SDG-Education 2030 Steering Committee

Ensuring quality teacher education: a key to building resilient education systems

July 2020

Abstract
Investing in quality pre-service teacher education or initial teacher education (ITE) will be key to building more resilient education systems post COVID-19. In addition, better preparing teachers for the classroom including innovation and problem solving to manage complex unforeseen situations is necessary. Likewise, investing in continuing professional development (CPD) and in-service education and training (INSET) to upskill under- or unqualified teachers will be increasingly critical to mitigate capacity weaknesses as well as ensure that working teachers are included in a system-wide reform of teacher education so that all teachers have the knowkedge and skills necessary to ensure no one is left behind.

Introduction

By mid-April 2020, almost every country across the world implemented nationwide school closures in response to the COVID-19 pandemic. These actions, while essential to containing the spread of the disease and protecting public health, could however further exacerbate the global learning crisis, with over 1.57 billion learners at all levels out of school, representing over 90% of the world's total enrolled student population. To date, the focus of the educational response has been on ensuring learning continuity through the mobilization of a range of high-, low-, and no-tech resources and modalities to bring learning content from school settings into learners' homes. The current health pandemic has however brought to light and exacerbated pre-existing inequalities within education systems where vulnerable and marginalized learners are disproportionately affected. This is best represented through the global digital divide where almost half of the world's learners are disconnected from the Internet resulting in significant educational disruption during school closures.

At the heart of these responses are the millions of teachers, principals, and other education personnel, who are the frontline workers during any crisis. SDG4.c underlines the role of increasing the supply of qualified teachers, yet even before the crisis, the global community was already significantly off track to deliver on this commitment. In the face of the COVID-19 pandemic, teachers across the globe have had to scramble to help their students navigate the world of distance learning, too often without sufficient guidance, training, support, and resources.

The short-term impact of the current pandemic on teachers' capacity to provide quality teaching and improve learning outcomes will be significant unless the immediate professional development needs of teachers are addressed as part of the COVID-19 response. However with the possibility of future crises, even greater sustained medium to long term investments will be required to achieve the Education 2030 agenda including SDG4 to leave no one behind. For teachers, investing in quality pre-service teacher education or initial teacher education (ITE) will be key to building more resilient education systems by better preparing teachers for the classroom including innovation and problem solving to manage complex unforeseen situations. Likewise, investing in continuing professional development (CPD) and in-service education and training (INSET) to upskill under- or unqualified teachers will be increasingly critical to mitigate capacity weaknesses as well as ensure that working teachers are included in a system-wide reform of teacher education so that all teachers have the knowkedge and skills necessary to ensure no one is left behind.

Teacher indicators in the SDG indicator framework

The UNESCO Institute for Statistics (UIS), which is the global respository for internationally comparable statistics on SDG4, estimated the world would need to recruit and train about 69 million teachers to reach universal primary and secondary education by 2030.

To meet global needs to monitor progress of the SDG4 targets, the UIS works regularly with national statistical offices and statistical units within ministries of education to collect education statistics. Target SDG4.c on teachers calls for *"By 2030, [to] substantially increase the supply of **qualified teachers**, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States."*

This target is measured and tracked based on seven indicators of which SDG indicator 4.c.1 is the global indicator to monitor progress. It measures the "*Proportion of teachers* in: (a) pre-primary; (b) primary; (c)

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lower secondary; and (d) upper secondary education *who have received at least the minimum organized teacher training* (e.g. pedagogical training) *pre-service or in-service required for teaching at the relevant level in a given country*." (UIS, 2019). Data for indicator 4.c.1-7 are collected through the UIS Survey of Formal Education, which is administered each year (See Table 1).

Table 1: SDG4.c indicators for teachers as defined by the Technical Cooperation Group led by UIS

4c. By 2030, substantially increase the supplied of qualified teachers, including through international cooperation for teacher training in developing countries especially least developed countries and small island developing States	
4.c.1	Proportion of teachers in: (a) pre-primary education; (b) primary education; (c) lower secondary education; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country, by sex
4.c.2	Pupil-trained teacher ratio by education level
4.c.3	Percentage of teachers qualified according to national standards, by level and type of institution
4.c.4	Pupil-qualified teacher ratio by level of education
4.c.5	Average teacher salary relative to other professions requiring a comparable level of qualification
4.c.6	Teacher attrition rate by education
4.c.7	Percentage of teachers who received in-service training in the last 12 months by type of training

Source: SDG 4 Global and thematic indicators(UIS, 2020*a*)

SDG4.c indicator 1: Proportion of teachers who have received at least the minimum organized teacher training

Indicator 4.c.1 requires data on the proportion of teachers in pre-primary through upper secondary education who have received at least the minimum amount of formal teacher training, whether pre-service or in-service, to do their job. According to **Figure 1**, 85 and 86 per cent of global teachers were trained in primary and secondary education, respectively, in 2018. Yet substantial regional differences exist with many of the world's teachers not receiving adequate training. For instance while the majority of primary and secondary teachers were trained in Central Asia – 97 and 95 per cent, respectively – just 64 and 50 per cent were trained in sub-Saharan Africa. The proportion of trained teachers was also low in Southern Asia where 72 and 77 per cent of teachers were trained. The capacity to train teachers requires significant national investments. Perhaps unsurprisingly, just 72 per cent of primary teachers in low income countries were trained compared to 84 in middle income countries.

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Figure 1: Teachers trained and pupil-trained teacher ratios in primary and secondary education, globally, by income level and SDG region, 2018
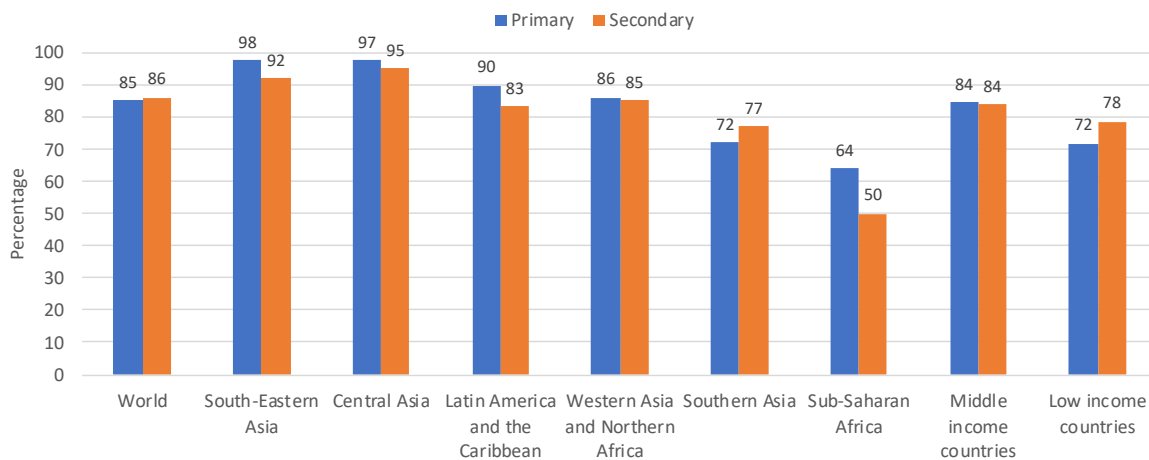
While Figure 1 shows regional differences, data are based on national standards that vary significantly between countries. This lack of international comparability understandably has resulted in debate on how to measure teacher training in a more meaningful way leading to a clearer global perspective. As long as the current international data collection on teacher training is poorly defined and lacking international comparability, charting the future for teacher training will remain difficult.

