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Who Needs Special Education Professional Development? International Trends from TALIS 2013

North Cooc

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Who Needs Special Education Professional Development? International Trends from TALIS 2013

OECD Education Working Paper No. 181

North Cooc, The University of Texas at Austin

This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

North Cooc, The University of Texas at Austin, ncooc@austin.utexas.edu

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Abstract

Although access to formal education has improved internationally for children with disabilities, concerns remain about education quality for this student population. Using data on 121 173 teachers from 38 countries in the 2013 Teaching and Learning International Survey (TALIS), this study examined the qualifications and professional development (PD) needs of teachers who work with children with special needs. The results indicate that teachers responsible for students with special needs had, on average, lower qualifications, worked in itinerant positions more frequently and expressed greater professional development need than colleagues who did not teach students with special needs. The need for professional development among teachers who taught special needs students was lowest in schools with greater instructional leadership. Additionally, only a small percentage of teachers reported that their professional development had a positive impact on their instruction. The paper discusses policy implications for teacher recruitment and designing professional development.

Résumé

Malgré l'amélioration au plan mondial de l'accès des enfants souffrant d'un handicap à l'éducation dans le cadre institutionnel, la qualité de l'enseignement qui leur est dispensé reste un sujet de préoccupation. À partir de données collectées auprès de 121 173 enseignants de 38 pays dans le cadre de l'Enquête internationale sur l'enseignement et l'apprentissage (TALIS) 2013, cette étude analyse les qualifications et les besoins de développement professionnel continu des enseignants en charge d'enfants ayant des besoins spécifiques d'éducation. En moyenne, il en ressort que ces enseignants ont un niveau inférieur de qualification, présentent souvent un taux de rotation plus élevé et font part de besoins de développement professionnel continu plus importants que leurs collègues ne travaillant pas auprès d'élèves ayant des besoins spécifiques d'éducation. C'est dans les établissements où l'encadrement pédagogique est plus important que les besoins en développement professionnel continu des enseignants en charge d'élèves ayant des besoins spécifiques d'éducation sont les moins significatifs. En outre, seul un faible pourcentage d'enseignants signale un impact positif de leur développement professionnel continu sur leurs pratiques pédagogiques. Ce document examine les implications stratégiques de ces résultats en termes de recrutement des enseignants et de conception des programmes de développement professionnel continu.

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Introduction

More than one billion people in the world (15%) live with some form of disability related to physical, mental, intellectual or sensory impairments that impact full participation in society (World Health Organization, 2011[1]). Among children aged 0 to 18 years, the number with a disability ranges from 93 million to 150 million according to different survey estimates (UNICEF, 2013[2]). For those with disabilities, unequal access to health care and employment and daily experiences with discrimination are common in many parts of the world. Consequently, disability is framed as a human rights issue in many international treaties, including the landmark Convention on the Rights of Persons with Disabilities (CRPD), which explicitly acknowledges rights related to respect, dignity and equal opportunity for individuals with disabilities. Countries that sign the CRPD (160 total) are obligated to address these barriers and advance legal disability reform as needed to eliminate discrimination.

A key element of the CRPD pertains specifically to respecting the capacities of children with disabilities and their right to be included in the general education system and receive appropriate instructional support. Numerous other international initiatives, such as the Salamanca Declaration, Educational for All Movement (EFA), and Millennium Development Goals, have established goals for improving access to education for children with disabilities (Peters, 2007[3]; Winzer and Mazurek, 2014[4]). As part of a new global agenda to end poverty, protect the planet and ensure prosperity for all, the United Nations (2015[5]) recently made quality education one of the 17 Sustainable Development Goals (SDGs) for the next 15 years. Goal 4.5 specifically calls for countries to ensure access to education and upgrade facilities for vulnerable populations, including persons with disabilities. Despite these international agreements about the educational rights of children with disabilities, their school participation remains low, particularly in low-income countries. The World Health Survey, one of the main sources of international data on disability rates, indicates that less than half of individuals with disabilities have completed primary school and many do not attend school at all in some countries (World Health Organization, 2011[1]).

The right to an education, however, means more than access to school and attendance. Much less attention has focused on the quality of education that children with disabilities receive in different countries. Research shows numerous school factors may impact the education of children with disabilities, including the quality of the curriculum (UNESCO, 2009[6]), the stigmatising effects of labelling (Florian et al., 2006[7]), and physical barriers in facilities (Stubbs, 2008[8]). However, perhaps the most important school-based determinant of student achievement and learning is quality teaching (Chetty, Friedman and Rockoff, 2014[9]; Feng and Sass, 2013[10]). Having appropriately trained and supported teachers in special needs education is crucial for developing curriculum, implementing behavioural supports, providing opportunities to learn, and creating inclusive classroom environments.[1] The lack of teachers prepared in special needs education compromises the gains made in increasing access to school for children with disabilities.

[1] To be consistent with international literature and definitions used in many countries, I treat the phrase "special needs education" as synonymous with special education in the United States.

As countries move towards including children with disabilities in mainstream classrooms, it is critical to assess whether schools and teachers, in particular, are meeting the learning needs of this student population. Using data from the 2013 Teaching and Learning International Survey (TALIS), I shift attention in this study from school access to education quality by assessing the extent to which teachers express needing professional development in special education.[2] The former addresses how far countries have moved beyond providing access to education, while the latter has implications for supporting teachers and, indirectly, improving the education of children with disabilities.

[2] In TALIS, special needs students are defined as "those for whom a special learning need has been formally identified because they are mentally, physically, or emotionally disadvantaged". Although not all students with special needs may have a disability according to this definition, I use "students with special needs" and "students with disabilities" interchangeably in this study.

Background

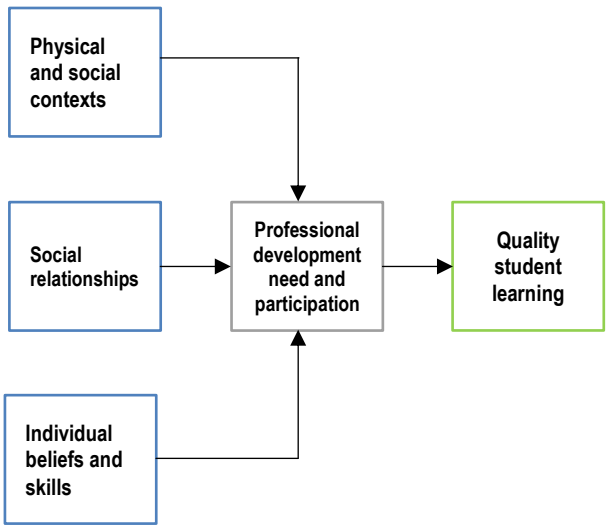
The shortage of special education teachers combined with the greater inclusion of children with disabilities into mainstream classrooms has forced schools in many countries to employ teachers without the appropriate qualifications (Chitiyo et al., 2017[11]; Deng and Holdsworth, 2007[12]; Kalyanpur, 2008[13]; Hadidi and Al Khateeb, 2015[14]; U.S. Department of Education, 2015[15]; Vorapanya and Dunlap, 2014[16]). One response from schools is to provide more professional development to teachers in special needs instruction and inclusive education as a means of increasing institutional capacity (Chao, Forlin and Ho, 2016[17]; Forlin, Kawai and Higuchi, 2015[18]; Kuyini et al., 2016[19]; Lang and Fox, 2004[20])

In this paper, I use a broad definition of professional development to include formal (e.g. courses and workshops) and informal activities (e.g. collaboration with other teachers) that develop an individual's skills, knowledge, expertise, and other characteristics as a teacher (OECD, 2014[21]). To understand what may contribute to differences in the professional development needs of teachers who work with students with disabilities, I use a situative perspective that considers the work context (Putnam and Borko, 2000[22]). I review the conceptual model below followed by the empirical literature.

Situating professional development

Putnam and Borko (2000[22]) define three concepts central to the situative perspective, arguing that professional development and learning is: a) situated in a particular physical or social context; b) social in nature; and c) distributed across individuals. I provide a modified version of this in Figure 1.

Figure 1. Conceptual framework of professional development using situative perspective



Source: Adapted from Putnam, R. T. and H. Borko (2000[22]) "What do new views of knowledge and thinking have to say about research on teacher learning?", *Educational Researcher*, 29(1), pp. 4-15.

Professional development as situated posits that the physical and social contexts in which an activity takes place are an integral part of learning. Rather than focusing on the

individual as the sole participant, the situative perspective emphasises how the work contexts interact with the individual to impact learning. For teachers, this means their engagement in professional development is a function of the school environment, which includes the institutional structure, accountability practices, leadership, school climate, and expectations around teacher learning. Teachers are likely to be more involved in professional development if the expectation and value of improvement is embedded within the school context.

