

KEY POINTS

- ADB's developing member countries (DMCs) continue to face challenges in teacher education reforms. Innovative approaches are required to optimize reforms within available resources.
- In many DMCs more support is needed for pre-service teacher education to achieve sustained improvements in teaching and learning, especially to enhance student learning.
- Professional learning communities in teacher education can focus on how information and communication technology (ICT) can be used to provide teachers with ongoing professional support.
- The versatile use of ICT skills to promote hybrid professional development should be part of all teacher education programs.
- Practicums have an important place in teacher education. Their use in different countries offers insights on how they can be structured, how they can link theory with practice, and how they can be organized and guided.

Challenges and Opportunities in Teacher Education Reforms

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This brief draws on the outputs of Asian Development Bank (ADB) technical assistance (TA) for Teacher Quality Analysis, implemented in 2021–2022. These outputs included a comprehensive literature review on global trends in teacher education reforms, and field studies on teacher education in four countries: Finland, Singapore, Sri Lanka, and Uzbekistan. Drawing on these studies, the TA project designed and delivered online training programs on teacher education reforms for participants in Sri Lanka and Uzbekistan. This brief highlights key findings and recommendations from the studies, and identifies potential areas for future ADB support of teacher education in its developing member countries (DMCs).

REVIEW OF GLOBAL LITERATURE ON TEACHER EDUCATION: KEY FINDINGS

Teaching can be an attractive profession, with positive status and competitive compensation policies. It is crucial to attract the best candidates as countries with strong learning outcomes such as Finland, the Republic of Korea, Singapore, and more recently Estonia, have demonstrated. Teacher education should be equally accessible to people from different backgrounds, to make it attractive to all. The application and selection process for entry to teacher education should be transparent and equitable. Teaching can be promoted as an attractive, highly respected profession, by using new research and evidence on teaching and learning. Effective teachers should also be recognized for their positive impact on student learning.

Teacher feedback and appraisals are important: they must be fair, transparent, and systematically organized, following established research-based standards. Several countries have developed a professional code of conduct for teachers, to accompany their teacher standards. While the standards set out expectations for teachers'

professional competencies, a code of conduct developed and supported by teachers can help to communicate what these expectations mean in day-to-day practice, and with regard to integrity and disposition. While many of the desired competencies are universal, they are affected by cultural, social, and teaching contexts. Using standards to benchmark performance and assess progress can motivate all teachers.

Quality initial teacher education includes a strong practicum component, to help teachers perform effectively as part of their professional learning communities.

Teacher education should enable effective teaching. Data from the Programme for International Student Assessment¹ shows a positive relationship between teacher qualifications and student learning: even after considering socioeconomic factors, students tend to perform better in schools with more fully certified teachers who also possess master's degrees.

The concept of a school as a learning organization (see examples below) is gaining popularity in education: teachers are considered part of a school's professional learning community, with high levels of collaboration, coherent activities in professional development, and shared practices. Professional learning communities provide teachers with structures and resources to follow inquiry-based professional development practices, such as action research, lessons study, and diverse learning circles focused on different topics, e.g., (i) curriculum innovation, (ii) student-centric teaching practices, (iii) new uses of information and communication technology (ICT), (iv) collaborative lesson planning, and (v) project-based learning.² Teamwork, including teacher-teams with various responsibilities, and co-teaching (e.g., multiple teachers in one classroom, or senior students as teaching assistants), can facilitate learning. Teachers should be highly competent in ICT, and effective team workers who share responsibilities in a learning organization and collaborate with each other. These goals require an aligned, integrated teacher education curriculum.

Weak quality assurance and unarticulated career opportunities, combined in some countries with sparsely distributed populations across a large territory, have led to a wide variety of initial teacher education providers with differing levels of quality. A common national position on the content of teacher education should be established as an important policy. Research-based teacher education and a normative curriculum as part of a continuum should be designed for early childhood, pre-primary, primary, and secondary education. The content and goals of the comprehensive education curriculum should be included in initial teacher education.

