The global teaching profession: How treating teachers as knowledge workers improves the esteem of the teaching profession

Dr. Heather E. Price
Leadership Studies, School of Education, Marian University, Fond du Lac, WI, USA

Dr. Kristen Weatherby
UCL Knowledge Lab, Institute of Education, University College London, London, UK

The global teaching profession: How treating teachers as knowledge-workers improves the esteem of the teaching profession

Abstract

To better understand the status of the teaching profession, we present a conceptual framework outlining the four domains of knowledge-worker professionals: professional benchmarks, professional discretion, room for promotion, and workplace conditions and use the TALIS 2013 survey data to show that these domains exist globally and vary within countries. Across more than 30 school systems, we address the question: *to what extent does the level and type of professionalism afforded to individual teachers shape their perceptions of the esteem of their profession?* The strongest domain traits that correlate with feeling valued as a teacher are teachers' satisfaction with their working conditions, involvement in school decision-making, and the chance to be recognized for good work. This framework shapes an actionable set of concepts that policymakers can use to address attraction and retention to the profession system-wide and that school leaders can use to improve working conditions in their own schools.

Keywords: teaching profession; knowledge-worker profession; teacher retention; teacher attraction; international education policy; Teaching and Learning International Survey (TALIS)

The global teaching profession: How treating teachers as knowledge-workers improves the esteem of the teaching profession

Introduction

The problem of attracting and retaining high-quality candidates to the teaching profession is not unknown, and is severe in many education systems around the world (UNESCO, 2016). In many countries, there is a looming shortage of teachers, due to increased birth rates or a generation of teachers facing retirement (UNESCO, 2016). Other countries, such as England, face different problems. Data from 2015 show that in every year since 2011, the number of prospective teachers entering initial teacher training has been below government targets (Lynch, Worth, Bamford, & Wespieser, 2016). The percentage of teachers leaving the profession before retirement has increased by 2% in the same period (Lynch et al., 2016). A shared issue among developing and developed countries is recruiting and retaining good teachers to challenging schools. In the United States, literature on the distribution of teachers within the system consistently finds that children from disadvantaged backgrounds have less access to the teachers with the most education, skills and experience to teach (Borman & Kimball, 2005; Chudgar & Luschei, 2016).

Policymakers are thus prioritizing the need to understand (1) the lack of attraction to the profession and (2) how to retain good quality new teachers once they enter the sector. Many assume that to attract and retain the best candidates into teaching, the profession needs to be held in the same esteem as other professions like medicine, law, and business (A. Hargreaves & Fullan, 2012). Others argue that teaching should be considered a knowledge profession, and as such teachers should be knowledge workers, continuously developing and innovating their own knowledge and skills and sharing that knowledge back to the profession (Schleicher, 2011). Still others maintain that teaching in its current form cannot be considered

a profession at all (Howsam, Corrigan, Denemark, & Nash, 1976; Hoyle, 1995; Krejsler, 2005), and that a rethinking of the teaching profession needs to occur to elevate its status.

Given this global need, this study explores data from the last cycle (2013) of the Organisation for Economic Co-Operation and Development (OECD) Teaching and Learning International Survey (TALIS), the world's first and largest international survey of teachers. The data examined are those that characterize knowledge-worker professions, in terms of the profession as a whole and within the context of the workplace in particular. The collected data point to consequential knowledge-worker traits that are associated with attracting and retaining professionals to a work sector, like teaching, and can be used to inform school- and system leaders who are seeking to improve schools by attracting and retaining the best teachers. The central question addresses how differently teachers perceive the esteem of their profession based on the levels and types of professionalism afforded to them. As this study will show, some of the knowledge-work traits examined are found system-wide while others vary by school organization. Understanding the factors which contribute to the level of esteem of the profession and whether it can be characterized as knowledge work can guide educational policy to improve the social standing of teaching as well as attraction to and retention of teachers to the primary and secondary education sector (Borman & Dowling, 2008).

Literature Review

The emergence of the "modern" teacher and the devaluation of the profession

To determine the path on which we want to lead the teaching profession, we must first examine its origins. Modern education emerged in much of the world via a privatized sector where education was reserved only for the aristocracy (Anderson, 1975; Sahlberg, 2012). At all levels of education, teachers and the teaching profession were held in high esteem as education was the currency for literacy and all its associated advantages (Tyack, 1974).

In much of the Western world, the turn to the 20th century experienced a rapid rise in primary education, due in large part to the new passage of child labor laws that took children off the assembly lines (Tyack, 1974; Walters, 2000). This created a rapid rise in demand for a primary education sector in place of a factory floor (Walters, 2000). The demand for teachers rose more quickly than supply could fulfil, so the professional criteria to enter teaching became less selective allowing women into the profession to fill the need (Cuban, 1993; Ravitch, 2011; Tyack, 1974; Webb, 2006).

In other countries around the world, the history of education might have been different, but the transition to a less esteemed teaching profession followed a similar trajectory. From the beginning of the 17th century, Japanese education consisted of several different types of schools that provided education for all levels of society, from the Samurai warrior class to "commoners" (Anderson, 1975). Teachers were men, predominantly former priests or Samurai with high social standing (Anderson, 1975). Reforms in the 1900s transformed all teachers into civil servants (Anderson, 1975) and today Japan is one of the few countries in which the majority of teachers is still male (OECD, 2014a).

The historically high status of Finnish teachers is similar to that in Japan. Dating back to the 17th century, before the advent of modern public education in Finland, Finnish teachers were typically priests and others affiliated with the church. Schools were ubiquitous in Finland, as Finns wishing to marry were required to know how to read and write (Sahlberg, 2012). Teachers were highly respected and this reputation has held, even with the transition to the modern profession in the early 20th century (Sahlberg, 2012).

The teaching profession -- or semi-profession

L. Hargreaves (2009) argues that the status of the teaching profession necessarily varies by country and this is evident in the previous examples. In countries like Finland and Japan, teachers have retained a "professional" status. However, in many others, either

teaching has never been considered a profession on the same level as medicine or law, for example, or over time the profession has been devalued and, in a sense, demoted, to the ranks of a semi-profession (Ingersoll & Perda, 2008). How we understand professions is influenced by our culture and what we as a society deem most valuable (Krejsler, 2005).

Likewise, the status of the teaching profession depends on a society's values. Status is often reflected in the working conditions, pay, and other material benefits that a profession is granted in relation to other professions (UNESCO/ILO, 2008). In the United States, these status symbols for teaching are lower than for professions such as medicine, law and engineering (Ingersoll & Merrill, 2011). But beyond the output-based benefits afforded professionals, the OECD describes the following input- and output-based characteristics as those that define the status of the teaching profession (Guerriero, 2017):

Input-based characteristics	**Output-based characteristics**
• Quality of applicants	• Working conditions, including salary
• Specialized knowledge and skills	• Economic supply and demand
• Proportion of women	• Career development and progression
• Initial teacher training	• Autonomy over practice
• Accountability and appraisal	• Media reactions
• Children as clients	• Governance and self-regulation
• Ease of access to professional development	

It is also these characteristics that help shape whether society values the teaching profession (Guerriero, 2017).

Research indicates that teachers view themselves as being part of a profession (Howsam et al., 1976) regardless of whether society or academia agree. Yet, teaching is lacking in several key areas vital to other professions, listed below:

- Rigorous preparation: Initial teacher training in many countries is not considered rigorous or lengthy enough for a profession.

- Theory-driven practice: There is not a clear scientific or theoretical basis for teaching practice.

- Professional autonomy: Teachers in most systems do not have autonomy over their own practice.

- Professional standards for membership: There are no agreed standards for entry into the profession or advancement and continuation.

    (Howsam et al., 1976; Ingersoll & Perda, 2008; Krejsler, 2005).

For these reasons, teaching is often considered a semi-profession. Some argue, however, that the definition of a profession itself must also change to meet the needs of changing societies. The old definition of a professional as being an expert who holds all of the knowledge in a particular field no longer works in a knowledge society. Today's professionals still need this content expertise but are also required to be lifelong learners, innovating and contributing knowledge back into their field, as well as possessing the interpersonal skills to interact with relevant stakeholders and customers (Krejsler, 2005). Today's professional needs to be a knowledge worker.

Who is a knowledge worker?

All work requires knowledge. Workers in all fields need to have a base of information and the necessary skills to do their jobs. After World War II, however, knowledge-based jobs became increasingly important to countries' economies (Van Weert, 2006). A knowledge-based work economy requires citizens and workers to be lifelong learners who develop and share knowledge (Van Weert, 2006). A common definition of a knowledge worker is someone who uses high-level knowledge, gained from either formal education or workplace experience, to create new knowledge and share it back to the profession (Ramirez &

Nembhard, 2004). Knowledge workers learn on the job in collaboration with their fellow employees (Despres & Hiltrop, 1996; Harteis & Billet, 2008). Thus knowledge work is not defined by the level of a worker's education or their specific job function, but by the knowledge-related tasks their work requires (Despres & Hiltrop, 1996). Specifically, this includes searching for existing knowledge, creating new knowledge, processing and sharing knowledge, and applying knowledge in work tasks (Vanthournout, Noyens, Gijbels, & van den Bossche, 2014). This corresponds with a specialized and deep knowledge that has diffuse peripheral foci (Despres & Hiltrop, 1996).

Drucker (1999) describes the difference between the tasks required of manual laborers and knowledge workers by saying that for manual work, "the work programs the worker" (85). In knowledge work, by contrast, the worker dictates the task based on their own specialized knowledge in how a particular problem might be solved (Despres & Hiltrop, 1996). Learning happens continuously for the knowledge worker, as problems continuously arise that require new knowledge to solve them (Despres & Hiltrop, 1996; Fontana, Milligan, Littlejohn, & Nash, 2015). Knowledge workers must have the autonomy to regulate their learning and direct their own professional development. It is the organisation's role, then, to remove any obstacles they might have in completing their task and provide ongoing opportunities for professional development (Vanthournout, Noyens, Gijbels, & Van den Bossche, 2014). The rapid and continuous growth of knowledge today influences how organisations manage knowledge, as well as how knowledge is developed and shared (Cheng, 2015).

Conceptual Framework

If we believe the premise that teaching needs to be a profession held in high esteem in order to attract and retain the best candidates, then we need to investigate the similarities and differences between teaching and the characteristics of esteemed professionals.

When reviewing the knowledge worker literature, four domains of knowledge-worker professions continually arise in the research as important for the motivation, success, retention, and productivity of knowledge workers and knowledge-intensive organisations. These are:

- **Professional benchmarks**, which includes standards or other progressions of professional learning to continually develop the skills and knowledge of knowledge workers;

- **Professional discretion**, which includes trusting the abilities of knowledge workers and providing them with the autonomy needed to determine the best way to solve problems;

- **Room for promotion**, comprising the success measures and reward structures for knowledge workers; and

- **Workplace conditions**, describing the organizational structures necessary for knowledge work to thrive.

Professional benchmarks

Professional benchmarks indicate minimum standards within a profession that are not possessed by those outside the profession (Howsam et al., 1976). Knowledge work requires continuous learning and the ability to share the knowledge with the wider community (Drucker, 1999; Fontana et al., 2015). One of the key motivators expressed by knowledge workers is their own personal growth and the possibility of reaching their own developmental potential (Tampoe, 1993).

Knowledge-worker organisations often enable their employees' skill development by offering professional development for their existing employees (Vanthournout et al., 2014) or by instituting a rigorous hiring process to ensure that highly qualified workers enter the organisation in the first place (Kelloway & Barling, 2000).

Professional discretion

Professional discretion regards the worker's ability to make decisions based on the needs of the work. Knowledge work requires workers to have autonomy to manage themselves and the work they do (Drucker, 1999) and to be trusted by the organisation to deal with the issue at hand (Avis, 2003). They must be given the space to exercise their own professional judgement and the discretion to solve the problem according to their own specialist knowledge (Alvesson, 2004). Research also suggests that a high level of control over their own work increases knowledge-worker success and decreases anxiety and burnout (Kelloway & Barling, 2000).

The freedom to communicate and collaborate is important for knowledge workers to share knowledge within their community and allows for the continual gain and sharing of knowledge with others in their profession (Kelloway & Barling, 2000). This type of collaboration goes beyond standard training activities of stand-alone workshops and conferences (Fontana et al., 2015; Littlejohn & Margaryan, 2013; Vanthournout et al., 2014). Productivity is higher when stronger ties exist between workers in different sub-units of an organization (Kelloway & Barling, 2000). Weak ties do not allow the transfer of highly complex knowledge between sub-units (Hansen, 1999).

Room for promotion

Having room for promotion in a knowledge-worker job requires the ability to rise in status among colleagues based on good work. Knowledge-worker tasks are not fixed; there are often no timelines for individual tasks, and the tasks can be performed differently (Ramirez & Nembhard, 2004). In addition, there is not necessarily a correlation between quantity of labor and quantity of output (Ramirez & Nembhard, 2004). Knowledge work is measured in terms of its quality rather than its quantity.

Given the qualitative aspects of knowledge-work tasks, quality of work and subsequent career advancement need to be evaluated using relative judgements that consider context and complexity of tasks. Just as there are many ways to accomplish one task, there is no one way to evaluate it.

Debate abounds about how to properly measure the quality of knowledge work, and many organizations still employ an antiquated reward structure in which job level equates to salary level. Evidence shows that this type of traditional evaluation system is not motivating for knowledge workers (Despres & Hiltrop, 1996). Knowledge-workers need to be able to expect that if they work well, they will be recognised in some manner (Kelloway & Barling, 2000).

Workplace conditions

Workplace conditions include providing employees with the professional resources needed to do their jobs well, even if the job – and the resources required -- changes.

The workplace climate – including the relationships with colleagues, the ability to collaborate, and the level of autonomy – forms a resource in-and-of-itself that facilitates the ability of a knowledge-worker to perform his or her job well (Van Weert, 2006).

Organizations also take a central role in developing and maintaining quality knowledge work amongst their employees through:

- Hiring highly-qualified individuals and promoting their continuous learning;

- Providing high levels of autonomy;

- Lowering hierarchical structures within the organization;

- Facilitating extensive communication between sub-groups within the organization;

- Supplying adequate resources for workers to do their jobs; and

- Building trust between the worker, the organization, and its management (Alvesson, 2004).