SDG4.c Indicator 3: Percentage of teachers qualified according to national standards, by level and type of institution

Complementing the UIS indicator on trained teachers, UIS also collects data on the percentage of teachers qualified according to national standards. Whereas trained teachers refers to pedagogical training to become certified as a teacher, indicator 4.c.3 is designed to measure and provide information on the proportion of teachers that have the minimum academic qualifications for teaching subjects at the relevant level in a given country. A reason for the distinction between these indicators is that unlike high income coutries, which offer a tertiary level qualificaton that provides both subject-matter content and pedagogical training, the criteria for meeting academic or training requirements in developing countries might be different. For example academic qualifications on academic subjects such as math or history could reflect completion of upper secondary qualifications in some countries. **Figure 2** shows the proportions of teachers that are both 'trained' and 'qualified' according to national standards in primary education in sub-Saharan African countries. The data show that across the region, the proportions of teachers trained and/or qualified varies demonstrating that many governments struggle to ensure teachers are both trained as well as having completed the necessary academic qualifications.

Figure 2: Proportion of primary teachers that are trained and qualified in sub-Saharan Africa, 2018
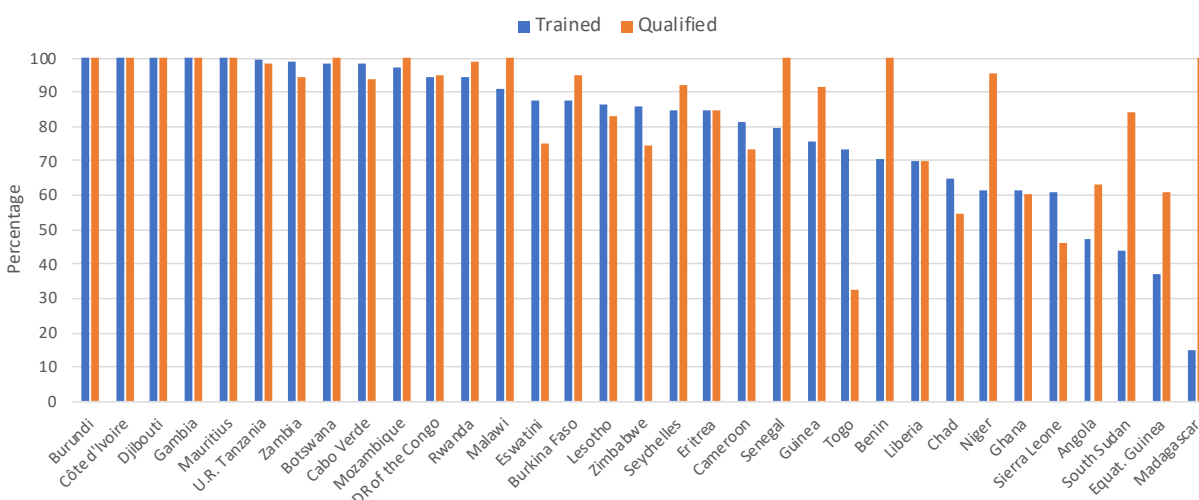
Source: UIS database, 2020.

The need for new metadata on teacher qualifications and training

Comparing data on trained versus qualified sheds important light on the extent that countries are achieving their national standards to ensure teachers have pedagogical versus subject-matter content skills; however key dimensions remain lacking to make stronger and better informed international comparisons. For instance while it is known that teacher training programmes can be classified between countries from ISCED 3 (eqivalent to upper secondary) to ISCED 5 and above (equivant to tertiary level), these data are generally not available or disseminated. Data are also generally absent in terms of the pre-requisite ISCED level needed to enter the programme, the duration of the programme in full-time years, and the ISCED level at which newly graduated teachers would teach after completion.

As the custodian for SDG 4 data, the UIS is developing a framework titled the *International Standard Classification for Teacher Training Programmes (ISCED-T)*, which will be an international classification of teacher training programmes and pathways to the teaching profession. The framework builds on and extends the International Standard Classification of Education (ISCED) and draws on extensive review of 170 teacher training programmes reported in the ISCED database (UIS, 2019).

ISCED-T will then expand the current ISCED coding from three digits to a six-digit code; with the three last digits coded for the following dimensions:

1. Target level for which teachers are trained to teach;
2. Minimum entry requirement as represented by the highest ISCED level needed to enter;
3. Duration of the programme in years.

UNESCO and the Teacher Task Force are supporting UIS's ongoing developmental work on the ISCED-T including additional data collection efforts and coding and analysis to be built into the new classification system. A new report based on current work is expected during the 4th quarter of 2020. While it is expected that the ISCED-T will represent an improvement to facilitate the provision of more internationally comparable data on teacher training programmes, and thus target SDG4.c, it will remain somewhat insufficient to shed light on the quality of the similarly classified programmes with the same ISCED-T code. Within programmes there will remain variability of the learning experiences which can yield

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differential outcomes. Future approaches and indicators will need to capure the nature and scope of teacher education curriculum including the:

- o depth of subject-matter content;
- o pedagogical training;
- o ICTs for teaching, learning, and assessment;
- o practical field work, and
- o induction period before full certification.

These are important aspects of teacher education quality as research has shown that teachers who have access to these opportunities are more effective in the classroom.

SDG4.c indicators 2 and 4: Pupil-trained teacher ratio by education level, and pupil-qualified teacher ratio by education level

The number and distribution of teachers are important policy parameters helping to determine the quality of education and teaching. To shed light on these, the pupil-teacher ratio (PTR) is a commonly-used indicator, reflecting the human resource capacity of education systems. High pupil-teacher ratios can signify an overstretched teaching staff, while low ratios may represent additional capacity. While not the same as class size, PTRs are predictive of class size. Large class sizes, which infer little face-to-face contact and differentiated instruction, are related to poor educational outcomes including dropout, repetition, and low learning achievement.