Ensuring teacher quality requires, for example, the recruitment of top graduates who are motivated to teach and more importantly, who want to develop themselves to become high-quality instructors over a 10–15-year period. In initial teacher education, student teachers need opportunities for extensive practice. High-performing systems integrate a substantial practical component within their initial teacher education through a network of practicum schools, to develop classroom management skills, and linking pedagogical theory with practice. Practicums already established in developed and developing countries should be examined: key elements for study include (i) their structure, location, and duration, (ii) how they combine theory and practice, (iii) how they are organized, and (iv) whether mentors have been trained.

Well-organized and scheduled continuing professional development for all teachers supports career progression.

The development of teachers' professional competence is increasingly important. Teacher education should be seen as a lifelong learning process, and there should be a clear continuum through which teachers can update their professional skills throughout their careers. It is particularly important to anticipate teachers' future needs for skills and training, to help prepare for them.

Continuing professional development (CPD) should be tailored, practical, and focused on improving the instruction-teaching process. A country's national central planning office, in collaboration with the planning division in the Ministry of Education (MOE) or other similar agency, should be responsible for developing and improving strategies to support the implementation of all government-funded CPD under one framework. It is also important for them to partner with other local institutions (e.g., universities and/or statistical agencies) that have the capacity to undertake labor force demand analysis and forecasting.

Collecting data on the contents and availability of CPD programs is necessary to avoid fragmented approaches, since education providers might not be fully aware of the overall aims of CPD. The CPD activities should be tailored to a teacher's individual needs, while training should be relevant, effective, and aligned with career progression. To encourage teachers toward professional development, many countries link participation in training and improved competencies with greater compensation and/or promotion along a performance-based career path. CPD can become an integral part of the teacher appraisal system.

¹ Organisation for Economic Co-operation and Development (OECD) and United Nations Children's Fund (UNICEF). 2021. *Education in Eastern Europe and Central Asia: Findings from PISA*. Paris. <https://search.oecd.org/education/education-in-eastern-europe-and-central-asia-ebbeb179-en.htm>.

² ADB. 2021. *Teacher Professional Development Case Studies: K-12, TVET, and Tertiary Education*. Manila. <https://www.adb.org/publications/teacher-development-case-studies>; A. Bautista, J. Wong, and S. Gopinathan. 2015. Teacher Professional Development in Singapore: Depicting the Landscape. *Psychology, Society, and Education* 7(3): pp. 311–326. doi:10.25115/psyse.v7i3.523. https://www.researchgate.net/publication/301225638_Teacher_Professional_Development_in_Singapore_Depicting_the_Landscape; and S. Vieluf, D. Kaplan, E. Klieme, and S. Bayer. 2012. *Teaching Practices and Pedagogical Innovations: Evidence from Teaching and Learning Survey (TALIS)*. Paris: OECD. [https://www.oecd.org/education/school/TalisCeri%202012%20\(tppi\)--Eb.ook.pdf](https://www.oecd.org/education/school/TalisCeri%202012%20(tppi)--Eb.ook.pdf).

Teachers' ICT and digital technology competencies are widely used and continuously developing to make students' learning more effective. All teachers need to realize the potentials for ICT-based pedagogy in classrooms with the use of different educational tools, particularly the promising development of new generation adaptive learning or personalized learning technologies. Thus, ICT skills and their versatile use should be part of initial teacher education, and an important topic in CPD to continue building on this development.

Simply using ICT does not change teaching and learning; more understanding is needed on what kind of use of ICT enhances student learning. As the pandemic has shown, the more teachers have evidence of its impact, the more likely they are to use ICT. Another teacher-level factor identified as a moderate or strong predictor of teachers' ICT use is their digital competency. This suggests that the higher the teachers rate their digital competency, the more they will use ICT in their teaching. Therefore, deliberate efforts are needed to help teachers acquire these digital competencies.

One new development from the pandemic is that teachers' advanced competencies in ICT-based learning environments can help to support home-based schooling more effectively. Proper utilization of ICT for teaching and learning will continue to be important in the post-COVID-19 era as pupils return to schools. It is also likely there will be exceptional situations in the future, requiring teachers to use their most advanced facilitation skills to keep schools operating. Strong abilities in ICT can help improve such resilience.