Give this framework, we seek to identify how the four domains of knowledge-worker professions inform our understanding of the esteem in which teachers perceive their own profession. We ask two research questions:

1) To what extent does the treatment of teachers as knowledge workers vary across the globe?

2) To what extent does the level of knowledge worker treatment shape teachers' perceptions of the esteem of their profession?

Method

We use the aforementioned research to operationalize these knowledge-worker domains using the TALIS data. We first establish which, if any, domains of knowledge workers are present in the teaching profession among different schooling systems. We then test the relation of these domains with teachers' feelings of value in order to understand the low esteem of the teaching profession. The findings can then be used to inform the policy question of how to improve the esteem of the teaching profession so that good teachers can be attracted to and retained in the classroom.

Data

TALIS selects a representative sample of teachers and their school leaders from countries around the world. The surveys ask teachers and leaders questions about themselves, their work, and their working conditions. The survey is distributed to lower secondary teachers[1] and leaders of schools who were randomly selected (20 teachers and 1 school leader

---

[1] TALIS 2013 sampled ISCED2 teachers, according to the UNESCO Institute of Statistics' classification of the level of educational programs and attainment. See: www.uis.unesco.org/en/glossary-term/lower-secondary-education-isced-2

per school) among a stratified sample of 200 mainstream schools in a country/economy.[2] In

total, some 104,000 lower secondary teachers responded to the survey to represent more than

four million teachers in 34 participating countries and economies across the globe, with the

exception of the African continent. Questionnaires were completed on paper or online during

mid-school year: September-December 2012 for Southern Hemisphere and February-June

2013 for Northern Hemisphere participants.

---

[2] We use these terms interchangeably. Although most of the school systems in the list refer to countries, others refer to independent education systems within a larger country, such as Alberta and England. In some instances, only one education system within a larger country elected to participate in the TALIS survey. For further information, see: http://www.oecd.org/edu/school/talis.htm.

Participating countries[3] are:

- Australia
- Bulgaria
- Croatia
- Denmark
- France
- Italy
- Latvia
- Netherlands
- Portugal
- Singapore
- Sweden
- United Kingdom (England)
- Belgium (Flanders)
- Canada (Alberta)
- Cyprus
- Estonia
- Iceland
- Japan
- Malaysia
- Norway
- Romania
- Slovak Republic
- United Arab Emirates (Abu Dhabi)
- United States
- Brazil
- Chile
- Czech Republic
- Finland
- Israel
- Korea
- Mexico
- Poland
- Serbia
- Spain

Although there are some limitations to the TALIS data, including the potential for bias due to the opt-in design (OECD, 2014b) and the body politic that shapes the direction of the survey topics (Meyer & Benavot, 2013), the advantages for this study outweigh these limitations. In particular, participating countries were interested in the factors associated with the attraction and retention of teachers for the 2013 survey (OECD, 2014b) so the influence of the body politic is advantageous for the research questions in this study. We also purport that understanding the esteem of the teaching profession is best in a comparative context. That is, the data on teachers from more than 30 distinct schooling systems provide ample evidence to address whether the low esteem of the teaching profession is an isolated or widespread global phenomenon and understand which characteristics act in predictable ways

---

[3] There are several school systems participating in TALIS that do not represent a country, but instead represent provinces or mega-city school systems. The academic standing of these non-country systems may differ from the rest of the country, but we have no reason to believe that the cultural standing of the esteem of teachers is skewed by provincial or urban contexts and so this should not act to bias our results.

across various cultural contexts. This evidence then allows for global as well as country-specific discussions on the topic.

Descriptively, Table 1 shows that in the aggregate of the systems included in this analysis, 63% of teachers are female. The average age of all teachers is 42 years, and 81% have more than five years of experience in the classroom. All but 4% of teachers in this sample have a university degree of some sort (although not necessarily in the fields of education or teaching) (OECD, 2014a). Moreover, more than half of all teachers across these countries teach in classrooms where more than 30% of their students are impoverished.[4] It is also commonplace for classrooms to comprise of students who have special needs, including those who speak a language in their home that is different than what is spoken in their classroom.

[Table 1 about here]

The esteemed professional: Feeling valued

As discussed in the introduction, feeling valued as a teacher is our focal outcome because it reflects the esteem afforded to the professional by society. This esteem is important because it aids in both the attraction of new candidates and retention of current teachers into the workforce. TALIS 2013 sought to capture this professional esteem by asking teachers how strongly they agreed or disagreed with the following statement:

"I think the teaching profession is valued in society."

(OECD, 2014a)

Table 2 shows that across more than 30 school systems and over 100,000 teachers, only 28% of teachers on average agreed that teaching was a valued profession in their

---

[4] The definition of "impoverished" is defined per country translation survey and is subject to interpretive error (OECD, 2014a).

societies[5]. In some countries, this percentage was shockingly low: in Sweden, France and the Slovak Republic, 5% or fewer teachers felt that teaching is valued. Indeed, there were only five school systems in which more than half of the teachers felt that their profession is valued: Finland, United Arab Emirates (Abu Dhabi), Korea, Singapore, and Malaysia (see Figure 1). Overall, it is apparent that the majority of teachers does not perceive society as holding their profession in high esteem.

[Figure 1 about here]

[Table 2 about here]

Analytic Technique

To answer the second research question regarding how well the four domains of knowledge work explain the variation in teachers' perceptions of the esteem of their profession, we first need to establish the prevalence and the degree of variation of treatment of teachers as knowledge-workers (research question one). Our analysis first provides the descriptive statistics on the variation between countries on the operationalized variables related to these four domains. For robustness, we also describe the absence of these domains in the profession. To describe the prevalence across countries, we apply the analytic sampling weights (TCHWGT).

For the latent constructs used in the analysis (collaboration with colleagues and collegial exchange of ideas, various professional development needs, and workplace satisfaction), we employ the scales constructed in the TALIS 2013 dataset (TCOOPS, TCEXCH. TPDPEDS, TPDDIVS, TJSENVS, respectively). To be included as scales in the TALIS 2013 dataset, clusters of items needed to pass a rigorous set of established TALIS standards to be developed as a latent construct scale. Namely, multi-group linear

---

[5] The average in our analytic sample is slightly lower than that of the OECD report on the full sample results from this question where 31% of teachers agreed or strongly agreed (OECD, 2014a: 187).

confirmatory factor analysis (MGCFA) and the typical model fit tests of Tucker-Lewis Index

(TLI), Comparative Fit Index (CFI), Root Mean Square Error Approximation (RMSEA), and

the Standardized Root Mean Square Residual (SRMR) were used at thresholds of ≥0.90,

≥0.90, ≤0.08, and ≤0.10, respectively, to robustly establish the cross-cultural comparability of

the latent constructs (OECD, 2014b, p. 150).[6] All of the scales used reached metric invariance

(OECD, 2014b). As explained in Annex B of the TALIS 2013 report (OECD, 2014a), metric

invariance is the necessary threshold to reliably interpret the slope estimates of the regression

coefficients (OECD, 2014a). The intercepts are not of analytic relevance for these research

questions; thus, the lack of scalar invariance does not threaten the validity of the results.

Once the prevalence of variables measuring these knowledge-worker domains is

established in research question one, we specify country fixed effects logistic regression

models to the outcome of interest: whether teachers agree that society values their profession.

We test five hypotheses for research question two, as illustrated in Figure 2:

H1) Professional benchmarks explain differences in teachers' perception of the

esteem of their profession.

H2) Professional discretion explains differences in teachers' perception of the esteem

of their profession.

H3) Room for promotion explains differences in teachers' perception of the esteem of

their profession.

H4) Workplace conditions explain differences in teachers' perception of the esteem of

their profession.

---

[6] MGCFA estimates are modeled using a missing at random (MAR) specification.

H5) The four domains of knowledge work explain distinct aspects contributing to the overall esteem of the teaching profession.

[Figure 2 about here]

To isolate the relationship of knowledge-worker professionalism from extraneous influences related to a teachers' feeling of value, we adjust our multivariate logistic regression models so that the gender, age, teaching experience, and educational background of the teachers as well as their classroom characteristics are controlled. Controlling for these important aspects allows our discussion to focus on the policy-malleable relationship between the domains of knowledge-worker professionals and the teachers' perception of the esteem of teaching regardless of the teachers' gender, age, experience, or educational background (Borman & Dowling, 2008). Additionally, estimates will not be conflated by the influences of student characteristics. The models also fix the unique effects of the school systems.

The regression analyses also apply the weights used in TALIS to account for the stratified sampling methods used. As explained in the Technical Report (OECD, 2014b), models are run using Fay-modified balanced repeated replication ("Fay's adjustment") to adjust the standard errors for the teacher survey data using Stata 14 statistical software.[7] The Fay's adjustment is a form of jackknife replication method that iterates the data in addition to the weight so as to properly estimate the standard errors in relation to the population. In TALIS 2013, the replication was set to 100 (OECD, 2014b). Without the use of this balanced repeated replication method, a standard regression estimate would be more likely to output biased results based on the non-random selection of schools identified in the stratified sampling design (Rust & Rao, 1996). To isolate teachers' perceptions independent of their

---

[7] HLM or fixed effects cannot be combined with this Faye's replication method. TALIS is specifically not designed to do hierarchical linear analysis within-countries with teacher-level differences.

country norms, we fix the influence of the between-country variation using dichotomous country indicators in the regression models.

The analytic sample for all findings is constrained to teacher data that is non-missing on all variables (listwise deletion[8]).[9] Italian teachers were excluded from the regression models since they were completely missing on the items related to room for promotion. We do report Italy's averages on the three other knowledge worker domains in the figures regarding research question one for informational purposes but these estimates are excluded from any tabular statistics.

Findings

Research question 1

To what extent does the treatment of teachers as knowledge workers vary across the globe?

Knowledge-worker element: Professional benchmarks

As reported by the OECD (2014a), most teachers in most school systems hold an advanced education credential. Overall, 96% of teachers on average in our analytic sample have earned some college-level educational credential. Only Mexico and Iceland fall to 91 and 90%, respectively, on this metric (OECD, 2014a: 34). Yet, Figure 3 shows that roughly 45% of teachers state that they had received limited formal training before beginning to teach. That is, although many teachers entered teaching with the required education credential, they felt unprepared in content, pedagogy, and classroom practice.

The professional benchmarks that are related to continuous learning, namely professional development opportunities and feedback to improve practice, show large variation between countries. The majority of teachers across countries reported attending a

---

[8] Analyses of the missing value patterns using Stata 14's "mvpatterns" show no pattern of missing data related to the dependent variable or other independent variables thus listwise deletion suffices (Allison, 2002). Correlation matrix results on the full data compared to the analytic sample confirmed no correlation between missingness on the variables of interest and thus can be assumed to be missing completely at random (MCAR).
[9] Paired t-tests confirm that the differences between each system's full sample and our analytic sample is significant, but minor since all but three t-tests were smaller than 20.

professional conference or workshop in the past 12 months to continue their professional development. On average, 80% of teachers reported attending some sort of professional development activity in the prior year, and no country averaged less than 60%.

[Figure 3 about here]

With regard to the notion that organizations promote continuous learning, many teachers in these countries state that the appraisal process in their school lacks any professional development value. Half of all teachers, on average, say that the teaching appraisals they received were done only for administrative reasons. This means that their appraisal was filed away with no feedback or discussion between evaluator and teacher, meaning that no continuous development of teaching practice could result. At least 60% of the teachers in Australia, Chile, Finland, France, Korea, Malaysia, Portugal, and the United States say their appraisals were performed for these superficial, administrative purposes with no impact on their professional learning and development. Of the teachers who did receive feedback with their appraisal, the majority (60% on average) say that it had a positive impact on their teaching practice. Only Chile and the Slovak Republic stand out as systems where feedback from appraisals did not have a positive impact on the majority of teachers who received it.

Knowledge-worker element: Professional discretion.

Two items to operationalize the professional discretion element of the knowledge-worker professional are: teachers take part in school decisions and teachers professionally interact in collegial sharing of ideas and strategies.[10]

Figure 4 shows how commonly teachers agree that they are provided room for professional discretion in their school organization. Across systems, it is more common than

---

[10] Due to the high collinearity between teacher cooperation and the teacher exchange of ideas scales (TCCOLLS, TCEXCH), we use the compound scale in TALIS that combines both scales into one scale of TCOOPS (OECD, 2014b).

not for teachers to be offered the opportunity to voice their professional thoughts and reflections in their workplace. On average, nearly 70% of teachers state that they teach in a school where they are allowed to actively participate in school decision-making. Teachers participating in collegial sharing is less common. Less than half of teachers, on average, work in schools where they regularly collaborate with their peers in terms of co-teaching, sharing lessons, or other exchanges of ideas.[11]

[Figure 4 about here]

Knowledge-worker element: Room for promotion

We measure room for promotion using three indicators: whether appraisals can lead to promotions or a salary raise and the proportion of time spent teaching. This latter item is included because, as the reviewed literature discussed, the more time that teachers actively teach, the less time they have to position themselves for promotion via contributing to non-classroom tasks of mentoring other teachers or collaboration work, for instance.

As Figure 5 shows, it is simply not the case that teachers who are commended on their teaching appraisals experience career notoriety. Fewer than four in ten teachers worldwide report that an appraisal of their teaching can lead to an increase in their salary and about five in ten report that appraisal can lead to some sort of career advancement or promotion. In only a handful of school systems does this commonly occur (Malaysia, Poland, Romania, Singapore).[12] It is also common for teachers to be spending 80% of their school time teaching. In Brazil, Malaysia, and Singapore, teachers are afforded a greater proportion of their work day to attend to non-classroom duties.

---

[11] Granted, the questions are not apples-to-apples. Teachers are asked if staff have the opportunity to participate in school decisions, not whether or not they did make a decision. This is qualitatively different than the teacher-to-teacher interactions questions which ask if the teacher had themselves participated in such activities with their colleagues.
[12] As a note, Italian teachers were not given two of these questions and so they are subsequently excluded from the statistical analysis in the next section.

[Figure 5 about here]

Knowledge-worker element: Workplace conditions

We operationalize the workplace conditions element of knowledge work with three tangible measures of the unmet professional needs of teachers regarding instruction, students' special needs, and classroom management. We also use the teachers' satisfaction with their working environment scale (TJSENVS) to estimate the workplace climate. Figure 6 shows that in these data across countries, teachers express a desire for further development in order to perform their teaching tasks. A substantial proportion of teachers expressed a lack of the necessary professional skills to address their students' particular needs. Specifically, teachers reported needing further development to teach their students with language, diversity, or other special education needs. They more often expressed a desire to advance their subject area or pedagogical skills than for skills to address classroom management.

