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The professional development of VET teachers in Italy: participation, needs and barriers. Statistical quantifications and benchmarking in an international perspective

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Abstract

Background: In a context of scarce statistical information, this paper focuses on the professional development of Vocational Education and Training teachers in Italy, namely those teaching vocational subjects. It provides a statistical picture of it, in an international perspective and along three dimensions (participation, needs and barriers).

Methods: Data used in this article originate from the 2013 Teaching and Learning International Survey and they are subject to its methodology. The analysis is carried at upper secondary level of education and adopts a comparative perspective at national and international level. Results for teachers of vocational subjects are compared with those for teachers of general subjects working in schools with and without vocational programmes (used as two distinct groups for contrasts and comparisons). Results for Italy are compared with those for other six countries. Differences across countries and teachers groups are presented, analyzed and discussed, also considering a number of background characteristics of the teachers and of the context in which they work. Methods for statistical analysis rely on inference statistics. Key descriptive findings are highlighted and further investigated by means of logistic regression models.

Results: The article quantifies, qualifies and internationally benchmarks a core set of figures, which can be used, in a comparative approach, to characterize the VET system in Italy and to report on its future progress in the field of teachers' professional development.

Conclusions: The article discusses policy relevant implications and advocates for collecting and further developing comparable data in future.

Keywords: VET, Teachers professional development, Participation, Needs, Barriers, Skills, Statistics, TALIS, Italy, Benchmarking, Australia, Denmark, Finland, Mexico, Poland, Norway

Background

In the field of Vocational Education and Training (VET), the importance of teachers, trainers and their professional development (PD) is widely acknowledged at national and international level.

The European Union (EU) has been calling for appropriate consideration and action for long time. Specific attention to their learning needs is paid in the Copenhagen Declaration on enhanced European cooperation in VET (European Ministers of Vocational Education and Training and the European Commission 2002). Later on, in 2010, EU countries and other ones formally committed to have highly qualified VET teachers and trainers by improving their initial and continuing training (European Ministers for Vocational Education and Training, the European Social Partners and the European Commission 2010). More recently, the so called Riga conclusions proposed a concrete set of actions and called for the introduction of systematic approaches and opportunities for the professional development of VET teachers and trainers, both in school and work based settings (Ministers in charge of vocational education and training of EU Member States, Candidate Countries, European Economic Area Countries 2015).

This seems correct. Alongside with trainers, teachers and their professional development are essential to sustain and further develop the attractiveness, the quality and the labour market relevance of VET, including and particularly at upper secondary level of education.

At this level, some VET teachers work on the general transversal skills of their pupils (e.g. literacy, numeracy, foreign languages). Others work on the theoretical and/or the applied element of their vocational subjects, which are in turn related to fast and frequent changes in the labour market at technological, organisational and ultimately at job and skills requirements level. All VET teachers face the challenges related to the dual objective of VET: being an education for professional excellence as well as one for tackling early leaving and social exclusion. This is not without consequences on students' characteristics as well as on teachers' skills requirements and skills development strategies.

Teachers in schools matter in the formation of pupils' vocational skills. They do so even in countries where the work-based learning component of upper secondary VET is substantial and well-established. They do so and will continue to do so even in countries which have more recently reinforced the work based component of formal VET, such as, for instance, Italy.[1] The teaching of VET related skills, including vocational ones, cannot be entirely delegated to trainers and the world of work. VET teachers in schools play and will continue to play a key role.

[1] In Italy, measures were taken to strengthen the work based component of formal VET programmes. Following the adoption of Law 107/2015, participation of VET students in a 400 h work based learning experience has been made compulsory and the implementation is being successful, based on available data (Ministero dell'Istruzione, dell'Universita'e della Ricerca Scientifica 2016). Moreover, the recent reforms of apprenticeship have defined three major schemes, in some of which the link between work and formal education has been clearly and better established, (Cedefop 2014). However, based on available data, enrolments in the schemes with a strong link to formal education are few and the "Apprendistato professionalizzante" continues to be the prevalent type of apprenticeship in the country (ISFOL 2017). Before the adoption of such measures data reveal that upper secondary VET was mostly school based In Italy: programmes involving a substantial and long term work based component did not account for large proportions of students (Cedefop 2017a, b; OECD 2015).

Consequently, their continuing professional development is essential. If it does not appropriately occur, the risk is that the quality of VET provision not only stagnates, but even deteriorates, to the extent that part of VET teachers, not participating in training, loose contact with latest developments in the fast evolving areas of knowledge, skills and competences which the labour market will require to their pupils. Deterioration of provision can easily undermine the overall attractiveness and labour market relevance of VET.

Professional development of VET teachers, particularly of those teaching vocational subjects, is even more important in countries where, due to age, they face a higher risk of skills obsolescence. Italy is an example, with a VET teachers' population who is much older than in the majority of other European countries.[2]

According to Carlini and Infante (2016), the key role played by VET teachers' professional development in Italy is confirmed by recent regulatory acts. They quote Law 128/2013 (urgent measures about education, university and research), which provided funds for teachers training initiatives for 2014, in the areas of digital teaching methods, school-work training pathways and disadvantaged youth. They also correctly stress the importance of Law 107/2015, now being implemented, which establishes that in-service training is compulsory, structured and continuing for all teachers, including those in VET.

Following Law 107/2015, the 2016–2019 plan for the professional development of teachers in Italy was passed (Ministero dell'Istruzione, dell'Universita' e della Ricerca Scientifica 2015). The Plan identifies motives, principles, governance mechanisms, quality aspects, ICT based information systems, and more importantly content, priorities and financial resources for teachers continuing professional development.

To further enhance professional development of teachers, the plan provides for skills needs analysis, incentives, more flexible training arrangements as well as for a substantial increase of financial resources. These were raised from 18.5 million euros (in the period 2013–2016) to 270 million euros (in the period 2016–2019). Up to 1.4 billion will be available, if resources are considered for the so called teacher's card (a tool to support individual training and cultural activities).

The plan identified the following national priorities:

- technological innovation in all its forms and related to the new learning environments and the use of new technologies in teaching;
- methodological innovation;
- foreign languages;
- the opportunities offered by curricular, organisational and didactic autonomy;
- inclusion and disability;
- social cohesion and prevention of youth problems;
- social inclusion and citizenship;

[2] According to Eurostat, in Italy, 62.9% of upper secondary VET teachers were aged 50 years or more in 2015. This is the highest value reported in the EU. Corresponding values range from 31.4% (Belgium) to 55.2% (Austria) averaging at 42.5% (arithmetic mean) in the 23 countries for which data were available at the time of writing (all but Denmark, UK, Ireland, Greece, Portugal). In general education in Italy, the percentage is 59.1%. Source: Eurostat, UOE data collection of formal education, Eurostat on line database.

- evaluation and improvement;
- strengthening the relation with the world of work (through work based learning and school to work transition).

Although the plan includes VET teachers, it has an evident transversal approach, cross cutting levels and orientations of education. VET is not explicitly addressed. The priority areas which were identified concern all levels of school education (primary, lower secondary, upper secondary and post-secondary non tertiary level of education) and both orientations (general and vocational).

Available statistical data, research and publications on teachers' professional development in an international perspective have largely focussed on lower secondary education. Professional development of upper secondary teachers has been dealt with some smaller attention and, in any case, largely disregarding the distinction between the general and the vocational dimensions (European Commission 2014; OECD 2014c, d, 2016; Ministero dell'Istruzione e della Ricerca Scientifica 2014; Schleicher 2016).

The specific case of upper secondary VET teachers, both in Italy and at international level, has been somehow neglected. There is little or no quantitative research based on internationally comparable data. At international level, almost no data is available and there is not even an agreed set of potential statistics and indicators to be used. Internationally comparable evidence is scarce. This too little for properly informing VET policies, for investigating differences and progresses within and across countries or simply for benchmarking countries and their VET systems in this area.

The situation is opposite when it comes to general and lower secondary education: the OECD Teaching and Learning Survey (TALIS) traditionally provides relevant information quantifying a well-established and well-known set of indicators. However, an important innovation was introduced in the 2013 round of TALIS. Countries were given the option to carry out the survey also at upper secondary level, distinguishing its orientation, i.e. whether it was general and vocational. Italy and a few other countries implemented such option. Based on those data, this paper contributes to fill in a knowledge gap. It proposes, quantifies, assesses and discusses a selection of statistics and indicators on VET teacher's professional development in Italy, by adopting an international perspective.

Objectives

This article focuses on the professional development of upper secondary VET teachers in Italy, namely those teaching vocational subjects. It provides a descriptive statistical picture of it along three dimensions (participation, needs and barriers). It aims at quantifying, qualifying and internationally benchmarking a core set of figures which can be used, in a comparative perspective, to characterise the initial VET system in Italy, to report on future progresses as well as to inform and stimulate the research and policy debate in this area at national and international level.