To gain further insight on face-to-face contact with trained and qualified teachers, SDG4 employs PTRs based on totals of trained and qualified teachers by educational level. The need for more trained and qualified teachers varies among regions but is greatest in low-income countries. According to **Figure 3**, in primary education the pupil-trained teacher ratio in sub-Saharan Africa and Southern Asia were 60:1 and 46:1, respectively, in 2018. In comparison, it was 20:1 in South-Eastern Asia. Pupil-trained teacher ratios are lower in most regions at the secondary level and can partly be attributed to the use of greater numbers of subject specific teachers needed to teach diverse curricular needs. In sub-Saharan Africa and Southern Asia, secondary pupil-trained teacher ratios were 44:1 and 35:1 in 2018, respectively.

Figure 3: Trained teacher-pupil ratio and qualified-teacher-pupil ratio, by educational level, 2018

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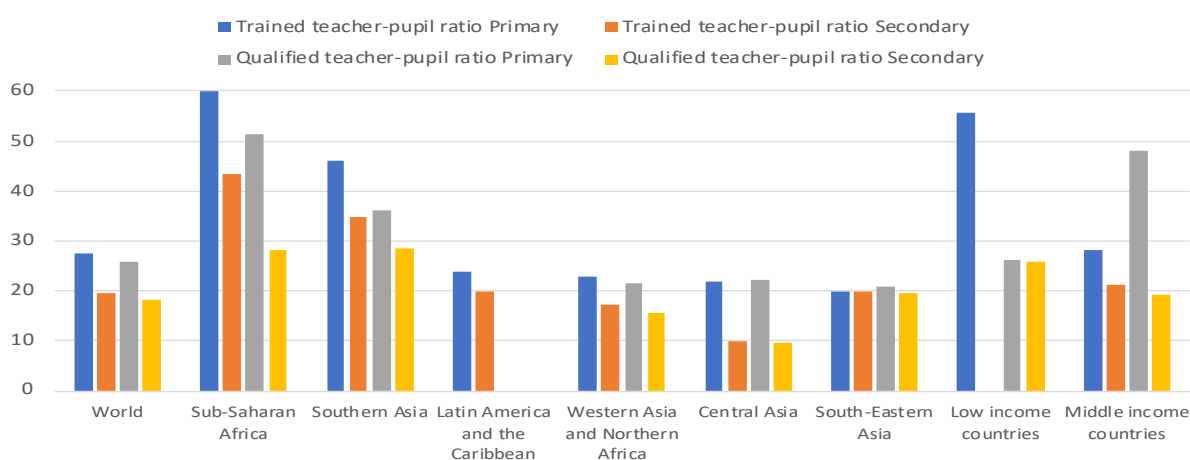
SDG4c indicator 7: Proportion of teachers who have received in-service training

Several countries remain challenged in the 21st century to ensure all teachers have the standard academic qualifications and minimum pedagogical training to teach. For this reason, CPD especially in-service education and training (INSET) remains an important means for filling gaps in teachers' knowledge and skills and providing information on new teaching methods to improve classroom instruction and learning. Training interventions for in-service teachers remain fundamental towards a number of other outcomes including teachers' disposiitons (Borko, H., 2004), the building of communities of practice (Darling-Hammond, L., Hyler, M. and Gardner, M., 2017), and increasing motivation and building resiliency against burnout and teacher attrition (See Table 1 for indicator SDG4.c.6).

The provision of CPD will remain key to achieve the SDGs and with the COVID-19 crisis has become even more imporrant. According to the OECD (2019):

> *"Previous OECD research has shown that CPD activities not only provide teachers with necessary skills, but also improve their sense of confidence and satisfaction. As such, by boosting both self-efficacy and job satisfaction, CPD activities can also be effective mechanisms for the retention of teachers. TALIS 2018 results show that, on average across the OECD, after controlling for teachers' characteristics, teachers who state that their training in the 12 months prior to the survey had an impact on their teaching practices have higher levels of job satisfaction than those teachers reporting that their training had no impact on their teaching practices."*

SDG4.c. indicator 7 measures the percentage of teachers by level of education taught (pre-primary to seondary), who, during the last academic year, have received in-service training required for teaching at the relevant level in a given country, by type of training received. In measuring the incidence of teacher training, programmes of all durations are included since all training can contribute to enhancements in teaching competencies.

The *OECD Teaching and Learning International Survey* (TALIS) provides a first glance at available data on SDG4.c indicator 7 from its member countries. **Figure 4** below shows the results from OECD member countries based on an average of 94% of teachers who participated in professional development activities in the twelve months prior to the survey (OECD, 2019). In-service training was defined as the following (OECD, 2019):
- courses/seminars attended in person;
- online courses/seminars;
- education conferences;
- formal qualification programmes;
- observation visits to other schools;
- observation visits to business premises, public organisations, or non-governmental organisations;
- peer and/or self-observation and coaching;
- participation in a network of teachers;
- reading professional literature; and
- other types of professional development activities.

Both OECD countries and developing countries participating in TALIS show high participation rates of professional development activities in lower secondary education ranging from 99 per cent in Lithuania

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to 83 in France. Among participating middle income countries, including Kazakhkstan, Vietnam, Turkey, Georgia, Argentina, Colombia and South Africa, more than 90 percent of lower secondary teachers also received some training. Somewhat less, still 89, 87 and 87 of teachers in Mexico, Brazil and Chile, respectively, also participated in professional development during the previous 12 months.

Figure 4: Percentage of lower secondary teachers who participated in professional development activities in the last 12 months
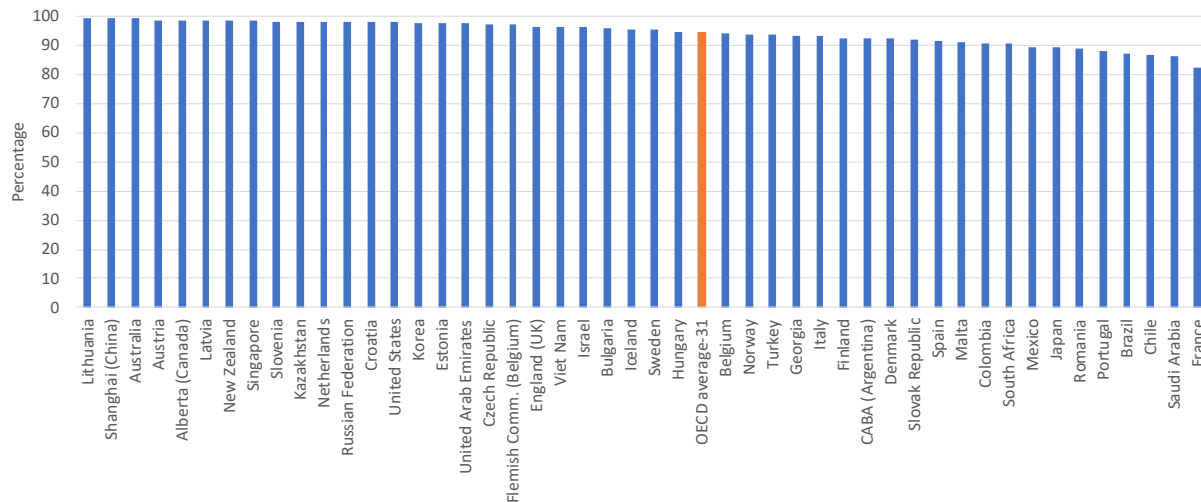
Source: OECD, TALIS 2018 Database, Table I.5.1.