Despite the expressed need for additional skills to meet their students' needs, teachers are overwhelming satisfied with their professional workplace climate. TALIS 2013 asked teachers how satisfied they were with their current school, if they would recommend their school to others, and whether they would like to change to another school.[13] In Japan and Korea, where teachers state the lowest levels of overall satisfaction with their school, they also express the highest level of need for further skills development.

[Figure 6 about here]

Teachers not treated as knowledge-worker professionals

Before we model the impact of the knowledge-worker characteristics that strongly relate to teachers' feelings that their profession is valued by society, we must underscore the prevalence of the lack of knowledge-worker professionalism in the teaching profession across

---

[13] Although we have no direct measure of trust, it is well-established that trust is a latent factor captured with teacher satisfaction measures (Tschannen-Moran, 2014; Tschannen-Moran and Hoy, 1998).

the globe. In some instances, simply the deficit of the aforementioned knowledge-worker characteristics signals this, but the data also highlight trends of when knowledge-worker professionalism is stripped from teachers and their work. Specifically, we observe the absence of: professional benchmarks, professional discretion, vertical career movement, and necessary workplace resources, factors which often characterize semi-professional work (Ingersoll & Perda, 2008).

Governments in many countries have been criticized for having loose professional benchmarks to certify teachers. In 75% of these countries, at least one in 20 teachers has not completed a teacher education program. In addition, in half of the systems, at least one in 20 teachers does not feel equipped to teach their subject matter even if they had participated in an initial teacher training program (OECD, 2014a: Table 2.3, 2.4).

Teacher autonomy is also strikingly low. The TALIS 2013 data show that one in three teachers globally does not determine their own course content and one in five teachers does not establish assessment policies. As the statistics in Figure 7 indicate, it is not uncommon for teachers to be handed a binder, textbook, or software package during their school year and instructed to teach those exact lessons to their students. Conversely, the power to develop discipline policies do appear to be relegated to schools and teachers. Notable exceptions in which teachers have less discretion over school discipline are Mexico, Malaysia, Abu Dhabi, and the United States.

[Figure 7 about here]

We know from TALIS reporting that 85% of teachers globally are evaluated by their school leader (OECD, 2014a). The question then becomes whether school leaders are afforded the ability to recommend promotion for their teachers. OECD reports show that overall, salary-based promotions are outside the purview of the principal (OECD, 2014a, Table 2.2). There do exist a handful of European countries where school leaders are able to

determine salary raises for teachers but in other counties this knowledge-worker characteristic is virtually non-existent.

Lastly, 26% of teachers report lacking basic textbooks and 30% lack sufficient internet access to conduct classroom lessons.[14] In fact more than 25% of teachers lack basic textbook materials in 14 of the school systems and sufficient internet access in 22 school systems (see Figure 8).[15] Many of these countries are in Eastern Europe, but also include Brazil, Mexico, Abu Dhabi, and the United States.

[Figure 8 about here]

Summary of research question 1

Table 3 summarizes the global statistical averages of the measures representing the four knowledge-work profession domains of: professional benchmarks, professional discretion, room for promotion, and workplace conditions. It is apparent from these data that teachers experience some elements of a knowledge-worker profession. It is also apparent from the findings that the prevalence of teachers' experiences varies between countries and in some countries certain knowledge-worker characteristics are absent from teaching altogether.

[Table 3 about here]

Research question 2

To what extent does the level of knowledge worker treatment shape teachers' perceptions of the esteem of their profession?

Treating teachers as knowledge-workers: Impact on feeling valued

Since the four knowledge-work domains do not occur in isolation but instead are considered parts of a whole conceptualization of knowledge work (as shown in Figure 2), we

---

[14] Worldwide, these TALIS reported numbers are downwardly biased since they exclude all African school systems where basic supplies are in even shorter supply.
[15] We define severe deficiency when 25% or more of the teachers lack these basic teaching materials.

focus on the contributions of each domain rather than on a list of 12 representative variables of knowledge-work.[16]

Global generalizations

The models in Table 4 provide evidence of the correlation between knowledge-worker professional domains and teachers' perceptions of the esteem of teaching by society. Indicators of professional benchmarks to practice, professional discretion, room for promotion, and workplace conditions do relate to teachers' perceptions of the value of teaching. When we look at these domains of knowledge-worker professions together in one model (column 1, Table 4), all but two of the indicators retain their associations in the full model. This indicates that the overall domains of knowledge-worker professions are distinct from one another; these domains do not simply say the same thing with different words (H5). Teachers' perceptions of the societal value of teaching are affected by professional benchmarks, professional discretion, room for promotion, *and* quality of workplace conditions – when any one of those domains is missing, teachers' feelings of value further decrease. The next subsections discuss the contributions of these distinct domains.

[Table 4 about here]

Professional benchmarks

Across teachers in these systems, professional benchmarks impact whether teachers perceive teaching as valued by society (H1). In particular, teachers who said that the feedback from their appraisals positively impacted their teaching are 1.5 times more likely to feel that teaching is valued than similar teachers who received no feedback from their appraisal. Teachers' perception of the value of teaching also moderately dips when they have attended a

---

[16] In other models specified with the teacher and classroom control variables (not shown here), all 12 individual variables we use to describe the four domains of knowledge-worker professions are significantly related to the value of teaching outcome, p<.05.

professional development conference or workshop in the past 12 months.[17] The amount of formal training in their subject and level (above and beyond the credential) does little on its own to explain teachers' perception on the value of teaching.

Professional discretion

Professional discretion also increases the likelihood that teachers will feel society values teaching (H2). Figure 9 shows that teachers who take part in decision-making in their school are more likely to believe society values teaching as compared to other teachers who do not have these decision-making opportunities. A portion of this effect is mediated in the full model, but is nonetheless a clear and positive indicator of feeling valued. Teacher collaboration, including exchange of ideas and cooperative teaching, does not significantly or substantially sway teachers' perceptions of society's value of teaching.

[Figure 9 about here]

Room for promotion

Even stronger than the impact of participation in school decisions on teachers' perception of the value of the teaching profession is the possibility of a teacher being promoted in his or her career (H3). The impact of the possibility of a raise in salary linked to positive appraisals on predicting the likelihood that a teacher feels valued is twice as strong as the opportunity to participate in school decisions. As Figure 10 shows, teachers who work

---

[17] Multicollinearity issues do not drive this result as all correlations with professional development are $\alpha < 0.10$. To investigate this surprising result, further modeling was performed. Results from univariate models for professional development on the value of teaching are not significant in all countries except Latvia, Romania, Serbia and the USA, where it is negative ($p<.05$) and in Sweden and the UK, where it is positive ($p<.05$). With most teachers in most countries being insignificant and not substantial (near zero coefficient), it *should be* the case that professional development is not significant in the full model. However, the addition of the other benchmarks into the model (formal training, appraisal impacts teaching, appraisal for administration only) reveals a true underlying negative effect of professional development on value of teaching ($\beta=-0.05$). When we additionally account for the other three sets of professional worker characteristics (room for promotion, professional discretion, and workplace conditions), the beta doubles in magnitude. These results show that once we account for whether or not the teacher is otherwise treated as a knowledge worker professional (all the other characteristics in the model), then we see the "true effect" that professional development is negative. Thus, it is not professional development in and of itself that contributes to teachers' value, but how it couples with their overall professional treatment.

in schools where their appraisal can positively impact their salary are 1.6 times as likely to perceive teaching as valued by society than teachers who do not have this appraisal-to-salary link.[18]

[Figure 10 about here]

Across countries, the percentage of time teachers spend on actual teaching in the classroom, as opposed to planning or administrative duties, does not substantially distinguish their perceptions of the value of teaching. When teachers know that their feedback can be linked to other professional advancements in the field of teaching, they do not experience a moderate upward shift in their views on society's value of teaching.[19]

Workplace conditions

Lastly, the working conditions of teachers very strongly relate to their views on society's value of teaching (H4). Teachers who highly rate their satisfaction with their school workplace are more than **three times** as likely to agree that society values teaching compared to their colleagues who express low satisfaction[20] (see Figure 11). In contrast, teachers who express the need for more professional development to advance their subject matter and pedagogical skills are slightly more likely to perceive teaching as valued.

[Figure 11 about here]

---

[18]There is quite a bit of literature in the US about the lack of or negative influence of teacher pay linked to student achievement. It is important to notice that the TALIS question only asks teachers about the link of appraisals to salary raises and excludes a penalty or sanction-based quality to the appraisal.

[19] This TALIS question solely focuses on the amount of *positive change* career advancement that can be received by a teacher due to feedback on their teaching. This excludes analysis of the impact of assessment to demote a teacher.

[20] For this illustration, teachers at the 15th percentile are compared to those at the 85th percentile among satisfaction with their school.

There is no relationship between teachers who express a need for further development around teaching students with special needs or classroom management and their perceptions of the value of teaching in society.[21]

Summary of research question 2

In the aggregate, we see strong evidence that the domains associated with knowledge work relate to greater likelihood that teachers feel their profession is valued by society. Columns 2-4 of Table 4 in comparison to column 1 of the full model clearly show that these four domains of knowledge work all uniquely contribute to teachers' perception of the value of the teaching profession; these domains are not overlaps of each other. The models do show that some items within a domain account for the others. For example, teachers' needs for professional development to address either the special needs of some of their students or classroom management are a symptom of their workplace satisfaction. More precisely, needs in these areas are simply a demonstration of general workplace dissatisfaction. It is apparent from these data that the treatment of teachers as knowledge workers significantly and substantially increases the likelihood that the profession will be perceived as one held in high esteem. Figure 12 illustrates the three knowledge-worker characteristics that, when present in the teaching profession, provide the strongest association with teachers' feelings of value by society.

[Figure 12 about here]

In light of the predicted probabilities shown in Figure 12, the compelling findings around teachers' satisfaction with their workplace, and the chance of a mediation effect, we were compelled to test the empirical question: what contributes to teachers' satisfaction with their workplace? When we look deeper into the interplay of the domains of knowledge-

---

[21] That is, once a teachers' general satisfaction with their school is accounted. In univariate models, these items did significantly relate to feeling valued.

worker professionals outlined here, we learn that two of them act as mediating factors to teachers' satisfaction with their school (see Figure 13).

- Satisfaction scores double for teachers who work in schools with opportunities to participate in school decisions compared with teachers who do not have these opportunities.

- Satisfaction scores increase for teachers who are in schools where feedback can lead to promotion.

[Figure 13 about here]

This mediation does not occur with the element of professional benchmarks, which makes sense since professional benchmarks are rarely school-organization standards and are often implemented from external educational authorities. It is also important to note that additional nested models (not shown here) confirm that the opposite direction of influence does not occur: school satisfaction does not improve professional discretion, opportunities for promotion, or skill needs.[22] Although we are unable to test directional hypotheses with these cross-sectional data, these results do empirically show the significant contribution of the organization to the three knowledge-worker domains that are not established prior to a teacher's work in the classroom.

Discussion

Teaching as a knowledge-work profession

From this study, we show that the four domains of knowledge-worker professions are present among some teachers in some countries. It is not the case that we can look to one country or one set of countries to find an exemplar system that treats teachers as knowledge workers. Likewise, the patterns among countries are not clustered across domains: there is

---

[22] Nested regression modeling confirms the direction of influence of professional discretion, opportunities for promotion, or skill needs on school satisfaction and not the opposite.

much variation within and between countries. The teaching profession in Singapore and Bulgaria, for example, shows strong indications of room for promotion but low indications of professional benchmarks. Within some domains there is cultural clustering. The teaching profession in Eastern European countries, for example, exhibits similarly high rates for professional discretion yet these countries vary greatly for professional benchmarks.

The conceptual interlocking of these distinct domains is important for thinking about knowledge work. A central attribute of knowledge workers is the need for continuous growth in their profession (Drucker, 1999; Fontana et al., 2015; Tampoe, 1993; Vanthournout et al., 2014). This growth can be obtained through many venues which span the domains of knowledge work: collaborative work with colleagues, personal growth plans developed from appraisals and feedback from organizational stakeholders, work time to read-up on the latest professional innovations, among others. Our finding regarding the negative impact of traditional workshop and conference professional development activities aligns with research that indicates that these traditional methods of professional development at off-site trainings and workshops do not provide knowledge workers with the continuous and adaptable on-the-job training that they require (Fontana et al., 2015; Littlejohn & Margaryan, 2013; Vanthournout et al., 2014). Knowledge workers require on-site learning opportunities with colleagues and thus we suspect (but are unable to test with these data) the negative impact of teachers who report attending a course or workshop is likely due to the disconnectedness of the formal, off-site training from their workplace context and colleagues.

We see from these analyses that these different measures of continuous learning within the profession are executed in various normed configurations in different systems. Our attention should be focused on countries in which the myriad of continuous learning opportunities is hindered by the organization. When teachers are in schools with low feedback from appraisals and low collaboration with colleagues, they are, in the aggregate,

receiving little feedback from colleagues in their daily work. This lack of collegial feedback can slow the development of their professional capital (A. Hargreaves & Fullan, 2012).

Importance of treating teachers as knowledge-workers

The evidence presented makes a strong case that treating teachers as knowledge workers impacts their perception of how society values their profession. We also show that these domains distinctly contribute to this perception: it is the sum of the whole that contributes to teachers feeling valued and not one variable that can sway the perception of the profession.

It is important to recognize that the rigor of initial teacher training is not the contributor to teachers' own perception of the status of teaching, as some have suggested (Han, Borgonovi, & Guerriero, 2017; Ingersoll & Perda, 2008). Rather, it is the lack of a collegial space to discuss one's professional practices with school leadership (between teacher and evaluator or through participation in school decision-making) that contributes to the feeling of lowered esteem of the profession The importance of this teacher-principal relationship is abundant in the literature (Canrinus, Helms-Lorenz, Beijaard, Buitink, & Hofman, 2012; Hallinger, 2003; Harris & Muijs, 2004; Hulpia, Devos, & van Keer, 2011; Ingersoll, 2001; Leithwood, Harris, & Hopkins, 2008; Price, 2012, 2015; Rosenholtz, 1989; Singh & Billingsley, 1998; Spillane, 2012; Tschannen-Moran, 2009). In this literature, trust is a central necessity (Tschannen-Moran & Hoy, 1998), as it is for knowledge work as well (Avis, 2003). Trust cannot be assessed with these TALIS 2013 data, but it is likely a latent mechanism that underlies the variation in teachers' experiences as a knowledge-worker in their schools. Other research on teacher attrition finds similar results as these (Borman & Dowling, 2008; Devos, Tuytens, & Hulpia, 2014; Helms-Lorenz, van de Grift, & Maulana, 2016).

