Six policy approaches to support effective working environments in schools

Teachers, school leaders and other school staff matter educationally and financially

The staff working in schools are probably the most important resource for today's education systems – both educationally and financially. There is a solid evidence base indicating that teachers are key in improving learning opportunities for students, likely more than anyone else in children's lives outside their families (Kraft, 2019[1]; Jackson, 2018[2]; Chetty, Friedman and Rockoff, 2014[3]; Rivkin, Hanushek and Kain, 2005[4]).

School leaders, in turn, play a pivotal role in raising school quality and creating the environments in which teachers continuously improve their competencies to support student learning (Branch, Hanushek and Rivkin, 2012[5]; Coelli and Green, 2012[6]; Pont, Nusche and Moorman, 2008[7]). Beyond teachers and school leaders, there are many other types of staff whose contribution to the holistic learning of students and the overall improvement of schools is increasingly recognised across OECD school systems (Masdeu Navarro, 2015[8]).

From a financial perspective, the importance of teachers and other school staff is reflected in the investments that school systems make in their human resources. Spending on staff constitutes the largest expenditure item in any OECD education budget. However, countries apportion vastly different levels of resources to staff salaries, ranging from less than 65% to more than 85% of their operating budgets (OECD, 2019[9]).

While the level of teachers' salaries remains the most important source of variation between countries, other factors also shape overall expenditure levels. For example, choices to provide or require smaller class sizes, longer teacher working hours or less instructional time per teacher all increase the number of teachers required and raise per student spending. Decisions about employment conditions, the staff mix in schools and the types of professional learning offered also influence spending patterns.

The related resource trade-offs, as well as many others discussed in this report, represent important policy choices that should be informed by an analysis of national and local contexts and the best possible evidence of effectiveness.

The importance of human resource policies

Effective human resource policies for schools can contribute to strengthening, recognising and preserving the positive impact that school staff have on students by creating supportive working environments in schools. At the same time, they can optimise the use of available funds for school education by matching staff resources to school needs and making informed choices about investments in career pathways, salary structures, working conditions and professional learning opportunities.

By human resource policies, this report broadly refers to the regulations and principles of action that shape who school staff are and what they do, through their direct influence on careers, staff distribution and professional learning. The OECD School Resources Review identified a set of common challenges in the design and implementation of human resource policies that emerged in some form or another in all participating countries. Most prominently, these included the following:

- Careers, salaries and working conditions remain unattractive and act as a barrier for talented individuals to pursue a career in teaching or school leadership.

- The most effective and experienced teacher and leadership staff are often not matched to the schools and students that need them the most.

- Traditional professional development systems often fall short of supporting continuous growth for those supporting learning in schools.

Based on the experience of the countries participating in the OECD review, this chapter provides a set of six policy approaches that may help countries address these challenges. While the report highlights the need to consider all adults who work in schools and contribute to their effectiveness, the systematic analysis of these policies focuses on teachers and school leaders due to the limited availability of information on other staff.

It is important to keep in mind that human resource policies are shaped by national, local and school contexts and that initiatives that work well in one context are not necessarily transferable. Nonetheless, the experiences of different countries can help distil useful ideas and lessons learned from systems that have sought for better ways to support the individual and collective impact that school staff can have on students' learning and well-being.

Policy 1: Designing career structures with opportunities for professional growth

The traditional teaching career has often been described as "flat" and providing few opportunities for advancement or diversification. It is therefore possible for many teachers to have the same set of responsibilities from the first to the last day of their career. In such contexts, the only way for motivated teachers to grow in their careers may be to leave the classroom and take up roles in school leadership or the education administration. This can be to the detriment of student learning since it risks depriving them of their most effective teachers. In addition, the competencies required for school leadership are quite different and there is no guarantee that the best teachers will make for the most effective leaders.

Well-designed career structures have the potential to enhance the effective deployment of staff and their knowledge and skills in schools. They provide a means to recognise good performance, match individuals to responsibilities that fit their skills and interests, and increase long-term motivation and retention (Crehan, 2016[10]; Natale et al., 2013[11]). Teachers' careers can offer both vertical and horizontal opportunities for professional growth. Along the vertical dimension, teachers' careers may take the form of a ladder, structured around a succession of formal positions or roles with distinct task profiles and progressively increasing responsibility within the classroom. Along the horizontal dimension, career structures may provide teachers with opportunities to focus on and assume responsibilities in a specific area of expertise inside or outside the classroom, often involving specialisation in a particular aspect of the teaching profession.

In some countries, teachers have very limited room for vertical career advancement but opportunities for horizontal specialisation may offer ways for them to develop their skills in a particular area. Other systems have successfully combined both vertical and horizontal

career pathways. Such "career lattice structures" allow teachers to specialise in a particular role through horizontal diversification and advance their career in this role through vertical progression. For example they may offer a number of parallel (horizontal) streams – e.g. a teaching track, a leadership track, and a curriculum design track, each comprising several stages of (vertical) career advancement. Singapore's career structure provides one such example (see Chapter 2).

The majority of OECD review countries do not provide a separate career track for school leadership roles and either treat them as the final stage of the teaching career or a mere extension of the teachers' role that they can assume alongside their teaching duties. While a deep understanding of effective teaching is key for a pedagogical leadership role, other competencies are also essential for school leadership. Acknowledging the distinct responsibilities of leadership positions in schools by providing them with a dedicated career structure can help in communicating the importance of leadership roles while raising their status and attractiveness to potential candidates.

Similarly to teachers, school leaders typically have few opportunities for promotion and specialisation, except by applying for positions outside of schools (e.g. in the local education administration). In addition, some countries rely on fixed-term contracts or a maximum service time for school leaders. While renewable contracts provide the opportunity to periodically reassess and acknowledge principals' performance, uncertainty about employment opportunities beyond a given contract can be a significant source of stress and make leadership roles less attractive.

However, a number of OECD countries have developed multi-stage career structures for school leadership. Such structures can extend both ways from the principal's role and include formal middle leadership positions as well as so-called "system leadership" positions extending beyond principal-ship in a single school. Middle leadership positions can provide teachers with an opportunity to test out and prepare for school leadership. At the same time, they allow schools to distribute leadership responsibilities across several individuals and create a pipeline for future school leaders. At the other end of the career ladder, system leadership roles can harness the capacity of experienced leaders to contribute to system-wide improvement by preserving and spreading good practice, for example as cluster leader or in improvement partnerships with other schools (Hopkins, Nusche and Pont, 2008[12]).

Reforming career structures in schools can pose a series of implementation challenges when it comes to ensuring sufficient resources, building political consensus, and creating broad ownership of the new system. The introduction of new formal positions which are associated with additional responsibilities and remuneration can create uncertainty among teachers and be perceived as threatening the profession's egalitarian norms, especially where the profession had previously operated on the basis of a single-stage career structure. A lack of clarity around what new roles would entail and how to move into them, concerns that the reform would create divisions among teachers, or its perceived association with other changes to teachers' working conditions can contribute to the failure of career structure reforms. Involving stakeholders from the outset in the design of new career structures and clearly communicating the goals of reform is therefore critical to build support for reform plans and avoid unintended consequences.