Data, definitions and methods

Data used in this paper originate from the 2013 round of the Teaching and Learning International Survey (TALIS), carried out by the Organisation for Economic Co-operation and Development (OECD). They are subject to its methodology (OECD 2013a, b, 2014a, b). They have been downloaded from the OECD website in the form of anonymised micro-data files for public use (http://stats.oecd.org/Index.aspx?datasetcode=talis_2013%20) in October 2014 and have been processed by the author.

In TALIS, a representative sample of teachers and school principals in each country are asked a set of questions about their working conditions and learning environments. Specific attention is devoted to teachers' professional development.

Data used in this paper refer to the survey carried out at upper secondary level of formal education, i.e. level 3 of the 1997 International Standard Classification of Education, ISCED 1997 (UNESCO 2006). At upper secondary level of education, the survey adopted and countries adhered to a probabilistic two-stages cluster sampling design with selection of schools (at Stage 1) and of teachers within schools (at Stage 2) (OECD 2013a, b, 2014a, b).

Data for Italy are contrasted and compared to those for Australia, Denmark, Finland, Norway, Mexico and Poland in order to support an international benchmarking. Countries have been selected mostly based on data availability, but they are assessed to constitute a sufficiently meaningful, reliable and diversified pool of benchmarks. Some countries such as Iceland, Singapore, and the United Arab Emirates are excluded from the analysis because of their size and/or because of the size of their samples.

The unit of analysis adopted in this paper is the teacher. The dataset used for the analysis refers to upper secondary teachers with information derived from the teachers' questionnaire (as declared by them). Information on the school where they teach (provided by the principal) was added as an additional characteristic of the teachers. The link was achieved by means of an anonymised school identifier.

A teacher is defined, based on TALIS methodology, as one whose primary or major activity in the school is student instruction, involving the delivery of lessons to students. Teachers may work with students as a whole class, in small groups or in a one-to-one relation, inside or outside regular classrooms. The operational definition does not include teachers' aides, pedagogical support staff, and health and social support staff (OECD 2014d). In VET, the definition includes teachers of the school element of dual system apprenticeships; trainers in the in company element of dual systems are excluded (OECD 2013a, b).

A set of distinctions, based on TALIS 2013 variables, have been derived for this paper.

Schools where teachers work have been distinguished in two categories:

- schools where VET programmes are taught, i.e. schools where vocational or technical education programmes are taught;
- schools where VET programmes are not taught, i.e. where vocational or technical education programmes are not taught.

Subjects taught by teachers have been distinguished in two categories:

- Vocational subjects: subjects related to practical/vocational skills[3] and/or orientation in technology;[4]
- General subjects: subjects not related to practical/vocational skills and/or not related to orientation in technology.[5]

On this basis, it has been possible to split the country samples of upper secondary teachers by orientation of education (general or vocational) in two senses: the orientation of the school where teachers work and the orientation of the subject they teach.

Teachers have been distinguished in three main groups, which, in this article, constitute respectively the main target group of the analysis and the two reference groups for comparisons:

- teachers of vocational subjects working in schools with VET programmes;
- teachers of general subjects working in schools with VET programmes (i.e. teachers not teaching vocational subjects and working in schools with VET programmes);
- teacher of general subjects working in schools with no VET programme (i.e. teachers not teaching vocational subjects and working in schools with no VET programme).

The analysis focuses on teachers of vocational subjects in schools with VET programmes. In the text, this group may be referred to as teachers of vocational subjects for ease of writing. Teachers of vocational subjects in schools with no VET programmes are filtered out.[6]

The number of observations available in the sample and used for analysis is reported in Table 1. For Italy, the sample was constituted by around 12 hundreds teachers of general subjects working in schools with no VET programme, 6 hundreds teachers of vocational subjects working in schools with VET programmes and 15 hundreds teachers of general subjects in schools with VET programmes.

Sampling and non-sampling accuracy of TALIS data at upper secondary level has been considered of sufficient quality. This is based on the author's own assessment who has considered available methodological documentation and dissemination of results (OECD 2014b, c, d).

Having specific regard to the analysis by orientation of education carried out for this article, it is to be noted that TALIS was not explicitly designed to this end, but it was devised in a way which could support it. In particular:

[3] These include: vocational skills (preparation for a specific occupation), technics, domestic science, accountancy, business studies, career education, clothing and textiles, driving, home economics, polytechnic courses, secretarial studies, tourism and hospitality, handicraft.

[4] These include: information technology, computer studies, construction/surveying, electronics, graphics and design, workshop, technology/design technology.

[5] These include: reading, writing and literature; mathematics, science, social studies, modern foreign languages, Ancient Greek and/or Latin, arts, physical education, religion and/or ethics.

[6] In the sample, as expected, the vast majority of teachers working in schools with no VET programmes were found to be teachers of general subjects (these were all included in the analysis), but a fraction of those, varying by country, was found to be teachers of vocational subjects. The following fractions were found in the sample: Italy (6.7%), Denmark (5.1%), Finland (6.0%), Norway (6.9%), Poland (9.3%). Australia (25.5%), Mexico (33.4%). These fractions may reflect different characteristics of the VET systems and/or non-sampling accuracy of the survey. These observations were dropped in the analysis to increase clarity, accuracy and international comparability of it.

Table 1 TALIS 2013-ISCED level 3: structure of the sample used in the analysis (upper secondary teachers in absolute numbers) (Source: Author's calculations based on TALIS 2013, ISCED 3)

Country	Working in a VET school: no; Teaching a general subject: yes	Working in a VET school: yes		
	Total (Group A)	Total (Group B)	Teaching a vocational subject: yes (Group C)	Teaching a vocational subject: no (Group D)
Australia	180	1355	404	951
Denmark	714	476	285	191
Finland	1546	725	445	280
Italy	1261	2150	612	1538
Mexico	1046	1287	602	685
Norway	202	1612	514	1098
Poland	891	2125	603	1522

- in their national implementation strategies, explicit stratification at Stage 1 (schools selection) was adopted by countries to further improve representativeness of the samples, considering various factors, mainly geographical areas and/or orientation (or stream) of schools; explicit stratification of the schools sample by orientation was adopted by Italy and other countries considered in this paper OECD (2014b);[7]
- sample sizes made available a reasonably sufficient number of observations for each group of teachers in all countries;
- possible unbalances in the samples, the loss of efficiency induced by the clustering approach as well as different sample sizes were addressed for the aim of this paper at the stage of data analysis, by considering appropriate weights and methods to estimate relevant statistics and related standard errors, in line with recommended approaches (OECD 2013a, b, 2014a, b).

The key concept of this paper is professional development of teachers. Professional development of teachers is understood here as teachers' professional development along their career, i.e. continuing professional development. Initial education and training before entry into the profession and initial induction programmes are not within the scope of the article. For ease of writing, the term continuing professional development is shortened in professional development.

Participation in professional development of teachers is defined and operationalised according to TALIS 2013 methodology and the standard OECD approach. In the survey, teachers were asked whether they participated in professional development activities in the 12 months prior to the survey. Various types of activities were considered in the questionnaire.[8] A positive answer to at least one of them is used in this paper for

[7] All countries analysed in this article adopted the two stages cluster sampling design.

[8] These are: courses/workshops (e.g. on subject matter or methods and/or other education related topics); education conferences or seminars; observation visits to other schools; observation visit to business premises, public organisations, NGOs; in-service training courses in business premises, public organisations, NGOs; qualification programme; participation in a network of teachers formed specifically for the professional development of teachers; individual or collaborative research on a topic of professional interest; mentoring and or peer observation and coaching as part of a formal school arrangement.

deriving an overall variable on participation. The percentages of those participating and of those not participating were estimated. This is in line with other OECD work on the topic (OECD 2014c). The percentage of those not participating is presented in this article. This is to better focus on the size of the issue.

Needs for professional development of teachers are investigated considering teachers self-assessment. A wide set of domains is considered in TALIS. With respect to each of these domains, teachers were asked to indicate the extent to which, at the time of the interview, they felt a need for further professional development. A Likert scale of need was used (no need, low, moderate, high level of need). The percentage of those indicating a high level of need in any given domain is estimated for (and used in) this paper. This is in line with other OECD work on the topic (OECD 2014c). The list of domains is reported in the "Needs for professional development" section.

Barriers to professional development are also investigated considering teachers perceptions. In TALIS, teachers were asked to consider a pre-defined set of items and to indicate the extent to which they considered them as barriers. A Likert scale of agreement (strongly disagree, disagree, agree, strongly agree) was administered. For each item, the percentage of agreement is estimated for (and used in) this paper. This considers and sums up teachers indicating agreement or strong agreement. This is in line with other OECD work on the topic (OECD 2014c). The list of items is reported in the "Barriers to professional development" section.