Lastly, the role of the school organization is central to this process. The largest contributors to teachers feeling valued by society are related to how teachers are treated inside the walls of their own school (workplace satisfaction, availability of resources to meet student needs, recognition of quality work). Again, this syncs well with the research on teacher attrition (Borman & Dowling, 2008; Helms-Lorenz, van de Grift, & Maulana, 2016; Kardos & Johnson, 2007; Kim, Youngs, & Frank, 2017), Of course, we cannot disaggregate the multidimensionality of these occurrences. The variation in schools' treatment of teachers as knowledge workers could be a function of differential treatment by the system or due to the variation in the school leaders' treatment of teachers. Although we cannot disentangle the cause, it is important to understand that although teacher collaboration has a strong relationship with teachers' feelings of overall job satisfaction (OECD, 2014a), the level of collaboration between teachers does not significantly or substantially sway teachers' perceptions of society's value of teaching.

Limitations of the analysis

The data here are clear in supporting the hypotheses: the domains of knowledge-worker professions positively correlate with higher levels of esteem of the teaching profession, as perceived by teachers in school systems globally. Due to the multicollinearity of the "absence of" and "presence of" knowledge-work characteristics related to similar elements (for example, teachers completing a teacher education program and highest level of education attained), it is not possible to directly model the impact of the absence of knowledge work on the esteem of the profession along with the presence of knowledge-work characteristics. Although we described the absences to inform the understanding of the knowledge-work characteristics in the teaching profession, we strategically focused our analytic attention on the presence rather than the absence of these characteristics. This

provides policymakers with springboards from which to develop policies that might see greater success in attracting or retaining teachers to the sector.

To promote these policy-building and forum-level discussions, we selected the international TALIS dataset instead of any one country's data on teachers. Focusing our analyses on the similarities between school systems across the globe provides more fodder for cross-country coalition-building around education policy tables. But the critiques of OECD-based data are not without merit (see Meyer & Benavot, 2013 for a review). There are political interests to uphold when developing a survey of over 100,000 teachers in a wide range of countries (Meyer & Benavot, 2013). The negotiations and resulting concessions that occur during the survey development process are necessary in order to secure participation from the maximum number of education systems. These concessions can have the effect of preventing more sensitive or possibly volatile questions from being asked on the survey. It would have been ideal to include in this analysis a measure of teacher salary, for instance, but that datum was not collected on the TALIS survey. Ultimately, the limitations of the OECD-based data like TALIS do not outweigh the potential coalition-building aspects of using such data here; TALIS provides the only dataset that exists across a wide-range of cultural contexts that looks deeply into the characteristics and working conditions of teachers.

Lastly, there could be the concern that the TALIS data misrepresent the full spectrum of teachers. Since the TALIS data only surveyed teachers still teaching and did not include those who have left the profession, we can surmise that the evaluations on some measures, such as school climate, could be upwardly biased. The sample is drawn cross-sectionally so in this snapshot of time, there should be as many "likely to leave" teachers informing the results as is common to any school year. This means that the results should not be upwardly biased. For places where teacher retention would likely be a solution to many impending

teacher shortage problems (Ingersoll, 2016), these findings should aid in that policy conversation.

Cultural bias, where the "meaning" of questions and the answer categories may differ across school systems is another threat to validity and so comparisons across school systems need to be approached cautiously (OECD, 2014b). This concern has been taken seriously by the OECD and in this study. For TALIS 2013, there has been extensive work performed to test the impact of cultural bias in question wording and the conclusions are clear that this is not a substantiated concern (van de Vijver & He, 2014). In this study, we have purposely focused our analysis on the international averages and not on country-mean comparisons. Our models also fix the effects for each school system so the differences across systems are statistically accounted to reduce any system-level contamination of the results presented.

Implications for policy and practice

Parallel discussions on the professionalism of teaching, teaching as a profession, and the professionalization of teachers have been occurring in many countries for decades. Many agree that teachers should be knowledge workers who constantly contribute to the knowledge base of the profession (Schleicher, 2012). The findings in this study demonstrate the value in treating teachers as knowledge workers. However, it is unclear whether knowledge-worker professionals would want to join the ranks of today's teachers, when in most countries they would experience a dip in status (Reis Monteiro, 2014; OECD, 2013) as well as a deficit in professional autonomy, among other losses.

The findings in this study present opportunities for reforms to be made, at both the system and school level, that could help elevate the status of the teaching profession by bringing it closer to knowledge work, as well as making it more attractive to the very professionals it is trying to recruit.

System-level implications

The teaching profession provides a stark contrast to other professions, such as medicine or law, whose members hold high status and earn above-average salaries in many countries. Yet these professions are highly regulated from the start: they accept only the top percentage of university graduates into their extensive training programs and require additional training throughout their careers. For the teaching profession, simply the completion of the initial teacher education coursework is enough to be considered fully-qualified to practice (Reis Monteiro, 2014; OECD, 2013), and we showed that teachers themselves do not feel prepared enough. In addition, the effect of lowering the professional bar where one in 20 teachers do not hold adequate qualifications seems to have consequences, which are corroborated by beginning teacher attrition research (Helms-Lorenz, van de Grift, & Maulana, 2016). Education systems need to reconsider the criteria for entry and continuation of a career in the teaching profession.

Before this can happen, however, the profession needs to be made more attractive to potential candidates. While this discussion typically revolves around teacher salary (Cha & Cohen-Vogel, 2011; Han, Borgonovi, & Guerriero, 2017), the findings from this study show that few teachers have the autonomy to choose the curriculum, assessments, or discipline policies to meet the needs of their students, thereby creating a semi-professional work environment. The impact of this lack of autonomy also contributes to teacher attrition (Cha & Cohen-Vogel, 2011; Firestone & Pennel, 1993; Rosenholtz, 1989). These results suggest school systems would benefit from re-instituting policies that trusted teachers to prescribe the best classroom teaching and learning experience for their students (Ingersoll & Perda, 2008). Admittedly, this cannot be done without a measure of accountability and support, discussed in the next section.

Most troublesome is the lack of basic teaching resources, which is a cited by other research (Firestone & Rosenblum, 1988; Hakanen, Bakker, & Schaufeli, 2006). Only in

catastrophic situations are professionals, such as nurses, expected to serve their clientele without the proper supplies. Yet in a typical school day, 26% of teachers do not have basic textbooks and 30% do not have sufficient internet access with which to conduct classroom lessons. The idea that any professional could perform their work in such inadequate conditions is unethical in practice and disrespectful to the professional. Although different resources may be needed each year, accumulated resources build the professional capital of the teacher, and ultimately benefit students (A. Hargreaves & Fullan, 2012).

School-level implications

The esteem of the teaching profession can be improved if we focus on what's happening in schools – the conditions in which teachers interact with one another as knowledge-worker professionals most affect their feelings of value as a professional. Ample research examines how allowing teachers to participate in school decisions bolster their autonomy (Devos, Tuytens, & Hulpia, 2014; Hallinger, 2003; Harris & Muijs, 2004; Ingersoll, 2001; Leithwood, Harris, & Hopkins, 2008; Muijs & Harris, 2003; Spillane, 2012; Tschannen-Moran, 2009).

Schools could also hold teachers accountable – and reward them – for a job well done using their own colleagues as the basis for evaluation, appraisal, and promotion. "Teacher leaders" could foster this type of collegial accountability (MacBeath, Frost, & Swaffield, 2005; Muijs & Harris, 2003). Collegiality is vital for workplace learning, especially if we want to bring the role of teacher closer to that of a knowledge worker. Like knowledge workers, teachers need continuous, on-the-job learning and feedback on their performance.

In terms of formal appraisal and feedback, the negative relationship of superficial, administrative appraisals to teachers' feeling un-valued can be remedied. Schools can provide meaningful systems of appraisal and feedback that can help improve the perception of the teaching profession's value, but also impacts teaching and learning. Others have shown this

to be effective for novice teachers (Borman & Dowling, 2008; Gordon & Maxey, 2000; Helms-Lorenz, van de Grift, & Maulana, 2016).

If there is good reason to improve the esteem of the teaching profession to attract and retain good teachers, we need to consider what can be improved to raise the profession's current reputation and status. The knowledge-worker research provides a solid framework and presents evidence of its positive impact on professions. The evidence here points policymakers and leaders to its relevance for the teaching profession across cultures.

Future Research

This study provides a framework of four knowledge-worker domains that connect the myriad of results linking the status of the teaching profession to teacher retention and attraction. In particular, research connecting teacher commitment and retention to student learning via the role of teacher self-efficacy (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; van Gasse, Vanlommel, Vanhoof, & van Petegem, 2017; Voelkel & Chrispeels, 2017), workplace satisfaction (Cha & Cohen-Vogel, 2011), collaboration (Devos, Tuytens, & Hulpia, 2014; Jäppinen, Leclerc, & Tubin, 2016), and professional learning communities (Horn & Little, 2010; Jäppinen, Leclerc, & Tubin, 2016; Voelkel & Chrispeels, 2017) have been circling around similar ideas regarding the role of the school organization as a crucial mechanism in creating and sustaining a climate in which teachers can act as knowledge-workers. As research moves forward, we encourage the use of this conceptual framework to connect ideas across individual indicators of knowledge work to explain teacher retention in, commitment to, and attraction to the teaching profession.

For policy, the call to attend to rising teacher shortages, attrition, and retention has been building substantially over the years. Some research has noted the economic costs of teacher turnover in general (Barnes, Crowe, & Schaefer, 2007). While the costs are one way to raise concern over this looming social dilemma, research that focuses on how to retain

quality teachers provides substance for policymakers to use in hopes to ameliorate the

problem (Borman & Dowling, 2008). A large portion of recent research focuses on the plight

of retaining beginning teachers in particular (Helms-Lorenz, van de Grift, & Maulana, 2016).

The upcoming TALIS 2018 data should provide a comparison point for policymakers to

know empirically whether the esteem of teaching is viewed as stagnant, dropping, or rising.

Of course, future data collections on the esteem of other professionals in healthcare, law

enforcement, or post-secondary education would provide relevant comparisons to aid in

understanding how teachers' views of their own profession compared to other social service

sector professions.

References

Allison, P. D. (2002). *Missing data: Quantitative applications in the social sciences*. Thousand Oaks, CA: Sage Publications.

Alvesson, Mats (2004). *Knowledge work and knowledge-intensive firms.* Oxford: Oxford University Press.

Anderson, R. S. (1975), *Education in Japan: A century of modern development*. Retrieved on 20/12/2015 from http://files.eric.ed.gov/fulltext/ED131057.pdf

Avis, J. (2003). Re-thinking trust in a performative culture: The case of education. *Journal of Education Policy, 18*(3), 315–332.

Barnes, G., Crowe, E., & Schaefer, B. (2007). The cost of teacher turnover in five school districts: A pilot study. *National Commission on Teaching and America's Future*. Retrieved from https://nctaf.org/teacher-turnover-cost-calculator/the-cost-of-teacher-turnover-study-and-cost-calculator/.

Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of educational research, 78*(3), 367-409.

Borman, G. D., & Kimball, S. M. (2005). Teacher quality and educational equality: Do teachers with higher standards-based evaluation ratings close student achievement gaps? *The Elementary School Journal*, *106*(1), 3–20.

Canrinus, E. T., Helms-Lorenz, M., Beijaard, D., Buitink, J., & Hofman, A. (2012). Self-efficacy, job satisfaction, motivation and commitment: Exploring the relationships between indicators of teachers' professional identity. *European Journal of Psychology of Education*, *27*(1), 115–132.

Cha, S.-H., & Cohen-Vogel, L. (2011). Why they quit: A focused look at teachers who leave for other occupations. *School Effectiveness and School Improvement*, *22*(4), 371–392. https://doi.org/10.1080/09243453.2011.587437

Cheng, E. C. (2015). Challenges for Schools in a Knowledge Society. In *Knowledge management for school education* (pp. 1-10). Singapore: Springer.

Chudgar, A. & Luschei, T. (2016). Understanding teacher distribution cross-nationally: Recent empirical evidence. *Teachers College Record*. Date Published: November 02, 2016. http://www.tcrecord.org ID Number: 21712

Cuban, L. (1993). *How teachers taught: Constancy and change in American classrooms, 1890-1990*. New York: Teachers College Press.

Despres, C. & Hiltrop, J. (1996). Compensation for technical professionals in the knowledge age. *Research Technology Management, 39*(5), 48–56.

Devos, G., Tuytens, M., & Hulpia, H. (2014). Teachers' organizational commitment: Examining the mediating effects of distributed leadership. *American Journal of Education*, *120*(2), 205–231.

Drucker, P. (1999). Knowledge-worker productivity: The biggest challenge. *California Management Review*, *41*(2), 79–94.

Firestone, W. A., & Pennell, J. R. (1993). Teacher commitment, working conditions, and differential incentive policies. *Review of educational research, 63*(4), 489–525.

Firestone, W. A., & Rosenblum, S. (1988). Building commitment in urban high schools. *Educational Evaluation and Policy Analysis, 10*(4), 285–299.

Fontana, R. P., Milligan, C., Littlejohn, A., & Margaryan, A. (2015). Measuring self-regulated learning in the workplace. *International Journal of Training and Development*, *19*(1), 32–52.

Gordon, S. P., & Maxey, S. (2000). *How to help beginning teachers succeed.* (2nd ed.). Alexandria VA: Association for Supervision and Curriculum Development..

Guerriero, S. (2017). *Pedagogical knowledge and the changing nature of the teaching profession.* Paris: OECD Publishing.

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43*(6), 495–513.

Hallinger, P. (2003). Leading educational change: Reflections on the practice of instructional and transformational leadership. *Cambridge Journal of Education*, *33*(3), 329–352.