Reforming career standards also requires the careful management of the transition process. When determining the standards for teachers' initial assignment to a career stage and for their subsequent promotion, mistakes can be made in both directions. Setting the bar too low can diminish the career structure's credibility and have significant fiscal consequences

if too many teachers are promoted. Likewise, setting the bar too high may lead to frustration and reduce the career structure's motivating effect. Some of these risks can be minimised by carefully piloting the assignment system and adjusting its standards accordingly to ensure that expectations are high, but realistic. The link between career steps and teachers' salaries is another challenge in the design and implementation of teachers' career structures. Since most career structures are linked to compensation, projecting the new career structure's long-term resource needs is critical to ensure its fiscal sustainability.

Policy 2: Establishing salary scales that attract new entrants and reward growing expertise

According to OECD estimates, teachers' salaries are lower than those of similarly educated workers in almost all countries with available information, although they tend to increase with the level of education (OECD, 2019[9]). Teacher shortages are often concentrated in specific subject areas and many schools have difficulty in recruiting teachers with mathematics or science qualifications or technical skills who could command higher salaries in the general labour market. Policy makers and academics have therefore considered differentiating teachers' salaries based on their training or subject areas to reflect their opportunity costs of pursuing a teaching career (Kershaw and McKean, 1962[13]). However, in most systems, the principle of uniform salary scales has imposed limits on subject-based pay differentiation.

For school leadership positions, salaries need to be attractive not only compared to positions with similar levels of responsibility in the public and private sectors, but also compared to senior teachers among whom most school leaders are recruited. While maximum salaries for school leaders typically exceed those of teachers, the salary ranges for teachers and leaders overlap in nearly all systems. In a number of countries, this means that school leaders' salaries may be inferior to those of their senior teachers. Establishing separate salary scales for school leadership roles, including principals and deputy principals, can provide a good basis to recognise their distinct responsibilities both financially and through the articulation of a separate career ladder.

Comparatively low salaries are frequently regarded as one of the factors contributing to shortages of qualified candidates for school-level positions. Data from the OECD Programme for International Student Assessment (PISA) 2015 confirm that 15-year-old students in OECD countries with higher teacher salaries are more likely to expect entering a teaching career (OECD, 2018[14]). Very low salaries for teacher and school leaders can impede a system's ability to attract high-quality individuals, alongside a range of detrimental consequences for staff, including low levels of motivation and the accumulation of excessive working hours or multiple jobs to make up for low compensation (Santiago et al., 2016[15]; Santiago et al., 2016[16]; Shewbridge et al., 2016[17]).

While compensation and benefits are important policy levers to influence the extrinsic motivation of individuals to pursue a career in the school sector, there is no one-size-fits-all solution to the design of effective salary scales. Instead, policy makers must consider the specific challenges of their system and the characteristics of their local labour markets. For example, broader economic developments, such as the level of private sector wages or unemployment rates need to be taken into account when reflecting on whether and up to which point higher starting salaries can be an effective means to attract high-performing candidates into teaching.

To understand the relative attractiveness of salaries for school staff, it is important to consider not only lifetime earnings, but also how compensation is distributed over the course of a career. Many OECD school systems face the dual challenge of providing competitive starting salaries to attract high-calibre entrants to the teaching profession while also seeking to retain, motivate and recognise experienced, high-quality teachers through salary increases. Countries may therefore face a trade-off between the benefits of higher starting salaries and greater pay rises over the course of the career.

Compressing the salary scale can free up resources to increase starting salaries at the expense of salaries for more experienced staff and thereby attract more students to teaching and reduce turnover in the early years of teachers' careers. Austria's 2015 teacher service code provides an example of a reform towards a more compressed salary scale (see Chapter 2). On the other hand, increasing the rate at which salaries rise over the course of a teacher's career can create space to provide higher salaries at the top end of the scale. Such scales may serve to retain and motivate more experienced staff or offer a wider scope for salary differentiation among teachers.

In addition to linking salaries to seniority, many systems seek to incentivise continuous improvement by differentiating compensation based on teachers' and leaders' education and training, responsibilities or performance.

In many OECD countries, teachers receive some form of compensation for attaining further formal qualifications (e.g. degrees that exceed the countries' minimum requirements or qualifications in additional subjects). In some systems, teachers also receive financial rewards for the successful completion of continuing professional development (CPD) activities (OECD, 2019[9]). Such education-based differentiation in teachers' salaries can serve as an incentive for teachers to update and enhance their skills throughout their career. One of the concerns around linking course credits directly to financial rewards is that teachers' participation might become disconnected from their professional improvement. The Slovak Republic has sought to address this through a requirement for schools to establish regulations which specify the conditions under which salary rises linked to professional development credits are approved (see Chapter 2).

Many countries recognise and financially reward teachers who fulfil tasks or specialise in particular roles that go beyond the official requirements of their jobs, for example supporting new teachers as part of mentorship and induction programmes, leading extracurricular activities or taking over managerial roles such as serving as the head of a department (OECD, 2019[9]). The financial compensation of additional tasks and responsibilities can provide recognition for teachers' efforts on relatively objective grounds and incentivise contributions that benefit the school community as a whole. At the same time, task-based rewards offer no direct recognition of or incentives for improvements in teaching quality (Conley and Odden, 1995[18]).

Other forms of differentiated pay have aimed to more explicitly link teacher pay to their assessed effectiveness in supporting student learning. In theory, performance-based compensation is meant to motivate teachers to improve their practice and raise students' achievement by rewarding effective teaching. However, research from different contexts has shown the difficulty of measuring performance at the level of individual teachers and the potential perverse effects of doing so, such as narrowing the curriculum or reducing teachers' efforts on tasks not explicitly rewarded by the programme (Ballou and Springer, 2015[19]; OECD, 2013[20]; Papay, 2011[21]; Rothstein, 2010[22]). There are also risks that an excessive reliance on extrinsic incentives undermines teachers' intrinsic motivation and negatively impacts on collegial relationships (Bénabou and Tirole, 2003[23]; Frey, 1997[24]).

Some countries have introduced incentive structures based on collective rather than individual performance, with the hope that they might encourage collaboration and collective improvement. Such incentives may exist for schools as a whole as is the case in Colombia and/or for school leadership teams as in Chile (see Chapter 2). Research finds that the larger the groups on which collective performance rewards are based, the weaker the incentives they provide for individual behavioural change. Consistent with this, their impact on student achievement has tended to be relatively small in the few existing robust evaluations (Jackson, Rockoff and Staiger, 2014[25]; Goodman and Turner, 2013[26]).

As discussed above, linking salaries to career advancement creates a more indirect link between teachers' growing expertise and their compensation and can address some of the challenges associated with conventional performance pay. First, this can combine extrinsic rewards for high performance (in the form of salary increases) with intrinsic rewards in the form of professional opportunities and responsibilities that grow in line with their knowledge and skills. Second, this offers both beginning and experienced teachers realistic goals based on their current position on the career ladder and a clear pathway to achieve them. Implementing such systems may require countries to further develop and integrate their teaching standards, appraisal systems, career structures and salary scales.