The dimensions of participation, needs and barriers are analysed separately without combining them. This considers the descriptive comparative approach of the work and the sample sizes. The aim is to maximise the number of available observations and to obtain more reliable estimates by group of teachers for each dimension of analysis.

Statistics in the form of percentages (%) and associated standard errors (s.e.) are used in this paper.

The percentages are valid percentages within the relevant group of teachers, with a low impact of item non response.[9] Standard errors of estimated percentages are expressed in percentage points. Both types of estimations were carried out following the OECD recommended approach (OECD 2014a). A dedicated software, specifically developed for the management and the analysis of 2013 TALIS data, was used. This is the IEA IDB Analyzer (IEA 2017). OECD and IEA provided final weights for teachers percentages and Balanced Repeated Replication (BBR) variables for empirical estimations of standard errors. They were used as recommended by these organisations, in order to account for the complex sampling design of the survey and the loss of efficiency induced by the clustering. To estimate standard errors for proportions, the software exploits the Fay's variation of the BBR method (Fay 1989; Judkins 1990; Lohr 1999), with the following two parameters set by default: 100 as the number of replications and 0.5 as Fay's factor (OECD 2014a).

Statistical significance of differences between countries and groups of teachers were tested by carrying out comparisons of percentages. To this end, two-tailed Z tests with

[9] The item non response rate reached its maximum value at 7.5% in the cell corresponding to the dimension of participation in professional development, in Finland, in the group of teachers of general subjects in schools with VET programmes. It was however generally lower and below 4%.

normality approximation were performed at 95% level of significance. This is the reference level for all statements concerning statistical significance in this article. Standard errors for the differences of two proportions were estimated based on the standard errors of each of the two proportions. This is also in line with OECD recommended approach (OECD 2014a). In the article, differences are defined unfavourable to a country (typically Italy) or to a group (typically teachers of vocational subjects) when their non-participation, their levels of needs or their perception of barriers are higher than those of others.

To qualify key descriptive findings for the dimensions under analysis, alongside with the variable indicating the teachers group, a number of other background variables are also considered. These include: teachers individual characteristics (gender, age, educational attainment, permanency of the job, intensity of work); characteristics of the context (i.e. the school) in which they work (prevalence of students from disadvantaged homes, prevalence of students with special needs and prevalence of students with a fist language different from that of instruction, with the latter used as a proxy for the minority/migrant background of students). The extent to which the lack of opportunities for teachers' professional development affects the effectiveness of principals' work (as declared by the principals) is also considered.

These variables have been dichotomised in order to follow the OECD analytical approach, to maximise number and size of non- empty cells and/or to maximise their discriminating power. In this form, they have been used to derive a comparative statistical profile of the teachers groups and to further enhance an analysis of their differences based on multivariate binary logistic regression models. The aim was to contextualise and facilitate an interpretation of key descriptive findings. The specifications for the background variables considered are provided in Table 12.

In the logistic regression models, all variables in Table 12 have been coherently considered as regressors, including the teachers group, whereas the binary outcome variable was changed depending on the specific aspect under analysis. In this sense, the logistic regression models support a more in depth investigation of the differences across teachers groups, while controlling for other factors. At the same time, they investigate the variability of the dimensions under analysis based on the background variables and the presence of other possible statistically significant associations. All models were estimated at country level. For each model, results include regressions coefficients, their standard errors and related statistics (Wald's statistics, p-values and odds ratios). Model specific information (− 2 Log likelihood coefficient, Cox and Snell R^2 coefficient, Nagelkerke R^2 coefficient) and related standard errors are also reported. Models based findings were found robust to different combinations of recodings, including no recoding, of the variables indicating prevalence of students with migrant/minority background, students with special needs and from disadvantaged homes, which are not displayed for ease of presentation.

Presentation of results is structured in 4 sections: profile, participation, needs and barriers, respectively in this order. In each section, estimates for teachers of vocational subjects in Italy are presented, commented and then compared to those for teachers of vocational subjects in other benchmarking countries. Then, the focus of the analysis gets back to Italy: estimates for teachers of vocational subjects are compared to those

for teachers of general subjects, considering two groups of them: (a) teachers of general subjects working in school with VET programmes and (b) teachers of general subjects working in schools with no VET programmes. The analysis of differences is carried out for Italy. Summary results of those differences in other benchmarking countries are provided as a reference. Key descriptive findings on participation, needs and barriers for Italy are highlighted and further investigated by means of logistic regression models estimated at country level. Additional statistical material is available from the author upon request.

Results are reported in tables and figures. For ease of presentation, key figures are presented in the "Results" section and the set of underlying tables is pooled in the "Data tables" section. Numbers in the tables are rounded. Due to rounding effects, slight discrepancies up to 0.1% points can be found across cells of the tables.

A set of limitations can be identified possibly affecting the data and the analysis. Most of them could be easily overcome in future, by simple adjustments of the instrument and/or of the design of the survey.

Some limitations relate to the consideration given to the orientation of education. First, although the analysis relies on representative data, bigger samples sizes and/or a stratification of the teachers' samples by subject taught would have certainly increased the precision of the estimates presented here. Secondly, the analysis rely on variables identifying the orientation of the school where teachers work (i.e. whether it offers or not vocational programmes) and the orientation of the subject taught by teachers (whether it is vocational or not), but information was not collected on the orientation of the programme in which they teach. This information would have allowed producing more specific estimates and more specific comparisons for VET teachers (as teachers working in VET programmes).

Another possible limitations can be identified in the subjective approach adopted for the measurement of teachers needs for PD. Although these are typically surveyed in such a subjective way,[10] a warning is to be mentioned about possible response bias in any sort of cross-national survey research. In particular, some authors (Tellis and Chandrasekaran 2010) explicitly identify Italy as one of the countries where answers to survey questions are more influenced by tendencies of social desirability and "yea saying". This is why the analysis of needs focuses on perception of high level of needs and neglects more moderate points of the scale.

A possible dimension of analysis, the self-assessed impact of professional development activities on teaching, has been excluded on purpose from this article. This is due to major limitations. First, the related questions were asked only to those who attended training and therefore the available sample for relevant estimations would have been further restricted. Secondly, measuring outcomes of adult learning in a cross-sectional survey with retrospective questions was not considered fully appropriate. Third and more importantly, severe problems affected the question used to operationalise the dimension of impact. This was formulated as follows: "Did the professional development activities you participated in during the last 12 months cover the following topics? If so,

[10] The three most relevant examples are the OECD PIAAC Survey (OECD 2010), Cedefop ESJS (Cedefop 2015b) and Eurofound EWCS (Eurofound 2016).

what positive impact did these have on your teaching?"). The scale was as follows: "no, small, moderate, large". The following problems have been identified: (a) the question was ambiguous so that it remains unclear whether it targeted the impact on the method of teaching, on the content of teaching or on the result of teaching, i.e. pupils' knowledge, competences and skills; (b) the question referred to activities undertaken in the last 12 months, which may not have been concluded or which may not have been able to display their effects at the time of the interview (for instance because teachers had not enough time to use the recently developed knowledge, skills and competences); (c) the question in its very formulation contained a strong and explicit reference to a positive impact and thus may have driven the respondents towards a favourable assessment, particularly in Italy, where the issues of social desirability and yea saying, are documented to be particularly intense. As a consequence, it has been assessed that any result could not be properly interpreted or used to integrate/support other findings.

Furthermore, whereas TALIS allows to derive indications about students characteristics which can influence the results, this derivation is possible only for a limited number of aspects, through the principal questionnaire and with a link which can be established only at aggregated school level. In addition, the analytical value of the variable indicating the lack of resources for professional development in schools is somehow diminished by the fact that the related question includes references and implications about the principal performance.

The analysis presented in this article can be considered in the wider frame of an investigation of professional development of upper secondary teachers (participation, needs, barriers) in the light of some key characteristics of them (i.e. the country where they work, the type of school where they teach, the subject taught and key background characteristics). However, admittedly, the paper does not intend to investigate or establish any causal relation or effect size. An appropriate investigation in this sense would require to consider, and in an international perspective, important aspects such as the characteristics of the demand and supply for teachers professional development (e.g. willingness to participate, flexibility of training arrangements, access to financing) or the role of policy measures in favour of teacher's training, which are not accounted for in TALIS dataset. However, background variables of TALIS are used. This is done to qualify key descriptive findings on the main dimensions under analysis, i.e. to contextualise them and to provide possible indications on their interpretation, based on the available data, and assuming this as a first, and yet very important, piece of information for VET policies.