Han, S. W., Borgonovi, F. & Guerriero, S. (2017, April). *Trends in high school students' expectations for the teaching profession: The role of teacher pay in a comparative perspective.* Paper presented at the annual meeting of the American Educational Research Association, San Antonio, TX.

Hansen, M.T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organizational sub-units. *Administrative Science Quarterly*, *44*(1), 82–111.

Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching*. New York: Teachers College Press.

Hargreaves, L. (2009). The status and prestige of teachers and teaching. In L. Saha & G. Dworkin (Eds.*), The Springer international handbook of research on teachers and teaching, Volume 21, Part 1* (pp. 217–229). New York: Springer.

Harris, A., & Muijs, D. (2004). *Improving schools through teacher leadership*. Maidenhead, UK: McGraw-Hill Education.

Harteis, C. and Billett, S. (2008). The workplace as learning environment. *International Journal of Educational Research*, 47, 209–12.

Helms-Lorenz, M., van de Grift, W., & Maulana, R. (2016). Longitudinal effects of induction on teaching skills and attrition rates of beginning teachers. *School Effectiveness and School Improvement*, *27*(2), 178–204. https://doi.org/10.1080/09243453.2015.1035731

Horn, I. S., & Little, J. W. (2010). Attending to problems of practice: Routines and resources for professional learning in teachers' workplace interactions. *American Educational Research Journal*, *47*(1), 181–217.

Howsam, R. B., Corrigan, D. C., Denemark, G. W. & Nash, R. J. (1976). *Educating a profession: Report of the bicentennial commission on education for the profession of teaching.* Washington, DC: American Association of Colleges of Teacher Education, 4–6.

Hoyle, E. (1995). Teachers as professionals. In L. W. Anderson (Ed.), *International encyclopedia of teaching and teacher education* (pp.11–15). Tarrytown, NY: Elsevier Science, Inc.

Hulpia, H., Devos, G., & Van Keer, H. (2011). The relation between school leadership from a distributed perspective and teachers' organizational commitment: Examining the source of the leadership function. *Educational Administration Quarterly*, *47*(5), 728–771.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, *38*(3), 499–534.

Ingersoll, R. (2016). Research fact sheet: The national teacher shortage: Sources and solutions. American Educational Research Association. Retrieved from http://www.aera.net/Portals/38/docs/Annual_Meeting/2016%20Annual%20Meeting/2016%20Knowledge%20Forum/Ingersoll.pdf.

Ingersoll, R. M. & Merrill, E. (2011). The status of teaching as a profession. In J. Ballantine & J. Spade (Eds.), *School and society: A sociological approach to education, 4th Edition* (pp. 185–198). Pine Forge, CA: Press/Sage Publications.

Ingersoll, R., & Perda, D. (2008). The status of teaching as a profession. In J. H. Ballentine & J. Z. Spade (Eds.), *Schools and society: A sociological approach to education, 3rd ed.*, (pp. 106–118). Thousand Oaks, CA: Sage Publications.

Jäppinen, A.-K., Leclerc, M., & Tubin, D. (2016). Collaborativeness as the core of professional learning communities beyond culture and context: Evidence from Canada, Finland, and Israel. *School Effectiveness and School Improvement*, *27*(3), 315–332.

Kardos, S. M., & Johnson, S. M. (2007). On their own and presumed expert: New teachers' experience with their colleagues. *Teachers College Record*, *109*(9), 2083-2106.

Kelloway, E. K. & Barling, J. (2000). Knowledge work as organizational behaviour. *International Journal of Management Reviews*, *2*(3), 287–304

Kim, J., Youngs, P., & Frank, K. (2017). Burnout contagion: Is it due to early career teachers' social networks or organizational exposure? *Teaching and Teacher Education, 66*, 250–260.

Krejsler, J. (2005). Professions and their identities: How to explore professional development among (semi-) professions. *Scandinavian Journal of Educational Research*, *49*(4), 335–357.

Leithwood, K., Harris, A. & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership & Management, 28* (1), 27–42.

Littlejohn, A. & Margaryan, A. (2013), Technology-enhanced professional learning: Mapping out a new domain. In A. Littlejohn & A. Margaryan (Eds.), *Technology-enhanced professional learning: Processes, practices and tools* (pp. 1–13). London: Routledge.

Lynch, S., Worth, J., Bamford, S. & Wespieser, K. (2016). *Engaging teachers: NFER analysis of teacher retention.* Slough, UK: NFER.

MacBeath, J., Frost, D., & Swaffield, S. (2005). Researching leadership for learning in seven countries (the Carpe Vitam project). *Education Research and Perspectives*, *32*(2), 24–42.

Meyer, H. D., & Benavot, A. (Eds.). (2013). *PISA, power, and policy: The emergence of global educational governance.* New York: Symposium Books.

Muijs, D., & Harris, A. (2003). Teacher leadership—Improvement through empowerment? An overview of the literature. *Educational Management Administration & Leadership*, *31*(4), 437–448.

Organisation for Economic Co-Operation and Development. (2013). *Education at a glance 2013: OECD Indicators*. Paris: OECD Publishing.

OECD. (2014a). *TALIS 2013 results: An international perspective on teaching and learning.* Paris: OECD Publishing.

OECD. (2014b). *TALIS 2013 Technical Report*. Paris: OECD Publishing.

Price, H. E. (2012). Principals' attitudes and behaviors matter: How principals' relationships with their teachers affect school climate. *Educational Administration Quarterly*, *48*(10), 39–85.

Price, H. E. (2015). Principals' social interactions with teachers: How principal-teacher social relations correlate with teachers' perceptions of student engagement. *Journal of Educational Administration, 53*(1), 116–139.

Ramirez, Y. & Nembhard, D. (2004) Measuring knowledge worker productivity: A taxonomy. *Journal of Intellectual Capital,* 5(4), 602–628.

Ravitch, D. (2011). *The death and life of the great American school system: How testing and choice are undermining education*. New York: Basic Books.

Reis Monteiro, A. (2014). *The teaching profession: Present and future*. New York: Springer.

Rosenholtz, S. J. (1989). Workplace conditions that affect teacher quality and commitment: Implications for teacher induction programs. *The Elementary School Journal, 89*(4), 421–439. Rust, K. F., & Rao, J. N. K. (1996). Variance estimation for complex surveys using replication techniques. *Statistical Methods in Medical Research*, *5*(3), 283–310.

Sahlberg, P.. (2012). *The most wanted: Teachers and teacher education in Finland*. In L. Darling Hammond & A. Lieberman (Eds), *Teacher education around the world* (pp.1–21). New York: Routledge.

Schleicher, A. (2011). *Building a high-quality teaching profession: Lessons from around the world,* Paris: OECD publishing.

Schleicher, A (Ed.). (2012). *Preparing teachers and developing school leaders for the 21st Century: Lessons from around the world.* Paris: OECD Publishing.

Singh, K., & Billingsley, B. S. (1998). Professional support and its effects on teachers' commitment. *Journal of Educational Research, 91*(4), 229–239.

Spillane, J. P. (2012). *Distributed leadership (4th Ed.).* New York: John Wiley & Sons.

Tampoe, M. (1993). Motivating knowledge workers: The challenge for the 1990s. *Long Range Planning, 26*(3), 49–55

Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration Quarterly*, *45*(2), 217–247.

Tschannen-Moran, M. (2014). *Trust matters: Leadership for successful schools (2nd ed.).* New York: John Wiley & Sons.

Tschannen-Moran, M., & Hoy, W. (1998). Trust in schools: A conceptual and empirical analysis. *Journal of Educational Administration*, *36*(4), 334–352.

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, *68*(2), 202–248.

Tyack, D. B. (1974). *The one best system: A history of American urban education*. Cambridge: Harvard University Press.

UNESCO & ILO. (2008) *The ILO/UNESCO recommendation concerning the status of teachers (1966) and The UNESCO Recommendation concerning the status of higher-education teaching personnel (1997).* Retrieved from http://unesdoc.unesco.org/images/0016/001604/160495e.pdf.

UNESCO Institute for Statistics. (2016). UIS fact sheet: The world needs almost 69 million new teachers to reach the 2030 education goals, No. 39. Retrieved from http://unesdoc.unesco.org/images/0024/002461/246124e.pdf.

Van Gasse, R., Vanlommel, K., Vanhoof, J., & Van Petegem, P. (2017). The impact of collaboration on teachers' individual data use. *School Effectiveness and School Improvement*, *28*(3): 489–504. https://doi.org/10.1080/09243453.2017.1321555

van de Vijver, F. J. R. V., & He, J. (2014). Report on social desirability, midpoint and extreme responding in TALIS 2013 (*OECD Education Working Papers, No. 107)*. Paris: OECD Publishing. Retrieved from http://dx.doi.org/10.1787/5jxswcfwt76h-en.

Van Weert, T.J. (2006). Education of the twenty-first century: New professionalism in lifelong learning, knowledge development and knowledge sharing. *Education and Information Technologies, 11*, 217–237.

Vanthournout, G., Noyens, D., Gijbels, D., & Van den Bossche, P. (2014). The relationship between workplace climate, motivation and learning approaches for knowledge workers. *Vocations and Learning*, *7*(2), 191–214.

Voelkel Jr, R. H., & Chrispeels, J. H. (2017). Understanding the link between professional learning communities and teacher collective efficacy. *School Effectiveness and School*

Improvement. doi:

http://www.tandfonline.com/doi/full/10.1080/09243453.2017.1299015.

Walters, P. B. (2000). The limits of growth: School expansion and school reform in historical

perspective. In M. T. Hallinan (Ed.), *Handbook of the Sociology of Education* (pp.

241-61). New York: Kluwer Academic/Plenum Publishers.

Webb, L. D. (2006). *The history of American education: A great American experiment*.

Upper Saddle River, NJ: Pearson: Merrill Prentice Hall.
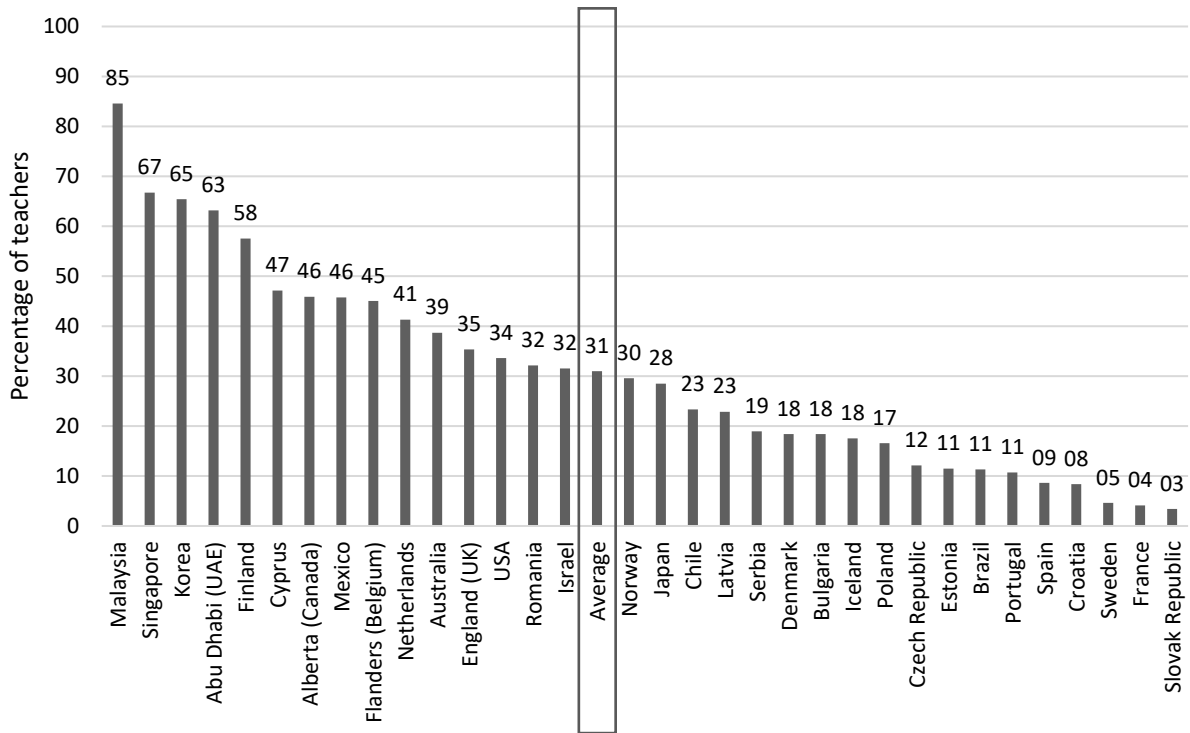
Source: TALIS 2013 Teacher Questionnaire: 46h, weighted results reported

Figure 1. Teachers' perceptions of the value of the teaching profession[23]