While absolute and relative salary levels are an important factor shaping the financial attractiveness of a career in schools, other aspects associated with remuneration should also be taken into account when assessing their competitiveness. In many OECD review countries, for example, teachers and leaders are civil servants and have a high level of job security or access to benefits like pension programmes, tax exemptions, family allowances and annual leave entitlements that workers in comparable private sector positions do not. The competitiveness of their salaries should therefore be assessed against a relevant comparison group, bearing in mind both financial and non-financial benefits.

Reforming salaries in education can pose significant implementation challenges. Compensation reforms will involve a degree of uncertainty about the size and distribution of their benefits and are likely to cause resistance among those who fear to lose out, whether in absolute or relative terms. Engaging in an open dialogue with stakeholders and involving them in reform and implementation processes are key principles of effective governance. This includes the relevant unions representing teachers in different sectors and at different levels of administration. To build and sustain trust for the implementation of reforms, they must be underpinned by clear communication, consensus building among the various stakeholders, and a process for prioritising competing claims on resources. Failing to effectively engage stakeholders in the design of compensation reforms can come at a high cost and some OECD review countries have had to delay or abandon their projects in the face of stakeholders' resistance (Liebowitz et al., 2018[27]).

The experience of OECD review countries also highlights the importance of anticipating the costs and challenges involved in compensation reforms. For example, although adjusting the slope of salary scales and shifting resources towards their lower or upper end can be budget neutral in theory, fiscal consequences are often hard to predict and reforms may involve significant transition costs over the course of their implementation (Nusche et al., 2016[28]). Policy makers also need to bear in mind the inertia of reform processes and the significant amount of time that it can take for a change in teachers' compensation systems to reach all or even just a majority of the profession.

Policy 3: Reviewing the staff mix and working time arrangements in schools

The pressures faced by teachers and school leaders in their daily work are well documented, as are the prevalence and harmful impact of stress, exhaustion and burnout in schools. Teachers' work is highly complex and involves a great variety of responsibilities and activities that compete for their time during the school day and week. In addition to regular classroom instruction, teachers are usually expected, among other things, to spend time preparing their lessons, correcting students' work, collaborating with their peers, counselling students, communicating with parents, engaging in professional learning and whole-school development.

In some countries, the OECD review teams also observed that teachers had to assume a significant share of administrative and secretarial tasks (sometimes in return for a reduced teaching load), due to a lack of sufficient support (Nusche et al., 2016[28]). This not only reduces the time that teachers can spend on improving instruction, but it is also inefficient given that teachers' time tends to be more highly remunerated than that of administrative staff. In addition, the distribution of administrative tasks among teachers has been a cause for concern in some OECD review countries since beginning teachers have been reported to be disproportionately burdened with these duties (Nusche et al., 2016[28]).

Surprisingly, across countries, there is no statistically significant association between the average proportion of teachers' working time devoted to general administrative tasks and the average number of administrative or managerial staff employed by their schools. Some of the systems with the highest number of support staff are also those whose teachers devote the largest share of their working time to administrative tasks. At the same time, teachers in some other countries perform little administrative work despite a low number of support staff. This indicates that the employment of additional support staff might neither be sufficient nor necessary to ease teachers' administrative burden. Technological solutions can certainly play a role in alleviating some of the challenges associated with administrative overload, as can reduced bureaucracy and effective reporting systems.

In many OECD school systems, service codes and other statutes that regulate how teachers spend their time are based on a narrow conception of the profession (Nusche et al., 2015[29]; Santiago et al., 2016[15]). They primarily regulate teaching hours, (i.e. the time teachers are expected to spend on classroom instruction) while only vaguely defining non-teaching time. Such teaching load systems fail to provide any formal recognition for the important work that teachers perform outside of the classroom and make it more difficult for school leaders to plan staff time based on a holistic conception of their tasks. As a consequence, teachers may work excessive hours or not find enough time to pursue important non-teaching tasks.

To address these challenges, all factors contributing to teachers' workload – including their non-teaching obligations – should be taken into account when determining their teaching and working hours. Reflecting the time teachers are expected to commit to non-instruction tasks in service codes and working regulations is an important step to bring regulations more closely in line with the reality of teachers' work in schools. Estonia provides an example for a country shifting from a teaching load towards a workload system (see Chapter 2).

Arguably, school leaders face even greater challenges than teachers in allocating their time among tasks associated with organisational management and pedagogical leadership. In addition to the various dimensions of their leadership role, some principals also have substantial teaching duties. But even where they can dedicate themselves exclusively to

leadership there is considerable disagreement over the kinds of activities that effective school leaders should prioritise. Studies drawing on time-use data find that some forms of pedagogical leadership are more effective than others. The time principals spend on teacher coaching, evaluation, and developing the school's educational programme, for example, seems associated with achievement gains, while time spent on informal classroom walkthroughs appears to be less effective, particularly if they are not integrated in the schools' broader improvement strategy (Grissom, Loeb and Master, 2013[30]).

Considering the intense demands placed on school leaders' schedules, their effectiveness depends on an ability to prioritise and manage their time efficiently, which may include identifying priorities, remaining organised, setting achievable goals and monitoring one's progress towards them. Considering that time-management skills are comparatively easy to impart, offering training to principals could therefore be a means to increase their time spent on high-priority tasks and reduce stress. But a precondition for this is to build a shared understanding of priorities for principals to spend their time on, for example through a set of leadership standards, jointly developed with the profession.

Another consideration is to shift some responsibilities for school management, professional evaluation and pedagogical leadership to permit those responsible for each task to be able to do so effectively. This might take various forms, such as specific school-based leadership functions responsible for operations, administration or student behaviour management to unload these tasks from the instructional school leader. Depending on their size, schools in Kazakhstan, for example, employ school leadership teams dividing responsibilities for overall leadership, academic, educational and economic affairs (see Chapter 3). As discussed above, establishing roles for teachers to take on leadership tasks mobilises their growing expertise while at the same time providing attractive opportunities for professional growth within the teaching career. Alternatively or in addition, school systems might assign additional school leaders to each school, with the potential for schools to decide how to divide up responsibilities based on their particular needs and available staff and their skills.

Decisions about the right staff mix in schools involve significant resource trade-offs and should be informed by evidence that is relevant for particular contexts. Such choices also require a shared understanding among key stakeholders about the types of tasks and responsibilities that are expected of teachers and school leaders and the roles they may take on as they develop in their career. Carefully designed task profiles or professional standards can play a key role in clarifying and reaching agreement about expected roles and responsibilities among various stakeholders in a system.

Needs-assessment studies are one tool to help determine the staffing needs of schools and inform future resource allocations. Such studies would examine what roles are currently performed by staff, how their time is spent, what needs schools have and which types of staff would help fulfil related responsibilities. As part of such a needs assessment, it would be valuable to explore the extent to which identified needs could be addressed by investing in increased training for all school staff, including teachers. In some cases, such investments may be a more efficient and effective use of resources than the employment of additional untrained support staff. In other cases, identified needs may require the employment of additional staff and changes to the staffing mix. Where staff can be employed to relieve teachers or school leaders by responding to less complex school needs (e.g. procurement or student discipline), a change in staffing may secure potential savings.