While the OECD provides some data related to this indicator for high and some middle income countries, there is a dearth of information for the majority of lower middle income and least developed countries. It is not currently clear the reason for the lack of data on these professional development activities, but it could include the lack of mainstreaming across school census forms or countries' challenges to collect and provide this data systematically due to other factors.

Revising SDG 4.c indicators in anticipation of achieving SDG4.c including post COVID-19 changes in education systems

At least 63 million primary and secondary teachers have been affected by school closures due to the COVID-19 pandemic. As UNESCO's issue note "Supporting teachers and education personnel in times of crisis" (UNESCO, 2020) explains, teachers also need access to relevant, quality professional development and support to be able to continue teaching in crisis contexts. This will include anticipated areas – perhaps most obviously ICT, socio-emotional awareness, and effective classroom management skills – as well as unanticipated areas that could still emerge.

Shift towards distance and blended education

While schools remain closed, teaching and learning – as well as any professional development and support – has been delivered in homes through distance learning in various forms through Ministry or school portals using open educational resources (OERs), massive open online courses (MOOCs), through email exhanges, social media, and where internet connectivity is a problem through public/community

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television, radio or by telephone. Elsewhere when no technology is available, the use of print-based packages with or without home visits is an alternative option.

This shift towards distance education will likely continue during the return to schools, which will make greater use of blended learning, as well as during potential future waves of the pandemic that could require further school closures. The pandemic may in fact represent a watershed moment that expedites the current societal transformation whereby more services are provided online including basic education. This would require the strenthening of teachers' skills not least those in ICTs and digital literacy.

ICT qualifications for teachers

There is a global need to build an understanding of the e-readiness in schools and teacher preparedness, which in turn can inform decision-making to modernize teacher education to meet the needs of a knowledge-based society. According to the UIS-led Technical Cooperation Group (TCG) paper on rethinking SDG4 indicators post COVID-19 "the most basic question about this indicator in a Post-COVID environment is: who is a teacher? The inevitable acquisition of different skills for an online and home education world indicates that for this indicator to make sense, it has to include those people coordinating, moderating, and/or directly participating in the transfer of knowledge to students. As a result, this indicator needs to redefine (UIS, 2020*b*):

a. Teacher pedagogical training, to include the skills needed for online schooling.
b. Training that would include hardware and software knowledge.
c. Multitasking and multimedia use for pedagogical purposes.
d. Continuous monitoring and evaluation of students.
e. Ability of teachers to help parents mediate their role at home."

Novel indicators of teachers' ICT skills were piloted by the UIS from 2010 to 2015 under a number of regional analyses in Asia, Arab States, Latin America and the Caribbean and sub-Saharan Africa. These are based on the UIS pubication: Guide to Measuring Informtion and Communication Technologies (ICT) in Education: Technical Paper No. 2 (UIS, 2009). The two indicators included:

- *ED8: Proportion of ICT-qualified teachers, by educational level*, and
- *ED38: Proportion of school teachers trained to teach subject(s) using ICTs, by educational level.*

These indicators relate to teachers' capacity to teach basic computer skills, and to teach curricular subjects using ICTs, respectively. **Figure 5** shows a comparison of teachers trained to teach ICT skills versus those trained to teach subjects using ICT. Across different various regions and national income levels, fewer than ten per cent of national teaching workforces were trained to teach basic computer skills or computing (ICT-qualified) in 2011/2012. This is in contrast to the proportion of teachers trained to teach subjects using ICT which had a much wider reach most likely reflecting the tendency for ICT skills to be integrated and mainstreamed across curricular subjects as opposed to being taught as an independent subject in many countries.

In isolation, these data represent national standards for teacher preparation and could be based on pre-service and/or combined in-service training. Therefore they lack international comparability. Moreover, they do not shed light on continuous training to ensure updating of skills.

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Figure 5: ICT-qualified teachers versus those trained to teach using ICT, 2012 or latest year available (ITU, 2015)
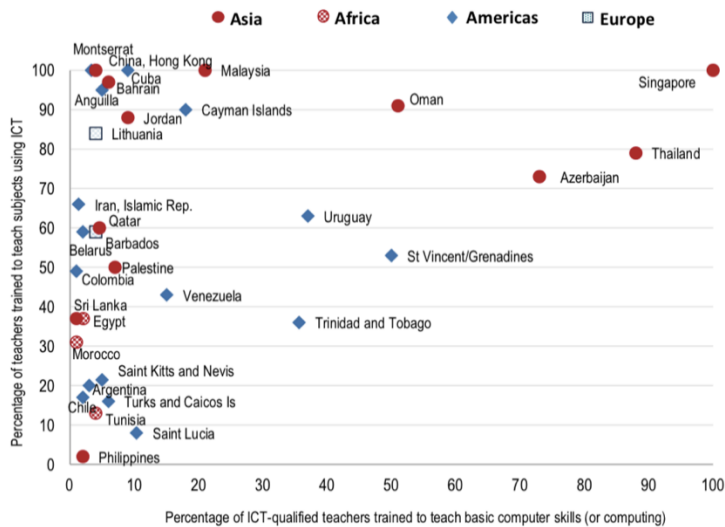
## Increased role for in-service teacher training on ICT

While ICT use in education is covered in many countries' pre-service preparation for teachers, there is limited information of its scope and depth, which will vary substantially. The COVID-19 and previous Ebola crises and related school closures provide a rationale for reform of teacher training including additional CPD and INSET to provide regularly updated ICT skills to deal with a variety of situations. Recent data from TALIS show that on average 56 per cent of surveyed teachers across 41 high income OECD and participating middle income countries reported that ICT has been included in their formal education or training. The situation in low income coutrries is not widely known due to a lack of available data (OECD, 2019).