Professional development as social, in contrast, refers to the social interactions among teachers, particularly the relationships and degree of collaboration within teacher communities. Where collaboration is high and teachers exchange ideas for improvement, professional development may be more common and viewed as an extension of professional learning. Teachers may also be socialised into professional development based on peer relationships and networks within the school.

Lastly, the view of professional development and learning as "distributed" contrasts with the traditional view of knowledge as residing solely within an individual. Distributed learning means teachers may view professional development as shared with colleagues and complementary to larger school tasks that require contributions from all members. However, Putnam and Borko (2000[22]) caution that the distributed perspective should be balanced with the view that professional development also depends on individual perceptions of self-efficacy, capacity, individual growth and self-improvement.

Prior literature on special education professional development needs

Numerous empirical studies provide insight into which teachers express needing special education professional development and under what contexts. In this section, I review gaps in the literature pertaining to special education from international contexts but highlight relevant studies on professional development broadly and in the United States. I focus specifically on the role of teacher characteristics, teacher relationships and school contexts in previous research. I also discuss studies related to professional development for inclusion given that many countries are exploring how to teach children with disabilities in mainstream classrooms. Lastly, it is important to note that in many of the studies below, teachers who report needing professional development in special education lacked specific skills and preparation in this area. However, it is possible that some who express needing professional development are competent teachers who continually seek improvement. Distinguishing between teachers who report needing professional development due to urgent skill gaps versus continual self-improvement is difficult but both reflect an interest, albeit to different degrees, in improving individual capacity in teaching students with special needs.

Teacher characteristics

Research shows a range of teachers' beliefs, practices, qualifications and skill levels may influence special education professional development need (Chao, Forlin and Ho, 2016[17]; Rix and Paige-Smith, 2011[23]). For instance, studies in Zimbabwe and Ethiopia report teachers struggling with mainstream classroom inclusion and expressing a desire for more training related to specific disabilities and how to provide appropriate accommodations (Chitiyo et al., 2017[11]; Franck and Joshi, 2017[24]). In these studies, teachers acknowledged their lack of familiarity in areas such as Braille and sign language, and critiqued professional development opportunities focused disproportionately on theory. Feng (2012[25]) found that teachers in China with lower competencies and motivation had, on average, more negative views of inclusive education and special needs professional

development. Indeed, more positive attitudes towards inclusion and children with disabilities may influence teachers' interest in further training and professional development in special education (Sharma, Forlin and Loreman, 2008[26]; Thaver and Lim, 2014[27]).

In the United States, professional development need among general and special education teachers may depend on knowledge of subject content areas and intensive instruction delivery for children with disabilities (Leko and Brownell, 2009[28]). Feng and Sass (2013[10]) found that in Florida students with disabilities had higher achievement when taught in classrooms with teachers who were certified in special education, possessed an advanced degree, and had more experience. If these professional characteristics and prior training are related to competence and self-efficacy, then such teachers may be less likely to report professional development need in special education (Nougaret, Scruggs and Mastropieri, 2005[29]; Sindelar, Daunic and Rennells, 2004[30]).

Research on overall professional development participation can provide insight into which teachers may desire more training. Choy et al. (2006[31]) analysed the Schools and Staffing Survey (SASS), one of the largest studies of professional development among US teachers (n = 55 000), and found teachers with less experience were more likely than teachers with ten or more years of experience to participate in professional development. Teachers with a bachelor's degree or less were more likely to participate in additional university courses, while those in full-time positions were more likely to participate in professional development than part-time teachers. Other research suggests that teachers who view learning as an active process of knowledge construction may seek more professional development, compared to those who see learning as a passive transmission (Opfer, 2016[32]). Although TALIS 2013 shows differences in overall professional development participation by teaching experience and between teachers in permanent and non-permanent positions (OECD, 2014[21]), it is unclear if these trends also apply to professional development in special education, specifically across countries other than the United States.

Whether teachers express needing professional development in special education is also related to how their skills and beliefs may interact with prior experiences participating in such activities (Wei et al., 2009[33]). Teachers who participate in effective professional development that improves their competency may not need additional professional development later. However, it is also possible that teachers have large skill gaps in special education, especially as schools move towards more inclusive policies for students with disabilities in different countries (Chitiyo et al., 2017[11]; Feng, 2012[25]), such that an effective professional development activity may motivate further professional development. Each of these outcomes has implications for improving professional development and targeting specific teachers, yet few studies have examined the relationship between prior participation and current need.

Teacher relationships

Teachers who experience high levels of collegiality and co-operation with other teachers may be more welcoming to professional learning and development than others (Loxley et al., 2007[34]; Nir and Bogler, 2008[35]). Those with lower levels of collaboration with peer teachers may feel more isolated and disconnected from the school community, leading to less interest in professional learning and improvement, even if there is high need (Arndt and Liles, 2010[36]; Griffin, Jones and Kilgore, 2006[37]). Nel et al. (2014[38]) found South African teachers who were ill-prepared to collaborate with other teachers within an

inclusive education system tended to refer students with special needs to other professionals or resources, rather than view inclusion as a shared responsibility and seek the appropriate training or professional development.

School characteristics and contexts

A large body of literature indicates that professional development may depend on the school context, particularly the school norms and leadership that motivate teachers to learn (Kraft and Papay, 2014[39]; Leithwood and McAdie, 2007[40]). Studies on school conditions related to special education in the United States have mostly examined work environments that lead teachers to leave the profession, including low levels of school morale, administrative support, instructional resources, colleague support and opportunities to learn (Bettini et al., 2016[41]; Billingsley, 2004[42]; Sindelar, Brownell and Billingsley, 2010[43]). School conditions that induce special education teachers to leave are likely to influence whether teachers engage in professional development and self-improvement.

Structural factors related to resources and school composition may influence professional development need and participation. Choy et al. (2006[31]) found US public school teachers in larger school districts were more likely than their colleagues in smaller districts to participate in various professional development activities. Teachers in schools with their own professional development budgets and structured time were also more likely to participate in professional development. In addition, teachers were more likely to participate in professional development in schools with a larger proportion of minority and low-income students who may have more learning challenges that require teachers to seek additional training. Although this suggests that teachers who work with more students with special needs may need more professional development in this area, there is a dearth of research on whether this is the case.

Present study

In this paper, I examined the personnel capacity of schools and the professional development needs of teachers in special education in 38 TALIS-participating countries and economies. Although global awareness of the educational rights of children with disabilities and access to schooling has improved, I assessed whether a shortage of teachers with competence in teaching students with special needs hinders a school's capacity to provide quality instruction and to what extent and under what context teachers self-report participating and needing professional development in special education.

Although teachers who express needing professional development can be viewed in different ways, based on previous literature and trends in the TALIS data, I interpret it as an urgency to increase the capacity of teachers to support children with special needs. I also examined the self-reported impact of prior professional development, particularly for teachers who work with children with special education needs (SEN), to assess whether effective programming influences current need. At the micro-level, identifying which teachers need more professional development, and under which context, is critical for improving the skills of teachers, the allocation of resources and the design of professional training activities. Each perspective provides new insight into educational quality for children with disabilities. To summarise, I ask the following research questions:

1. What is the level of participation and current need in professional development for special needs education among teachers in TALIS-participating countries and economies?
2. What teacher and school-level factors are associated with special education professional development need among teachers in TALIS-participating countries and economies?

Methodology

Data source and sample

I used data from the 2013 TALIS to examine the special education professional development needs of teachers. As one of the only large-scale international surveys with a focus on the working conditions of teachers in schools, TALIS is ideal for the research objectives. The scope and size of the teacher sample, measures of teacher professional development and qualifications, and rich information on school contexts from principals allows an assessment of the training of teachers in special needs education in different countries. The analytic sample consists of 121 173 total teachers at the lower secondary levels from 38 countries and partners and 1 074 schools.[3] Participants were surveyed using a two-stage probability sampling design with schools first selected using probability proportion to the size (PPS) of teachers within the select strata according to the specific context of each country. In the second stage, teachers were randomly selected from the list of teachers in each randomly selected school (OECD, 2014[44]).

Two other features of the TALIS dataset should be noted for the current study. First, TALIS did not sample schools that taught exclusively students with special needs. This means that in TALIS-participating countries and economies where students with special needs are taught mostly in separate schools, the analytic sample would not capture the professional development needs of their teachers. Second, in contrast to other large-scale datasets (e.g. SASS), TALIS does not include a designation for whether teachers are formal special education teachers in terms of certification or primary responsibility. The exclusion of separate schools and lack of formal designation of special education teachers may limit inferences in this study but should be interpreted within the context of current shortages of special education teachers and a broader movement of including students with disabilities into mainstream classrooms (Artiles, Kozleski and Waitoller, 2011[45]). That is, all teachers may find themselves at some point responsible for educating students with disabilities and need professional development in this area. It is important to note that TALIS data on classroom composition is based on students whose special learning needs have been formally identified because they are mentally, physically or emotionally disadvantaged. However, this definition varies across countries, and there may be many other students whose special needs remain unidentified because of lack of expertise or resources in this domain among educators and society in general. Thus, cross-country comparison should be done carefully.