Early career support is available for novice teachers in forms compatible with local education systems. Mentoring and guidance are needed to support the beginning of a novice teacher's career. All education systems should build one solid model and decide on the principles of how to guide and motivate teachers. Adequate resources, appropriate learning materials, and suitable conditions for teaching including reasonable workloads, can all help teachers in their early careers. New developments, such as teaching at the right level and using data on learning, require schools and education systems to provide the necessary support for teachers to target lagging students. Novice elementary education teachers, especially those who teach many subjects, need quality instructional materials, induction programs, and subject mentors. More experienced teachers, principals, and university teacher educators can guide novice teachers.

TEACHER EDUCATION IN FINLAND AND SINGAPORE: COMPARATIVE PERSPECTIVES AND RECOMMENDATIONS

Recruitment of teachers. The fundamental difference between teacher education in Finland and Singapore lies in the type of degree awarded before entering the profession. In Finland, all

teachers are postgraduates. The teacher education in universities and associated teaching practice schools is research-based, leading to a master's degree. High levels of critical thinking and research skills prepare Finnish teachers to respond to uncertainties.

In Singapore, teachers may not be postgraduates. They may enter the National Institute of Education (NIE) to study diploma, undergraduate, or postgraduate programs in education; all these have varying entry prerequisites, but share a common quality assurance rigor that ensures the entry and retention of quality teachers. This allows more student-teachers to study at NIE and teach at various levels; but it also means the levels of proficiency, knowledge, and skills vary and are not comparable. However, in Singapore there is more emphasis on in-service training: the MOE regularly reviews the diverse needs for teachers' professional development, and coordinates with NIE to facilitate the required support.

Recommendations: Teachers should be qualified through higher education that meets rigorous international standards. Whether recruitment pathways lead to diploma, graduate, or postgraduate levels of qualification will depend on the capacity of countries' institutions in providing high-quality teacher education.

Teaching practicums and deployment of teachers. Guided teaching practice is an important part of K-12 teacher education in both Finland and Singapore.³ The practicum is one example of where student-teachers apply their theoretical knowledge of teaching. In both countries, the practicum is an important platform in teacher training to test the theory-praxis nexus. It is the step before teacher-graduates enter schools. In Finland, most of this practice is done in university teacher-training schools; in Singapore, it is undertaken in public schools.

Finnish teachers have a high level of autonomy. Thus, the Finnish system exhibits greater individual professional accountability when compared with the Singaporean system. However, as student-teachers differ as individuals, their understanding of the theory-practice nexus also varies. In contrast, practicums in Singapore go beyond the theory-praxis nexus by also requiring student-teachers to demonstrate specific competencies and values. The Singaporean approach is arguably much more structured, with more sessions, mentors, school visits, lesson observations, and specific items to study, which—though potentially overwhelming—can provide adequate support and references for both school mentors and student-teachers. Graduates from teacher training programs in Finland may apply to any schools they prefer; whereas in Singapore, the MOE controls deployments.

Recommendations: Practicums in schools should be part of the curriculum in teacher education. They need to be well-coordinated, and their importance should be emphasized. Having experienced teacher-mentors in schools to guide student-teachers during practicums can ensure accountability.

³ K-12 refers to the period from kindergarten to 12th grade, or the ages of approximately 5–18.

Retention, in-service education, and professional development of teachers. In Finland, the lack of coordination between different stakeholders providing in-service teacher education is identified as a challenge. The Finnish system leaves the responsibility for professional development to the individual teacher. On the other hand, such freedom of choice can be key to teacher retention. Teachers remain motivated because they can study more subject areas and find new pathways in teaching. Finnish teachers also have the freedom to choose where they want to teach; and school principals are responsible for the recruitment of teachers. By giving a lot of autonomy to teachers, the Finnish system encourages them to develop continuously as professionals.

In Singapore, teachers apply for in-service education and curriculum-related training. Other forms of developmental training are permissible, if relevant to their teaching subjects. The school staff developer aims to match a teacher's preferences to the school's strategic goals for deployment purposes; so teachers' developmental needs are still dependent on fulfilling schools' pragmatic needs. An important feature to help keep teachers in the workforce is an incentivized financial savings plan for retirement.

In Singapore, although teachers may choose from training courses offered by the MOE (e.g., how to teach a particular subject more creatively), there is still an arguably unnecessarily didactic approach to what is prioritized. Finland prepares teachers for lifelong learning through research-based teacher education, which gives high priority to continuing professional development that is guided by teachers' personal preferences.

