the use of ICTs for access as in the Honduras model, or it may relate to the materials that are adapted for different language, cultural, and practice needs as in the TESSA and TESS-India programs. It may relate to the form and intensity of support—in-person, synchronous or asynchronous online, through SMS or phone calls. In all localizations, the aim is to respond to diversity and move towards equity in TPD.

This localization can be conceptualized as being centrally driven as in Honduras (see *Box 10*) or locally initiated as in the Philippines (see *Box 11*). These are not discrete implementations of localization, and the Framework is sufficiently flexible that both can exist within any one program



as in TESSA (see Box 1). The centralized approach to localization requires close working with different communities of teachers to understand the opportunities and constraints to their active engagement with the TPD@Scale design. These understandings then inform adaptations of the Framework that improve the fit between it and local conditions. Adaptations are implemented centrally.

In the decentralized (bottom-up) approach to localization, practitioners make adaptations to the model appropriate to their context at school level or within a cluster of schools. This usually happens through their practice with the materials. It is an iterative process that is strengthened as they become more familiar with the affordances of the materials and the ICT tools available to them.

Box 10. Centralized localization of ICT access for equity

GPE-KIX TPD@Scale Honduras ([Project Profile](#))

Initial research for this program (see Section 3C) included exploration of teachers' access to digital tools and connectivity, one aspect of equity. Three groups of teachers were identified. The first group is made up of teachers who have complete access to devices and the internet. These teachers tend to live in large cities. The second group comprises teachers with a mobile phone but limited connectivity who work in small urban centers while the third group of teachers has mobile phones but very limited or no connectivity. This latter group almost all work in remote, socioeconomically and culturally disadvantaged communities.

Historically, many of the teachers in groups 2 and 3 have had no sustained regular TPD experiences. This led to the TPD@Scale Framework being adapted to offer three versions of each course for equity in teacher access and participation:

- Group 1: The TPD course is embedded in an online platform
- Group 2: The TPD course is available offline on a smartphone using the Moodle app
- Group 3: The TPD course is available online and offline using WhatsApp

The interactivity of the course was adapted so that it remains accessible and attractive on a phone's small screen.

Box 11. Decentralized localization for inclusion**TPD on Learning Delivery Modalities (LDM) During COVID-19 in the Philippines** ([Project Profile](#))

This program was implemented in the 2020-21 school year by the National Educators' Academy of the Philippines, the unit of the Department of Education responsible for professional development, to prepare school leaders and teachers for remote teaching and learning during school closures due to COVID-19. Around 40,000 school leaders and over 500,000 teachers participated in the program across the country.

A number of different forms of localization were enacted to enhance equity within the program. For example, in some districts professional learning communities (known as Learning Action Cells or LACs) were sub-divided to facilitate higher levels of interaction between coaches and teachers in the LAC. Schedules for LAC sessions were also varied according to teachers' other commitments, such as preparing for the opening of classes. LAC sessions were held fully online, blended or exclusively face-to-face depending on teachers' ICT access.

Decentralized localization is important for vertical scaling, i.e., deeper engagement by different groups of teachers. It is through adaptation that TPD programs can become appropriate to the needs of different subject teachers. Teachers and other practitioners can adapt the ideas and activities to their own discipline, to the needs of their own students, and to the specifics of their classroom. Through this

they ensure that the curriculum as experienced by learners (whether teachers or school students) draws on learners' knowledge and experiences within the teaching of the mandated curriculum (Bernstein, 1990). These multiple adaptations at different levels and for different purposes are made possible through the use of ICTs and facilitated when materials are openly licensed.

Box 12. Practitioner-led localization**Information and Communication Technology for Rural Education Development (ICT4RED) in South Africa** (TPD@Scale Compendium Profile 15)

This school-based TPD program from SchoolNet worked in a highly collaborative way with teachers across both primary and secondary schools in an under-resourced district in the Eastern Cape. Teachers, head teachers, and district officials were involved both in the co-design of the program and in continuous evaluation using a design science methodology. The program consisted of 10 modules made available to teachers offline on low-cost tablets. The modules were focused on teaching principles and were not subject- or phase-specific. Teachers acted as content co-creators to localize the module activities for their own subject and class. These were then shared across the schools.