Measures

Outcomes

I used two measures for prior professional development participation and current need. First, teachers were asked whether they had participated in professional development activities on special education in the last 12 months (yes or no) and the impact of these

[3] The United States is a participating country but did not meet the OECD requirements for TALIS response rates. However, the TALIS Board of Participating Countries agreed that the US data were of sufficient quality for reporting separately. I have included the US data in my analyses because the model results were similar with and without the US sample.

activities: (1) No, (2) Small, (3) Moderate, and (4) Large. I dichotomised the impact measure into "large impact" or "other" to focus on highly effective professional development. Second, teachers were asked their level of professional development need for teaching special needs students on an ordinal scale: (1) No need at present, (2) Low level of need, (3) Moderate level of need, and (4) High level of need. Given the focus on professional development need in this study, I dichotomised responses according to "high need" or "not high need".

Teacher-level predictors

Based on the literature described earlier, I examined teacher professional characteristics that may be associated with professional development need in special education among teachers. All scales selected for this study were previously validated and demonstrate strong reliability and validity. The items in each scale are available in the *TALIS 2013 Technical Report* (OECD, 2014[44]). Teacher characteristics included measures for gender, education level (Level 5A or higher on the International Standard Classification of Education), whether the teacher attended a teacher education programme, and teaching experience in years. I included two measures of whether the position was part-time and permanent at the school. For training, teachers were asked whether they received training in three areas related to the subjects they taught: content, pedagogy, and classroom practice. Because professional development need may be related to opportunities within the school, I added two dichotomous measures of whether a teacher was part of a formal induction programme and assigned a mentor. To capture teacher beliefs about their teaching, I used two separate scales of individual self-efficacy and constructivist approaches to instruction (i.e. learning through experience).

If professional development consideration is situated within social contexts and relationships, then these working conditions are important to consider (Putnam and Borko, 2000[22]). I included three TALIS scales related to teacher relationships. The teacher co-operation scale consists of eight items related to the exchange of teaching ideas and professional collaboration. The teacher-student relations scale contains four items related to social interactions, perceptions of and supports for students, and teacher beliefs. The stakeholder scale is based on five items asking teachers if they agreed that their school provided staff, parents and students with opportunities to participate in school decisions and shape the culture.

A key variable related to the classroom context and professional development need is whether teachers worked with special needs children. Teachers were asked to select from one of their classes and indicate the percentage of students who have special needs using the following response options: (1) none, (2) 1% to 10%, (3) 11% to 30%, (4) 31% to 60%, and (5) more than 60%.[4] I grouped the last two categories because of the lower frequency in each. One advantage of this variable is it allows for an analysis of whether professional development need in special education among teachers changes as the percentage of students with special needs increases in the classroom. A separate variable asked teachers the extent to which the "target" class was representative of all their classes; about 86% of

[4] I considered two other variables to identify students with special needs. The first asked teachers to indicate across their classes how many students are special needs students: none, some, most or all. The TALIS developers used this variable mainly to identify special needs schools for sampling purposes. The second asked teachers whether their class was mainly special needs students: yes or no. This variable lacked the additional information about the classroom composition available in the variable used in the present study.

teachers responded "representative" or "very representative." I found similar results when using the full sample and a subsample of teachers whose target class was representative or very representative (see Annex A).

School-level predictors

Given that school environment may affect the performance of teachers and professional development need (Johnson, Kraft and Papay, 2012[46]), I used school-level variables from the principal survey. All variables are summarised in Table 1. To control for the location and institutional context, I included two dichotomous measures of whether the school was a public school and located in a city (100 000 to 1 million people), and a continuous measure of the student population size. I also included three ordinal measures describing in each school the percentage of students from the following groups: language minority, special needs and low socio-economic status. The response options for each measure were none, 1% to 10%, 11% to 30%, 31% to 60% and more than 60%.

I examined four measures of school resource and climate and two measures of leadership. This included using whether there was shortage of teachers with competency in special needs education (the outcome in Research Question 1) as a predictor. It is possible that, in schools with a shortage of teachers with special education expertise, teachers may feel the need for, or be asked to participate in, professional development. The school materials scale consists of five items asking principals whether a shortage of equipment – instructional materials, computers, software, Internet access and library materials – was a problem at the school. The school delinquency and violence scale focuses on four items related to the frequency of vandalism, physical injury among students, intimidation of staff, and verbal abuse among students. The mutual respect scale contains four items on open discussion among staff, respect for colleagues' ideas, culture of sharing and positive relationships. For school leadership, I used the distributed leadership scale measured by three items related to the ability of staff, parents and students to participate in school decisions. The instructional leadership scale consists of three items asking how frequently principals took actions to ensure that teachers developed and improved teaching practices.

Analysis

I addressed the research questions using descriptive statistics and generalised linear regression models. To examine the degree to which a shortage of teachers with competency in special education for Research Question 1 hinders the capacity of schools to provide quality instruction, I reported the proportion of such schools based on the principal survey across countries. For Research Question 2, regarding the level of prior professional development participation, impact and current need in special education among teachers, I summarised the proportion of teachers for each measure by country. I also disaggregated the proportion in high need of professional development by the percentage of special needs students in each teacher's target class. To address what teacher and school factors are associated with professional development need for Research Question 3, I fitted a two-level logistic regression model with teachers nested within schools (Singer and Willett, 2003[47]):

- Level 1 (Teacher): $logit(p_{ij}) = \beta_{0j} + \gamma X_{ij}$
- Level 2 (School): $\beta_{0j} = \beta_0 + \omega Z_j + u_{0j}$
- Combined model: $logit(p_{ij}) = \beta_0 + \gamma X_{ij} + \omega Z_j + u_{0j} + \delta_k$

In the combined model, p_{ij} is the probability of high professional development need in special needs education for teacher i in school j; X_{ij} represents a vector of teacher-level characteristics with γ as a vector of the associated coefficients; Z_j represents a vector of school-level characteristics with ω as a vector of the associated coefficients and u_{0j} as a school random intercept. To account for differences in school systems across schools, particularly how and where students with disabilities are educated, I included a set of country fixed effects, δ_k, to the combined model. I also fitted a separate model interacting the country fixed effects with the key predictors (i.e. the percentage of students with special needs in the classroom) to allow the effect to differ across countries.[5] In all descriptive analyses and regression models, I incorporated the TALIS teacher sample weights and replicate weights to account for the complex survey design and generate appropriate population estimates and standard errors. All analyses were conducted in Stata 14.0 using the "svy" complex survey commands.[6] Lastly, to mitigate bias from missing data in the regression models, which was not considered missing at random, I explored imputed values using chained equations in Stata ("mi imputed chained" command) that pooled together results from five imputed datasets (available in Annex A). Information for the imputation comes from all available variables in the analyses (see Table 1). I present the non-imputed results here because the findings were consistent with those from imputation. Across all figures presented in this paper, a total weighted average of all participating systems is signalled under the "TALIS" banner.

[5] The results are identical to fitting the same model for each country separately.

[6] The "repest" module is designed specifically to account for the complex service design in OECD datasets such as TALIS. I found similar results using the "svy" command in Stata, which can also incorporate multiple imputation techniques.

Results

Descriptive characteristics of who teaches special needs students

In Table 1, I provide a descriptive summary of teachers and their schools disaggregated by the percentage of children with special needs in their classroom. A clear pattern emerges for teachers who worked with a higher percentage of children with special needs (30% or more) in terms of their professional characteristics. For example, a greater percentage of these teachers were in part-time positions (91% vs. 76%) than those who worked with children without special needs. Teachers who worked with a greater percentage of children with special needs were also employed at a lower rate in permanent positions (72% vs. 81%) and had less teaching experience (14.5 vs. 17.4 years). In addition, they had less self-reported training in subject content areas (69% to 78%) and pedagogy (66% to 72%). These statistically significant differences indicate teachers who worked with students with special needs had, on average, lower qualifications and were employed in positions with greater mobility that likely impact students with special needs.

Also notable from Table 1 are characteristics of the schools for different teachers. Teachers who worked with more students with special needs in their classroom taught in larger schools with a higher percentage of students with special needs, with more language minorities, and more students from lower socio-economic backgrounds than teachers who did not teach any students with special needs. These schools, on average, also had lower levels of material resources, mutual respect among teachers, and distributed leadership, and higher levels of student delinquency. Thus, in addition to having lower qualifications and less training, teachers who worked with more students with special needs were employed in less supportive school environments than those who taught students without special needs.