With these differences, both Finnish and Singaporean systems advocate the idea of professional learning communities, which is an innovation that should be investigated further. This could include examination of the ways in which ICT can be used to provide teachers with ongoing professional support.

Apart from curriculum needs, in-service teacher education in Finland and Singapore is increasingly based on forms of action research. This means teachers can immediately rectify problems on the ground. The themes for research are usually current and based on scholarly reviews of literature. This helps professionalize the teaching workforce.

Recommendations: The professional development of a teacher can be based on the specific needs of both the teacher education system and the individual's competencies, informed by agreed regular assessments. Multiple opportunities for professional development should be provided in accordance with the needs identified by learning communities for individual teachers. A personal development plan should be agreed with teachers, and its implementation monitored; if necessary, the plan should be updated together with the school principal. The management of teachers' work should be developed by training school principals and administration staff. Action research has proven effective in helping teachers to reflect and continuously improve.

ICT and responsiveness to COVID-19. Perhaps because Singapore's schools are ultimately governed by the MOE, its centralized ICT coordination has proven to be effective and responsive, especially during COVID-19. Though schools have the autonomy to run their own home-based learning on a centralized platform, the MOE helps with resources for specific needs. In addition, Singapore was already holding e-learning days before COVID-19 emerged, so schools were equipped to handle home-based learning. The MOE has also been developing ICT master plans since 1997, demonstrating long-term planning from a policy perspective.

In Finland, young people are often more computer literate than teachers. The absence of any central ICT coordination results in disparate learning experiences for students across the country. However, ICT skills are taught as one of the transversal skills in their current curriculum for basic education. Schools have also appointed teachers as ICT tutors, to help build their colleagues' competencies in using digital technology for teaching. This was one of the highlights at schools during COVID-19, in contrast to professional development, as ICT tutor support has direct relevance for teachers' development needs.

Recommendations: Teachers should be constantly empowered to adapt to circumstances, so they can consistently support the education of students. This means that schools, or education ministries, should have sufficient funds to acquire relevant technologies that support learning and make teaching more effective.

State control versus personal autonomy. It is imperative to contextualize teacher education systems within the respective frameworks of government. The (political) governance creates the infrastructure and culture of teacher education. Finland's teacher education emphasizes freedom and autonomy; whereas Singapore's teacher education emphasizes structure, regulation, and coordination. Both systems have the potential to produce quality teachers to promote learning at schools.

Recommendations: The effectiveness of pre-service and in-service teacher education must be considered within the prevailing sociocultural and political contexts. This perspective should be taken into account when designing and targeting training for teachers.

TEACHER EDUCATION REFORM IN UZBEKISTAN

Uzbekistan inherited a relatively well-balanced education system from the former Soviet Union. Strong government commitment to keep education as a priority area has allowed the maintenance of a systemic approach to teacher training. The mandatory in-service teacher education system is well-structured and institutionalized, assuring universal accessibility for all teachers. Nevertheless, the

realities and challenges of the 21st century bring new demands for education in schools, and thus demands for further development of teacher education.

The Ministry of Public Education (MOPE) publishes estimates on the expansion of educational services, such as growth in the number of students and in demand for teachers. The latest estimates apply to 2022 and indicate that, with the current rate of annual population growth (1.5%–1.9%), the number of students in basic education grades 1–11 may increase to 8.5 million by 2030, from 6.2 million in 2022. The teaching force for these grades should increase from the current 500,000 to 675,000 by 2030. This will create demand for an annual enrollment of 20,000 students into pre-service teacher education. The system's capacity has strong potential to cover the current demand; but greater challenges include education quality, and the effectiveness of management in the existing education structures. The field study in Uzbekistan provided a detailed analysis of the reform efforts and further reform needs. The main findings and recommendations are presented in the following paragraphs and summarized in Box 1.

Challenges for pre-service teacher education. There is a focus on theoretical knowledge over practical competencies. Memorization of information dominates, while there is inadequate support for critical thinking and professional reflection. The selection of future

teachers is mostly based on formal recognition of knowledge they have obtained during university studies; the selection process does not assess candidates' abilities or suitability for a teaching career.