However, there is a risk that adaptation changes the core components of the Framework in ways that make it less effective. This is more likely if implementers and practitioners are not familiar or proficient with the ideas of practice-based professional learning and how the affordances of ICTs can be deployed to support professional learning. In some circumstances it might be advantageous to consider a scaffolded approach to these adaptations drawing on a Vygotskian perspective (Vygotsky, 1978). The program might be designed at scale but implemented in phases, with continuous adaptation within phases and between phases to improve equity, quality, and efficiency as stakeholders and practitioners develop their understanding of how the components of the TPD@Scale Framework work together, on the one hand, and enhance their skills in designing and executing effective adaptations, on the other (*see Key Insight 3*).

B. Match technology choice with professional learning needs

TPD@Scale programs use ICTs as tools to facilitate design and implementation of large-scale TPD and to personalize TPD to meet the professional learning needs of different sub-groups of teachers. The affordances of ICTs enable efficiencies of scale in the overall design and support equity through local adaptation or localization to enlarge and enrich opportunities for all teachers to engage in meaningful TPD. Many express concern that there are tremendous inequalities in teachers' ownership and access to ICTs. However, the range of programs studied here suggests that ICTs are essential to scaling quality TPD in more equitable ways. Even when ICTs are not in the hands of teachers themselves, they have a role to play

in TPD programs in distributing and localizing content, in supporting experts and mentors, and so on.

However, ICTs need to be used in contextually appropriate ways to ensure that they create value and enhance equity. Using technology to scale TPD harnesses the ability of technologies to offer teachers across regions and hierarchies access to learning opportunities of consistent quality. Content (learning activities and pedagogic principles) is digitized for distribution and access although in the "final mile" teachers may access the content in a non-digital format, e.g., in hard copy, by radio or through face-to-face classes. Communication to various points in the system in multiple modes is enabled through digital technologies. This may be between peers or between teachers and mentors or coaches.

Selection of where in the program to use ICTs and which ICTs to use for inclusion must be a local decision informed by the available infrastructure, teachers' personal access (to devices and data), their level of digital competencies, and the professional learning activity. Teachers have diverse starting points and varied needs. This will influence the choice of ICTs. What is important is that a teacher has the digital competencies and resources (including affordable internet access) to effectively engage with the ICT tools, and that these tools are deployed in ways which enable their affordances to support teachers' learning.

Box 13. Selecting ICTs for remote coaching

TPD on Learning Delivery Modalities (LDM) During COVID-19 in the Philippines ([Project Profile](#))

Coaching of teachers for the LDM course (see *Box 11*) took place through different media depending on teachers' access to the internet. In general, remote coaching was done through chat groups, voice calls, and texting. But where a reliable internet connection was present, coaching videos were distributed through YouTube and a website was established for teachers to seek online coaching through a message board.

Box 14. Local choice of ICTs

Teacher Learning Centres (TLCs) in Indonesia ([Project Profile](#))

The TLCs in Indonesia (see *Box 2*) have local autonomy to adapt their provision to meet the professional learning needs of the teachers they serve. A key mechanism for such localization is the use of ICTs in ways that are context-appropriate and needs-based. Hence a range of online, blended, and face-to-face provision is found within and across TLCs. For example, instant messaging applications (WhatsApp, Telegram, etc.) are used for information-sharing, mentoring, and the conduct of online classes while online survey tools (Google) are used regularly to assess needs and conduct short assessments. However, the use of ICTs is not without challenges. One critical barrier to widespread adoption is the resistance of older teachers to using ICTs.

The choice of ICTs needs to be future-looking and alert to the logistics and costs of scaling. For example, over the past 15 years a number of programs have utilized SD cards in teachers' own mobile phones in low-resource contexts. This proved to be an excellent way to introduce and familiarize teachers with digital materials (Power, 2019) but there are considerable costs involved in scaling this approach and, more importantly, with sustaining it—updating the SD cards cannot be done remotely. More flexible solutions need to be considered, such as the use of offline apps as in the Honduras program (see *Box 10*), as well

as solutions that model to teachers ICT-enabled transformation in curriculum content and/or pedagogy that cannot be achieved without ICTs. This is the focus of the TPD program of the Connected Learning Initiative (CLIX) in India, which uses social learning principles to support teachers' professional growth (Charania et al., 2021) (see *Box 15*).

Box 15. Modelling practice with ICTs**The Connected Learning Initiative (CLlx) in India** (TPD@Scale Compendium Profile 10)

Launched in 2015 by the Centre for Education Innovation and Action Research at the Tata Institute of Social Sciences (TISS) with the help of funders and partners also in India, the TPD aspect of the CLlx program aims to improve teacher education and transform teacher practice in Mathematics, Science, and English in secondary schools working in under-resourced communities.