---

[23] For parsimony, this analysis dichotomizes the four-category answer categories of strongly disagree, disagree, agree, and strongly agree into whether or not teachers disagree or agree with the statement.
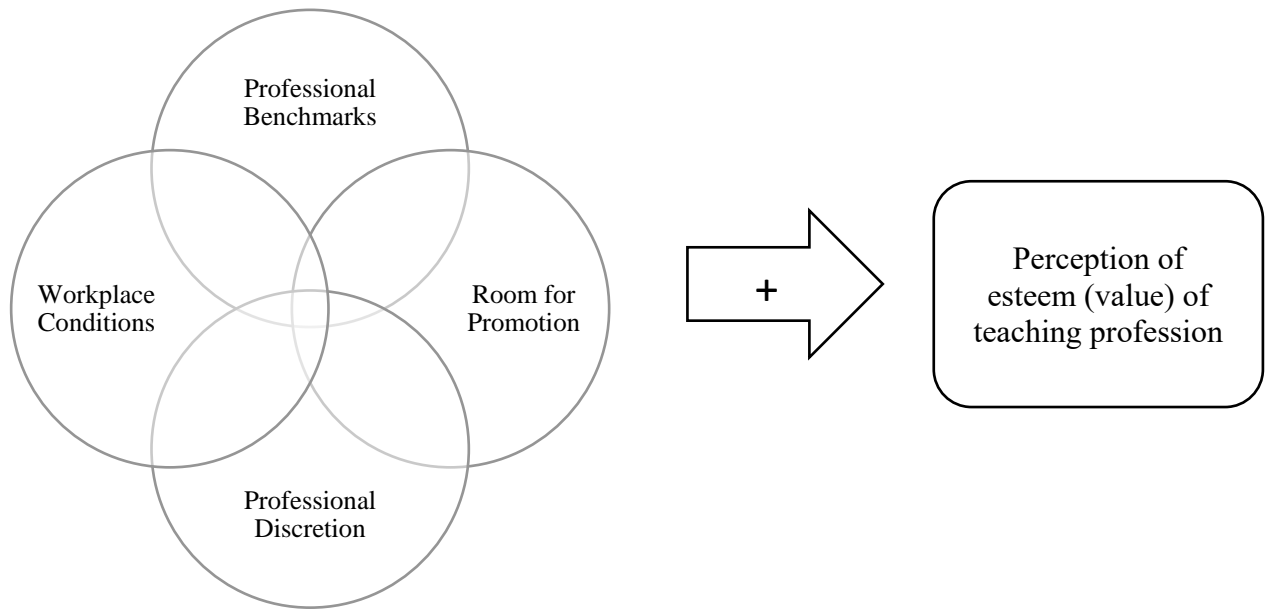
Figure 2. Proposed relationship of knowledge-worker profession on esteem of teaching
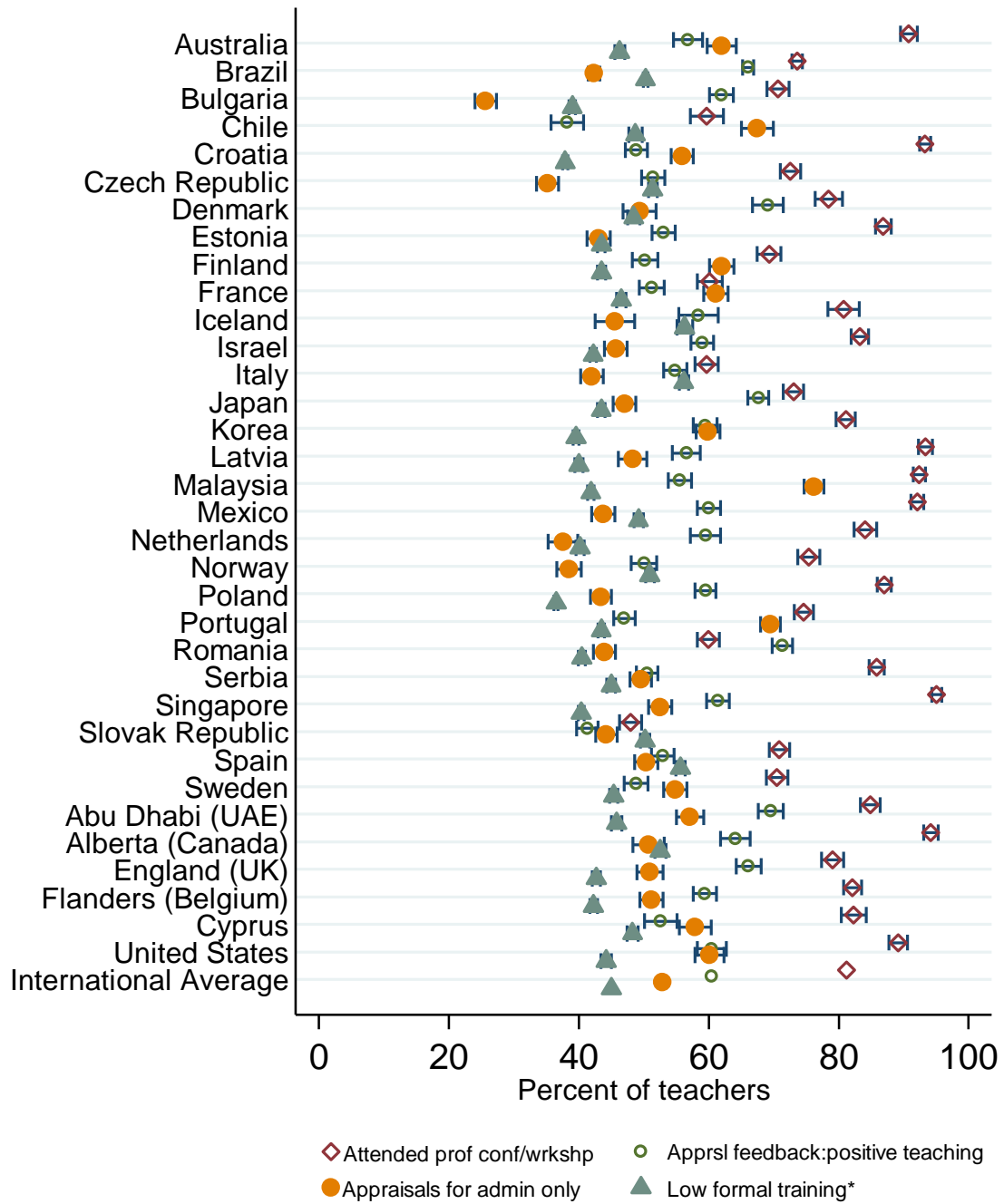
Figure 3. Professional benchmarks in teaching across school systems
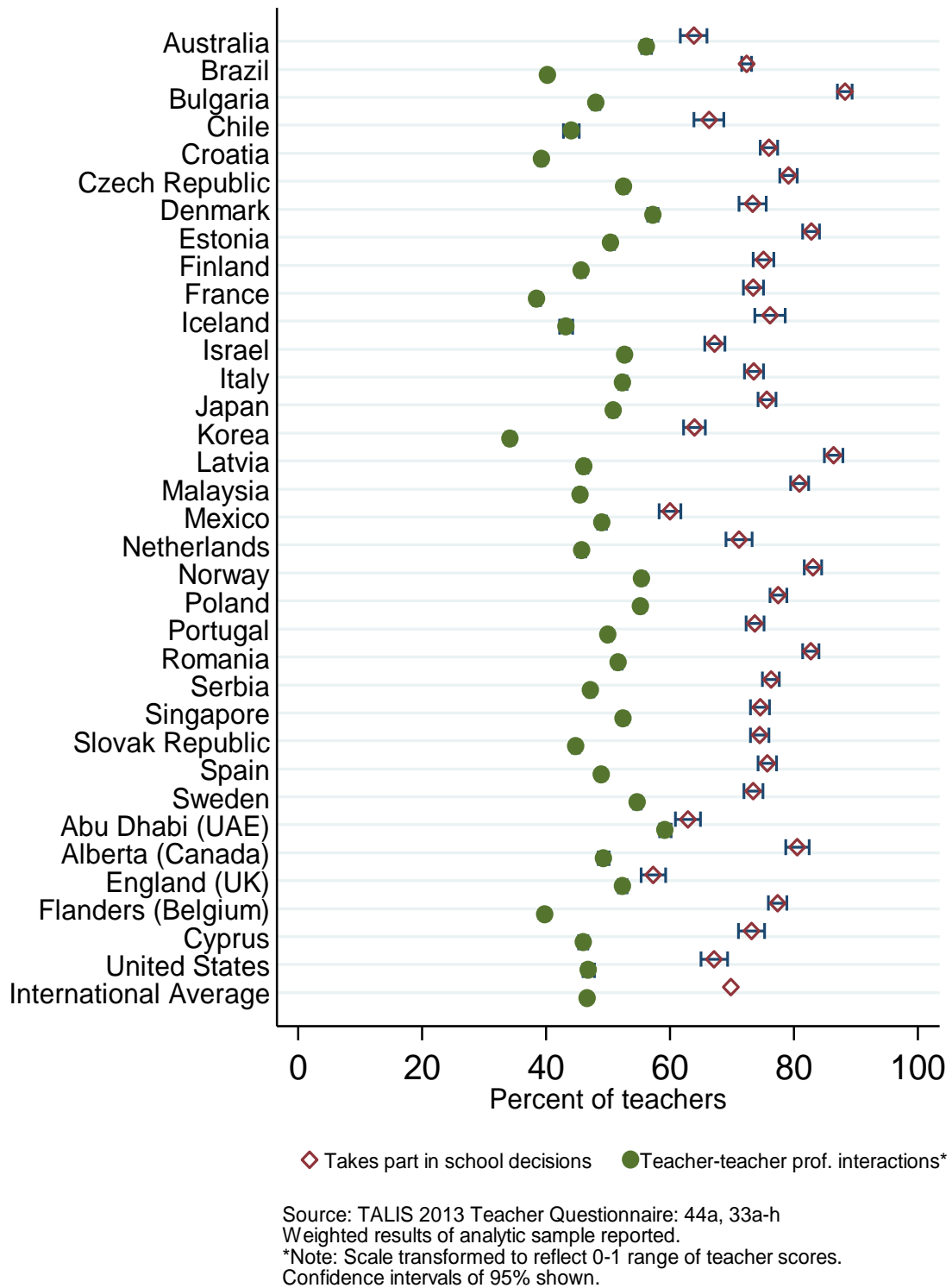
Figure 4. Professional discretion in teaching across school systems
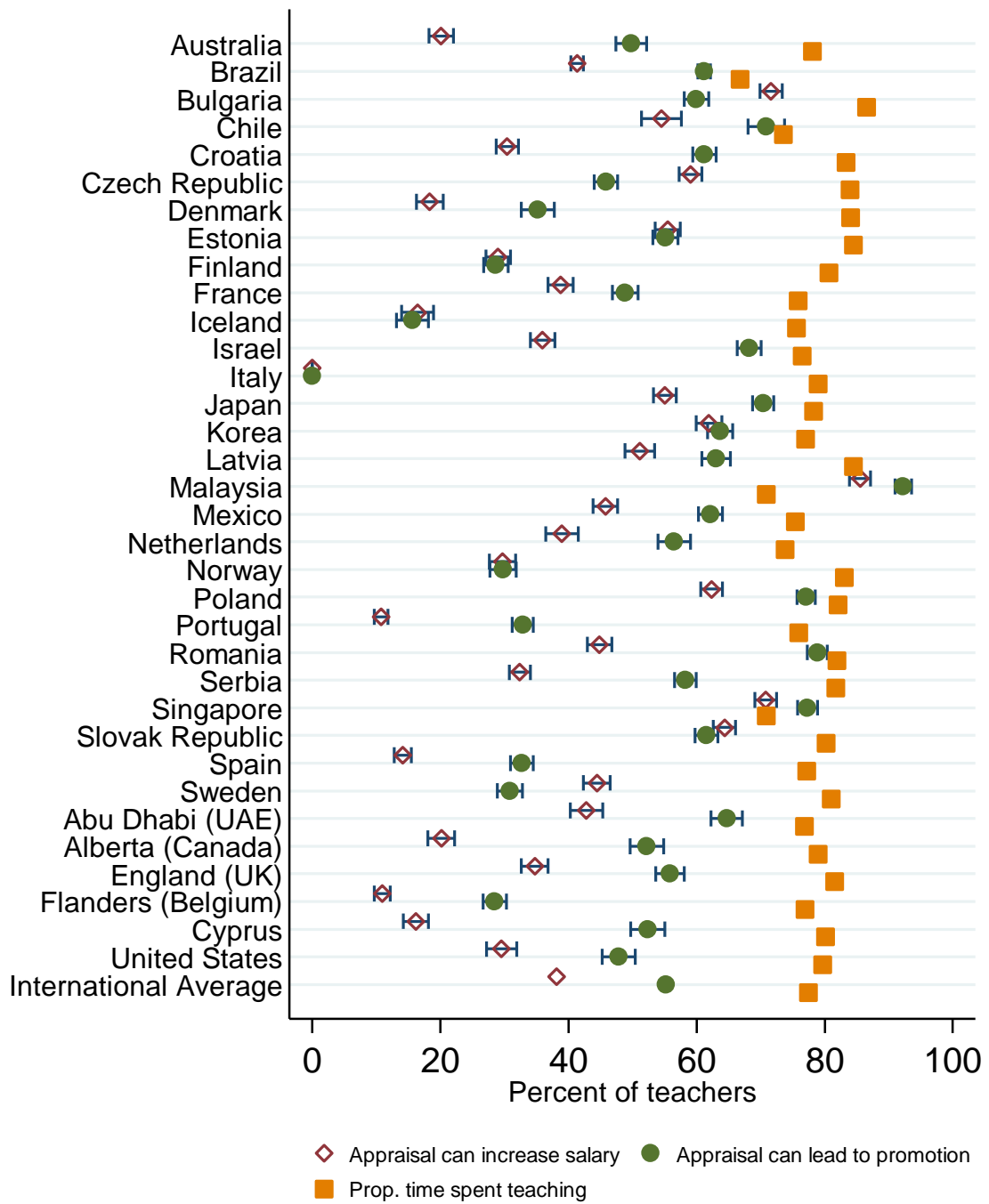
Figure 5. Room for promotion in teaching across school systems
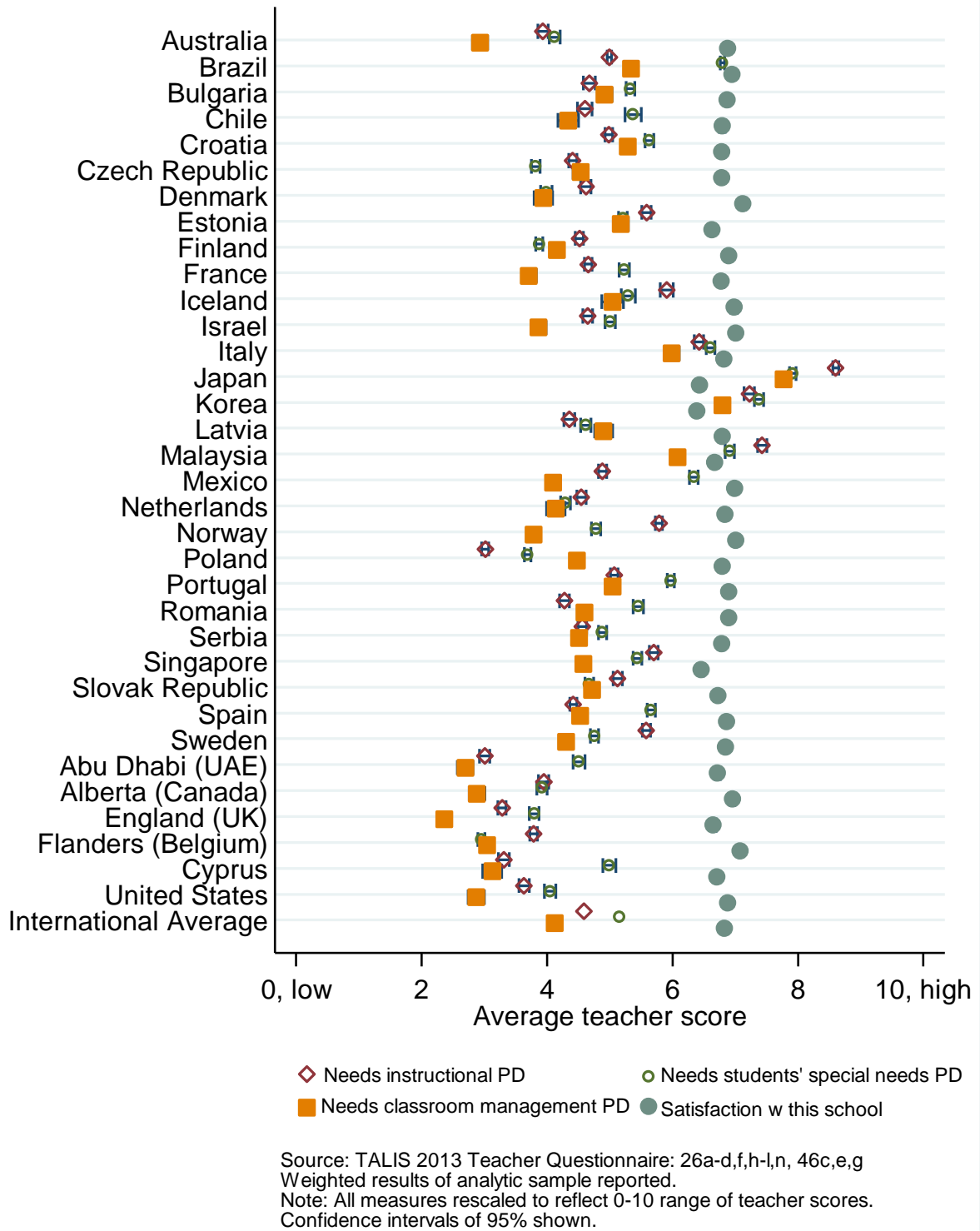
Figure 6. Workplace conditions in teaching across school systems
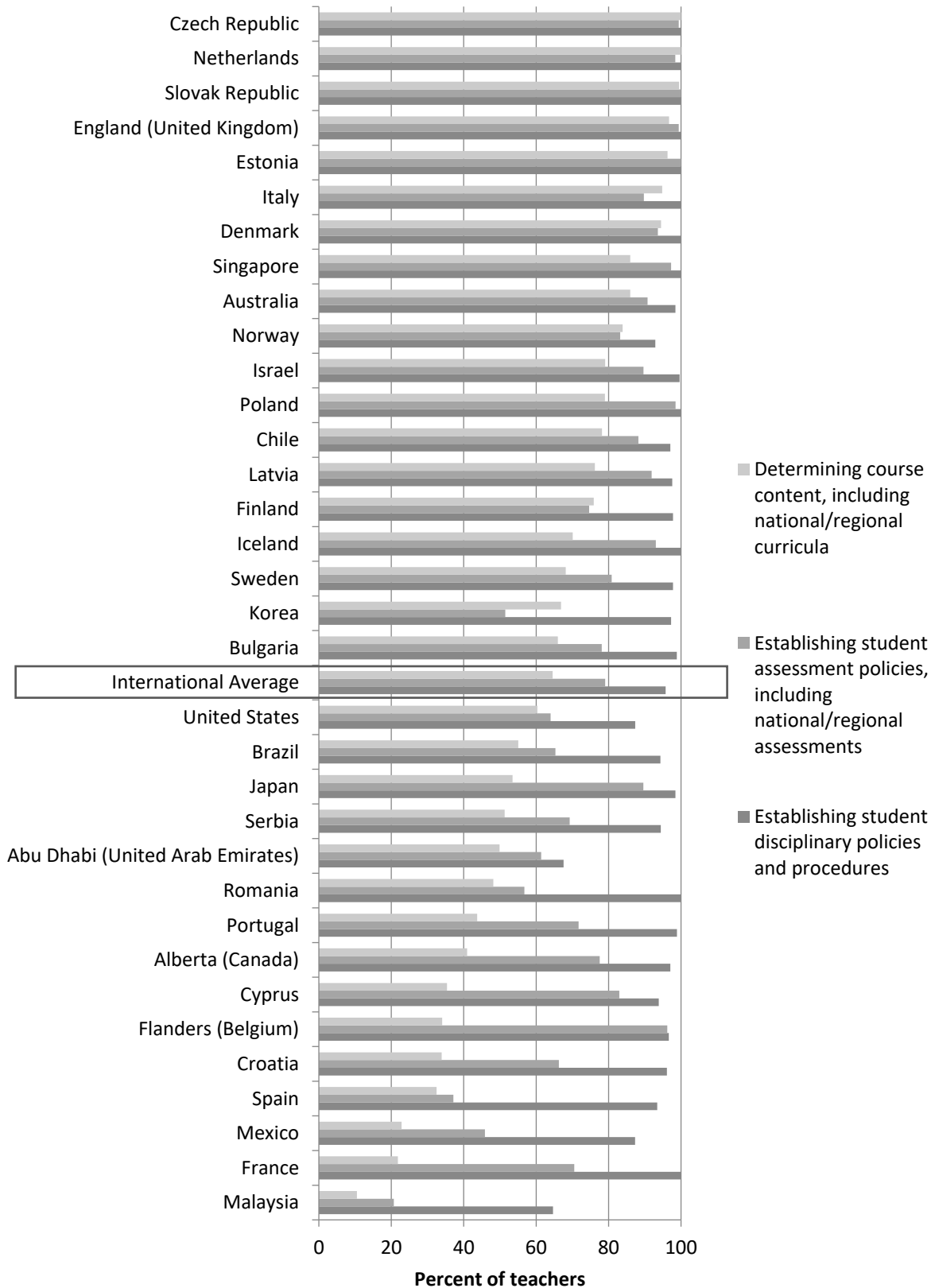
Figure 7. Percent of teachers in schools with discretion over teaching
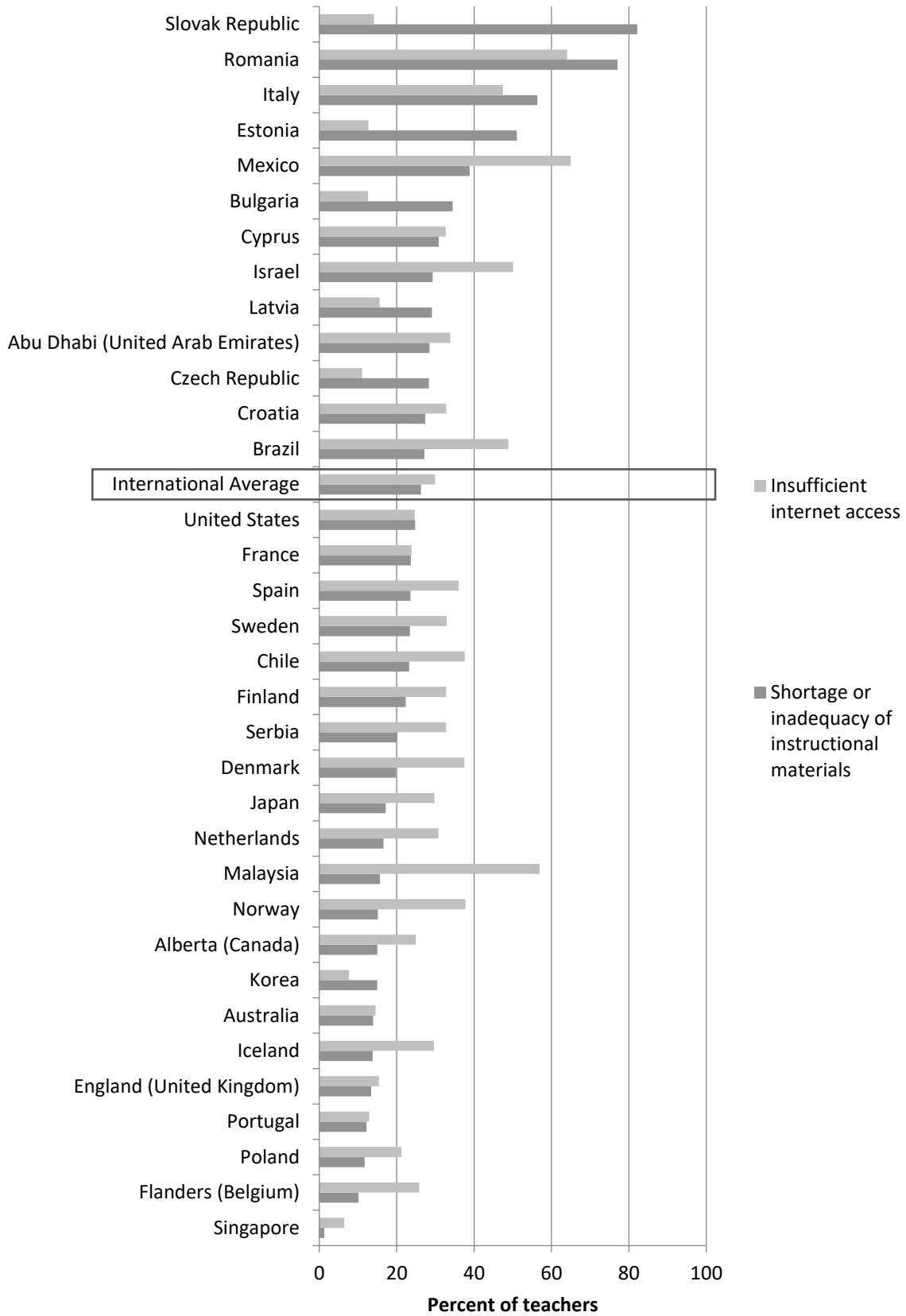
Figure 8. Percent of teachers in schools with inadequate basic classroom materials
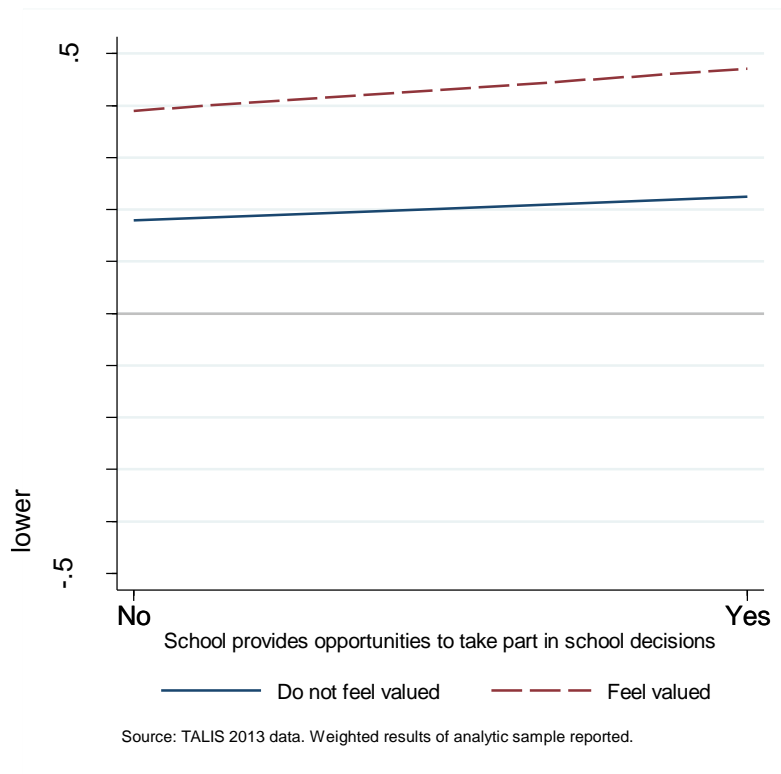
Figure 9. Professional discretion related to feeling valued, predicted probabilities shown