Results

The profile of teachers

Gender

In Italy, in 2013, only 36.9% (s.e. 2.3) of teachers of vocational subjects were women. This was found much and significantly lower than in other countries such as Australia (49.1%, s.e. 3.1), Finland (55.5%, s.e. 5.1), Mexico (44.3%, s.e. 2.4), Norway (44.3%, s.e. 1.8) and Poland (59.3%, s.e. 3.8), which all had considerably higher values. As compared to Italy, only Demark presented similar values (38.0%, s.e. 7.0) with no statistically significant difference. In Italy, at 36.9%, the prevalence of women among teachers of vocational subjects was found significantly lower than among teachers of general subjects, both

working in schools with vocational programmes (72.9%, s.e. 1.3) and without (71.6%, s.e. 1.4). At different levels, the same pattern was found in the other benchmarking countries,[11] but, compared to Italy, a more balanced gender distribution was found across teachers groups.

Age

In Italy, in 2013, more than half of teachers of vocational subjects were aged 50 and over. The percentage was estimated at 51.9% (s.e. 2.10). This was found to be much and significantly higher than in other countries such as Australia (35.6%, s.e. 2.74), Denmark (43.9%, s.e. 2.6), Mexico (23.4%, s.e. 2.5) and Poland (34.6%, s.e. 3.4). The proportion was also slightly higher, though not significantly higher, than in Finland (50.7%, s.e. 4.0) and Norway. (51.1%, s.e. 2.0). In Italy, the percentage of teachers aged 50+ was estimated slightly lower for teachers of vocational subjects than for teachers of general subjects but the related differences (2–4% points) were not found statistically significant. In the other benchmarking countries, a clear overall pattern was not identified as far as this aspects is concerned, with peculiar situations emerging based on the specific country context.

Educational attainment

In Italy, about a quarter of teachers of vocational subjects had a low educational attainment (at ISCED level 5B or below). The percentage was estimated at 25.0% (s.e. 1.8). It was remarkably and significantly higher than in other countries such as Australia (0.7%, s.e. 0.4), Mexico (6.6%, s.e. 1.6), Poland (4.0%, s.e. 1.1) and Norway (11.0%, s.e. 1.1). Finland (28.0%, s.e. 2.8) and Denmark (33.2%, s.e. 5.2) were also found to have high point estimates with no statistically significant differences as compared to Italy. In Italy, the percentage of those with lower educational attainment (ISCED 5B or below) was remarkably higher for teachers of vocational subjects (25.0%, s.e. 1.8) than for other teachers. It was estimated at 7.1% (s.e. 0.6) for teachers of general subjects in schools with VET programmes and 5.5%, (s.e. 0.5) for teachers of general subjects in schools without VET programmes. Differences were found to be statistically significant. At different levels, the same patterns was generally observed in other countries.[12]

Permanency of the job

In Italy, among teachers of vocational subjects, the percentage of those with a fixed term contract was estimated at 22.3% (s.e. 2.10). This was found to be much and significantly higher than in other countries such as Australia (9.1%, s.e. 1.8), Denmark (2.5%, s.e. 1.0), Norway (7.1%, s.e. 1.3). Point estimates for Italy were also higher than those for Poland (17.7%, s.e. 2.4) and Finland (17.4%, s.e 3.1), although differences were not found to be statistically significant. Only, in Mexico point estimates were significantly higher than in Italy. In Italy, the prevalence of fixed term contracts was found to be significantly higher for teachers of vocational subjects (22.3%, s.e. 2.1) than for teachers of general subjects

[11] With statistically significant differences for at least one of the groups of teachers of general subjects as compared to teachers of vocational subjects.

[12] Namely in Denmark, Finland, Poland and Norway (with statistically significant differences) and in Australia with no statistically significant differences. In Mexico an opposite pattern was found.

working in school without vocational programmes (15.8%. s.e. 1.9); no statistically significant difference was observed with teachers of general subject working in schools with VET programmes. In the other benchmarking countries, generally, differences across groups of teachers were not found to be statistically significant.[13]

Intensity of work

In Italy, 13.1% (s.e. 1.4) of teachers of vocational subjected worked on a part time basis. This was in line with the majority of other benchmarking countries. No statistically significant differences were found as compared to Australia, Finland, Norway and Poland. Point estimates were considerably lower in Denmark (3.3%, s.e. 1.6) and higher in Mexico (62.6%, s.e 2.7), with statistically significant differences. In Italy, incidence of part-time was slightly lower for teachers of vocational subjects than for teachers of general subjects, but differences were not statistically significant. This also held in other benchmarking countries.[14]

Students linguistic background

In Italy, 29.8% (s.e. 4.2) of teachers of vocational subjects worked in schools with a considerable prevalence (more than 10%) of students speaking a first language different from that of instruction. This percentage was significantly higher than in Finland (11.3% of teachers, s.e. 4.8), Mexico (1.1%, s.e. 1.1) and Norway (7.1% s.e. 1.3). Differences with Australia and Denmark were not statistically significant (data for Poland are not available). In Italy, the percentage resulted significantly higher for teachers of vocational subjects than for teachers of general subjects working in schools with no VET programmes (by 24% points). In the other benchmarking countries, differences across groups of teachers showed heterogeneous patterns and they were generally not statistically significant.

Students with special needs

In Italy, 26.6% (s.e. 5.0) of teachers of vocational subjects worked in schools with more than 10% of students with special needs. This percentage was significantly lower than in Finland (78.3%, s.e. 6.3), Denmark (66.4%, s.e. 13.1) and Norway (41.5%, s.e. 9.9), and not statistically different than in Australia, Denmark and Poland. In Italy, the percentage resulted significantly higher for teachers of vocational subjects than for teachers of general subjects working in schools with no VET programmes (by 20% points). In the other benchmarking countries, although at different levels, this pattern was also generally found.[15]

Students from disadvantaged homes

In Italy, 24.1% (s.e. 4.6) of teachers of vocational subjects worked in schools with more than 30% of students from disadvantaged homes. This percentage was significantly

[13] A statistically significant difference was found in Denmark, revealing a pattern opposite to that of Italy.

[14] In Denmark and Mexico differences were found to be statistically significant.

[15] The pattern present and was statistically significant in Denmark, Finland and Poland (where it was found statistically significant) as well as in Australia and Norway (without statistical significance).

higher than in Finland (2.4%, s.e. 1.8), Denmark (7.9%, s.e. 4.4) and Norway (2.3%, s.e. 1.6) and not statistically different than in Australia and Poland. It was significantly lower than in Mexico. In Italy, the percentage resulted significantly higher for teachers of vocational subjects than for teachers of general subjects working in schools with no VET programmes (by 22% points). In the other benchmarking countries, this pattern was only found in Australia and Mexico.

Lack of resources

In Italy, 71.2% (s.e. 5.0) of teachers of vocational subjects worked in schools where the principal declared a lack of resources for teachers' professional development. This percentage was significantly higher than in all other countries, where it ranged from 7.7% (s.e. 4.8) in the case of Finland to 47.9% (s.e. 7.3) in the case of Australia. In Italy, the percentage did not significantly differ across groups of teachers. In the other benchmarking countries a clear overall pattern was not identified as far as this aspects was concerned, with peculiar situations emerging based on the specific country context.

Overall summary profile

These data allow to outline a summary profile of teachers of vocational subjects in Italy. By cross-country comparisons, their profile is characterised by relatively high percentages of male and older teachers, as well as of teachers with low educational attainment and working with fixed term contracts. In an international perspective, their profile is also characterised by relatively high percentages of teachers working in schools affected by lack of resources for professional development (as declared by their principals) and having a considerable prevalence of students from disadvantaged homes, with special needs and with a minority/migrant background. In Italy, high percentages of males and of those with a low educational attainment are distinctive of teachers of vocational subjects (percentages are much lower for those teaching general subjects); high percentages of teachers working with fixed term contract are distinctive of all teachers working in schools with vocational programmes (regardless of the subject they teach), whereas considerable percentages of older teachers are found across all teachers groups. The characteristics of the students in Italy create a more challenging work environment for teachers in schools with VET programmes, whereas the lack of resources for professional development is similar for teachers of all groups.

Participation in professional development

In Italy, the majority of teachers of vocational subjects participated in professional development activities in 2013. However, a considerable proportion of them did not. The percentage of those not having participated in any professional development activity (non- participation rate) was estimated at 25.6% (s.e. 2.2). This was by far the highest and least favourable point estimate across countries for which data were analysed (Fig. 1). Corresponding values in other countries were much lower: they ranged from 1.8% (s.e. 0.5) in Australia to 14.3% in Finland (s.e. 5.2). Unfavourable differences between Italy and other countries analysed were considerable in magnitude and statistically significant (Table 3—Group C), ranging from 11.3 to 23.8% points.