The governance and funding of different types of staff, including teacher and school leadership positions, will shape the staffing mix in school systems. In decentralised systems, regulations and funding allocations provide potential steering mechanisms, for

instance in the form of minimum staffing ratios or targeted funding (see Chile and New Zealand for targeted funding initiatives in Chapter 3). Horizontal and bottom-up accountability (e.g. through school boards) can help ensure an effective use of resources for school staffing (OECD, 2017[31]). Where responsibilities for the employment and funding of different types of staff are split, collaboration will be essential to manage the effective staffing of schools and related trade-offs. This includes relevant authorities outside of the school sector which may provide essential professional support services.

The effective provision of staff also depends on the effective organisation of the school network (OECD, 2018[32]). Where feasible, the sharing of specialised staff across a number of schools may help ensure a broad provision of related services, although it may involve trade-offs in the level of involvement and collaboration that can be expected of staff in individual schools. Where the organisation of school education changes (e.g. the organisation of the school day and learning time), governance and funding arrangements for different types of staff often need to be reviewed, as does the preparation and training of different types of staff and the creation of new staff roles.

Policy 4: Ensuring an effective and equitable distribution of school staff

Identifying high-potential graduates at the point of hiring is an important challenge for any recruitment process. In the school sector, evidence indicates that most externally observable teacher characteristics are weak predictors of actual teacher performance in the classroom (Rockoff et al., 2011[33]; Boyd et al., 2008[34]). In addition, teachers who are effective in improving students' cognitive skills may not necessarily be equally effective in supporting students in developing their non-cognitive skills, such as resilience, growth mindset, self-efficacy and behaviour in class (Gershenson, 2016[35]). Therefore a broad range of competences, including affective and motivational skills, should be taken into account in hiring processes.

School systems vary in the extent to which their schools are autonomous in recruiting their own staff. Experience from different countries indicates that school involvement in staffing decisions can help avoid misallocations and frustrations for both schools and teachers, facilitate the matching of staff profiles to the needs of particular schools and contribute to greater job satisfaction by allowing applicants to choose their workplace and build a sense of commitment to a particular school (Nusche et al., 2015[29]; Shewbridge et al., 2016[17]). At the same time, there are concerns that school autonomy in recruitment may lead to greater disparities in staff qualifications and experiences among schools, with more advantaged schools being able to attract better candidates. There are also variations among schools in the extent to which they have the capacity, time, expertise and resources to effectively manage all aspects of selection and recruitment processes (DeArmond, Gross and Goldhaber, 2010[36]; Liu and Johnson, 2006[37])

International data suggest that inequities in the distribution of teachers can be observed both in systems with higher-level teacher recruitment and those with school-based teacher recruitment (OECD, 2018[14]). This indicates that an effective distribution of teachers depends not only on the level of decision making on recruitment but also on recruitment processes, incentives and teacher preferences. Transparency, trust and fairness in the recruitment process are important considerations to attract and select the best candidates (Finan, Olken and Pande, 2015[38]). It is therefore essential to build adequate capacity to ensure screening and selection processes are well managed. Transparent and timely information systems, and requirements to advertise vacancies as widely as possible should also be in place.

Particular potential seems to lie in ensuring that schools and the education administration work together to build effective teacher recruitment systems. Some countries, such as states in Germany, have mixed systems in place, which allow schools to have a say in their recruitment while some of the logistical and administrative demands are handled at a higher level. In such a system, education authorities can also support particular schools that have difficulty recruiting sufficient or high-quality staff. Schools may be allowed to express their preferences over a given number of centrally-ranked candidates, be involved in the selection process, or recruit a certain share of their teaching force locally. Student teacher placements as part of initial education are another route for schools to identify and hire teachers whose profiles match their needs.

Inequities in the distribution of staff across schools in different socio-economic circumstances are problematic in many countries. Data from PISA show that teachers in the most disadvantaged schools are less qualified or experienced than those in the most advantaged schools in more than a third of the participating school systems (OECD, 2018[14]). There is less evidence on inequities in the distribution of leadership staff, but some studies suggest that principals may sort into schools along similar patterns so that those with less experience and qualifications typically work in more challenging contexts (Loeb, Kalogrides and Horng, 2010[39]).

The distribution of staff across schools crucially depends on the preferences and choices of individual teachers and school leaders, as well as on the selection and transfer regulations and financial incentives in place. In systems with central teacher allocations, teachers with the highest rank may be allowed to choose their school. In decentralised systems, schools or local authorities may have to safeguard statutory rights of teachers, such as giving preference to teachers with a permanent contract or with greater seniority.

Together with teachers' preferences for working in particular schools, seniority-based systems often channel beginning teachers to schools that are considered more difficult. As new teachers often struggle with classroom realities before adapting and improving their practice (Jensen et al., 2012[40]), this may reduce their sense of efficacy and make them more likely to move to another school or to leave teaching altogether.

Research on teacher preferences also suggests that teachers typically prefer to work close to their homes, families and friends, even when they gain their initial teaching qualification elsewhere (Engel and Cannata, 2015[41]; Boyd et al., 2005[42]). This suggests that teacher labour markets are geographically relatively small and the pool of prospective teachers available to work in a given school is likely limited. In specific areas facing teacher shortages, "Grow your own" strategies can therefore play an essential role for meeting the demand for teachers (see Colombia and Mexico for the role of teacher education in rural areas in Chapter 3) (Echazarra and Radinger, 2019[43]; Sipple and Brent, 2015[44]).

Some school systems have introduced financial incentives for teachers to work in areas of need, such as higher salaries in schools enrolling large proportions of students from disadvantaged backgrounds, differential pay for particular expertise, or scholarships and subsidies for working in disadvantaged schools. In some contexts, monetary incentives have shown promising results to distribute teachers where they are needed the most. But such policies will work differently depending on the design and size of the incentives and the general framework for teacher employment and career progression. Financial incentive schemes therefore require adequate evaluation and monitoring. For example, in some contexts, financial incentives have been shown to be effective in attracting teachers to rural schools, but less so to remote schools (Pugatch and Schroeder, 2014[45]).

Of course, non-financial incentives also matter. For example, recognising experience in difficult or remote schools for staff career development is a further option. Research shows that most teachers are highly motivated by the intrinsic benefits of teaching, namely working with children and young people and helping them develop and learn (OECD, 2019[46]). Professional factors, such as opportunities to take on extra responsibilities and to engage in research and innovation, then also need to be taken into account as do working conditions, such as preparation time, leadership, collegiality, accountability demands, class size or facilities. Hence, it is equally important to ensure that all schools, and especially those in challenging circumstances, provide attractive conditions for staff to work in.

Policy 5: Adopting a broad vision of initial preparation for teaching and school leadership

Initial preparation can be conceived of as a continuum that comprises initial or pre-service education, but also support for staff during their first years on the job, be it through formal or informal induction or mentoring. Initial teacher and leader preparation should thus provide beginning school staff with a coherent learning experience across coursework, practical training, induction and early career development (OECD, 2019[47]).

Designing initial preparation so it presents a continuum requires a vision of teachers and school leaders as continuous learners. It also firmly broadens the range of actors involved in initial preparation. While most student teachers, teacher educators and researchers belong to the tertiary education system, most teacher mentors, school leaders and policy makers operate in the school system. Positive feedback loops can then play an important role in driving change as can cross-institutional and multilevel partnerships to build a coherent initial preparation system that engages different stakeholders.