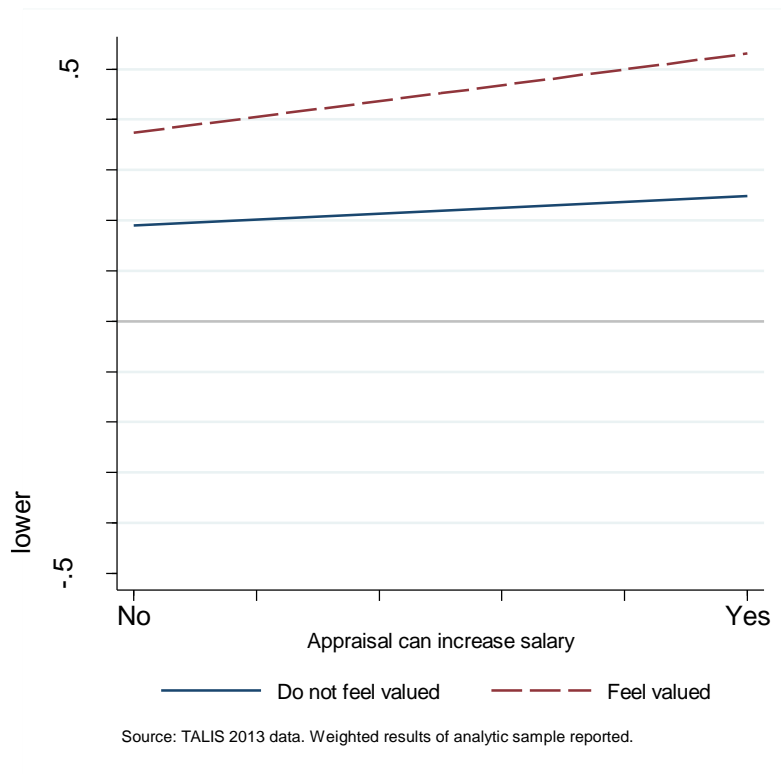**Figure 10.** Room for promotion related to feeling valued, predicted probabilities shown
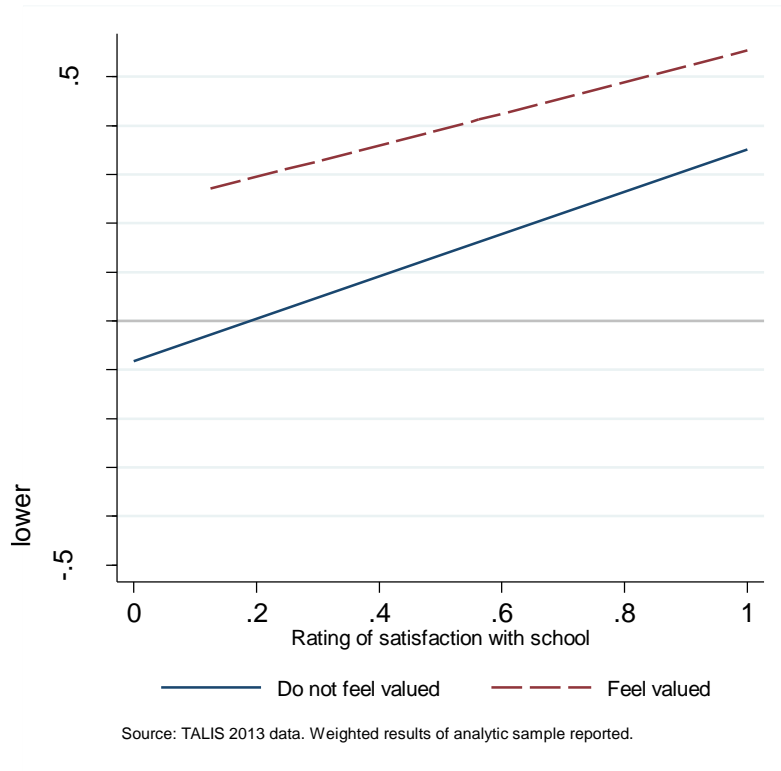
Figure 11. Workplace conditions related to feeling valued, predicted probabilities shown
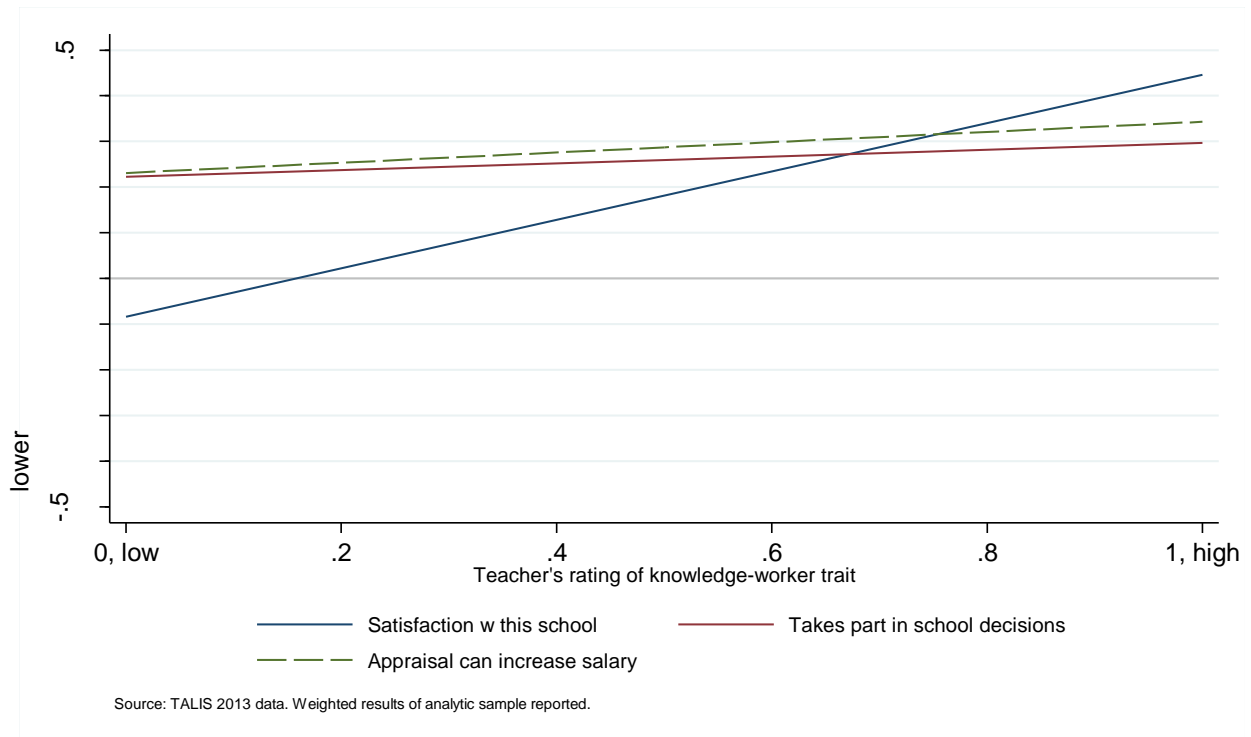
Figure 12. Traits of knowledge-worker domains related to teachers feeling valued, predicted probabilities shown
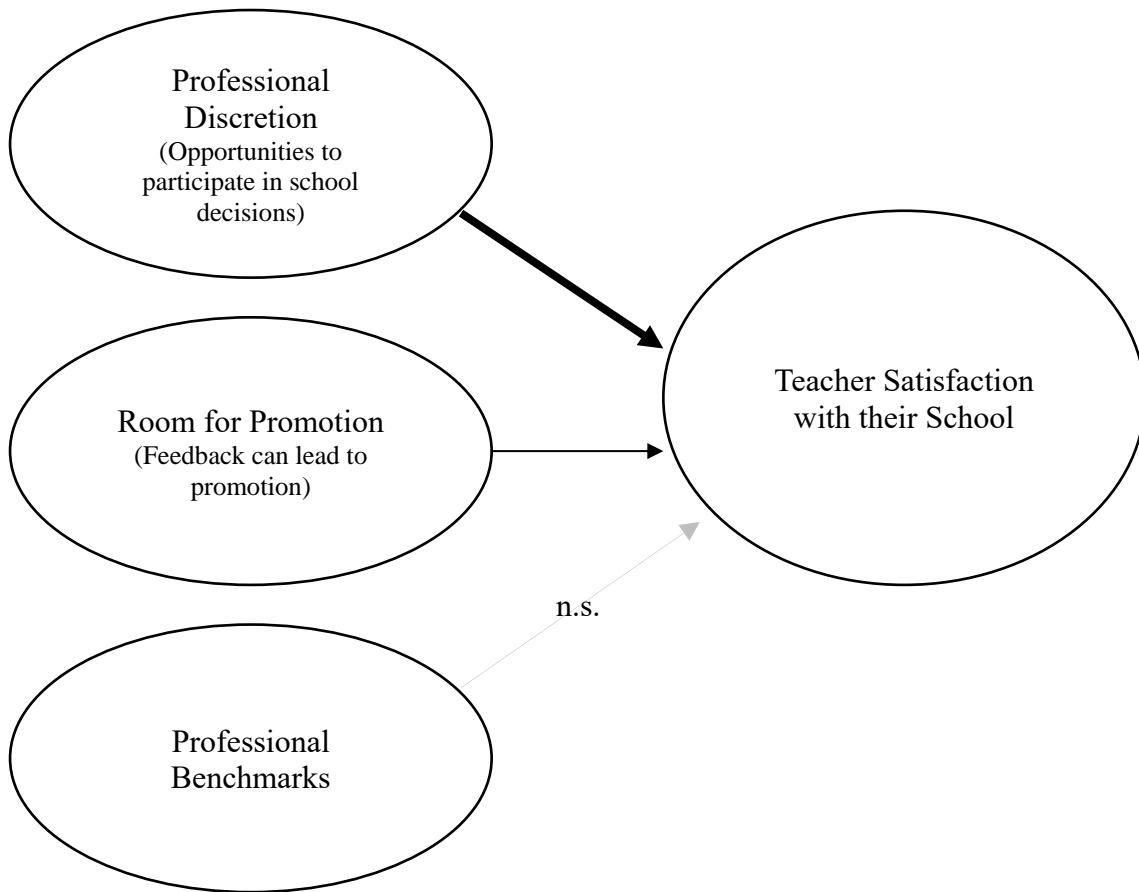
Figure 13. Knowledge-worker domains related to teachers' satisfaction with their school