Bridging and apprenticeship programs hardly exist; those that do exist are inadequate to support young teachers at schools under the guidance of advanced and more experienced colleagues as mentors. Inductions of new teachers mostly focus on learning about regulatory rules, requirements, school procedures, and the education system. Advanced teachers are not encouraged to share their experiences with university students or newly recruited teachers or even if they do, the effectiveness of such activities is not researched or studied properly.

Challenges for in-service teacher education. In-service education is comprehensive in terms of institutional structures but fragmented in terms of learning outcomes. The link between the content of in-service teacher education and pre-service teacher education has been improving due to the current changes in the in-service education curricula for teachers.

Teachers sometimes used to lack motivation to improve their category level and participate in professional development programs. The mandatory in-service training system did not create incentives for professional development. However, current changes

Box 1: Uzbekistan Field Study: Key Recommendations to Improve Teacher Education in the Country

Prioritize the comprehensive implementation of professional standards. As these standards were developed only recently, they need further dissemination and operationalization. Procedures evaluating teachers should be improved to correspond with developments in teacher standards.

Expand training and capacity-building resources to support continuous professional development. The government has decided to depart from the approach of providing teacher retraining courses once every 5 years, to pursue continuous teacher development. To realize this intention, there is a need to expand training and capacity-building far beyond the current limits of teachers' in-service training institutions. In the present system, about 1,000 staff provide training to 100,000 teachers annually. To make professional development continuous and meaningfully intensive for all existing 500,000 teachers, there is a need to attract many more resources and reconsider approaches. Assisted by teachers in the highest assessment category, the total capacity of the in-service education system could increase by 17 times. With the help of first category teachers and district level methodology inspectors, the total capacity of this in-service education system could be extended to 100,000 qualified staff. With this effort, ideally the system could reach a ratio in schools of one mentor per 5–6 mentorships, including teacher-student-interns and young and less-qualified teachers.

Develop a specific capacity-building program for mentors, which could include on-the-job training, workshops, and materials. The education system should provide mentors with a tool kit, including mentoring training materials, methodologies, and mentorship performance assessment tools. Mentors' workload should be optimized with allocation of time for mentoring, and their evaluation should include new criteria, i.e., assessments of participants' performance under their mentorship.

Expand the role of in-service teacher institutions to include the development and implementation of pedagogical innovations. These institutions could offer a range of online and offline institute- and school-based short courses, consultancies, and interactive applications.

Consider priority areas for assistance from international development partners. Key areas for assistance could include normative legislation—the improvement of teaching standards and performance evaluation procedures for teachers; the improvement of teaching practice through the development of classroom management skills and competencies; and the development of quality instructional materials for teacher training and teacher evaluation.

Source: Authors.

mean that teachers can now receive a 25% increase in salary when taking part in professional development activities, which has increased their motivation to participate.

Infrastructure constraints. The current system of 10,000 schools serves 6.24 million pupils, but has only 5.06 million pupil seats available. One-third of the schools require renovation. Some 34% of all schools operate classes in one shift; 65% operate in two shifts; and 1% operate in three shifts.⁴ The average classroom capacity allows 25–30 students per class. However, because of high demands in overpopulated areas, sometimes schools accommodate more than 40 students in a class. It is a clear challenge for teachers to maintain the quality of education in such overcrowded classes. By 2030, an estimated increase in the student population of more than 2 million will create demand for extra capacity at existing schools, and the construction of about 1,000 new schools (a 10% increase in the current number) operating in two shifts.

Recent reform efforts. The system's response to these challenges of a teacher shortage has included efforts to improve teachers' competencies, and to expand the teaching force. To guide and support these efforts, the Law on Education was amended in 2020; this outlines the legal status of teachers and describes their rights, obligations, and social protection measures. Efforts have been made to improve textbooks, as well as the teaching of science, technology, engineering, mathematics (STEM) subjects, and foreign languages. After reviewing teachers' workloads, many irrelevant functions and duties were lifted. New universities, including universities for teacher training, were established; so the number of available places for admission to higher education programs almost doubled in 2021.