Schools often have little say over the design of initial education programmes, whereas initial education institutions often have little say over the design of school induction programmes and other support schemes provided to beginning teachers or leaders. A coherent approach to initial preparation would involve collaboration between both to provide an authentic and reflective practical training and induction experience for new staff. Strong partnerships would go beyond regular discussions between schools and tertiary institutions on operational issues such as practical training placements, and also include the joint design, evaluation and improvement of programmes. This also requires dedicated time, sustainable funding, and professional responsibility, agency and trust.

Higher education institutions should consider partnering with local school networks to identify the particular challenges specific to their communities that early career teachers face and then design their curriculum in response. Ensuring that practicing teachers who serve as co-operating or supervising mentors have a say in the design of curricula will be critical to both tailor learning for prospective teachers and provide leadership and growth opportunities for expert practitioners. The Netherlands present an example for an innovative partnership between initial education and networks of schools (see Chapter 4).

In many OECD countries, initial preparation is unduly focussed on disciplinary knowledge at the expense of opportunities to practice pedagogical skill. Sizeable proportions of teachers in some countries report completing their initial education feeling unprepared for the realities of the classroom (OECD, 2019[46]). While in almost all OECD review countries the education of prospective teachers entails some requirement for practical experience in school, expectations for pre-service school-based hours of practice vary widely across and sometimes within countries.

Where prospective teachers have limited opportunities for practical experience they lose opportunities to practice instructional skills in settings in which they will have to later apply them. A rich body of literature suggests this may leave them unprepared to transfer learning from the higher education classroom to the primary and secondary context (Feuer et al., 2013[48]; O'Neill and Stephenson, 2012[49]). These challenges of transferring academic skills to school realities are also relevant for other types of school staff. For instance, school social workers in many contexts would also benefit from more practical applications in their training (Finigan-Carr and Shaia, 2018[50]).

Similarly, for school leadership, there is widespread recognition that new leaders are typically insufficiently prepared for the realities of leading a school. While some systems have more or less extensive pre-service school leadership preparation approaches, others have no set requirements for preparation beyond a teaching qualification. Still others only require training within a fixed amount of time once appointed to remain in the position. Clear and consistent expectations for initial preparation that combine instructional, management and operational skill development, both theoretically and in practice, are critical to improve school leader development. The French Community of Belgium has recently sought to strengthen its school leader preparation through an increase in training hours (see Chapter 4).

Ensuring practical experience of high quality is essential for all prospective teachers and school leaders. For example, simply placing student teachers in classrooms with poor models for instruction, weak guidance and supervision will not yield better prepared novice teachers. Education authorities may set requirements regarding the qualifications of staff hosting prospective educators, oversee quality through external screening bodies and/or identify and support particular schools and mentors in these schools to provide a suitable learning environment. From a resource perspective, shifting credits away from higher education course settings to practicum or internship experiences will require some readjustments. Higher education institutions may find that they will need to prioritise hiring more practitioner instructors rather than academic researchers.

Models of clinical practice in education, based on the medical residency system, can bring research-based understanding of teaching and learning into dialogue with the professional understanding of experienced teachers (see Chapter 4 for examples). These residencies invert the learning model so that the majority of candidate teachers' and leaders' time is spent in school. They integrate aspects of traditional university classroom preparation with the on-the-job learning of alternative pathways into an immersive learning experience. Urban teacher residencies in the United States have been evaluated, with most studies revealing improved retention outcomes for teachers entering the profession through these residencies and potential learning gains for students of teachers prepared through the residency pathway (Guha, Hyler and Darling-Hammond, 2016[51]; Papay et al., 2012[52]).

The transition from initial education to classroom teaching is a critical stage in preparing teachers and helping them to be effective in the classroom. Many teachers report significant struggles early in their careers related to classroom management and understanding school social systems (Schuck et al., 2017[53]). Evidence suggests lower levels of productivity in terms of student learning outcomes early in teachers' and school leaders' careers (Papay and Kraft, 2015[54]). At the same time, early career professionals bring with them enthusiasm and recent training that can be potentially valuable for schools to innovate and for team learning among staff.

A number of countries have made efforts to promote induction for teachers so they are successful in launching their career and joining the profession (see examples from Austria,

Chile and Estonia in Chapter 4). Such programmes often seek to bridge the gap between theory and practice, address workload challenges, provide strategies in classroom management and understanding the school culture. Intensive teacher coaching focussed on improving classroom practice has been demonstrated across multiple contexts to improve teaching practice and student achievement outcomes (Kraft and Blazar, 2016[55]; Campbell and Malkus, 2011[56]). Reviews of traditional mentoring programmes, focussed more on providing general advice rather than responding directly to observed classroom practice, have found more mixed effects (Ingersoll and Strong, 2011[57]).

Common challenges in developing effective induction include a lack of alignment between initial preparation and induction curricula and obstacles to connecting induction with continuing professional learning. Quality induction processes also need to consider implementation challenges. The cost of effective induction programmes can be high, as teaching load reductions, programme curricula and regular training for participants and mentors or coaches will need to be funded. Thus, school systems considering to invest in induction programmes must carefully estimate the relative costs and expected benefits of each policy option to determine their value. School systems will need to find efficiencies or make trade-offs with other resources, such as class size, to invest in this resource.

Policy 6: Supporting continuing professional learning and collaboration

Professional learning does not end after the initial years in a new position. To be effective, it needs to be considered as a continuous process, contextualised in clear system-wide and school goals, and then schools must redefine themselves as places of continuous learning for both children and adults (Kools and Stoll, 2016[58]; Opfer and Pedder, 2011[59]) However, many have expressed concerns regarding the effectiveness of traditional types of professional development, in the form of one-time or short-series externally provided learning courses, and impact evaluations frequently fail to establish a link to improved teaching and learning outcomes (Garet et al., 2016[60]; Harris and Sass, 2011[61]; Jacob and Lefgren, 2004[62]).

Research points to some features of more effective traditional professional development. These include embedding learning in the already ongoing work of schools, continuing learning over an extended period and a focus on a concrete set of teaching skills (Opfer, 2016[63]). Promising improvements to traditional course-based forms of professional development include the creation of regional training centres to learn about schools' particular needs and the delivery of locally provided courses corresponding to these needs.

However, formal professional development activities, in the form of university-affiliated courses, centrally or locally provided trainings or online activities are certainly only one component in a coherent professional learning plan. The majority of skills required of teachers are not easily transmitted in a set number of training days. Therefore, regular coaching, mentoring and collaboration opportunities hold particular promise for promoting reflection and practice improvement among teachers. The critical aspect is that such ongoing learning experiences are aligned to school (and potentially system) goals. This ensures that colleagues can work together on their improvement.

Several countries have introduced supports to encourage teachers' participation in different forms of professional learning such as time and leave entitlements. However, there can be challenges in securing substitute teachers to provide coverage permitting teachers to leave their classrooms during this time. One way to address this is for schools to plan specific arrangements for managing the school calendar, such as a number of professional learning

days on which schools may suspend classes and/or clear arrangements for student teachers or other school staff to substitute for those engaged in professional development.