Lessons learned from online training programmes in crisis contexts suggest that teachers have to understand and feel comfortable with the technology used in order to realise the full benefits of the training. Unfortunately, even in stable contexts with adequate infrastructure and connectivity, many educators lack even basic ICT skills, meaning they will likely struggle with their own ongoing professional development, let alone with facilitating quality distance learning. Given limited capacity-building efforts, many teachers remain feeling ill-equipped to teach using ICT in teaching and other 21st century skills. TALIS data for instance show that just 43 per cent of teachers reported feeling "well prepared" or "very well prepared" for the use of ICT for teaching (OECD, 2019).

To meet these challenges more effectively, teachers should continuously update their skills to become more familiarised with ICTs and how it can enhance their teaching to improve student outcomes and meet educational objectives (GPE, 2019). TALIS collects data on the proportions of teachers that recently participated in professional development activities that used ICT. Based on 41 countries, **Figure 6** shows that an average of 60 per cent of lower secondary teachers reported usage of ICT in recent CPD activities. While previous TALIS data show relatively smaller differences between countries in relation to participation overall in CPD (See Figure 4), Figure 6 shows data varying from as high as 93 per cent of teachers in Vietnam reporting use of ICT in CPD to as low as about one third (36 per cent) in Israel. While

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these data do shed some light on teacher training that uses ICT, it still remains difficult to conclude the extent that training emphasised the pedagogical aspects and use of ICT in teaching and learning.

Figure 6: Percentage of teachers for whom use of ICT for teaching has been part of recent professional development activities, 2018
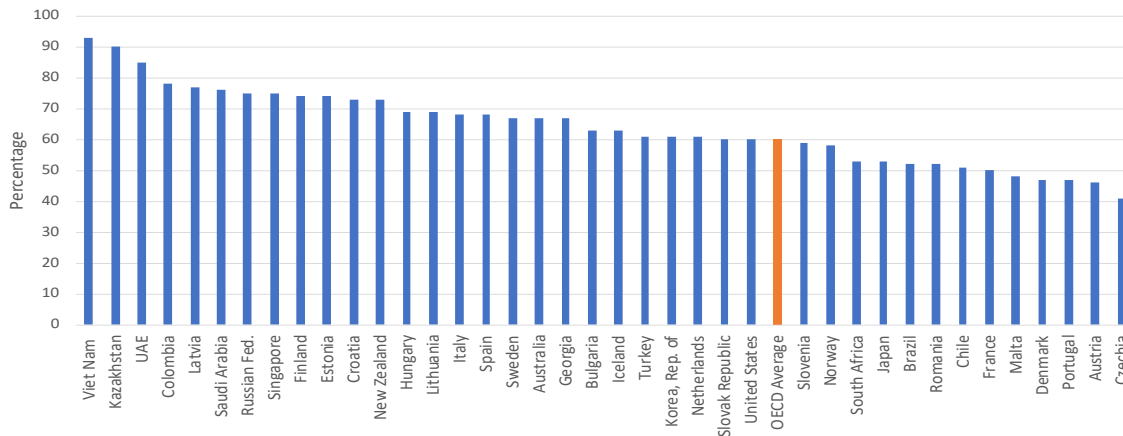
Source: TALIS 2018 Database, Table I.1.1.

A new indicator could therefore be considered that measures not just the use of ICT in CPD activities but that uses ICT as means to enhance pedagogy, teaching and/or learning. This is separate from CPD or INSET that uses ICT for administrative or organisational issues.

While the range of information measuring the spectrum of CPD models in a comparative manner has increased especially through OECD's TALIS[1], similar information addressing developing and least developed countries is lacking. Some international assessments have examined in-service training for teachers, however data are few and only cover a limited number of countries. This includes the *Trends in International Mathematics and and Science Study* (TIMSS)[2], which collects data from a number of high and middle income countries. TIMSS has developed some indicators shedding additional light on in-service training related to ICT integration in curricular subjects to enhance pedagogical practice. More specifically, it collects data from teachers whether they have participated in CPD activities that integrated information technology into mathematics or science. In TIMSS reporting, rather than showing the proportions of teachers who have participated in such a training during the previous two years, it portrays the proportion of students in Grade 8 who have a teacher who has had the relevant training. This is due to the goal to make links between inputs and student achievement.

According to **Figure 7** the proportion of students taught by a teacher who was trained on IT integration in mathematics was 50 per cent on average ranging from 82 per cent in Kazahkstan to 18 per cent in Sweden. Two countries from sub-Saharan Africa participated in this study including Botswana and South Africa,

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[1] http://www.oecd.org/education/talis/
[2] https://timssandpirls.bc.edu

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which reported below average scores of 45 and 26 per cent of students, respectively, to have a teacher that participated in training.

Figure 7: Percentage of grade 8 students whose teachers participated in a training to integrate information technology into mathematics during the last two years, 2015
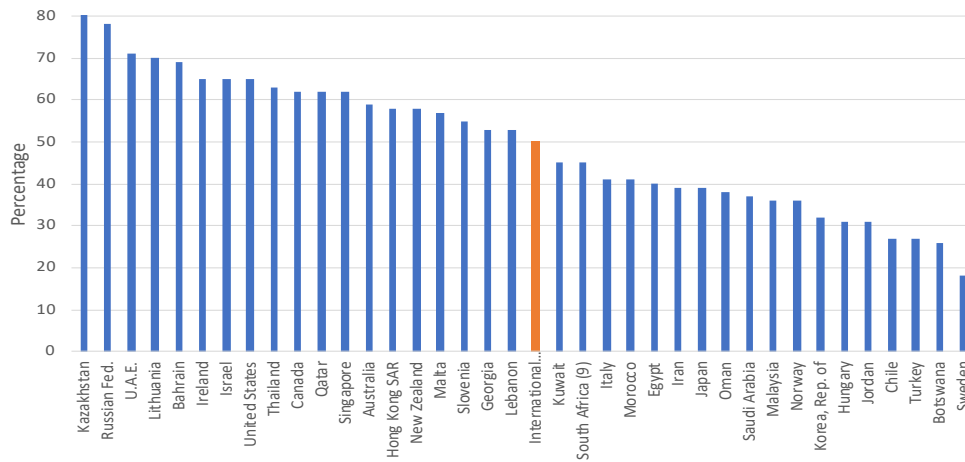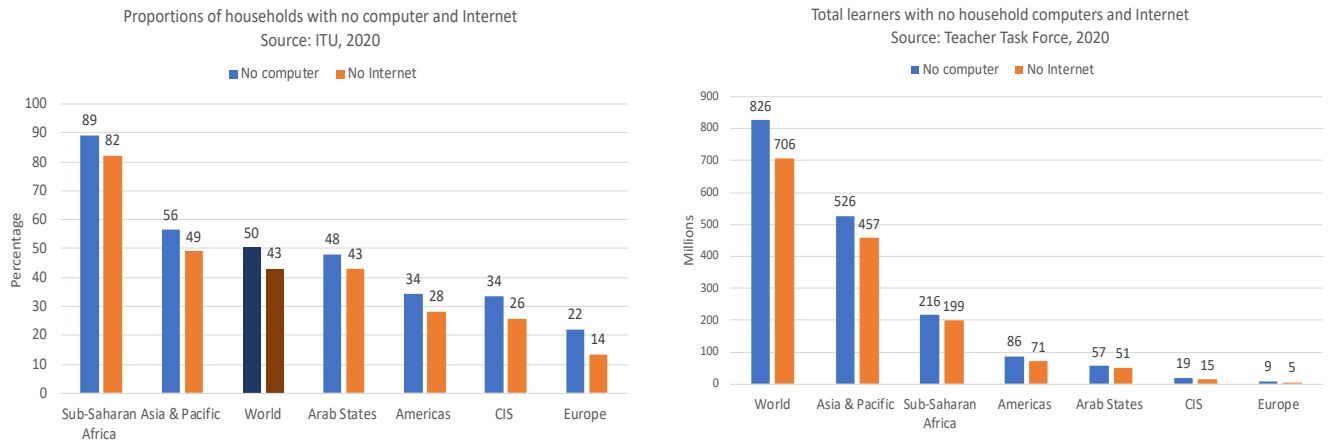