Research question 1: professional development participation, impact and current need

Prior participation in special needs professional development varied across countries, as seen in Figure 2. Nearly 34% of teachers reported participating in special needs professional development in the last 12 months, ranging from 17% in Portugal to 58% in Poland. For context, of the 14 professional development areas, special needs education was the fifth least participated in (OECD, 2014[21]), while participation in professional development related to subject knowledge was the highest (76%). Countries with special education professional development participation rates lower than 20% include Malaysia, New Zealand and Spain; whereas Croatia, Japan and Korea had participation rates greater than 45%.

Of the teachers who participated in prior special needs professional development, nearly 25% reported a large positive impact on their teaching. This impact rate was lower than for teachers who attended professional development in subject knowledge (47%) (OECD, 2014[21]). Less than 20% of participating teachers in Australia, Finland, New Zealand and Singapore found that professional development had a large positive impact, compared to more than 40% of teachers in Israel, Korea and Romania.

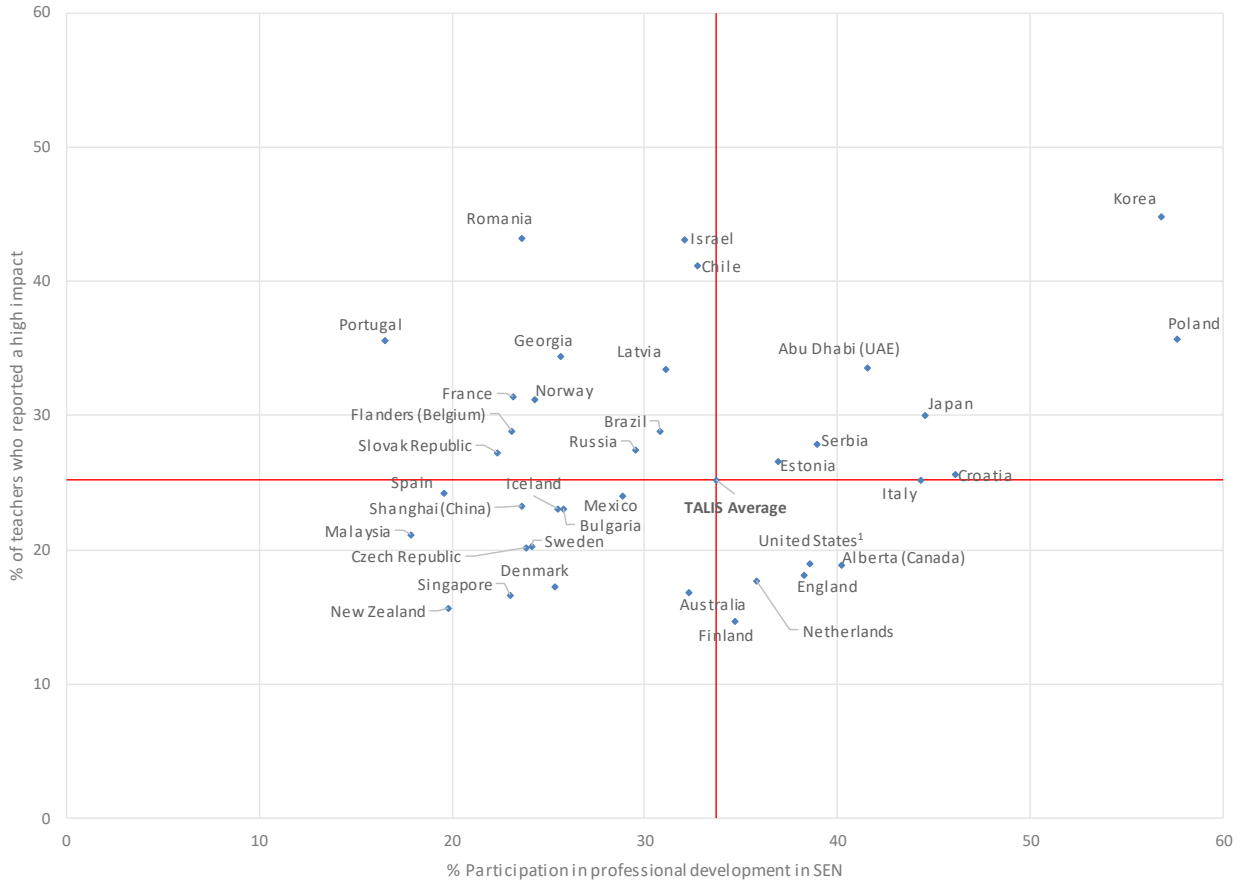
Table 1. Descriptive summary of teachers by percent of classroom children who have special needs, TALIS 2013

	All	None	1-10%[a]	11-30%[a]	>30%[a]
Percentage of teachers	100.0	30.2	48.6	13.8	7.5
Teacher characteristics					
Female (%)	67.8	72.8	67.0***	60.9***	68.3*
Part time (%)	81.0	76.4	80.6***	88.4***	90.6***
Experience (years)	16.1	17.4	16.1***	14.6***	14.6***
Permanent position (%)	79.2	81.1	79.1**	79.8	71.8***
Education (>5A, %)	94.2	92.6	94.9***	95.6***	95.2***
Teacher programme (%)	89.1	87.4	89.2***	91.1***	91.9***
Content training (%)	75.1	77.9	74.5***	75.6*	69.4***
Pedagogy training (%)	70.0	71.7	69.9*	70.9	66.0**
Practice training (%)	70.1	71.6	69.4*	70.6	69.8
Assigned a mentor (%)	15.2	14.8	15.8	14.1	14.0
Induction programme (%)	54.3	52.3	55.0***	54.9	56.5*
Speed education PD					
Participation (%)	33.7	19.5	36.3***	42.8***	57.2***
Large impact (%)	25.2	25.1	24.4	22.3	34.3***
High current need (%)	22.9	22.6	24.4**	19.9*	19.8
Teacher relationships					
Co-operation with teachers[b]	9.8	9.8	9.8	9.9	10.0**
Student relationships[b]	13.2	13.1	13.2***	13.3***	13.5***
Stakeholder relationships[b]	11.0	11.3	11.0***	10.7***	10.6***
School characteristics					
City (%)	36.6	37.1	37.0	34.4*	34.1
Public school (%)	84.5	87.3	83.2***	84.2**	83.9
Student enrolment (*M*)	705.2	656.4	716.8***	747.0***	734.1***
Language minorities (%)	58.3	48.3	59.0***	71.9***	74.1***
Special needs students (%)	26.7	10.6	26.9***	49.7***	56.1***
Low SES students (%)	57.2	45.1	58.6***	72.2***	74.6***
Shortage of SEN teachers (%)	46.3	43.5	48.7***	43.1	46.4
School climate					
Instructional leadership[b]	11.4	11.4	11.3***	11.4	11.3
Distributed leadership[b]	12.3	12.7	12.2***	12.0***	11.8***
Student delinquency[b]	6.6	5.8	6.7***	7.2***	7.5***
Mutual respect[b]	13.4	13.5	13.3***	13.3**	13.2***
Material resources[b]	1.7	1.8	1.7***	1.6***	1.7***

Note: All estimates include teacher- and school-level replicate weights where appropriate. [a]Statistical comparisons are with reference group in "None". [b]TALIS developed scales. See Annex A for items. *p < .05, ** p < .01, *** p < .001

Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

Figure 2. Previous professional development in special needs education and high impact