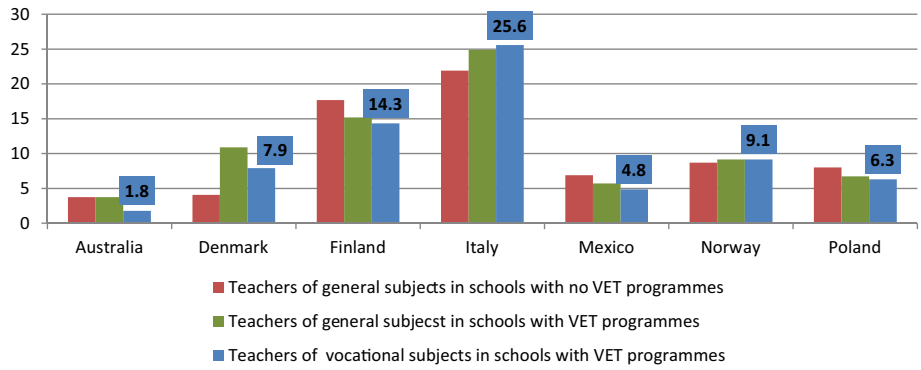

Fig. 1 Upper secondary teachers not participating in professional development, 2013 (%). Source: Author's calculations based on OECD, TALIS 2013

These unfavourable results are striking but consistent with other findings concerning teachers' professional development in the country.[16] Levels of non-participation for teachers of vocational subjects were contrasted and compared to those for two other groups of teachers: teachers of general subjects who work in schools with vocational programmes (Table 4) and teachers of general subjects who work in schools without vocational programmes (Table 5). In Italy, levels of (non) participation in professional development activities did not remarkably differ across group of teachers: estimated differences were found small in magnitude and not statistically significant. The absence of major differences in (non) participation levels between groups of teachers was also found in the other countries for which data were analysed (Tables 4, 5). However, in Italy, the absence of major differences across groups of teachers combined with relatively high levels of non-participation.

To better investigate (non) participation patterns, based on teachers' characteristics, further empirical analysis was carried out. Non participation (as a binary outcome variable) was analysed by means of logistic models, estimated at country level, using the standard set of background variables considered in Table 12 as regressors. Table 13 presents models based results for Italy and other benchmarking countries. Results for Italy confirmed the absence of statistically significant differences in non- participation across the three teachers groups (related regression coefficients were not significant). This also held in most of other countries.[17] In Italy, higher levels of non-participation were found to have a statistically significant association with a lower educational attainment (ISCED 5B or below), an age 50+ and a non-stable permanency of the job (fixed term contract). These associations were found in other benchmarking countries, but not in all of them and, in any case, not in this combination. In addition, in Italy, these three associations combined with a profile of the teachers population which is

[16] Based on OECD results, levels of participation in teachers professional development are much lower in Italy than in many other countries, both at upper secondary level, where the analysis disregarded the orientation of education (OECD 2014c) and at lower secondary level, where it does not make full sense to consider it (OECD 2014b; European Commission 2014).

[17] With the exception of Australia, for teachers Group A, and Denmark for teachers Group D, both cases presenting statistically significant differences as compared to Group C of teachers, i.e. teachers of vocational subjects.

characterised, in a cross-country comparison, by relatively high shares of teachers aged 50+, of teachers with a fixed term contract and of teachers with low educational attainment (Table 15).

It is well documented that older age and low educational attainment (and related factors) generally associate with lower participation in adults job related training (Desjardins et al. 2006; Cedefop 2015a). However, Table 13 shows that, for upper secondary teachers, a low educational attainment plays a significant role in this direction only in Italy and Mexico and that an older age is positively associated with non-participation in most but not all countries (Italy, Mexico, Norway and Poland). Similarly, a statistically significant association between higher non participation and a non-stable permanency of the job, although plausible in a return for investment perspective, was found only in Italy, Denmark and Poland. The "Barriers to professional development" section provides further insights about how a non-stable permanency of the job may operate in the Italian context, being associated to higher perception of barriers such as the cost and the lack of pre-requisites. Based on model results for Italy, the characteristics of the context in which teachers work, as measured in TALIS, including the lack of resources for professional development, were not found to have a statistically significant association with (non) participation in teachers professional development. Overall this also held in the other countries: only 2 regression coefficients were found significant out of the 24 which were estimated (for the other 6 countries and the 4 relevant context variables).

Needs for professional development

An analysis of teachers needs for further professional development was carried out in relation to the following domains: D1—knowledge and understanding of their subject(s); D2—pedagogical competencies in teaching their subject(s); D3—student evaluation and assessment; D4—practice ICT skills for teaching; D5—student behaviour and classroom management; D6—approaches to individualised learning; D7—teaching to students with special needs; D8—teaching in a multicultural or multilingual setting; D9—teaching cross curricular skills; D10—approaches to developing cross-occupational competencies for future work/studies; D11—new technologies in the workplace; D12—student career guidance and counselling; D13—knowledge of the curriculum; D14—school management and administration. The percentage of teachers feeling a high need for further professional development in each of these domains was estimated.

In Italy, across all domains surveyed and analysed (D1–D14), remarkable proportions of teachers of vocational subjects declared a strong need for further professional development (Fig. 2).

In Italy, point estimates for the corresponding percentages stood at over 14% in 12 out of the 14 domains for which data were available (D1–D12). In these 12 domains, they ranged from 14.5% (s.e. 1.5) in the case of D6 (approaches to individual learning), to almost 40% in D11. In particular, in Italy, 39.2% (s.e. 2.0) of teachers of vocational subjects declared a high need for professional development in the domain of new technologies in the workplace (D11). This was the domain where needs were mostly felt in Italy.

In ten of these 12 domains (D1–D12), Italy was found to have the highest point estimates among all countries for which data were analysed. In the remaining two of these 12 domains (D7 and D8), only Mexico was found to have point estimates higher than

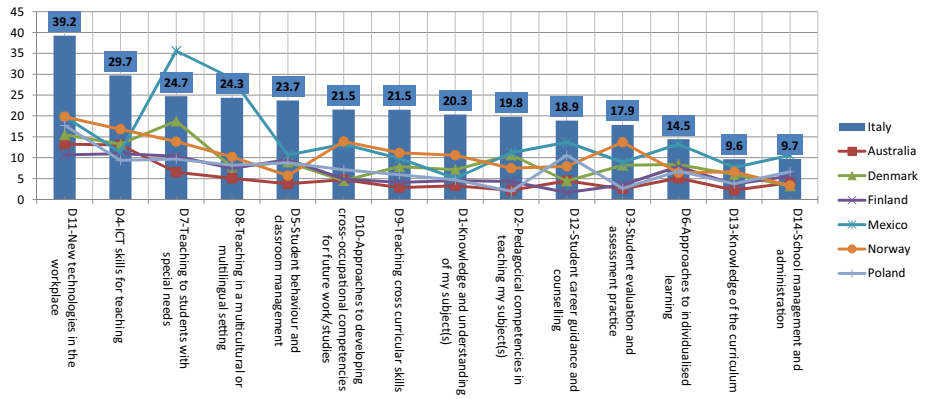

Fig. 2 Upper secondary teachers of vocational subjects declaring a high level need for professional development by domain, 2013 (%). Source: Author's calculations based on OECD, TALIS 2013

those for Italy. Across the domains D1–D12, unfavourable differences, between Italy and other countries were found relatively big in magnitude (with an average of 14.0% points) and statistically significant[18] (Table 6). The widest differences between Italy and other countries were found in the domain of new technologies in the workplace (average unfavourable differences with other countries by 23.1% points).

In the two remaining domains (D13 and D14), teachers of vocational subjects in Italy also declared a high need of professional development, but in lower proportions than in other domains (point estimates at around 10%, Fig. 2) and with smaller differences as compared to other countries (Table 6). In particular, for Italy, the percentage of teachers of vocational subjects in high need for professional development was estimated at 9.6% (s.e. 1.5) in the domain D13—knowledge of the curriculum and at 9.7% (s.e. 1.3) in the domain D14—school management and administration. In these two domains, point estimates for Italy were also higher than in other countries (in D13 Italy had the highest one, in D14 the second highest one). Unfavourable differences between Italy and other countries averaged at 4.9% points across these two domains and generally remained statistically significant, with the exception of those with Mexico and Norway in D13 (Table 6) and those with Finland and Poland in D14.

The proportions of teachers declaring high needs for professional development were estimated for teachers of vocational subjects and also for teachers of general subjects working in schools with and without vocational programmes. Then an analysis of the differences between such proportions was carried out, revealing that, in Italy, needs for professional development, as measured in TALIS, did not remarkably differ across group of teachers (Tables 7, 8).