Source: TIMSS, 2015.

Other assessments have previously collected data on in-service teacher training in sub-Saharan Africa including the *Southern and Eastern Africa Consortium for Monitoring Educational Quality* (SACMEQ) and the *Programme d'analyse des systemes educatifs de la Confemen* (PASEC); however both programmes are currently yielding little relevant data across the countries they survey.

Other forms of distance education

School closures and home-based schooling has shined a light on the digital divide more than ever. Based on household data from the International Telecommunication Union (ITU), **Figure 8** demonstrates the digital divide's extent globally based on the availability of household Internet and computers by region. Globally, about 50 and 43 per cent of households had no computer nor Internet, respectively in 2018; this proportion varies considerably from 89 and 82 percent in sub-Saharan Africa to just 22 and 14 in Europe, respectively. Using UIS data, the Teacher Task Force calculated the number of learners affected demonstrating that while the digital divide is most pronounced in sub-Saharan Africa, the overall magnitude of learners with no access to household Internet and computers is greatest in the Asia and Pacfic region given the presence of several E9 high population countries including Bangladesh, China, India, Indonesia and Pakistan where the national digital divide is significant. In total some 526 million learners were without Internet connectivity while 457 million were without a household computer.

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Figure 8: Proportions of households and total learners with no Internet connectivity or computer, 2018

Proportions of households with no computer and Internet
Source: ITU, 2020

Total learners with no household computers and Internet
Source: Teacher Task Force, 2020

Source: ITU database, 2020; and Teacher Task Force, 2020.

With no other option, indicators to measure training on other forms of ICTs in teaching would be key. This could include training on the use of mobile phones or low-tech solutions such as radio, interactive radio and television/video. It could also include no-tech solutions including print-based take-home packages and home visist by teachers. While mobile units—especially smart phones—are less common in a number of developing countries with many individuals using only basic handsets without many updated contemporary features, their use is even further complicated in low income countries because they are primarily used by parents and not by young learners. The argument for adequate training on radio, television and other means is strengthened by its broad availability in many households where Internet is lacking.

Figure 9 demonstrates the availability of Internet, television and radio in households of several middle and low income countries. In particular it shows that in some middle income Latin American countries, television is almost ubiquitous filling gaps for the dissemination of education materials, whereas in a number of low income countries including sub-Saharan Africa, radios are more common than both Internet and television.

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Figure 9: Proportion of households with Internet, television and radio by country, 2018 or latest year available
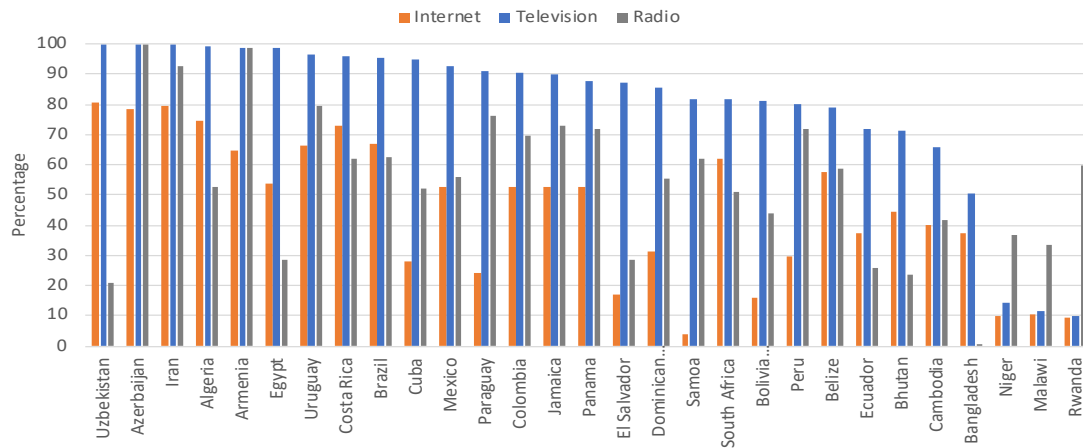

Source: ITU database, 2020.

Note: Countries are listed in descending order according to the percentage of households with a television.

Other potential areas for in-service training and support

Emerging research on teachers in crisis contexts has highlighted the importance of building the psychological and socio-emotional competencies and resilience of teachers. Those who have built up their own psychosocial skills and who have access to regular professional debriefing and learning sessions with internal counselling services, are better equipped to provide psychosocial support to their students and help them navigate the uncertainty and anxiety that accompanies crises including that related to COVID-19. As outlined in the Teacher Task Force recommendations for policy makers in response to the COVID-19 pandemic, teachers need to have the skills to manage their own stress, as well as support their students and other teaching staff. For the future, these social-emotional skills need to be better integrated into initial and ongoing teacher education. Indicators capturing the training of in-service teachers as well as availability of support mechanisms to schools and teachers are recommended.

Teachers also need more training related to classroom management and diagnostic assessment, especially for novice teachers. New teachers, and even experienced teachers, are confronted with many new novel situations requiring advanced classroom management skills including; i) blended learning with some students learning remotely, (ii) children spread across more space to accommodate for physical distancing; and iii) rearrangments of children for more remedial and differentiated instruction. Teachers will increasingly need this training in a number of contexts to deal with learning disruptions due to crises. Available indicators have been developed by the OECD and collected under TALIS as shown in Figure 10.