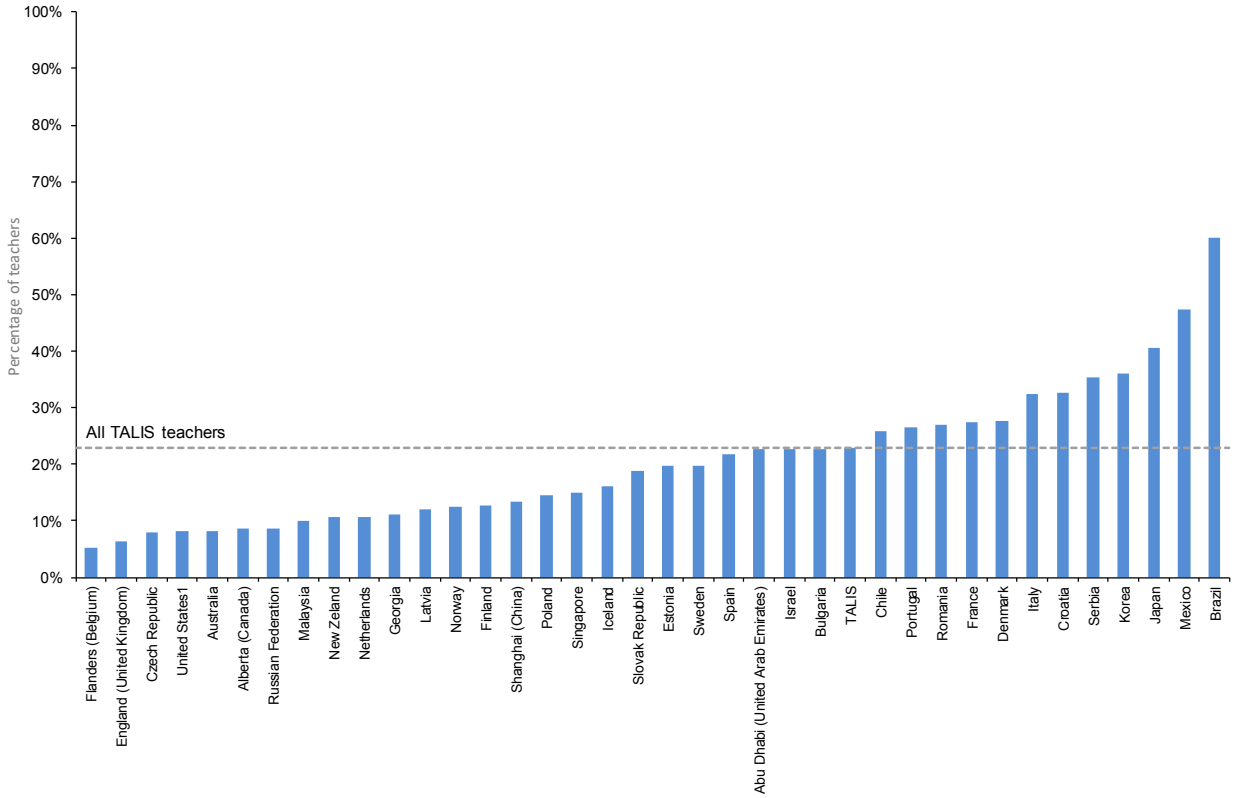


1. The data from the United States should be interpreted carefully. This is because the United States did not meet the international standards for participation rates

Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

In Figure 3, I summarise the current special education professional development needs of teachers in each country. About 23% of all teachers reported high need in special education professional development, ranging from 5% in Flanders (Belgium) to 60% in Brazil. More than 30% of teachers in Croatia, Italy, Japan, Korea, Mexico and Serbia reported high need, compared to less than 10% of teachers in Australia, the Czech Republic, England (United Kingdom) and the United States. It should be noted that across the 14 TALIS professional development need areas, special education was the highest, on average, among teachers across countries (OECD, 2014[21]). The next highest professional development areas, in terms of teacher need, were in new technologies in the workplace (20%) and information and communication technology for teaching (18%). In 27 of the 38 TALIS-participating countries and economies, professional development need in special education was one of the top three areas of high need.

Figure 3. High need in special needs education professional development



1. The data from the United States should be interpreted carefully. This is because the United States did not meet the international standards for participation rates.
Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

Research question 2: Who needs special education professional development?

In Table 2, I present the results of logistic regression models predicting high professional development need in special education among all teachers. Below, I discuss different teacher and school characteristics associated with professional development need, but focus on the role of special needs classroom composition and prior professional development given the previous descriptive results. Model 1 shows that teachers who taught a greater percentage of students with special needs had higher odds of professional development need than those who taught fewer students or none at all, on average. For instance, teachers with more than 30% of students with special needs have 2.2 times the odds of needing professional development than teachers with no students with special needs. Teachers who had previously participated in professional development in the last 12 months were about 10% less likely to report current professional development need in special education.

Model 2 adds measures of teacher characteristics and relationships to the baseline model. The coefficients associated with whether teachers work with more special needs students remain unchanged but having participated in previous professional development is no longer statistically significant (OR = 0.96, $p < .42$). Teachers with more teaching experience, training in classroom practice or who had participated in a school induction programme had lower odds of needing professional development in special education.

Teachers who were in part-time positions or held constructivist beliefs related to learning had higher odds of professional development need. Measures of teacher relationships were not associated with professional development need, except stakeholder relationships.

Table 2. Logistic regression models (in odds ratios) predicting high professional development need among all teachers in TALIS 2013

Sample	M1 All TALIS teachers	M2 All TALIS teachers	M3 All TALIS teachers	M4 Teachers have participated in PD	M5 Teachers have participated in PD	M6 Teachers have participated in PD
Teacher characteristics						
SEN Students (ref.: none)						
1% to 10%	1.274***	1.300***	1.276***	1.195*	1.230*	1.249*
11% to 30%	1.642***	1.691***	1.609***	1.384*	1.388*	1.391*
More than 30%	2.279***	2.321***	2.217***	2.120***	2.200***	2.257***
Participated in previous PD	0.896*	0.960	0.957			
High impact of previous PD				1.413***	1.411***	1.517***
Part-time		1.199***	1.164**		1.279**	1.266**
Teaching experience		0.982***	0.982***		0.990*	0.989**
Permanent position		1.065	1.070		1.068	1.065
Education (5A or 6)		1.059	1.072		0.826	0.834
Teacher education programme		1.045	1.004		1.031	0.968
Content training		0.988	0.972		1.023	0.956
Pedagogy training		1.003	1.024		1.073	1.084
Classroom practice training		0.885*	0.895~		0.854~	0.879
Mentored at school		1.029	1.050		1.087	1.129
School induction programme		0.892*	0.898*		0.875~	0.858~
Self-efficacy		1.009	1.014		0.960	0.954
Constructivist beliefs		1.089***	1.096***		1.114***	1.117***
Teacher relationships						
Co-operation with teachers		0.986	0.981		1.008	1.005
Students		1.022	1.033~		1.033	1.042
Stakeholders		0.948***	0.950**		0.966	0.966
School composition						
Geography size (ref.: hamlet)						
Village			0.798~			0.914
Small town			0.954			1.021
Town			0.924			1.004
City			0.852			0.905
Large city			1.039			1.086
Public school (ref.: private)			1.130			1.348*
School size			1.000			1.000
Language minority (ref.: none)						
1% to 10%			1.035			1.006
11% to 30%			0.868			0.894
31% to 60%			0.985			0.855
More than 60%			0.905			1.204
Special need students (ref.: none)						
1% to 10%			1.080			1.052
11% to 30%			1.063			1.049
31% to 60%			1.334			0.939
More than 60%			0.958			0.554
Low SES (ref: none)						

Sample	M1 All TALIS teachers	M2 All TALIS teachers	M3 All TALIS teachers	M4 Teachers have participated in PD	M5 Teachers have participated in PD	M6 Teachers have participated in PD
1% to 10%			1.283*			1.268
11% to 30%			1.187~			1.103
31% to 60%			1.162			1.393
More than 60%			1.227~			1.456~
Special needs teacher shortage						
Very little			1.052			0.848
To some extent			1.209*			0.942
A lot			1.359***			1.244
School climate						
Instructional leadership			0.968*			0.926**
Distributed leadership			1.030*			1.035
Student delinquency			1.005			0.984
Mutual respect			0.990			0.990
Material resources			0.985			1.021
Intercept	0.273***	0.267***	0.086***	0.155***	0.058***	0.075***
Goodness-of-fit test *(F)*[a]	2.71**	0.74	0.84	2.77**	0.67	1.38
Observations	92262	83331	75765	28535	25664	23478

Note: All models control for the fixed effects of countries and include replicate sample weights at the teacher level. Models 4-6 are subsamples of teachers who participated in previous professional development. [a]Results of F-adjusted mean residual test according to Archer and Lemeshow (2006[49]), using "estat gof" in Stata 14.1.
~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Ref. in a cell means that the result is in comparison to the reference category.
Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

These trends remain with the inclusion of school-level variables in Model 3, which are generally weak predictors of professional development need after accounting for teacher traits. Teachers in schools with a shortage of teachers with special needs competency have greater odds of needing professional development in special education. In schools with greater instructional leadership, teachers had lower odds of professional need, which is the opposite for teachers in schools with greater distributed leadership.

I repeat the same analyses in Models 4-6 but substitute prior professional development with its reported impact according to teachers. Model 4 shows that teachers who reported a high impact of previous professional development in special needs education had 1.41 times the odds of needing further professional development than teachers who did not report a large impact. This trend remains consistent in Model 5 and 6 when controlling for teacher and school characteristics, respectively.

Given the influence of student composition, I explore in Table 3 whether the effects of prior professional developmental and instructional leadership differs for teachers working with more students with special needs. There is no differential effect of prior professional development (Model 1) and its impact (Model 2) on current need. However, among teachers with 30% or more students with special needs (Model 3), those in schools with higher instructional leadership were less likely to need professional development than those in schools with lower leadership.