Table 1. Global descriptions of teachers

Variable	Mean or Proportion	Std. Dev. of Mean	Min	Max
Teacher characteristics				
Male	0.373		0	1
Age	41.59	10.51	18	76
More than 5 yrs teaching experience	0.81		0	1
University education	0.96		0	1
Classroom characteristics of students				
More than 10% non-home language	0.17		0	1
More than 10% special needs	0.21		0	1
More than 30% impoverished	0.52		0	1

Source: TALIS 2013 data, weighted results reported for analytic sample

Table 2. International distributions of the societal value of teaching

	Strongly Disagree	Disagree	Agree	Strongly Agree
Abu Dhabi (UAE)	13.05	23.85	43.79	19.31
Alberta (Canada)	13.45	40.7	38.88	6.97
Australia	17.65	43.75	32.81	5.79
Brazil	44	44.66	9.44	1.9
Bulgaria	29.45	52.15	15.87	2.54
Chile	40.94	35.67	17.66	5.74
Croatia	45.83	45.79	7.65	0.72
Cyprus	12.28	40.59	38.99	8.14
Czech Republic	29.87	58	11.45	0.69
Denmark	34.8	46.79	16.91	1.5
England (UK)	20.98	43.66	30.09	5.26
Estonia	36.33	52.17	9.95	1.55
Finland	5.87	36.57	52.46	5.1
Flanders (Belgium)	10.44	44.51	41.78	3.27
France	59.3	36.57	3.65	0.48
Iceland	37.76	44.71	16.26	1.27
Israel	18.72	49.76	27.13	4.38
Italy[a]	49.09	38.45	9.41	3.04
Japan	20.34	51.16	26.32	2.18
Korea	7.59	27	50.07	15.35
Latvia	20.82	56.31	21.59	1.28
Malaysia	1.55	13.88	56.91	27.66
Mexico	18.86	35.37	30.94	14.83
Netherlands	13.79	44.9	38.2	3.11
Norway	16.7	53.72	27.77	1.81
Poland	27.79	55.62	15.18	1.4
Portugal	40.59	48.7	9.69	1.02
Romania	21.58	46.27	27.48	4.66
Serbia	35.8	45.26	15.44	3.51
Singapore	8.04	25.22	54.65	12.09
Slovak Republic	61.53	35.05	2.57	0.86
Spain	45.13	46.25	7.93	0.69
Sweden	63.68	31.71	3.55	1.07
United States	25.45	40.95	27.6	5.99
International average	29.22	42.39	23.22	5.16

[a] Italy included for reference yet is excluded from the analytic sample
Source: TALIS 2013 Teacher Questionnaire: 46h, weighted results reported for analytic sample

Table 3. Characteristics of teacher knowledge-worker professionalism

Variable	Mean	Std. Dev.	Min	Max
Professional benchmarks				
Low formal training	0.45		0	1
Professional Development in past year	0.82		0	1
Appraisals with impact	0.60		0	1
Appraisal for admin purposes only	0.53		0	1
Professional discretion				
Participation in school decisions	0.70		0	1
Regular teacher-teacher professional interactions	0.47		0	1
Room for promotion				
Appraisal can lead to pay raises	0.38		0	1
Feedback leads to promotion	0.55		0	1
Percent of work spent teaching	77.48	16.72	0	100
Workplace conditions				
Wants PD for subject and pedagogy	4.59	2.29	0	10
Wants PD special needs of students	5.16	2.33	0	10
Wants PD for classroom management	4.13	3.23	0	10
Teacher's satisfaction with their workplace	6.83	0.81	0	10

Source: TALIS 2013 Teacher Questionnaire, weighted results reported for analytic sample

Table 4. Value of teaching explained by knowledge-worker characteristics, odds ratios and standard errors reported

	(1) Full model	(2) Professional Benchmarks	(2) Professional Discretion	(3) Room for Promotion	(4) Workplace Conditions
Professional benchmarks					
Low formal training	1.000	0.986			
	(0.018)	(0.017)			
Professional Development in past year	0.800**	0.842*			
	(0.061)	(0.072)			
Appraisals with impact	1.057	1.158*			
	(0.064)	(0.066)			
Appraisal for admin purposes only	0.857*	0.703***			
	(0.051)	(0.040)			
Professional discretion					
Participation in school decisions	1.299***		1.808***		
	(0.090)		(0.128)		
Teacher-teacher professional interactions	0.956		1.029		
	(0.037)		(0.038)		
Room for promotion					
Appraisal can lead to pay raises	1.621***			1.678***	
	(0.114)			(0.115)	
Feedback leads to promotion	1.149			1.327***	
	(0.097)			(0.108)	
Percent of work spent teaching	0.999			1.003	
	(0.002)			(0.002)	
Workplace conditions					
Wants PD for subject and pedagogy	1.054*				1.055*
	(0.026)				(0.025)
Wants PD special needs of students	0.968				0.975
	(0.020)				(0.019)
Wants PD for classroom management	1.003				1.004
	(0.043)				(0.042)
Teacher's satisfaction with their workplace	1.630***				1.864***
	(0.083)				(0.098)
Classroom characteristics of students					
More than 10% non-home language	1.017	1.013	1.003	1.008	1.028
	(0.096)	(0.094)	(0.094)	(0.098)	(0.096)
More than 10% special needs	1.037	1.002	1.019	0.997	1.033
	(0.092)	(0.089)	(0.094)	(0.086)	(0.099)
More than 30% impoverished	0.818**	0.772***	0.768***	0.767***	0.817**
	(0.061)	(0.047)	(0.051)	(0.055)	(0.056)
Teacher characteristics					
Male	1.263***	1.333***	1.314***	1.285***	1.320***
	(0.087)	(0.092)	(0.089)	(0.086)	(0.093)
Age	1.007*	1.006	1.006	1.008*	1.006
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
More than 5 yrs teaching experience	0.878	0.858	0.846	0.839	0.851
	(0.083)	(0.081)	(0.084)	(0.077)	(0.086)
University education	0.855*	0.803***	0.816*	0.795**	0.833*
	(0.075)	(0.065)	(0.067)	(0.066)	(0.074)
F-test (prob > F)	112.98***	137.20***	131.07***	143.80***	127.05***

$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ All country indicators included in models, but not shown in table above.

Source: TALIS 2013 data, weighted results reported