[18] In the domains D1–D12, the vast majority of unfavourable differences between Italy and other countries were found statistically significant. Only three of them were not found statistically significant: a difference by 1.2% points with Mexico in the domain D6 (approaches to individualised learning); one by 4.2% points with Norway in the domain D3—student evaluation and assessment; one by 5.9% points with Denmark in the domain D7 (teaching to students with special needs).

However, some key descriptive findings seem of interest and have been further investigated.

Descriptive findings reveal that, in Italy, in the domain of students behaviour and classroom management, teachers of vocational subjects declared levels of needs for professional development which were not statistically different from those of other teachers working in the same schools (i.e. schools with VET programmes) (Table 7). However their needs were higher than those of teachers working in schools with no VET programmes (by a small but statistically significant difference of 5% points, Table 8). In other words, in Italy, needs for professional development in the domain of student behaviour and classroom management were uniformly higher for teachers working in schools with VET programmes than for other teachers. To better investigate this aspect, further analysis was carried out.

Perception of high needs in this domain (as a binary outcome variable) was analysed by means of a logistic regression model, using data for Italy and the standard set of background variables presented in Table 12 as regressors. Results (Table 16) show that descriptive findings are driven by the different characteristics of the work context. Only one factor in the analysis was found to have a statistically significant association with the outcome variable: this was working in a school with a considerable prevalence of students speaking a first language different from that of instruction (more than 10%). In other words, regardless of the group to which they belong, teachers are significantly more likely to declare high needs for professional development in classroom management and students behaviour when working in school with a considerable presence of students from a migrant/minority background. This combines with the finding that the percentage of VET teachers working in this type of schools is higher than for other teachers.

It seems reasonable to formulate the hypothesis that there may be other factors, related to students characteristics, which underlie and drive the different levels of needs across groups of teachers in the domain of students behaviour and classroom management. TALIS, data have limitations in this sense and it is not possible to properly test this hypothesis considering the availability of variables. Cedefop Opinion Survey on VET (Cedefop 2015b) provides useful indications. Survey results indicate that, when asked about the reasons for choosing the stream of their upper secondary education (i.e. general or vocational), people with a vocational background attribute more importance to the (often shorter) duration of the study and the possibility to get a job, whereas people with a general background attribute more importance to the possibility to continue in further education and to the fact they liked the subjects taught. Cedefop survey results also show that the vast majority of the population agree that VET has a worse image than general education, that students with low grades are directed to VET and that it is easier to get a qualification in the VET stream of education. This suggests that students in general and vocational education have different characteristics which can relate to different attitudes and behaviours in a classroom environment and at school in general. On the other hand, the image of VET may even bias teachers perceptions of their needs in this specific domain. However, it is not possible to properly account for these aspects by TALIS data.

Similarly, based on descriptive findings for Italy, in the domain of new technologies in the workplace, teachers of vocational subjects declared needs which were not statistically different from those of other teachers working in the same schools (i.e. schools with VET programmes). However their needs were slightly but significantly higher than those of teachers working in schools with no VET programmes (by 5.6% points, Table 8). Therefore, also in the domain of new technologies in the workplace, needs for professional development were found uniformly higher for teachers working in schools with VET programmes than for other teachers. Regardless of the causes, which were assessed difficult to be properly investigated by means of TALIS data, this also deserves some attention.

Barriers to professional development

An analysis of obstacles to teacher professional developments was also carried out. In TALIS 2013, teachers were asked, on a Likert scale of agreement (strongly agree, agree, disagree, strongly disagree) whether they considered the following elements as barriers to their professional development: B1: lack of pre-requisites; B2: cost (i.e. it was too expensive—unaffordable); B3: lack of employer support; B4: conflicts with work schedule; B5: family responsibilities; B6: lack relevant offers; B7: absence of incentives for participating. For each of them, the percentage of teachers agreeing (i.e. agreeing or strongly agreeing) was calculated.

In Italy, remarkable proportions of teachers of vocational subjects perceived the existence of barriers to their professional development (Fig. 3). 85.2% (se. 1.5) and 70.3% (s.e. 2.2), of them respectively agreed that the lack of incentives and the lack of relevant offer were elements constituting barriers to their professional development. These turned out to be the major barriers. However, more than 50% of teachers of vocational subjects considered the conflict with work schedule (58.0%, s.e. 1.9), the cost (57.7%, s.e. 2.4) and the lack of employer support (54.9%, s.e. 2.2) as elements of obstacle. Smaller but not negligible proportions also indicated family responsibilities (32.3%, s.e. 1.9) and lack of pre-requisites (18.4%, s.e. 2.1).

As compared to other countries (Table 9), Italy resulted to have the highest point estimates for B7-lack of incentives, B6-Lack of relevant offer and B2-cost and the second highest point estimates for B4-conflict with work schedule, B3-lack of employer support, B5 family responsibilities and B1-absence of pre-requisites. The majority of the country-element comparisons are unfavourable to Italy (38 out of 42), in the sense that in Italy

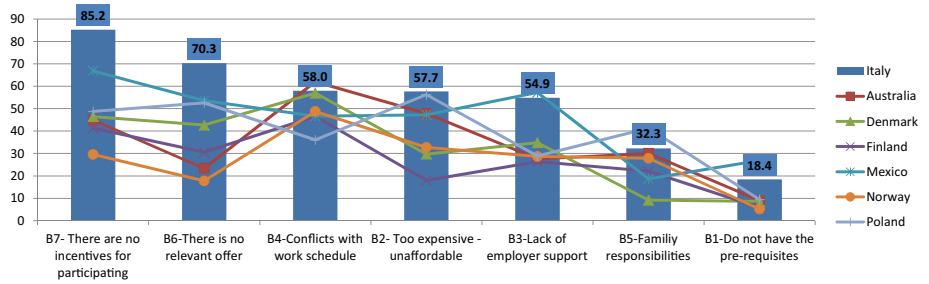

Fig. 3 Upper secondary teachers of vocational subjects perceiving barriers to their professional development, 2013 (%). Source: Author's calculations based on OECD, TALIS 2013

proportionally more teachers of vocational subjects perceived the existence of barriers than in other countries. Unfavourable differences were found to be statistically significant (34 out of 38). Unfavourable differences with other countries averaged at 20.7% points, depending on the country and the element considered. The major unfavourable differences with other countries were found when analysing lack of incentives, absence of relevant offers and lack of employer support (average difference with other countries by respectively 38.9, 33.5 and 26.6% points).

The percentage of teachers perceiving barriers to their professional development was estimated for teachers of vocational subjects and also for teachers of general subjects working in schools with and without vocational programmes. Then an analysis of the differences between such percentages was carried out (Tables 10, 11), revealing that the perception of barriers is not subject to major variations across groups of teachers in Italy.

However some key descriptive findings seem of interest and have been further investigated.

Descriptive findings reveal that in Italy, teachers of vocational subjects perceived the lack of employer support as an obstacle to their professional development significantly more than both groups of teachers of general subjects (i.e. those working in schools with vocational programmes and those working in schools with no vocational programmes). Moderate and statistically significant differences by 10 and 9% points were respectively found (Tables 10, 11). The lack of employer support (as an outcome binary variable) has been further analysed by means of a logistic regression model, implemented at country level and using the standard set of background variables presented in Table 12 as regressors. Model based results for Italy (Table 17) have not provided further useful insights. They partly confirmed descriptive findings: when controlling for other variables, teachers of vocational subjects tend to suffer the lack of employer support more than teachers of general subjects, but significant differences were found only with respect to teachers of general subjects working in schools with VET programmes. Other factors, including a non-stable permanency of the job, plausible in a return for investment perspective, do not seem to have a considerable influence on a perceived lack of employer support.[19]

Barriers related to cost and lack of pre-requisites were also investigated. Indeed, descriptive findings revealed (Table 10) that, in schools with vocational programmes, lack of pre-requisites and cost were perceived as obstacles by teachers of vocational subjects more than by teachers of general subjects (with slight, but statistically significant, differences by 6.5 and 5% points).

Logit model results for the lack of pre-requisites as a binary outcome variable (Table 18), confirm the existence of those differences across teachers groups. Moreover, based on model results, a set of background characteristics is also found to be significantly associated with the perception of lack of pre-requisites. These include age, gender educational attainment and permanency of the job. In particular, controlling for other factors, teachers with lower educational attainment, those aged 50+ and those having a fixed term contract were found significantly more likely to indicate the lack

[19] Only one factor was found to have a significant statistical association with the outcome variable: part time teachers were found to be less likely to indicate the lack of employer support as a barrier to professional development. This is due to fact that part time teachers to indicate more frequently other obstacles.

of pre-requisites as a barrier to professional development. Logit model results for the barrier of cost (as a binary outcome variable) further confirmed the importance of the permanency of the job: having a fixed term contract is the only factor significantly associated with higher chances to indicate cost as a barrier (Table 19).