Figure 10. Percentage of lower secondary teachers for whom student behaviour and classroom management were included in their professional development activities
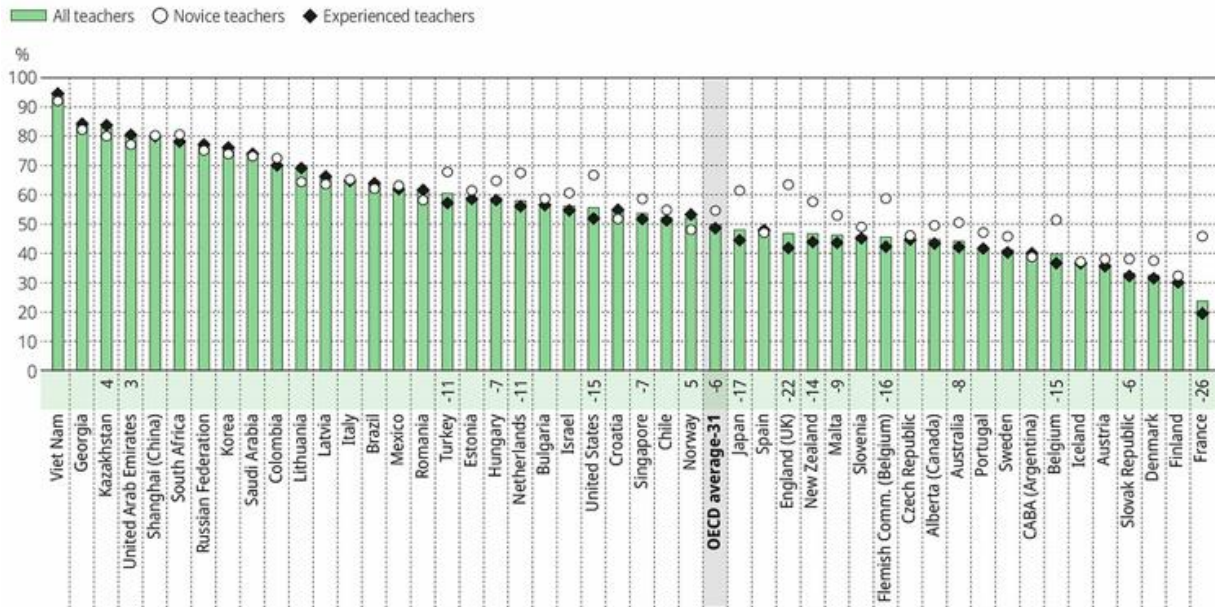
Source: OECD, 2020

One of the most important success factors in effective CPD is that it is part of a holistic system of teacher development, beginning with high quality initial teacher education and supervised field experiences, followed by induction, mentoring and continuing professional development on a regular basis. The existence of a career structure or path that allows for progression and development over a teacher's career is believed to have an impact on teacher retention, as teachers are motivated by the possibility of progression. However, effective progression along a career path needs to be linked to meaningful CPD options aligned to the different roles within the teacher career structure (International Task Force on Teachers, 2019). The creation and effective implementation of a national CPD and teacher development framework aligned with mastery of competencies at different levels along the career structure is critical to guide this process as well as ensure that teachers have developed the requisite profile at each level to meet their professional obligations and if not to be directed towards the appropriate CPD to fill gaps.

The most effective CPD targets specific needs or gaps in teachers' skills and knowledge. CPD needs to be focused and linked to the daily activities of teaching and learning. Professional development programmes work best when focused on building knowledge teachers can use during instruction (Hill, H. C., Lynch, K., Gonzalez, K. E., 2020). But regardless of the content, what ensures the effectiveness of the programmes is its design and method. Training should be designed based on the types of skills or competencies that are to be acquired. In some cases this requires a didactic approach while in others a constructivist approach would be more appropriate. Indicators to measure the adaptation of training methods and content based on teachers' previous experiences and current needs would be important for measuring the quality of in-service teacher training and CPD.

Related to the SDG4 goal that includes "inclusive and equitable quality education", it will also be increasingly important for teachers to be trained about teaching in multicultural and multilingual settings to ensure that learners from cultural and linguistic minority groups are adequately supported during the

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educational process. Training for teachers that is gender responsive and covers training for disability and special needs will also be important to ensure all no one is left behind.

Finally, ongoing support from head teachers and school and district leaders is also necessary for the sustainability of teacher training. The professional support teachers receive from head teachers makes a big difference to their ability to improve learning given that head teachers have the requisite training." (GPE, 2019). Disaggregated data by teachers and headteachers as well as additiona indicators on specialized training for headteachers will be increasingly useful.

Financing Pre-Service Teacher Education and CPD

The cost to train a teacher and then lose them in the first years of teaching due to burnout and lack of prospects is greater than to provide well thought-out high quality initial teacher education within a career pathway framework including effective continuous professional development. To ensure an effective implementation of quality continuous professional development for teachers, prominence should be given to financing and costs of professional learning activities either through national budgets, development partners financing/donor funding or joint financing.

Financing is a determinant factor and plays a key role for the provision of CPD opportunities to teachers, the identification of the beneficiaries and what results are expected. Therefore, policymakers need to understand the levels and availability of funding sources required and financing strategies that can be used to help support, sustain, and scale-up quality CPD and INSET. Though very essential for CPD, financing or funding constitutes a major challenge (for both teachers and educators worldwide) and alone not enough to ensure the provision of quality CPD.

This also suggests that countries need to invest in high quality initial (pre-service) teacher education up-front, rather than supplementing poor initial education with ad-hoc and unregulated INSET or CPD activities. Improving teacher quality will be more effective when CPD builds on a well-developed and strong initial foundation.The current economic climate in most low- and lower-middle income countries is characterized by limited resources allocated to the education sectors. In most of these countries, more than 70 per cent of the national education recurrent budgets are allocated to salaries. In the face of COVID-19, future education budgets could begin being reduced as national governments begin prioritizing the health sector as well as covering various social programmes related to weakening economies and growing pandemic-related unemployment.

In addition to facing shrinking budget allocations, education sectors decision-makers will be very well conscious of the need to consider mobilizing funds for teachers' CPD within the context of complex and comprehensive allocation of resources and emergency measures. However, it's incumbent on them to determine the share of the national allocated recurrent resources to be spent on teachers' continuous professional development. But this determination may not be an easy task. Within the context of scarcity of resources, reallocation of budget funds and teacher time may be explored as one such strategy. Countries may also consider developing national CPD cost frameworks that will guide the decision-making processes that are better informed and comprehensive.

The International Task Force on Teachers for Education 2030 explains in its 2019 policy guide that CPD should be included in education budgets at the national, regional, local or school level, depending on the nature of the education system. A comprehesnsive teacher management plan should also integrate dedicated financing for CPD to avoid education monies being used for other purposes, such as capital expenditures. An annual CPD allocation per teacher, adjusted for purchasing power parity, including the cost of remunerating supply teachers where necessary, may be a strategy to finance CPD.