Addressing the issue of teacher quality, education authorities have initiated a number of measures. The MOPE developed teacher standards, detailing teachers' functions, knowledge, skills, and competencies. The State Inspection for Education Quality introduced a new system of teacher evaluation, which currently allocates 80% of scores to the assessment of subject knowledge. In a recent decision, the government demonstrated an intention to develop and implement the concept of continuous professional development for teachers.

TEACHER EDUCATION REFORM IN SRI LANKA

In Sri Lanka, the need to improve teacher education has been acknowledged. The Education Sector Development Plan for General Education⁵ covers 2018–2025 and promotes the quality of teaching in several ways. It focuses on improving competency,

upgrading national colleges of education to degree-awarding institutes, and further developing all teacher centers. It prioritizes the need to improve (i) teacher education, professional development, and management, and (ii) the teaching and learning environment, with digital tools. The former is related to teacher recruitment, deployment, and retention; while the latter is linked to the use of ICT in education. In recent years, the COVID-19 pandemic has shown that education needs to involve digital literacy. Yet many issues arise, e.g., ICT accessibility in remote areas, the availability and usability of hardware and software, and affordability.

Currently, Sri Lanka's general education system is undergoing reform. A report for the reform, by the Presidential Task Force on Sri Lankan Education Affairs emphasizes the need for teachers to know curricular principles and different approaches in teaching, and it highlights the importance of teachers' professional development, including an essential licensing system. The report also underlines the importance of (i) utilizing international experience in teacher development, (ii) recognizing teaching as the premier service, and (iii) supporting school-based teacher development. It invites the MOE to pursue digital education and expand ICT initiatives strategically within the government's policy framework.⁶

Another significant document, in its final stage of development, is the National Curriculum Framework for General Education.⁷ This recommends (i) converting courses at the national colleges of education into bachelor's degrees in education, (ii) developing a scientific teacher development framework, and (iii) establishing a national teacher empowerment unit, with local units attached to provincial boards of education.

While reforms of teacher education are being pursued in Sri Lanka, the field study provides a detailed analysis of these efforts and of further needs for reform. The main findings and recommendations are presented in the following paragraphs and summarized in Box 2.

There is no comprehensive and cohesive national policy on teachers' professional development. There should be cooperation and dialogue between policy makers, education institutions, and professional communities; all these stakeholders should share a common vision on teacher policy, and on teaching and learning in general. A shared vision is a solid base for a teacher education curriculum. Such a policy should cover the continuous professional development (CPD) of pre-service and in-service teachers, as well as their recruitment, deployment, and retention. There is also a need to eradicate gender disparities in recruitment, deployment, and retention.

⁴ MOPE estimates, 2022.

⁵ Government of Sri Lanka, Ministry of Education. 2017. *Education Sector Development Plan*. Colombo.

⁶ Presidential Task Force on Sri Lanka's Education Affairs. 2020. *Re-imagining Education in Sri Lanka. Summary report*. Colombo.

⁷ Government of Sri Lanka, Ministry of Education. 2020. *National Curriculum Framework for General Education in Sri Lanka*. Colombo.

Box 2: Sri Lanka Field Study: Summary of Key Recommendations to Improve Teacher Education in the Country

Develop and implement a national policy on professional development. This policy should guide all training programs for student and qualified teachers. It should also guide teacher recruitment, deployment, and retention, while eradicating gender disparities in these areas.

Establish a professional council to support teacher development, and introduce a national competency framework. These steps are important to help coordinate and structure education for teachers' professional qualifications and competence certifications.

Utilize profiles in teacher licensing. Preparing and using teacher profiles in pre-service and in-service teacher education would provide helpful input for the national teacher licensing system. It would help ensure the quality of teachers' performance, and their participation in continuous professional development (CPD) at different levels.

Expand the use of ICT and online technology for teacher education. ICT should be included in teacher development to benefit

teachers and their students; a national conceptual framework should be developed, fostering learner-friendly developmental aspects. Thus, ICT should be made generic in teacher education, and virtual pedagogy should be supported as much as possible to encourage peer- and self-directed learning in pre-service and in-service teacher education for CPD.

Strengthen teacher education through school-based teacher development. School-based action research should form part of the different modes of teacher education and work. Teachers can improve the quality of education through research, assignments, and other creative efforts to support authentic learning.