In most countries, however, substantial time in teachers' schedules exists outside of mandatory teaching hours, which might be refocussed on professional learning. While teachers schedules are clearly taxed with many responsibilities outside of time spent teaching in front of students, ample room exists to restructure grading, administrative and other requirements to provide additional release time opportunities to pursue professional learning. Policy makers should also pay particular attention to school leaders' time availability to lead professional learning, which will likely require restructuring leadership structures in schools.

Research shows it is particularly important for professional learning to make a specific connection to an individual teachers' practice or to a problem within the school (Timperley et al., 2007[64]). Teachers will not improve by understanding theory and evidence alone, but through numerous activities such as observation, demonstration, practice, and feedback (Joyce and Showers, 2002[65]). However, in the OECD Teaching and Learning International Survey (TALIS) 2018, a large proportion of educators report never to engage in school-embedded professional development practices like peer-observation or coaching (OECD, 2019, p. 159 and Table I.5.7[46]).

Many OECD countries have educator appraisal systems in place that attempt to accomplish the following goals: i) use the evaluation process to provide feedback and stimulate learning for the teacher or leader and ii) use the evaluation process to hold staff accountable for low effort or skill (OECD, 2013[20]; Radinger, 2014[66]). In some school systems, appraisal policy priorities aim at one at the expense of the other. In other systems, appraisal policy attempts to accomplish both aims simultaneously, but struggles to effectively resolve conflicts between the two. While few of the OECD review countries emphasise the accountability dimensions of teacher appraisal, the appraisal's function as a formative tool to build capacity was often also underdeveloped. Typically, limited structures were in place for tying teacher learning, either in the form of professional development or structured improvement plans, with the outcomes of the appraisal process.

Assigning individualised, structured instructional coaching to teachers, either with designated positions or matching effective teachers with less effective ones, has shown promise in improving students' learning outcomes (Kraft and Blazar, 2016[55]). However, there are also indications that the benefits of coaching are substantially reduced in larger coaching programmes serving many teachers at a time. One of the challenges in large-scale programmes is to find high-quality coaches for large numbers of teachers. This challenge is only amplified at the leadership level since far fewer experienced school leaders exist.

Colombia's Let's All Learn programme (*Programa Todos a Aprender*, PTA) provides an interesting example for a systematic coaching initiative (see Chapter 4). School systems which have no tradition of teacher coaching might begin by recruiting coaching staff to support, perhaps, only early career and struggling teachers. Once awareness of these programmes becomes more widespread, interest in serving in these roles (and willingness to receive support) may grow. School systems that already have pockets of instructional coaching (or similar) roles might consider the use of technology (e.g. video-based coaching) to allow current coaches to have a wider reach. Ongoing monitoring and evaluation have an important role to play in ensuring effectiveness as coaching programmes and initiatives go to scale.

Ultimately, any system considering bringing coaching programmes to all teachers will face two budgetary options. The first option would be to invest significantly in these dedicated coaching positions, including in efforts to recruit coaches and provide ongoing support for coaches to ensure their coaching remains of high quality. The second option is to integrate coaching responsibilities into the duties of existing classroom teachers who would continue to have teaching as their primary responsibility. They might receive either small periods of non-instructional time or an additional stipend to provide feedback to their colleagues. The second option has the benefit of being less costly and coaches in these roles would have both current teaching experience and credibility. The evident drawbacks is that their attention will be spread thin and the quality of their coaching may suffer as a result.

In addition to using teacher (and other staff) appraisals to inform professional learning at the individual level, results from individual appraisals can be aggregated or whole-school evaluation results can replace them to generate topics for professional development. Understood as such, evaluation-informed professional development can explicitly recognise the ecological context in which teachers and leaders work. Teachers improve most when they work in supportive environments of peers seeking to improve on similar dimensions (Johnson, Kraft and Papay, 2012[67]). Thus, a collective focus to linking appraisal with development holds promise.

Collaboration can help to build up trust and social capital in schools that enables the unlearning of old assumptions and habits, the development of new understandings and practices, and the possibility to solve collective action problems. In addition, collaboration and peer learning are important for making the most of other types of staff who may work in schools (Masdeu Navarro, 2015[8]). Social workers, for example, can support teachers struggling with student behavioural issues (Finigan-Carr and Shaia, 2018[50]).

Collaborative learning communities that entail active and shared discussions can provide safe environments for teachers to challenge tacit assumptions on what works and why. While many schools and systems have traditions of staff meetings (e.g. departmental or grade-level meetings), these are distinct in nature from learning teams. Schools, teachers and leaders can of course benefit from the traditional work of such meetings, but these types of activities tend to change teaching practice minimally.

The work of effective learning teams requires minimally i) regular, dedicated time in working schedules, ii) leadership roles, including for practicing teachers, iii) supports in the form of protocols or defined work processes to ensure work remains focussed on instructional and organisational improvement and iii) a school culture that tolerates and encourages peer-to-peer feedback and innovation.

Such opportunities, particularly defining time in staff schedules, represent significant resource investments. While resource-constrained systems may find it tempting to seek to minimise these expenditures by focussing only on the schedule time, this may ultimately lead to the inefficient reality of increased costs with minimal improvements. Policy makers interested in the potential benefits of school-based learning teams should budget for the relatively smaller supports for team leader capacity development and resources to support the teams' work, such as ongoing professional development, support networks of schools sharing similar learning goals, electronic teaching libraries, or other tools to support adult learning.

To support continuing professional learning at the school and system level, it is important that schools and systems codify the knowledge they gain about which teaching processes are and are not effective. Since causal research designs and evaluations are costly and time

intensive and require specific competencies, one option may be to collect insights across multiple staff on the effectiveness of particular teaching strategies. Such a process of external knowledge development which would include both cross-school and research-practice partnerships is a critical part of developing a generalisable knowledge base in teaching.

Just as codifying internally developed knowledge is important, so too are networks for collaboration and knowledge sharing across schools, also to enable schools to combat their isolated natures and gain insights from effective practices in near or distant peer institutions. Teachers, leaders and other school staff stand to benefit from networks and school-to-school collaborations.

External advisory networks of pedagogical experts can support broader knowledge creation and sharing within a system. Some systems have created central bodies of learning consultants working with schools in their improvement efforts and facilitating peer exchange between schools (see an example from Denmark in Chapter 4). Their work can be based on both evidence from research and practical knowledge from the field, creating a circle of learning between the central and the local level. Technology offers new ways to connect schools and staff for learning and to codify knowledge via digital platforms.
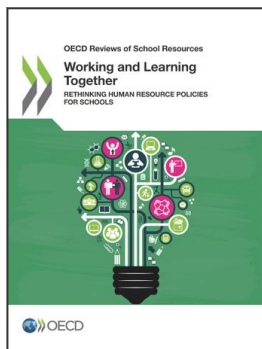
References

Ballou, D. and M. Springer (2015), "Using student test scores to measure teacher performance", *Educational Researcher*, Vol. 44/2, pp. 77-86, http://dx.doi.org/10.3102/0013189x15574904. [19]

Bénabou, R. and J. Tirole (2003), "Intrinsic and extrinsic motivation", *Review of Economic Studies*, Vol. 70/3, pp. 489-520, http://dx.doi.org/10.1111/1467-937x.00253. [23]