Table 3. Logistic regression models (in odds ratios) examining differential effects on professional development need among all teachers in TALIS 2013

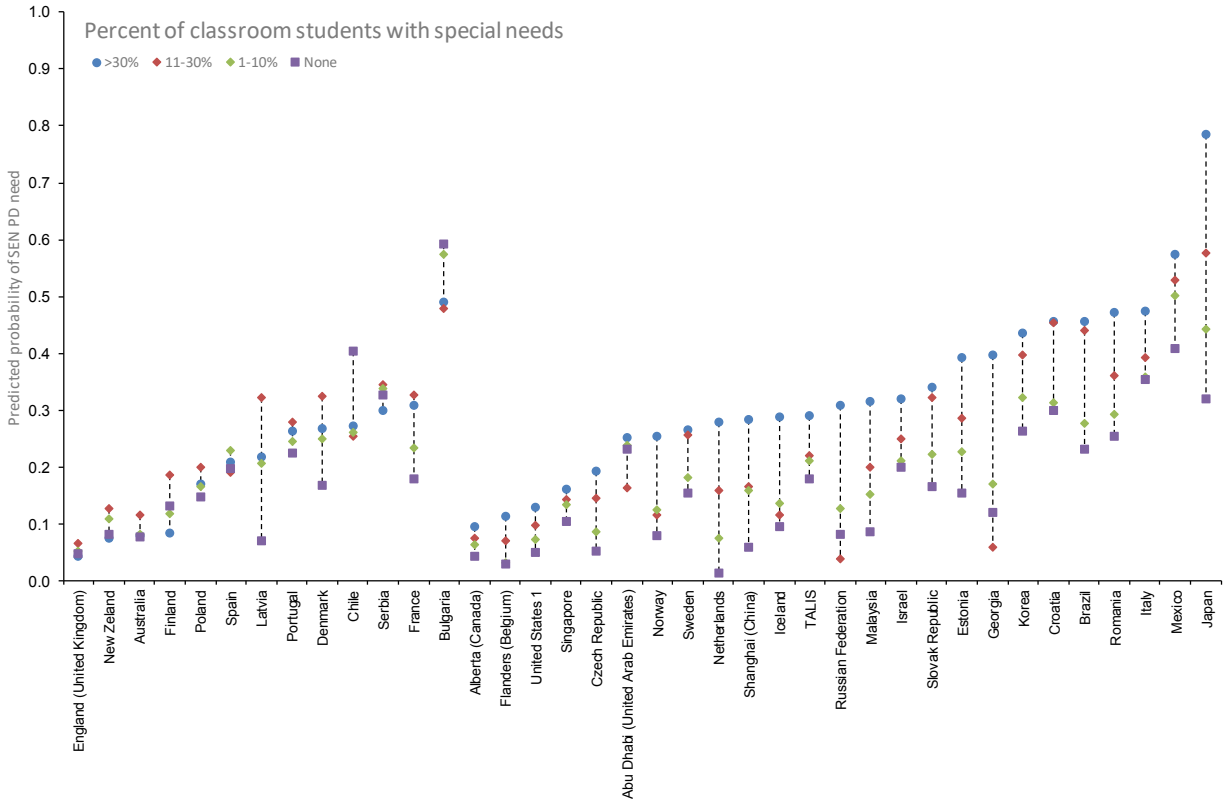
	M1	M2	M3
SEN students (ref.: none)			
1% to 10%	1.278***	1.377**	1.272
11% to 30%	1.757***	1.456~	2.546*
More than 30%	2.174***	2.776***	16.259***
Participated in previous PD	1.001		
1% to 10% x previous PD	0.980		
11% to 30% x previous PD	0.794		
More than 30% x previous PD	1.012		
High impact of previous PD		1.964***	
1% to 10% x high impact PD		0.741	
11% to 30% x high impact PD		0.882	
More than 30% x high impact PD		0.553~	
Instructional leadership			0.990
1% to 10% x instructional leadership			1.000
11% to 30% x instructional leadership			0.959
More than 30% x instructional leadership			0.834**
Country fixed effects	Yes	Yes	Yes
Teacher characteristics	Yes	Yes	Yes
School characteristics	Yes	Yes	Yes
Observations	75765	23478	75765

Note: All models include replicate sample weights at the teacher level. See Table 1 for teacher and school variables. ~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Ref. in a cell means that the result is in comparison to the reference category.
Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

Country-level trends

To better understand country-level trends, I disaggregated the main findings by country. In Figure 4, I display the professional development trends by the percentage of students who have special needs in the target classroom of each teacher into two groups of countries from an unconditional model with no other predictors. On the right side, teachers who taught 30% or more students with special needs were generally those with the highest reported professional development need, compared to teachers who taught fewer or no children with special needs. On the left, however, is a second group of countries where teachers with fewer or no special needs children in their classrooms reported needing more professional development relative to teachers who taught mostly special needs children. For instance, in Chile, teachers who taught no students with special needs reported the highest professional development need (40%), whereas teachers in Japan who taught 30% or more students with special needs reported the most professional development need (78%). In countries like Canada and England (United Kingdom), professional development need is low for teachers regardless of the student composition. It should be noted that, in many countries, teachers who did not work with students with special needs reported greater professional development need in special education than teachers who worked with 30% or more special needs students. Overall, the results in Figure 5 indicate large variation in professional development need in special education among teachers across countries related to the classroom student composition.

Figure 4. Teachers who need professional development in special needs education

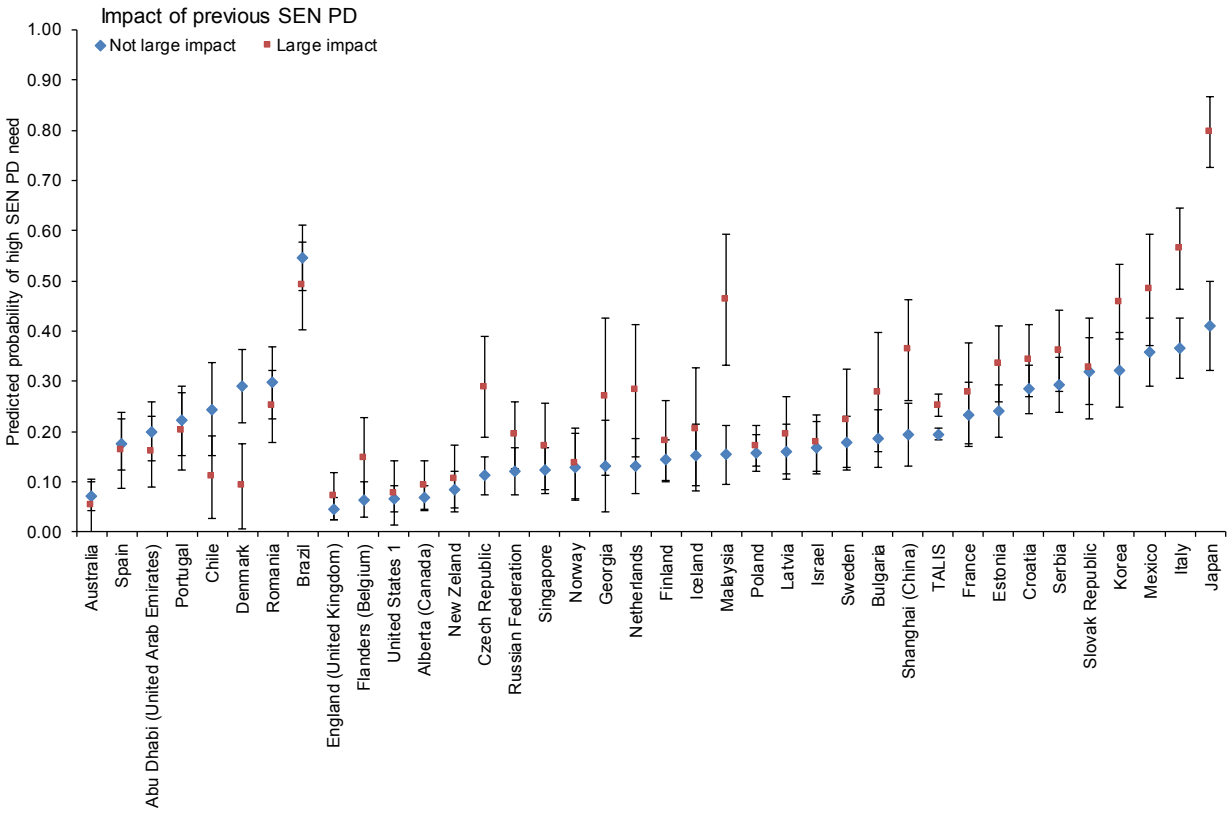


1. The data from the United States should be interpreted carefully. This is because the United States did not meet the international standards for participation rates

Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

I display the reported impact of prior professional development on current need by country in Figure 5 based on Model 2 in Table 1. On average, teachers who reported that prior professional development had a large impact on their teaching were more likely to report needing more professional development currently than teachers who did not report a large impact of prior professional development. Although the overlapping 95% confidence intervals suggest no statistically significant differences between both groups in many countries, this trend was consistent for the Czech Republic, Italy, Japan, Malaysia and Shanghai (China). In Denmark, teachers who reported previous professional development had a large impact were less likely to report needing more.