Teachers participate in a number of different types of learning experiences including independent study on a MOOC and professional learning communities on Telegram (school- or district-based), and try out new activities including problem-based learning with their students.

Evaluation of the program, and of subsequent work with the teachers during the pandemic, indicated that prior exposure to effective TPD with ICTs increased the likelihood of teachers adopting these forms of teaching and learning pedagogies, e.g., the use of instant messaging in a flipped classroom approach across home and community settings.

Finally, the emphasis on the power of ICTs does not preclude face-to-face learning sessions in TPD@Scale programs. Rather, it is important to consider where these face-to-face sessions might support greater inclusion compared to working in virtual spaces, and the balance between virtual and in-person interactions. For example, in TESS-India in-person classes complement peer-peer and peer-expert interactions in virtual spaces and are particularly valuable for those without easy

internet access or digital devices, while in ELLN Digital the primary form of peer interaction is through in-person meetings at the school.

"[T]he emphasis on the power of ICTs does not preclude face-to-face learning sessions in TPD@Scale programs."

Box 16. Blending to increase reach**Programa Nacional de Informática Educativa (PRONIE) in Costa Rica**

(TPD@Scale Compendium Profile 14)

This comprehensive program of professional development on educational use of ICTs for all teachers in Costa Rica maximizes reach by combining wholly online and face-to-face/blended offerings. One learning track consists of online courses that lasts 40 hours. Another 40-hour set of courses involves face-to-face sessions supported by digital content and tools, online and offline. Recent data indicate that over 90% of teachers in the country working in Grade 9 and below had engaged with the program. Completion and pass rates vary by mode: an average of 86% completed the face-to-face/blended courses, with 67% passing; 58% completed the online courses, on average, with 33% passing.

C. Act, evaluate, improve

Education settings are dynamic. They are constantly changing, frequently required to respond to shifts in policy, fluctuations in the environment—as we have seen during the pandemic—advances and availability of technologies, and changes in learners' needs. TPD systems and structures are no exception. Regular reliable evaluations or research inquiries need to be carried out to identify where adjustments to support improvement in quality, equity, and efficiency need to be made in the TPD model. This requires evidence relating to the process of implementation at different layers of the system to inform cycles of improvement.

Frequent evaluation and adjustment through cycles of improvement are also critical to sustainability. It is through collaboration in these cycles that the shared vision for TPD is developed and embedded within the system. Through participation in these cycles, the capacity and capabilities of relevant institutions, organizations, and actors are enhanced. This shift away from traditional top-down TPD programs enhances understanding between policymakers and practitioners. This dynamic relationship is important in an environment that encourages local adaptations that might be fed back into the larger system. It is crucial that teachers' voices are recognized in these cycles of improvement; regular feedback from individual teachers, their unions, subject associations, and other relevant professional bodies is essential. Technology can play a role here, enabling feedback from diverse groups of teachers across the system.

One methodology that has been successfully deployed is improvement science. Originally used in manufacturing, then in the healthcare sector, this methodology and associated tools have recently been used across a variety of educational

contexts (Bryk, 2015). In essence, it consists of developing theories around improvement, testing small changes in rapid cycles, generating data to ascertain if these changes are resulting in improvement, and then sharing the changes more widely across the system. What is critical here is an understanding that if the change has not led to any improvement, the change is abandoned or not pursued and alternative changes are explored. This should not be considered a failure—it is part of learning what will work under these particular conditions.

Implementation of improvement cycles or other similar methodologies can take place at multiple levels within the system. It might be driven centrally through the system or it might be undertaken at local level as in the example from the Philippines where it is occurring at division, district, and school levels, the latter within professional learning communities (*see Box 17*).

The improvement science approach generates shared working practical knowledge about what works better in some places than others. Evidencing these variations helps to understand how local conditions shape the implementation of the program change and how it might need to be adapted to work under different conditions. Thus, the methodology helps to inform scaling by providing evidence from different conditions that can be drawn on in the design of the model as in the case of the GPE-KIX TPD@Scale project (*see Box 18*).