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Conclusion and recommendations

A number of conclusions about achieving SDG4 can be made; however with the ongoing COVID-19 pandemic, the field has changed significantly and the ambitious SDG4 agenda that was already in jeopardy of not being achieved will be further compromised. While distance learning cannot replace teachers, this crisis has highlighted that teacher education is in need of significant change, allowing teachers to develop more learner-centred practices aided by the use of ICTs and digital platforms to enhance pedagogical practice, support curriculum differentiation and enable more individualized learning.

The pandemic has brought to light that teachers and schools are struggling to deliver distance education because they were poorly trained in the first place. Initial Teacher Education (ITE) and Continuous Professional Development (CPD) are key to building resilient education systems, in particular around decreasing inequalities and leaving no one behind.

Added to this, the short- and long-term impact of the current pandemic on teachers' capacity to provide quality teaching and improve learning outcomes will be significant unless the professional development and up-skilling needs of current teachers are addressed as part of the COVID-19 response.

The UNESCO-led Global Education Coalition for COVID-19 and its Teacher Flagship will be playing a strong brokership role in identifying training experiences for teachers in particular on ICT in education to ensure national teaching workforce capacity has been reinforced.

The SDG-Education 2030 Steering Committee calls on governments to support teachers as reflective practitioners within a lifelong learning perspective according to the following recommendations:

- Invest in financing high quality initial teacher education, inclusive of supervised field experiences and an induction period with mentoring and supervision by a highly accomplished lead teacher.
- Modernize and reform initial teacher education curricula to ensure high quality and include knowledge and skills for distance education, including the use of ICTs for pedagogy (and adapting for high-, low- and no-tech solutions), classroom management, and grade-appropriate child-centred pedagogies in response to crises. Importantly in the current context, priority should be given to training teachers on formative and diagnostic assessment of student learning losses and gains due to school disruptions. Enure teacher education curriculum is adapted for multilingual and multucultral education, ESD, GCE and for inclusive education.
- Harmonize and regulate ad-hoc provision of INSET for under- and unqualified teachers to ensure a core level of quality and alignment with national professional teaching standards and career development and pathways frameworks. INSET and CPD activities should target teachers' specific developmental needs based on formative appraisal of their knowledge and skills.
- Establish a professional teaching body or council to oversee, regulate, and accredit (both public and private) teacher education provision (pre-service and in-service) and to certify or license teachers and teacher educators. These bodies, comprised of teachers, teacher educators, and other curriculum specialists, should be responsible for setting guidelines and standards for conducting teacher performance appraisals that are designed for developmental or formative purposes, and aligned to career pathways and development frameworks.

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- Ensure teachers and their representatives are included in policy dialogues that concern the teaching profession and their working conditions.
- Mandate the regular collection of disaggregated data for monitoring and reporting purposes to keep track of progress towards SDG 4.c.

The following are more specific recommendations for the short-, medium- and longer-terms:

- *In the short-term:*
  - ✓ Where possible, designate official platforms for the sharing of relevant resources and support; in an attempt to provide support to educators at this time, UNESCO has collected a number of resources including open educatioanal resources (OERs) for teachers to create their own digital content, and the UNESCO International Institute for Capacity Building in Africa (IICBA) is opening its virtual campus to teachers. MOOCs can be used to transform teachers from crisis-affected communities into teacher-educators by providing a platform for producing and disseminating knowledge and good practice based on teacher experiences, as demonstrated by past research.
  - ✓ Work with teacher education institutions and teacher organisations to select, develop, and distribute guidance on curriculum, essential subjects, digitizing learning material, and assessment of learning during crisis, the reopening of schools, and future stages of the pandemic to train teachers on accelerated/remedial education approaches once schools reopen in the immediate aftermath of the COVID-19 crisis and if there are future closures.
  - ✓ Organize targeted online trainings for teachers to promote teaching skills which are necessary for distance education to ensure the immediate continuation of learning and that teachers have some basic skills during school closures and for the reopening of schools.
  - ✓ While schools are closed, ensure principals, headteachers, teachers, and other education personnel are provided with relevant guidance on the remote provision of key lifesaving messages to students to ensure a safe and healthy school environment.
  - ✓ Provide teachers with training on psychological and socio-emotional support to give them skills to ensure well-being and reduce stress as well as support students and other staff.
  - ✓ Survey all teachers on their CPD and INSET experience during the last 12 months.

- *In the medium- to long-term:*
  - ✓ Ensure principals, teachers, and other education personnel are sensitized on the risk of future COVID-19 outbreaks and on key prevention measures.
  - ✓ Invest in high-quality initial teachers education to ensure a high quality curriculum and pre-service teacher education reform, including the development of a strong component on adapting to new technologies including no-, low- and high-tech solutions as well as preventing, preparing for, and responding to crises. Enure pre-service teacher education curriculum is adapted for multilingual and multucultral education, ESD, GCED and for inclusive education. Ensure under- or unqualified in-sesrvice teachers receive quality training to fill in weaknesses in these domains.
  - ✓ Invest in understanding the effectiveness of various teacher preparation programmes to determine what mix of curriculum (subject-matter versus pedagogy), use of ICTs, field practicum, duration, and induction would be required to make a teacher school ready
  - ✓ Develop career frameworks for teachers aligned with national professional standards for teaching.
  - ✓ Develop strategies which include initial teacher education and CPD aligned with other dimensions of an integrated, holistic teacher policy.
  - ✓ Allocate time (hours) for learning.

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- ✓ Train learning institution leaders to support lifelong learning
- ✓ Earmark funds specifically for CPD.
- ✓ Develop online platforms and resources for regular teacher training, which are accessible for all teachers to take professional training at anytime, anywhere.
- ✓ Provide teachers with ICT tools and Internet to develop their ICT skills and prepare them better for online learning in case of future phases of the pandemic; include training elements related to other low and no tech solutions to ensure no child is left behind.
- ✓ Ensure social dialogue with teachers and their representative organisations in order to ensure their voices are included and they help inform the plan for inservice training based on their own perceived needs and concerns.

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The SDG-Education 2030 Steering Committee is the global multi-stakeholder consultation and coordination mechanism for education in the 2030 Sustainable Development Agenda. Its primary objective is to harmonize and strengthen support to countries and their partners for the realization of the global education goal and targets. The Steering Committee is composed of members representing a majority from countries, the World Education Forum 2015 convening agencies (UNESCO, UNDP, UNFPA, UNHCR, UNICEF, UN Women, ILO, the World Bank), the Global Partnership for Education, the OECD, regional organizations, teacher organizations, civil society networks, the private sector, foundations and youth organizations.