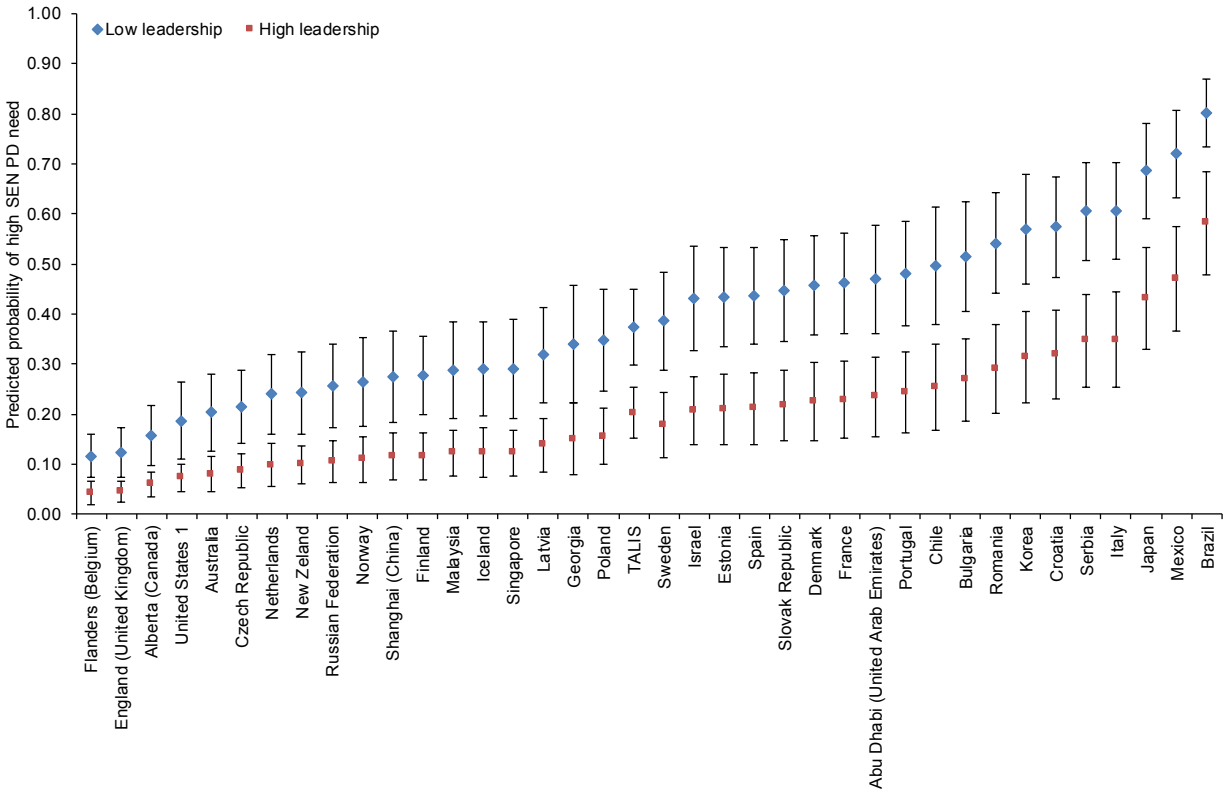
Figure 5. Impact of previous professional development in special needs education



1. The data from the United States should be interpreted carefully. This is because the United States did not meet the international standards for participation rates.
Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

Lastly, I display in Figure 6 the effects of low (10% percentile) and high (90% percentile) instructional leadership on professional development need by country based on Model 3 in Table 3. The results focus only on teachers who taught 30% or more students with special needs, showing that, on average, these teachers in lower instructional leadership schools have a higher probability of needing professional development in special needs education than colleagues in high instructional leadership schools. The gap is smallest in Alberta (Canada), Australia, England (United Kingdom) and Flanders (Belgium) where professional development need is also the lowest overall. For Brazil, Japan and Mexico the gap between teachers in low and high instructional leadership schools is wider but both groups are still likely to need professional development.

Figure 6. Relation between instructional leadership and SEN PD need



1. The data from the United States should be interpreted carefully. This is because the United States did not meet the international standards for participation rates.

Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.

Discussion

The focus on improving access to education and inclusive classrooms for children with disabilities has often overlooked education quality. In this study, I examined the capacity of schools to teach students with special education needs and the professional development of teachers in this area. A better understanding of the scope of these challenges across countries is important in order for education ministries and departments to recognise the urgency of the problem, allocate resources and develop appropriate policies. Identifying the extent of professional development need in special education, for which teachers it is required and under what work conditions, also has implications for improving the quality and supply of professional development activities.

Concerns about teacher qualifications

The shortage of teachers with special education competency is reflected in the employment position and characteristics of teachers who teach students with special needs. The profile of teachers who work with students with special needs in Table 1 shows that a higher percentage are employed in part-time and non-permanent positions that may disrupt instructional continuity for students and the development of teachers themselves (Ingersoll, Merrill and Stuckey, 2014[50]). In a separate analysis, I found part-time and non-permanent teachers who taught 30% or more students with special needs averaged 4.7 years at the school, compared to 11.1 years for their counterparts in full-time, permanent positions. More importantly, teachers in part-time positions reported greater need for professional development in special education. Limited school capacity is consistent with the lower skills and qualifications of teachers who work with students with special needs, a trend also found in the United States (Billingsley, Fall and Williams, 2006[51]; Boe and Cook, 2006[52]). The results together suggest that students with disabilities are likely not receiving quality instruction from teachers in these schools.

High professional development need in special needs education

About one-quarter of all teachers reported high need in special education professional development. This was also the highest area of professional development need according to teachers and can be interpreted in different ways. If self-reported professional development need is viewed as an indicator of the level of preparation of teachers, then the finding shows a large number of teachers not only desire more training in special education but may also have less training to currently teach students with special needs (Darling-Hammond, 2005[53]). Indeed, in a subsequent analysis, I found teachers who reported needing special needs professional development had, on average, lower levels of training in subject content, pedagogy and classroom practice than teachers who did not report needing professional development (Annex A). Another possibility is that professional development need is an indicator not of gaps in skills or preparation but of teachers wanting to constantly improve or hone their craft. However, the main regression analyses further suggest that professional development need in special education is concentrated among teachers who likely need it the most.

Primarily, teachers who taught a greater percentage of students with special needs in their classrooms had higher odds of reporting professional development need than teachers with a lower percentage of students with special needs, on average. This trend remains even

after accounting for other teacher- and school-level differences. The finding may imply greater need for strategies on teaching more students with special needs, as opposed to professional development on special education broadly. Further evidence that high professional development need reflects gaps in teacher training is the trend that teachers who report a large positive impact of a previous professional development activity were the ones who expressed a greater need for professional development currently. Although this is less consistent across all countries, one possible explanation is teachers experiencing effective professional development may become more aware of gaps in their special education knowledge and then request more professional development. In contrast, merely participating in previous professional development was not associated with current need. Is it also important to highlight that only around one out of four teachers reported that their previous professional development had a positive impact on their instruction, which might indicate important shortcomings in the quality of the current programmes.

Potential benefits of school instructional leadership

Professional development need depends not only on the individual backgrounds of teachers but also on the school context. Although school-level variables overall had less influence on teacher professional development need in this study, teachers in schools with higher instructional leadership had lower odds of professional development need in special education. Furthermore, among teachers who taught 30% or more children with special needs, teachers in schools with high leadership were less likely to need professional development than those in schools with lower instructional leadership. This suggests that teachers who work with more students with special needs and perhaps face greater challenges may benefit from school principals who play an active role in their development which, in turn, leads to less professional development need. This trend was consistent across countries, though the gap in professional development need between high and lower instructional leadership schools was wider.

The effect of instructional leadership in this study seems contrary to previous research showing that teachers are more likely to participate in professional development in schools where principals are more engaged with teachers in professional activities and had more influence on training activities (Choy et al., 2006[31]). However, recall that instructional leadership in TALIS is an index of how frequently principals took actions to ensure teachers developed and improved teaching practices. The findings here suggest that the effect of instructional leadership on professional development need may have an inflection point that depends on the preparation of teachers. At lower preparation levels, greater instructional leadership may help teachers recognise their gaps and participate in professional development; but, as principals help teachers develop, there might be less need for professional development later.