In addition, it supports adaptive integration as the program moves into new conditions either as it expands to new contexts or the environment changes due to new policies, conditions external to education such as humanitarian crises, or the emergence of new digital technologies. This culture of improvement strengthens the system and moves provision towards the goals of equity, quality, and efficiency. It recognizes the mutuality

in the relationship between the Framework and the context: the context influences how individuals and organizations engage with TPD@Scale while in turn the ideas, tools, and practices of TPD@Scale influence local practice, thereby enhancing capacity. This approach also recognizes

that practice change takes time, whether this is in individual teachers' classrooms or in the ways in which they collaborate. Practice is socially and historically embedded in the complex stable education systems found across most of the world. Shifting these practices is difficult work.

Box 17. Using improvement science approaches for continuous improvement

ELLN Digital in the Philippines (TPD@Scale Compendium Profile 17)

Plan-Do-Study-Act (PDSA) improvement cycles were integrated at the school and division levels into the national scale-up of ELLN Digital that began in 2019. Supported by a readiness assessment regime (see *Box 2*), PDSA cycles were focused on identifying and analyzing problems encountered by teacher-learners, and the division coaches assigned to them, as they went through each of the five modules of the ELLN Digital course, and then devising and enacting real-time solutions suited to their capacities and contexts. Each module took roughly two weeks to complete. The goal of the PDSA cycles was to improve the teachers' course experience from module to module.

Box 18. Improvement science to inform scaling

GPE-KIX TPD@Scale in Ghana, Honduras and Uzbekistan

This project is using improvement science to understand how to adapt and implement the TPD@Scale Framework in three very different contexts: Ghana, Honduras and Uzbekistan. In each context, initial interrogation of the policy environment and teacher practice with ICT has informed a country-specific adapted TPD@Scale model that aligns with existing or future education structures. In the first field test in 2021, the basic stability of this model was tested. This was the first PDSA cycle, which led to adaptations in the country model. In the second field test in 2022, more extensive PDSA cycles are being used to understand how variations in the model improve efficiency, equity, and quality with different subgroups of teachers. This will inform the final country TPD@Scale model, ensuring it has sufficient flexibility in appropriate components to enable decentralized or bottom-up localization.



05

Recommendations for Policymakers, Program Designers, and Funders

1. Generate a renewed shared vision of TPD as career-long, situated in practice, and accessible to all teachers.

In many contexts this will involve a paradigm shift in how teacher education is conceptualized and designed: a move away from sporadic programs or initiatives, with a highly specific focus usually delivered through external workshops, to a set of regular practices that are personalized and integrated into teachers' professional lives in their place of work.

Many current TPD structures were designed before educators were fully aware of the importance of relationships to learning, i.e., social learning. There is a growing body of research demonstrating that effective TPD is collaborative, classroom-focused, and intensive. These features need to be central to the renewal of TPD.

It will also involve a shift from perceptions of TPD as meeting "deficits" in teachers towards a position in which regular sustained professional learning experiences are an integral part of being a teaching professional.

It is important that teachers are full participants in the renewal process for TPD. Their professional needs, priorities, and practices are critical inputs to the process. Policymakers and other key stakeholders must establish mechanisms for engagement with members of the education workforce to ensure that there is co-ownership of the TPD@Scale models generated from the TPD@Scale Framework and subsequent evaluation and improvement actions.

For the vision for TPD to be sustainable, it should be fully congruent with the national education system and anticipate reform plans. It is essential to recognize that education systems are complex, with complicated patterns of multiple interdependent relationships. Thus,

the TPD vision should align with frameworks for professional standards, career pathways, teacher education curricula, accountability mechanisms, etc. It should be appropriate for teachers at different stages of their careers and include provision for those who work with teachers as mentors, tutors, and facilitators such as school leaders and district officials. These actors need to be empowered to facilitate and nurture a culture of collaboration and to make available space and resources for TPD.

2. Use the TPD@Scale Framework to create models for TPD that contribute to realizing the vision for TPD.

The TPD@Scale Framework provides a guiding blueprint for the design and implementation of high-quality, equitable, and efficient TPD for large numbers of teachers including those in low-resource contexts. It supports incremental improvement in TPD experiences for all teachers.

However, education systems are highly complex and use of the TPD@Scale Framework must involve consideration of existing structures, education priorities and, critically, resourcing levels. Its use needs to be informed by a deep understanding of the education ecosystem.

- What structures can be harnessed by the TPD@Scale Framework?
- What structures would a TPD@Scale model support?
- What are current TPD practices and institutional arrangements?
- How much capacity to support TPD is available within the system?
- Which ICTs are available? Which are affordable?
- What are teachers' current competencies with digital technologies?