Establish a systematic, countrywide mentoring network to support teacher education. For mentoring, there is a need to develop an administrative and pedagogical policy framework supporting pre-service and in-service teacher education programs, and CPD. A mentoring network would make an important contribution to all these areas of teacher development.

ICT = information and communication technology

Source: Authors.

At the policy level, attention should be given to include language planning in education, aligned with the national language policy, and bilingual education in the curriculum of teachers' professional development.

Teaching as a profession could be promoted more effectively.

It is important to establish a professional council that helps structure teacher development with professional qualifications and competence certifications. It is vital to promote teaching as a profession, and to introduce a national professional competency framework, coordinated by NIE. This is necessary to help upgrade the quality of professional development courses for teachers that are delivered by all institutes across the country.

Teacher profiles can be useful in licensing. Institutes responsible for teacher education should introduce a policy of using teacher profiles in both pre-service and in-service teacher education, for the national teacher licensing system. This would help ensure the quality of teachers' performance, and their participation in CPD at different levels.

There is a need to expand the use of ICT and online technology for teacher education. The COVID-19 pandemic has increased the need to use education technology. To benefit teachers and students, there is an urgent need to include the use of ICT in teacher development, and to develop a national conceptual framework on this, which addresses learner-friendly developmental aspects. Thus, ICT should be made generic in any

teacher education program or curriculum, and virtual pedagogy should be supported as much as possible, to encourage peer- and self-directed learning-based assignments for pre-service and in-service teachers to sustain their CPD. ICT literacy and competencies should be fostered as 21st century skills, and training should also be provided for teacher educators on virtual pedagogy.

It is important to strengthen school-based teacher development. School-based action research is recommended to be part of the different modes of teachers' education and work. Teachers can readily improve the quality of education through research, assignments, and other creative efforts to support authentic learning.

Mentoring can support teacher development in a convenient way. Mentoring should become the leading mechanism for supporting teachers, and can be promoted in collaboration with relevant authorities. It is essential to develop teacher performance through CPD that deviates from the subject-focused programs and cascade model. A systematic countrywide network for mentoring is strongly recommended, combining its support for pre-service and in-service teachers and CPD. For mentoring, there is a need to develop an administrative and pedagogical policy framework that is integrated into the professional teacher development curriculum in colleges of education. The same approach is recommended for in-service teacher education and CPD.

CONTINUING SUPPORT FOR TEACHER EDUCATION

Developing countries will continue to need support in teacher education reform policy and planning, and in prioritizing certain aspects and implementing reforms in a manageable, phased manner. They face challenges in optimizing approaches to teacher education reform in the context of limited financial and human resources, so innovative strategies are needed.

The demand for support in reforming pre-service teacher education in particular can be explored more deeply in ADB DMCs. This is important given that, in many countries, substantial support is already provided by development partners to other areas of teacher education reform, such as in-service teacher education and CPD.

Professional learning communities that support teamwork among teachers represent an important development area in teacher education. Both the Finnish and Singaporean teacher education systems advocate the idea of professional learning communities, which is recommended for further investigation. This could include looking at ways to use ICT in providing teachers with ongoing professional support.

The versatile use of ICT skills should form part of teacher education. All teachers need to realize the potential of ICT-based pedagogy in the classroom, and be familiar with different educational tools. More understanding is needed about the types of ICT use that enhance student learning: the more teachers have evidence of its impact, the more they are likely to use it. Another teacher-level factor identified as a moderate or strong predictor of teachers'

ICT use is their digital competency: the higher teachers rate their digital competency, the more they will use ICT. Therefore, digital competency should be recognized as an important component of teachers' skills. Given the extensive shift to home-based schooling in many countries because of the COVID-19 pandemic, the demand for advanced competencies in ICT-based teaching and learning has greatly increased. Proper utilization of ICT for teaching and learning will continue to be important in the post-COVID-19 era.

Since practicums have an established position in teacher education, they should be examined more closely in a range of countries. Practicums are already an integral part of teacher education in Finland, Singapore, Sri Lanka, and Uzbekistan. The key elements for study include the structure, location, and duration of practicums; how they combine theory and practice; how they are organized; who provides guidance; and whether mentors have been adequately educated for their role.

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