Boyd, D. et al. (2008), "The narrowing gap in New York City teacher qualifications and its implications for student achievement in high-poverty schools", *Journal of Policy Analysis and Management*, Vol. 27/4, pp. 793-818, http://dx.doi.org/10.1002/pam.20377. [34]

Boyd, D. et al. (2005), "The draw of home: How teachers' preferences for proximity disadvantage urban schools", *Journal of Policy Analysis and Management*, Vol. 24/1, pp. 113-132, http://dx.doi.org/10.1002/pam.20072. [42]

Branch, G., E. Hanushek and S. Rivkin (2012), "Estimating the effect of leaders on public sector productivity: The case of school principals", *NBER Working Papers*, No. 17803, National Bureau of Economic Research, Cambridge, MA, http://dx.doi.org/10.3386/w17803. [5]

Campbell, P. and N. Malkus (2011), "The impact of elementary mathematics moaches on student achievement", *The Elementary School Journal*, Vol. 111/3, pp. 430-454, http://dx.doi.org/10.1086/657654. [56]

Chetty, R., J. Friedman and J. Rockoff (2014), "Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood", *American Economic Review*, Vol. 104/9, pp. 2633-2679, http://dx.doi.org/10.1257/aer.104.9.2633. [3]

Coelli, M. and D. Green (2012), "Leadership effects: school principals and student outcomes", *Economics of Education Review*, Vol. 31/1, pp. 92-109, http://dx.doi.org/10.1016/j.econedurev.2011.09.001. [6]

Conley, S. and A. Odden (1995), "Linking teacher compensation to teacher career development", *Educational Evaluation and Policy Analysis*, Vol. 17/2, pp. 219-237, http://dx.doi.org/10.3102/01623737017002219. [18]

Crehan, L. (2016), *Exploring the impact of career models on teacher motivation*, UNESCO International Institute for Educational Planning (IIEP), Paris, http://unesdoc.unesco.org/images/0024/002462/246252e.pdf (accessed on 11 July 2018). [10]

DeArmond, M., B. Gross and D. Goldhaber (2010), "Is it better to be good or lucky? Decentralized teacher selection in 10 elementary schools", *Educational Administration Quarterly*, Vol. 46/3, pp. 322-362, http://dx.doi.org/10.1177/0013161x10365824. [36]

Echazarra, A. and T. Radinger (2019), "Learning in rural schools: Insights from PISA, TALIS and the literature", *OECD Education Working Papers*, No. 196, OECD Publishing, Paris, https://dx.doi.org/10.1787/8b1a5cb9-en. [43]

Engel, M. and M. Cannata (2015), "Localism and teacher labor markets: How geography and decision making may contribute to inequality", *Peabody Journal of Education*, Vol. 90/1, pp. 84-92, http://dx.doi.org/10.1080/0161956X.2015.988533. [41]

Feuer, M. et al. (2013), *Evaluation of teacher preparation programs: Purposes, methods and policy options*, National Academy of Education, Washington, DC, https://naeducation.org/publications (accessed on 15 July 2019). [48]

Finan, F., B. Olken and R. Pande (2015), "The personnel economics of the state", *NBER Working Papers*, No. 21825, National Bureau of Economic Research, Cambridge, MA, http://dx.doi.org/10.3386/w21825. [38]

Finigan-Carr, N. and W. Shaia (2018), "School social workers as partners in the school mission", *Phi Delta Kappan*, Vol. 99/7, pp. 26-30, https://doi.org/10.1177/0031721718767856. [50]

Frey, B. (1997), "On the relationship between intrinsic and extrinsic work motivation", *International Journal of Industrial Organization*, Vol. 15/4, pp. 427-439, http://dx.doi.org/10.1016/s0167-7187(96)01028-4. [24]

Garet, M. et al. (2016), *Focusing on mathematical knowledge: The impact of content-intensive teacher professional development (NCEE 2016-4010)*, US Department of Education, Institute of Education Sciences, Washington, DC, https://ies.ed.gov/ncee (accessed on 15 June 2019). [60]

Gershenson, S. (2016), "Linking teacher quality, student attendance, and student achievement", *Education Finance and Policy*, Vol. 11/2, pp. 125-149, http://dx.doi.org/10.1162/EDFP_a_00180. [35]

Goodman, S. and L. Turner (2013), "The design of teacher incentive pay and educational outcomes: Evidence from the New York City Bonus Program", *Journal of Labor Economics*, Vol. 31/2, pp. 409-420, http://dx.doi.org/10.1086/668676. [26]

Grissom, J., S. Loeb and B. Master (2013), "Effective instructional time use for school leaders: Longitudinal evidence from observations of principals", *Educational Researcher*, Vol. 42/8, pp. 433–444, http://dx.doi.org/10.3102/0013189X13510020. [30]

Guha, R., M. Hyler and L. Darling-Hammond (2016), *The Teacher Residency: An Innovative Model for Preparing Teachers*, Learning Policy Institute, Palo Alto, CA, https://learningpolicyinstitute.org/product/teacher-residency. (accessed on 23 June 2018). [51]

Harris, D. and T. Sass (2011), "Teacher training, teacher quality and student achievement", *Journal of Human Resources*, Vol. 95, pp. 798-812, http://dx.doi.org/10.1016/j.jpubeco.2010.11.009. [61]

Hopkins, D., D. Nusche and B. Pont (eds.) (2008), *Improving School Leadership, Volume 2: Case Studies on System Leadership*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264039551-en. [12]

Ingersoll, R. and M. Strong (2011), "The impact of induction and mentoring programs for beginning teachers", *Review of Educational Research*, Vol. 81/2, pp. 201-233, http://dx.doi.org/10.3102/0034654311403323. [57]

Jackson, C. (2018), "What do test scores miss? The importance of teacher effects on non–test score outcomes", *Journal of Political Economy*, Vol. 126/5, pp. 2072-2107, http://dx.doi.org/10.1086/699018. [2]

Jackson, C., J. Rockoff and D. Staiger (2014), "Teacher effects and teacher-related policies", *Annual Review of Economics*, Vol. 6/1, pp. 801-825, http://dx.doi.org/10.1146/annurev-economics-080213-040845. [25]

Jacob, B. and L. Lefgren (2004), "The impact of teacher training on student achievement qusai-experimental evidence from school reform efforts in Chicago", *Journal of Human Resources*, Vol. 39/1, pp. 50-79, http://dx.doi.org/10.2307/3559005. [62]

Jensen, B. et al. (2012), *The Experience of New Teachers: Results from TALIS 2008*, TALIS, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264120952-en. [40]

Johnson, S., M. Kraft and J. Papay (2012), "How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement", *Teachers College Record*, Vol. 114/10, pp. 1-39, https://www.tcrecord.org. [67]

Joyce, B. and B. Showers (2002), *Student achievement through staff development*, Association for Supervision and Curriculum Development, Alexandria, VA. [65]

Kershaw, J. and R. McKean (1962), *Teacher Shortages and Salary Schedules*, RAND Corporation, Santa Monica, CA. [13]

Kools, M. and L. Stoll (2016), "What Makes a School a Learning Organisation?"*, OECD Education Working Papers*, No. 137, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jlwm62b3bvh-en. [58]