The resulting TPD@Scale model should align with existing structures and practices to help sustainability yet be sufficiently flexible to allow for adaptation, both centralized and decentralized (user-led), to meet diverse teacher professional learning needs in contextually appropriate ways at different times. This adaptation to local practices, knowledge, resourcing levels, and needs is critical for quality and equity in TPD.

ICTs are a key part of the TPD@Scale Framework. Hence it is important to concurrently advocate for investment in ICT infrastructure to ensure that all teachers (and their students) benefit from the affordances of ICTs. When there is advocacy for low-cost ICTs, it is important to consider the total cost of ownership and sustainability to avoid the risk of exacerbating inequalities and inappropriate use.

3. Implement continuous or regular adaptive improvement of TPD systems or programs.

While the design of TPD@Scale programs is important, it is necessary to pay equal attention to implementation of these programs—to

understand what is working in a particular context and how different features of the program work together in diverse settings. Education systems are complex, multi-level, and constantly dynamic. Hence implementation needs to be supported through constant cycles of improvement. Implementers need to work in partnership with teachers and teacher educators to develop capacity and shared ownership of action improvement cycles at multiple levels. These improvement cycles must be focused on evaluation criteria linked to equity, quality, and efficiency in TPD.

Funders need to provide support for this continuous evaluation and to encourage the use of appropriate qualitative and/or quantitative methods. It may be appropriate to use new ICT-based approaches such as learning analytics in the evaluation process. Funding should also be available to enable wider dissemination of the findings to build the knowledge base on use of the TPD@Scale Framework and implementation of TPD@Scale models in a range of different systems, including resourcing implications.



REFERENCES

- Alexander, R. J. (2008). *Essays on pedagogy*. Routledge.
- Bau, N., & Das, J. (2017). *The misallocation of pay and productivity in the public sector: Evidence from the labor market for teachers*. (Policy Research Working Paper 8050). World Bank.
- Bernstein, B. (1990). Social class and pedagogical practice. In *Class, Codes and Control: Volume 4 The Structuring of Pedagogic Discourse* (pp. 63-93). Routledge.
- Biesta, G. (2015). What is education for? On good education, teacher judgement, and educational professionalism. *European Journal of Education*, 50(1), 75-87. <https://doi.org/10.1111/ejed.12109>
- Boateng, P., & Wolfenden, F. (2022a). *TPD@Scale briefing note: Assessment in large-scale teacher professional development programs*. Foundation for Information Technology Education and Development.
- Boateng, P., & Wolfenden, F. (2022b). *TPD@Scale briefing note: Moving towards successful teacher professional development in the Global South*. Foundation for Information Technology Education and Development.
- Bold, T., Filmer, D., Martin, G., Molina, E., Stacy, B., Rockmore, C., Svensson, J., & Wane, W. (2017). *Enrollment without learning: Teacher effort, knowledge, and skill in primary schools in Africa*. *Journal of Economic Perspectives*, 31(4), 185-204.
- Boud, D. (2000). Sustainable assessment: Rethinking assessment for the learning society. *Studies in Continuing Education*, 22(2), 151-167. <https://doi.org/10.1080/713695728>