On the other hand, descriptive findings for Italy reveal that family responsibilities and conflict with work schedule, both linked to availability of time, seem to be less relevant for teachers of vocational subjects than for the other two groups of teachers of general subjects. In the first case (family responsibilities) moderate, uniform and statistically significant differences by around 10% points were observed (Tables 10, 11); in the second case (conflict with work schedule), smaller but statistically significant differences were observed, ranging from 4 to 6% points (Tables 10, 11).

Based model results for the conflict with work-schedule (as an outcome binary variable), it is the non-stable permanency of the job which drives descriptive findings for Italy. When controlling for other variables, differences across teachers groups, as captured by the related regression coefficients (Table 20), are no longer statistically significant. Only one factor, having a fixed term contract, was found significantly associated with lower chances to indicate conflict with work schedule as a barrier. This association is plausible: teachers with a fixed term contract tend to suffer the conflict with work-schedule to a lower extent, as they have time for training in between job spells or over the summer, or simply because they are more likely to indicate other non-time related barriers. This is further discussed below.

When considering barriers related to family responsibilities (as an outcome binary variable), results of the logistic regression model for Italy confirmed descriptive findings: differences across teachers groups, as captured by the related regression coefficients, remained significant. Moreover, based on model results (Table 21), the perception of barriers related to family responsibility was found to have a statistically significant association also with gender (higher perception for women), age (lower perception for older teachers), permanency of the job (lower perception for teachers with fixed term contract) and intensity of work (higher perception for part-time workers). This is well plausible. For social and demographic reasons, older workers and male workers (particularly in Italy) were expected to have smaller family responsibilities and therefore to indicate them as an obstacle less frequently than their counterparts.[20] Having a fixed term contract has an impact on the perception of non-time related barrier (cost and pre-requisites), reducing the importance of family responsibilities as a possible obstacle. On the contrary, part-time work, is often a consequence of important family responsibilities and this may be the reason why part time workers report family responsibility as an obstacle more than others. These relations combines with a profile of teachers of vocational subjects which in Italy is characterised by relatively higher shares of males and of those with a fixed term contract when compared to teachers of general subjects.

Based on this findings, it is possible to conclude that in Italy having a fixed term contract and having a low educational attainment play an important role in shaping the

[20] In Italy, women's average age at first child birth is 31.7 years (Istat 2017) and the percentage of people caring for and educating their children or grandchildren, elderly or people with disabilities is considerably higher for women (34.1%) than for men (24%) (EIGE, calculations for the Gebder Equality index based on Eurofound 2016 EWCS survey, accessed on line on 05/02/2017).

perception of barriers to teachers professional development. As compared to their counterparts with a permanent job, teachers with a fixed term contract are more likely to perceive the existence of barriers related to cost and lack of pre-requisites. This is particularly relevant for VET teachers who more than others have fixed term contracts. As compared to their counterparts with a higher educational attainment, teachers with an education at ISCED level 5B or below are more likely to perceive the existence of barriers related to lack of pre-requisites. This is particularly relevant for teachers of vocational subjects who more frequently than others have this type of education.

Conclusions and policy implications

Based on 2013 round of the OECD TALIS Survey, a set of indicators were propose and quantified to describe the professional development of teachers of vocational subjects in Italy. The results generated a coherent and integrated statistical picture where, regardless of the causes, they were found to have, by international comparisons, lower levels of participation in professional development activities, higher level of needs for it and perception of higher barriers to access it.

In particular, findings reveal that, in absolute and cross-country comparative terms, teachers of vocational subjects in Italy felt a particularly strong need for professional development in the domain of new technologies in the workplace. However, in almost all domains of competence which were surveyed and analysed, their needs were found considerably high, and significantly higher than in most of other benchmarking countries. These also include the domain of students' behaviour and classroom management, where, In Italy, the level of their needs for professional development was similar to those of teachers of general subjects working in the same schools, but significantly higher than those estimated for teachers of general subjects working in schools without VET programmes. Teachers of vocational subjects in Italy were found to have by cross country comparisons, not only higher level of needs, but also a lower participation in professional development. Levels of participation were not remarkably different as compared to those of teachers of general subjects in the country. This held in Italy and, overall, in the other benchmarking systems, where participation was however higher for all different groups of teachers. Teachers of vocational subjects in Italy tended to perceive the existence of barriers to their professional development more than in other countries, with the most remarkable access barriers, in absolute and cross-country comparative terms, being related to the absence of incentives and the unavailability of relevant offers. However they also identified other ones, in remarkable proportions, including the lack of employer support, the cost and the absence of pre-requisites, which, in Italy, affected teachers of vocational subjects more than teachers of general subjects (with statistically significant differences). Time related factors (conflict with schedule and family responsibilities) were also considered to be influential, but less than for teachers of general subjects. Descriptive findings should be qualified and interpreted, also considering the different background characteristics of the teachers groups, in Italy and across countries. Particular regard should be given to teachers age, gender, educational attainment, permanency of the job and the characteristics of their students. Indeed, in a comparative perspective, the profile of teachers of vocational subjects in Italy is found to be characterised by relatively high percentages of male and older teachers, as well as of teachers

with low educational attainment, working with a fixed term contract and in schools with a considerable prevalence of students with a first language different from that of instruction (used as a proxy for students with minority/migrant background). These characteristics are found to be related to key findings, although in different ways, through statistically significant associations emerging from logit regression models.

This body of evidence can be used to propose reflections and indications which could be considered in the debate on VET at policy and research level.

The article shows that, by international comparisons, teachers of vocational subjects in Italy have significantly lower participation in professional development activities. This should be interpreted considering their age, educational attainment and permanency in the job. They are to be seen not only as possible explanatory factors, but also as additional elements of concern.

The article shows that teachers of vocational subjects do not participate in professional development activities significantly more than teachers of general subjects. This may surprise from a policy perspective. This can happen if one considers: (a) how many, how frequent and how fast are changes in nowadays labour markets occurring at technological, organisational, and job level; (b) how relevant these changes are for the vocational skills young graduates should have; (c) how important it is considered that professional development of VET teachers is used to account for and cope with those changes. Although possibly surprising, this very finding is not necessarily bad. It is fine if participation is high across all different groups of teachers. However, in a country such as Italy, where in an international perspective, teachers of vocational subjects have low participation in professional development and high needs for it, a risk emerges. The risk is that the quality of VET provision does not only stagnate, but it even deteriorates, to the extent that part of VET teachers, not participating in training, loose contact with the latest developments in the fast evolving areas of knowledge, skills and competences which the labour market will require to their pupils. This risk, further increased by the old age of VET teachers', may undermine the overall attractiveness and labour market relevance of VET in Italy. It is a risk of skills obsolescence and it requires careful attention.

The article shows that New technologies in the workplace was the domain where the strongest need for further professional development was felt by teachers of vocational subjects in Italy. However, the need was high, and comparatively higher than in other countries, in almost all domains of competences which were surveyed and analysed. Whereas it may be correct to identify that domain as priority, others should not be neglected given the level of needs associated to them. Teachers perception of needs, as measured in TALIS, did not remarkably differ across groups of teachers in Italy, but it could be usefully considered that, in the domain of students behaviour and classroom management, teachers working in schools with VET programmes declared higher needs for professional developments than teachers in schools without VET programmes. The article shows that this relates to student's characteristics and the specific role VET plays in Italy with respect to social inclusion.

The article shows that in Italy teachers of vocational subjects tended to perceive the existence of barriers to their professional development to an extent which was estimated considerably high and higher than in other countries. In Italy, they identified the lack of incentives and lack of relevant of offer as major barriers, with no significant differences

as compared to teachers of general subjects There are clear policy implications with respect to the themes of motivation, recognition and career development but also with respect to the characteristics of the supply of training (content and arrangements). However, other elements are not to be neglected. These include inter alia, the lack of employer support, the cost, and lack of pre-requisites which teachers of vocational subjects identified as barriers significantly more than teachers of general subjects. There are evident policy implications with respect to the themes of availability of resources, access requirements, validation of teachers' competences and awareness rising.

Based on this evidence it is not possible to assess the appropriateness of recent policy measure on teacher professional development in Italy nor to predict whether and to what extent they will be effective, particularly for VET teachers and for those of vocational subjects. In future, an ex-post analysis based on comparable trend data will be needed. However, this article outlines a coherent and integrated statistical picture, where teachers of vocational subjects in Italy are found to have, in an international perspective, higher needs for professional development, lower participation in related activities and perceive higher barriers of access. The article identifies a set of indicators, quantifies and qualifies relevant baselines figures which could be used for informing implementation of policies and reporting on progresses achieved in the area of VET teachers' professional development. The article uses OECD TALIS survey as a relevant source of information. It advocates for collecting comparable data in future and encourages Italy to implement the survey at upper secondary level, having regard for keeping and further improving the elements supporting a distinction between general and vocational education (variables and sample characteristics). If this will happen, it will be possible to assess whether national policies will have been beneficial to upper secondary teachers, and in particular to those of vocational subjects: removing barriers to their professional development, raising their participation in it and lowering their needs will be good measures of success.