Large disparities across countries

The main findings summarised above should be interpreted within the context of wide variation across countries in school capacity and teacher professional development. As mentioned previously, the definition for special needs student varies across countries and, thus, cross country comparison should be done carefully. However, certain countries and groups consistently stand out. Teachers from Japan and Korea, for instance, were among the highest in terms of self-reported special education professional development participation and need. Both countries share not only geographic proximity and historical ties but have been in the process of reforming special education and inclusive education

policies over the last 15 years (Forlin, Kawai and Higuchi, 2015[18]; Kim, 2014[54]; Yoo and Palley, 2014[55]). This includes revising earlier special education policies borrowed from Western countries and, more importantly, requiring teachers to have more knowledge of disabilities and special education. These changes and the results in this study likely reflect an ongoing teacher education reform in Japan and Korea. In contrast, teachers in Alberta (Canada), Australia, England (United Kingdom) and the United States were among the lowest in terms of special education professional development need. The low need may be due to the longer history of disability rights, special education, teacher professional development and inclusive practices in these countries (Ainscow, Booth and Dyson, 2006[56]; Jenkins and Yoshimura, 2010[57]; Specht et al., 2016[58]; Stancliffe, 2014[59]). It is also possible that the disparity is due to cultural differences in how professional development is perceived among teachers in East Asia compared to the West.

Policy implications

The findings in this study show that many schools around the world face a shortage of teachers with competency in special education, and a significant proportion of teachers recognise the need for professional development. I highlight several policy implications below but note that, given the variation across country contexts, they should be interpreted with caution and as suggestive. First, to address the teacher shortage issue, countries may need to adopt a two-prong approach that addresses recruiting more teachers and the reliance on part-time, non-permanent positions for teachers who work with more students with special needs. Recruiting more teachers, particularly in special education, is a challenge in many countries (Deng and Holdsworth, 2007[12]; Kalyanpur, 2008[13]; Hadidi and Al Khateeb, 2015[14]; Vorapanya and Dunlap, 2014[16]). Alternatives may depend on whether shortages are due to the certification process, public perception of the profession, or salary constraints (Sindelar, Daunic and Rennells, 2004[30]). In contrast, addressing the reliance on part-time and non-permanent positions for teachers who work with students with special needs appears more feasible. This may mean conveying to school leaders the importance of funding and converting these positions to full-time in order to build continuity in instruction for students with special needs. Part-time, non-permanent positions may address short-term costs for schools but may be costly in the long run if teachers are constantly leaving (Ronfeldt, Loeb and Wyckoff, 2013[60]).

Although many teachers expressed a need for special education professional development, one policy implication from this study is to focus on teachers who teach a higher percentage of students with special needs. More specifically, professional development activities for this group may need to address not only special education content but also the challenges of working with more special needs students in a classroom. For other teachers, and given the demand, schools should provide more professional development opportunities in special education. In some countries, the need for professional development is high even among teachers who do not teach students with special needs at all. The finding that teachers who attended a high impact professional development activity expressed further need is an indicator that schools may need to provide more opportunities for teachers to improve special education competency. Given that special education professional development need was highest across all skills areas for teachers, school principals should take this into consideration when prioritising resources.

School principals also play a clear role in the special education professional development needs of teachers. Instructional leadership – in terms of helping teachers learn from each other, develop new teaching practices and take responsibility for improving their skills and

their students' learning – is one area that principals can focus on to better prepare all teachers. For teachers who work with a large percentage of students with special needs, this type of instructional leadership style may be particularly helpful. Although these teachers in high instructional leadership skills needed less special education professional development, this does not necessarily mean such opportunities should be reduced for teachers. It is possible that strong instructional leadership encourages teachers to improve via professional development. Principals should be aware of the potential impact of this form of leadership but, similar to teachers, they may need training in how to assist teachers in becoming independent learners. Lastly, the low percentage of teachers who reported a large impact from participating in professional development in special needs education suggests that the need for more training among teachers may also reflect low quality programming in this area. That is, principals who aim to provide more professional development must re-examine and monitor the quality.

Limitations and future directions

Several limitations in this study should be considered when interpreting the findings and thinking of future research. First, examining the professional development needs for teachers is important, but the assumption is that quantity or quality matters for the learning experiences of students with special needs. Without data linking the professional development needs of teachers to the educational outcomes of students, it is unclear whether students perform better in classrooms with teachers who have stronger training. Future studies using randomised control trials should explore how specific professional development activities or workshops on special education may impact teacher competencies and student outcomes.

Second, while the TALIS 2013 dataset provides information on special education professional development participation, need and impact, there are few qualitative details on these activities. Given that special education is a broad field, it would be helpful to know whether teachers need more professional development on specific disabilities, classroom management, inclusion, diagnostic assessments, curriculum planning, accommodations or parent involvement. A related question is why teachers feel some special education professional development activities have a larger impact on their teaching than others. For instance, for teachers who indicated low impact, is this due to poor professional development quality or mismatch with the needs of teachers? More robust research assessing specific components of special education professional development is required to understand the needs of teachers.

A key finding in this study is that teachers with a greater percentage of students with special needs report greater professional development, but how students with special needs are identified is likely to differ across countries. Research shows that common disabilities in some countries are not recognised in others (OECD, 2008[61]). The country fixed effects used in the analyses help account for country-specific differences in special needs identification for students. The main results are also robust in controlling for observable teacher-level characteristics that may influence whether teachers perceive students as having a disability. However, as is the case with most international research, cross-country comparisons are most reasonable for countries that share similar educational or political contexts. Whether students with special needs are included in mainstream classrooms versus separate schools is a critical feature to consider.

Although it is important for all teachers to have some competency in special education, in many countries the responsibility for teaching children with disabilities still belongs to

formal special education teachers who are also likely supporting inclusive education efforts. A limitation of the TALIS dataset is teachers were not asked about their special education credentials or assigned teaching positions. Future international research should collect information on formal special education teachers to better assess their professional development needs, training and experiences. A comparison of special education teacher turnover rates would also be informative as research in the United States indicates nearly half leave the profession within their first five years (Billingsley, 2004[42]). This information can be used to examine whether teacher shortages identified in this study were due to inadequate supply or annual turnover.

Conclusion

The challenge of providing a quality education for children with disabilities around the world depends on the training and preparation of teachers. This study provides new insight into the scope of this global challenge, showing that nearly half of all schools face a shortage of teachers with special education competency. Teachers also appear to recognise their own gaps as nearly one-quarter expressed high need for special education professional development, particularly among those who work with more students with special needs. Despite these staffing challenges, there is reason for optimism as well. Effective special education professional development seems to encourage teachers to seek more training, and strong instructional leadership may support the professional needs of teachers. The hope is that these findings will continue to spark urgency across countries to improve the recruitment and training of teachers who work with students with special needs and, ultimately, ensure the right to a quality education for this population.

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Annex A.

Table A A.1. A comparison of logistic regression models (in odds ratios) predicting professional development needs in full TALIS sample and sample based on representativeness of target class

Variables	Full Sample	Representative Class Sample
Teacher characteristics		
SEN students (ref.: none)		
1% to 10%	1.276***	1.240***
11% to 30%	1.609***	1.765***
More than 30%	2.217***	2.458***
Participated in previous PD	0.957	0.928
Part-time	1.164**	1.194**
Teaching experience	0.982***	0.979***
Permanent position	1.070	1.068
Education (5A or 6)	1.072	1.167
Teacher education programme	1.004	1.040
Content training	0.972	0.984
Pedagogy training	1.024	0.948
Classroom practice training	0.895~	0.903
Mentored at school	1.050	1.017
School induction programme	0.898*	0.909~
Self-efficacy	1.014	1.018
Constructivist beliefs	1.096***	1.096***
Teacher relationships		
Co-operation with teachers	0.981	0.982
Students	1.033~	1.040*
Stakeholders	0.950**	0.947**
School composition		
Geography size (ref.: hamlet)		
Village	0.798~	0.845
Small town	0.954	0.925
Town	0.924	0.923
City	0.852	0.892
Large city	1.039	1.054
Public school (ref.: private)	1.130	1.185
School size	1.000	1.000
Language minority (ref.: none)		
1% to 10%	1.035	1.006
11% to 30%	0.868	0.896
31% to 60%	0.985	0.916
More than 60%	0.905	0.954

Note: Ref. in a cell means that the result is in comparison to the reference category.
Source: OECD (2013[48]), *Teaching and Learning International Survey (TALIS): 2013 complete database*, http://stats.oecd.org/index.aspx?datasetcode=talis_2013%20.