- Boud, D., & Brew, A. (2017). Learning to teach as the development of practice. In B. Leibowitz, V. Bozalek, & P. Kahn (Eds.), *Theorising learning to teach in higher education: Sociomaterial, social practice and realist approaches* (pp. 77-92). Routledge.
- Brodie, K., Lelliott, A., & Davis, H. (2002). Forms and substance in learner-centred teaching: Teachers' take-up from an in-service programme in South Africa. *Teaching and Teacher Education*, 18(5), 541-559.
- Bruns, B., & Luque, J. (2014). *Great teachers: How to raise student learning in Latin America and the Caribbean*. World Bank Group.
- Bryk, A. (2015). Accelerating how we learn to improve. *Educational Researcher*, 44(9), 467-47.
- Burns, M. (2021). *Technology in education* [Background paper]. 2023 Global Education Monitoring Report. UNESCO.
- Butcher, N., & Hoosen, S. (n.d.). *The cost-effectiveness of digital learning: Lessons from educational experiences in Africa*. Unpublished manuscript.
- Charania, A., Bakshani, U., Paltiwale, S., Kaur, I., & Nasrin, N. (2021). *Constructivist teaching and learning with technologies in the COVID-19 lockdown in Eastern India*. *British Journal of Educational Technology*, 52, 1478-1493.
- Clarke, D., & Hollingsworth, H. (2002). *Elaborating a model of teacher professional growth*. *Teaching and Teacher Education*, 18, 947-967.
- Cobb, P. (1999). Cognitive and situated learning perspectives in theory and practice. *Review of Research in Education*, 28(2). <https://doi.org/10.3102/0013189X028002004>
- Coburn, C. E. (2003). Rethinking scale: Moving beyond numbers to deep and lasting change. *Educational Researcher*, 32(6), 3-12.
- Coburn, C.E., Catterson, A. K., Higgs, J., Mertz, K., & Morel, R. (2013). *Spread and scale in the digital age: A memo to the John D. and Catherine T. MacArthur Foundation*.
- Cook, S.D.N., & Brown, J.S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10, 381-400. <http://dx.doi.org/10.1287/orsc.10.4.381>
- Crisp, M., Safford, K. & Wolfenden, F. (2017) *It takes a village to raise a teacher: The Learning Assistant programmes in Sierra Leone*. The Open University, UK and Plan International.
- Cross, S., Adinolfi, L., & Wolfenden, F. (2019). *TESS-India: An approach to supporting teacher development and improving classroom practice*. The Open University, UK.
- Crossley, M. (2019). Policy transfer, sustainable development and the contexts of education. *Compare: A Journal of Comparative and International Education*, 49(2), 175-191. <https://doi.org/10.1080/03057925.2018.1558811>
- Cuban, L. (2013). Why so many structural changes in schools and so little reform in teaching practice? *Journal of Educational Administration*, 51(2), 109-125. <http://dx.doi.org/10.1108/09578231311304661>
- Darling-Hammond, L., Hylar, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.
- Elmore, R.F. (1999). Getting to scale with good educational practice. *Harvard Education Review*, 66(1), 1-26. <https://doi.org/10.17763/HAER.66.1.G73266758J348T33>
- Elmore, R.F. (2008). Leadership as the practice of improvement. In D. Hopkins, D. Nusche, & B. Pont (Eds.), *Improving school leadership, volume 2: Case studies on system leadership*. <https://doi.org/10.1787/9789264039551-en>
- Fenstermacher, G. D., & Richardson, V. (2005). On making determinations of quality in teaching. *Teachers' College Record*, 103(6), 1013-1055. <http://dx.doi.org/10.1111/j.1467-9620.2005.00462.x>
- Fenwick, T. (2009). Making to measure? Reconsidering assessment in professional continuing education. *Studies in Continuing Education*, 31(3), 229-244. <https://doi.org/10.1080/01580370903271446>