Kraft, M. (2019), "Teacher effects on complex cognitive skills and social-emotional competencies", *Journal of Human Resources*, Vol. 54/1, pp. 1-36, http://dx.doi.org/10.3368/jhr.54.1.0916.8265r3. [1]

Kraft, M. and D. Blazar (2016), "Individualized coaching to improve teacher practice across grades and subjects: New experimental evidence", *Educational Policy*, Vol. 0/0, pp. 1-36, http://dx.doi.org/10.1177/0895904816631099. [55]

Liebowitz, D. et al. (2018), *OECD Reviews of School Resources: Portugal 2018*, OECD Reviews of School Resources, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264308411-en. [27]

Liu, E. and S. Johnson (2006), "New teachers' experiences of hiring: Late, rushed, and information-poor", *Educational Administration Quarterly*, Vol. 42/3, pp. 324-360, http://dx.doi.org/10.1177/0013161x05282610. [37]

Loeb, S., D. Kalogrides and E. Horng (2010), "Principal preferences and the uneven distribution of principals across schools", *Educational Evaluation and Policy Analysis*, Vol. 32/2, pp. 205-229, http://dx.doi.org/10.3102/0162373710369833. [39]

Masdeu Navarro, F. (2015), "Learning support staff: A literature review", *OECD Education Working Papers*, No. 125, OECD Publishing, Paris, https://dx.doi.org/10.1787/5jrnzm39w45l-en. [8]

Natale, C. et al. (2013), *Creating Sustainable Teacher Career Pathways: A 21 st Century Imperative*, Pearson & National Network of State Teachers of the Year (NNSTOY), https://www.nnstoy.org/download/career_pathways/Final%20updated%20Research%20Report.pdf (accessed on 11 October 2018). [11]

Nusche, D. et al. (2015), *OECD Reviews of School Resources: Flemish Community of Belgium 2015*, OECD Reviews of School Resources, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264247598-en. [29]

Nusche, D. et al. (2016), *OECD Reviews of School Resources: Austria 2016*, OECD Reviews of School Resources, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264256729-en. [28]

OECD (2019), *A Flying Start: Improving Initial Teacher Preparation Systems*, OECD Publishing, Paris, http://dx.doi.org/10.1787/cf74e549-en. [47]

OECD (2019), *Education at a Glance 2019: OECD Indicators*, OECD Publishing, Paris, https://dx.doi.org/10.1787/f8d7880d-en. [9]

OECD (2019), *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*, TALIS, OECD Publishing, Paris, https://dx.doi.org/10.1787/1d0bc92a-en. [46]

OECD (2018), *Effective Teacher Policies: Insights from PISA*, PISA, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264301603-en. [14]

OECD (2018), *Responsive School Systems: Connecting Facilities, Sectors and Programmes for Student Success*, OECD Reviews of School Resources, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264306707-en. [32]

OECD (2017), *The Funding of School Education: Connecting Resources and Learning*, OECD Reviews of School Resources, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264276147-en. [31]

OECD (2013), *Synergies for Better Learning: An International Perspective on Evaluation and Assessment*, OECD Reviews of Evaluation and Assessment in Education, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264190658-en. [20]

O'Neill, S. and J. Stephenson (2012), "Does classroom management coursework influence pre-service teachers' perceived preparedness or confidence?", *Teaching and Teacher Education*, Vol. 28/8, pp. 1131-1143, https://doi.org/10.1016/j.tate.2012.06.008. [49]

Opfer, D. (2016), "Conditions and Practices Associated with Teacher Professional Development and Its Impact on Instruction in TALIS 2013", *OECD Education Working Papers*, No. 138, OECD Publishing, Paris, https://dx.doi.org/10.1787/5jlss4r0lrg5-en. [63]

Opfer, V. and D. Pedder (2011), "Conceptualizing teacher professional learning", *Review of Educational Research*, Vol. 81/3, pp. 376-407, http://dx.doi.org/10.3102/0034654311413609.   [59]

Papay, J. (2011), "Different tests, different answers", *American Educational Research Journal*, Vol. 48/1, pp. 163-193, http://dx.doi.org/10.3102/0002831210362589.   [21]

Papay, J. and M. Kraft (2015), "Productivity returns to experience in the teacher labor market: Methodological challenges and new evidence on long-term career improvement", *Journal of Public Economics*, Vol. 130, pp. 105-119, http://dx.doi.org/10.1016/j.jpubeco.2015.02.008.   [54]

Papay, J. et al. (2012), "Does an urban teacher residency increase student achievement? Early evidence from Boston", *Educational Evaluation and Policy Analysis*, Vol. 34/4, pp. 413-434, http://dx.doi.org/10.3102/0162373712454328.   [52]

Pont, B., D. Nusche and H. Moorman (2008), *Improving School Leadership, Volume 1: Policy and Practice*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264044715-en.   [7]

Pugatch, T. and E. Schroeder (2014), "Incentives for teacher relocation: Evidence from the Gambian hardship allowance", *Economics of Education Review*, Vol. 41, pp. 120-136, http://dx.doi.org/10.1016/j.econedurev.2014.04.003.   [45]

Radinger, T. (2014), "School leader appraisal - A tool to strengthen school leaders' pedagogical leadership and skills for teacher management?", *European Journal of Education*, Vol. 49/3, http://dx.doi.org/10.1111/ejed.12085.   [66]

Rivkin, S., E. Hanushek and J. Kain (2005), "Teachers, schools, and academic achievement", *Econometrica*, Vol. 73/2, pp. 417-458, http://dx.doi.org/10.1111/j.1468-0262.2005.00584.x.   [4]

Rockoff, J. et al. (2011), "Can you recognize an effective teacher when you recruit one?", *Education Finance and Policy*, Vol. 6/1, pp. 43-74, http://dx.doi.org/10.1162/EDFP_a_00022.   [33]

Rothstein, J. (2010), "Teacher quality in educational production: Tracking, decay, and student achievement*", *Quarterly Journal of Economics*, Vol. 125/1, pp. 175-214, http://dx.doi.org/10.1162/qjec.2010.125.1.175.   [22]

Santiago, P. et al. (2016), *OECD Reviews of School Resources: Uruguay 2016*, OECD Reviews of School Resources, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264265530-en.   [15]

Santiago, P. et al. (2016), *OECD Reviews of School Resources: Slovak Republic 2015*, OECD Reviews of School Resources, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264247567-en.   [16]

Schuck, S. et al. (2017), "The experiences of early career teachers: new initiatives and old problems", *Professional Development in Education*, Vol. 44/2, pp. 209-221, http://dx.doi.org/10.1080/19415257.2016.1274268.   [53]

Shewbridge, C. et al. (2016), *OECD Reviews of School Resources: Czech Republic 2016*, OECD Reviews of School Resources, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264262379-en.   [17]

Sipple, J. and B. Brent (2015), "Challenges and Strategies Associated with Rural School Settings", in Ladd, H. and M. Goertz (eds.), *Handbook of Research in Education Finance and Policy*, Routledge, New York, NY and Abingdon, OX.   [44]

Timperley, H. et al. (2007), *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration*, New Zealand Ministry of Education, Wellington, http://www.educationcounts.govt.nz/publications/curriculum/2515/15341 (accessed on 6 April 2019).   [64]