- Ferrer-Wreder, L., Adamson, L., Kumpfer, K. L., & Eichas, K. (2012). Advancing intervention science through effectiveness research: A global perspective. *Child Youth Care Forum, 41*, 109-117. <https://doi.org/10.1007/s10566-012-9173-y>
- Fletcher-Campbell, F., & Soler, J. (2022). *TPD@Scale briefing note: The evaluation of "equity" within TPD@Scale*. Foundation for Information Technology Education and Development.
- Global Education Evidence Advisory Panel (2020). *Cost-effective approaches to improve global learning: What does recent evidence tell us are "smart buys" for improving learning in low- and middle-income countries? Recommendations of the Global Education Evidence Advisory Panel*. World Bank, UK Foreign Commonwealth and Development Office and Building Evidence in Education.
- Guskey, T.R. (2002). *Professional development and teacher change. Teachers and Teaching: Theory and Practice, 8*(3/4).
- Hargreaves, A. (2010). Presentism, individualism, and conservatism: The legacy of Dan Lortie's "Schoolteacher: A sociological study". *Curriculum Inquiry, 40*(1), 143-154.
- Hargreaves, A., & O'Connor, M.T. (2017). Cultures of professional collaboration: Their origins and opponents. *Journal of Professional Capital and Community, 2*(2), 74-85. <https://doi.org/10.1108/JPC-02-2017-0004>
- Kennedy, M. (2016). How does professional development improve teaching? *Review of Educational Research, 86*(4), 945-980.
- Kim, J.S., Burkhauser, M.A., Quinn, D.M., Guryan, J., Kingston, H.C., & Aleman, K. (2017). *Effectiveness of structured teacher adaptations to an evidence-based summer literacy program. Reading Research Quarterly, 52*(4), 443-467.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511815355>
- McDonald, S-K., Keesler, V-A., Kauffman, N. J., & Schneider, B. (2006). Scaling-up exemplary interventions. *Educational Researcher, 35*(3), 15-24. <https://doi.org/10.3102/0013189X035003015>
- McLean, R., & Gargani, J. (2019). *Scaling impact: Innovation for the public good*. Routledge and International Development Research Centre.
- Morel, R., Coburn, C., Catterson, A., & Higgs, J. (2019). The multiple meanings of scale: Implications for researchers and practitioners. *Educational Researcher, 48*(6), 369-377. <https://doi.org/10.3102/0013189X19860531>
- Murphy, P. (2008). Gender and subject cultures in practice. In P. Murphy, & K. Hall (Eds), *Learning and practice: Agency and identities*. SAGE Publications and The Open University, UK.
- Naylor, R., & Sayed, Y. (2014). *Teacher quality: Evidence review*. Department of Foreign Affairs and Trade, Government of Australia.
- Ndaruhutse, S. (2022). *TPD@Scale briefing note: Cost-effectiveness: Considerations for scaling teacher professional development*. Foundation for Information Technology Education and Development.
- OECD. (2021). *The state of school education: One year into the COVID pandemic*. <https://doi.org/10.1787/201dde84-en>
- OECD. (2005). *Education at a glance*.
- Opfer, V.D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*, 376-407. <https://doi.org/10.3102/0034654311413609>
- Passey, D. (2014). *Inclusive technology enhanced learning: Overcoming cognitive, physical, emotional and geographic challenges*. Routledge.
- Piper, B., Simmons Zuilkowksi, S., Kwayumba, D., & Strigel, C. (2016). *Does technology improve reading outcomes? Comparing the effectiveness and cost-effectiveness of ICT interventions for early-grade reading in Kenya. International Journal of Education, 49*, 204-214.
- Popova, A., Evans, D., Breeding, M. E., & Violeta, A. (2018). *Teacher professional development around the world: The gap between evidence and practice (Policy Research Working Paper No. 8572)*. World Bank.
- Power, T. (2019). *The EIA approach to teacher development. In I. Eyres, R. McCormick, & T. Power (Eds.), Sustainable English language teacher development at scale: Lessons from Bangladesh (pp. 67-78)*. Bloomsbury Academic.
- Priestley, M., Biesta, G. J. J., & Robinson, S. (2015). *Teacher agency: An ecological approach*. Bloomsbury.
- Pyhältö, K., Pietarinen, J., & Soini, T. (2014). Comprehensive school teachers' professional agency in large-scale educational change. *Journal of Education Change, 15*, 303-325. <https://doi.org/10.1007/s10833-013-9215-8>
- Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J. V. Wertsch, P. Del Río, & A. Alvarez (Eds.), *Sociocultural studies of mind (pp. 139-164)*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139174299.008>
- Scanlon, E., Sharples, M., Fenton-O'Creavy, M., Fleck, J., Cooban, C., Ferguson, R., Cross, S., & Waterhouse, P. (2013). *Beyond prototypes: Enabling innovation in technology-enhanced learning*. The Open University, UK.
- Schmid, R., Borokhovsi, E., Bernard, R., & Abrami, P. (2021). *Meta-analysis of studies comparing classroom instruction to online learning, blended learning, and flipped classrooms for pre-service and in-service teachers*. Manuscript in preparation.
- Schwille, J., Dembélé, M., and Schubert, J. (2007). *Global perspectives on teacher learning: Improving policy and practice*. UNESCO International Institute for Educational Planning.

- Sellar, S., & Lingard, B. (2013). The OECD and global governance in education. *Journal of Education Policy*, 28(5), 710-725. <https://doi.org/10.1080/02680939.2013.779791>
- Siemens, G., Gašević, D., & Dawson, S. (2015). *Preparing for the digital university: A review of the history and current state of distance, blended, and online learning*. Athabasca University.
- Stone Wiske, M., & Perkins, D. (2005). Dewey goes digital: Scaling up constructivist pedagogies and the promise of new technologies. In C. Dede, J. P. Honan, & L. C. Peters (Eds.), *Scaling up success: Lessons from technology-based educational improvement*. Jossey-Bass.
- SUMMA. (2022). *Teacher professional development supported by information and communication technologies: A case study of the 2016-2018 Teacher Training Program for Curricular Update in Ecuador*. SUMMA and Foundation for Information Technology Education and Development.
- Tarisayi, K., & Manhibi, R. (2017). Social media tools in education: A case of WhatsApp use by heritage studies teachers in Zimbabwe. *Greener Journal of Social Sciences*, 7, 34-40. <https://doi.org/10.15580/GJSS.2017.4.082217108>
- Timperley, H., & Alton-Lee, A. (2008). Reframing teacher professional learning: An alternative policy approach to strengthening valued outcomes for diverse learners. *Review of Research in Education*, 32(1), 328-369. <https://doi.org/10.3102/0091732X07308968>
- TPD@Scale Coalition for the Global South. (2019). *A landscape review of TPD@Scale*. Unpublished manuscript.
- TPD@Scale Coalition for the Global South. (2021). *Policy brief: Designing teacher professional development @scale for equity in education*. Foundation for Information Technology Education and Development.
- TPD@Scale Coalition for the Global South. (2022). *Scaling ELLN Digital*. Manuscript in preparation. Foundation for Information Technology Education and Development.
- Torrance, D., Forde, C., King, F., & Razzaq, J. (2021). *What is the problem? A critical review of social justice leadership preparation and development*. *Professional Development in Education*, 47(1), 22-35.
- Twining, P., Raffaghelli, J., Albion, P., & Knezek, D. (2013). Moving education into the digital age: The contribution of teachers' professional development. *Journal of Computer Assisted Learning*, 29, 426-437.
- UNESCO. (2016). *Global Education Monitoring Report 2016: Education for people and planet: Creating sustainable futures for all*.
- UNESCO. (2018). *Global Education Monitoring Report 2019: Migration, displacement and education: Building bridges not walls*.
- UNESCO. (2020). *Global Education Monitoring Report 2020: Inclusion and education: All means all*.
- UNESCO Institute for Statistics. (2016, October). *The world needs almost 69 million new teachers to reach the 2030 education goals* (UIS Fact Sheet 39).
- Vavrus, F., & Bartlett, L. (2012). Comparative pedagogies and epistemological diversity: Social and materials contexts of teaching in Tanzania. *Comparative Education Review*, 56(4), 634-658.
- VVOB. (2021). *Putting SDG4 into practice: Moving education innovations from pilot to scale*. (Technical Brief No. 6).
- VVOB, Brookings Center for Universal Education, Educate!, MSI, Pratham, & STiR Education. (2021). *Education scalability checklist*.
- Vygotsky, L. S. (1987). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Walls, E., Tulloch, C., & Holla, A. (2020). *Cost measurement guidance note for donor-funded education programming*. United States Agency for International Development.
- Wegerif, R. (2007). *Dialogic, education and technology: Expanding the space of learning*. Springer.
- Wolfenden, F. (2015). *TESS-India OER: Collaborative practices to improve teacher education*. *Indian Journal of Teacher Education*, 1(3), 33-48.
- Wolfenden, F. (2021). *Innovations in teacher policy and practice for education recovery [Concept note]*. International Task Force for Education 2030 Policy Dialogue Forum, Kigali.
- Wolfenden, F., & Adinolfi, L. (2019). *An exploration of agency in the localisation of open educational resources for teacher development*. *Learning, Media and Technology*, 44(3), 327-344.
- Wolfenden, F., Cross, S., & Henry, F. (2017). *MOOC adaptation and translation to improve equity in participation*. *Journal of Learning for Development*, 4(2).
- World Bank Group. (2016). *Developing a proficient and motivated teacher workforce in the Philippines* (World Bank Other Operational Studies 24746).
- World Bank Group. (2020). *World development indicators*.

ABOUT THE AUTHOR

Freda Wolfenden is a Professor of Education and International Development in the Faculty of Wellbeing, Education and Language Studies of The Open University in the United Kingdom. Prof. Wolfenden has deep and extensive experience engaging with and examining education systems in the Global South, with a particular focus on enhancing teacher learning and the ways in which new technologies can influence pedagogy and teacher change especially at scale. She has played an instrumental role in three of the TPD@Scale initiatives cited in this working paper: Principal Investigator of the GPE-KIX Ghana, Honduras, and Uzbekistan project, which is still ongoing; Academic Director of the TESS-India program; and Director of the TESSA program. She continues her work on TPD@Scale with an ongoing study of the possibilities and limitations of scaling quality teacher professional development across the Global South. Concurrently, she is leading projects in six developing countries that apply improvement science principles to strengthen school leadership. At The Open University, she has directed several teacher education programs including the online teacher professional development program teachandlearn.net.



TPD@Scale Coalition for the Global South Secretariat
Foundation for Information Technology Education and Development
Email: tpdatscalecoalition@fit-ed.org
Website: <https://tpdatscalecoalition.org>