Data tables

The main output of the analysis in the form of data tables is presented in this section (Tables 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21). Data tables support and complement the "Results" section.

Table 2 Non participation in teachers' professional development activities: group percentages (%) and related standard errors (s.e.), 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Country	Teachers of general subjects in schools with no VET programme (Group A)		Teachers in schools with VET programmes (Group B)		Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with VET programmes (Group D)	
	%	s.e.	%	s.e.	%	s.e.	%	s.e.
Australia	3.8	2.4	3.3	0.5	1.8	0.5	3.8	0.7
Denmark	4.1	0.7	8.8	1.8	7.9	2.8	10.9	1.8
Finland	17.7	1.5	14.5	3.1	14.3	5.2	15.2	3.9
Italy	*21.9*	*1.7*	*25.1*	*1.6*	*25.6*	*2.2*	*24.9*	*1.7*
Mexico	6.9	1.3	5.3	0.7	4.8	1.1	5.7	1.0
Norway	8.7	3.2	9.2	0.9	9.1	1.5	9.1	1.1
Poland	8.0	1.3	6.5	0.5	6.3	1.8	6.7	0.7

NB: Data refer to teachers in upper secondary education

Table 3 Non participation in teachers' professional development activities: differences between Italy and other countries, in percentage points (pps) and standard error of the differences (s.e.), 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Country	Teachers of general subjects in schools with no VET programme (Group A)		Teachers in schools with VET programmes (Group B)		Teachers of VET subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with VET programmes (Group D)	
	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.
Australia	18.2 (*)	2.9	21.8 (*)	1.7	23.8 (*)	2.3	21.2 (*)	1.9
Denmark	17.8 (*)	1.8	16.3 (*)	2.4	17.7 (*)	3.6	14.0 (*)	2.5
Finland	4.2	2.2	10.6 (*)	3.5	11.3 (*)	5.7	9.7 (*)	4.2
Mexico	15.0 (*)	2.1	19.8 (*)	1.7	20.8 (*)	2.5	19.2 (*)	2.0
Norway	13.2 (*)	3.6	15.9 (*)	1.8	16.5 (*)	2.7	15.8 (*)	2.0
Poland	13.9 (*)	2.1	18.6 (*)	1.7	19.3 (*)	2.9	18.2 (*)	1.8

NB: Data refer to teachers in upper secondary education. Positive values of the difference indicate that, for a given group of teachers, non-participation is higher in Italy than in the benchmark country. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 4 Non participation in teachers' professional development activities: differences between Group C and Group D of teachers, in percentage points (pps) and standard error of the difference (s.e.), 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Country	Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with VET programmes (Group D)		Difference (C) − (D)	
	%	s.e.	%	s.e.	pps	s.e.
Australia	1.8	0.5	3.8	0.7	− 2.0	0.9
Denmark	7.9	2.8	10.9	1.8	− 3.0	3.4
Finland	14.3	5.2	15.2	3.9	− 0.9	6.5
Italy	*25.6*	*2.2*	*24.9*	*1.7*	*0.7*	*2.8*
Mexico	4.8	1.1	5.7	1.0	− 0.9	1.5
Norway	9.1	1.5	9.1	1.1	0.0	1.8
Poland	6.3	1.8	6.7	0.7	− 0.4	1.9

NB: Data refer to teachers in upper secondary education. Positive values of the difference indicate that, in a given country, non participation is higher for teachers of vocational subjects than for teachers of general subjects

Table 5 Non participation in teachers' professional development activities: differences between Group C and Group A of teachers, in percentage points (pps) and standard error of the difference (s.e.), 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Country	Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with no VET programmes (Group A)		Difference (C) − (A)	
	%	s.e.	%	s.e.	pps	s.e.
Australia	1.8	0.5	3.8	2.4	− 2.0	2.5
Denmark	7.9	2.8	4.1	0.7	3.8	2.9
Finland	14.3	5.2	17.7	1.5	− 3.4	5.4
Italy	*25.6*	*2.2*	*21.9*	*1.7*	*3.7*	*2.8*
Mexico	4.8	1.1	6.9	1.3	− 2.0	1.7
Norway	9.1	1.5	8.7	3.2	0.5	3.5
Poland	6.3	1.8	8.0	1.3	− 1.7	2.2

NB: Data refer to teachers in upper secondary education. Positive values of the difference indicate that in a given country non participation is higher for teachers of vocational subjects than for teachers of general subjects. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 6 Teachers of vocational subjects (Group C) declaring a high level of need for professional development by domain: differences between Italy and other countries, in percentage points (pps) and standard error of the differences (s.e.) (Source: Author's calculations based on OECD, TALIS 2013)

Domain for professional development	Australia		Denmark		Finland		Mexico		Norway		Poland	
	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.
D1-knowledge and understanding of my subject(s)	17.1 (*)	1.9	13.2 (*)	2.2	15.8 (*)	2.6	15.3 (*)	2.1	9.7 (*)	2.1	15.7 (*)	2.1
D2-pedagogical competencies in teaching my subject(s)	17.6 (*)	2.1	9.1 (*)	4.2	15.5 (*)	2.7	8.6 (*)	2.6	12.3 (*)	2.3	17.8 (*)	2.1
D13-knowledge of the curriculum	7.4 (*)	1.7	3.7 (*)	2.0	6 (*)	2.0	2.0	1.9	3.0	1.9	5.9 (*)	1.7
D3-student evaluation and assessment practice	15.3 (*)	1.8	9.7 (*)	2.1	14.4 (*)	2.0	9 (*)	1.9	4.2	2.2	15.3 (*)	2.2
D4-ICT skills for teaching	16.7 (*)	3.0	16.5 (*)	3.7	18.8 (*)	2.4	18.4 (*)	2.7	12.9 (*)	2.9	20.4 (*)	2.8
D5-student behaviour and classroom management	19.9 (*)	2.3	14.8 (*)	2.4	14.2 (*)	2.3	13.1 (*)	2.5	18 (*)	2.2	14.9 (*)	2.5
D14-school management and administration	5.7 (*)	1.7	6.5 (*)	2.0	4.1	2.1	− 0.9	2.0	6.3 (*)	1.7	3.0	1.6
D6-approaches to individualised learning	9.3 (*)	2.2	6.1 (*)	2.2	6.6 (*)	1.9	1.2	2.2	8.0 (*)	2.1	7.7 (*)	2.2
D7-teaching to students with special needs	18.2 (*)	2.7	5.9	5.0	14.3 (*)	2.4	− 10.9 (*)	3.2	10.8 (*)	2.8	15.1 (*)	2.8
D8-teaching in a multicultural or multilingual setting	19.3 (*)	2.2	16.7 (*)	3.0	16.9 (*)	2.3	− 4.7	3.2	14.1 (*)	2.4	16.2 (*)	2.1
D9-teaching cross curricular skills	18.6 (*)	1.9	13.6 (*)	2.5	17.4 (*)	2.2	11.7 (*)	2.2	10.3 (*)	2.3	15.5 (*)	2.1
D10-approaches to developing cross occupational competencies for future work/studies	16.8 (*)	2.1	17 (*)	2.1	16.7 (*)	2.2	8.3 (*)	2.4	7.7 (*)	2.4	14.5 (*)	2.3
D11-new technologies in the workplace	26.0(*)	2.9	23.7 (*)	2.7	28.6 (*)	2.6	19.4 (*)	2.8	19.4 (*)	2.9	21.5 (*)	2.8
D12-student career guidance and counselling	14.4 (*)	1.9	14.5 (*)	2.4	17.3 (*)	1.7	5.2 (*)	2.3	11 (*)	2.0	8.4 (*)	2.6

NB: Data refer to upper secondary teachers. Positive values of the difference indicate that, in a given domain, teachers of vocational subjects (Group C) declare higher needs for professional development in Italy than in the benchmark country. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 7 Teachers of vocational subjects (Group C) declaring a high level of need for professional development by domain: differences with Group D of teachers, in percentage points (pps) and standard error of the difference (s.e.), Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Domain for professional development	Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with VET programmes (Group D)		Difference (C) − (D)	
	%	s.e.	%	s.e.	pps	s.e.
D1-knowledge and understanding of my subject(s)	20.3	1.7	17.1	1.1	3.3	2.0
D2-pedagogical competencies in teaching my subject(s)	19.8	2.0	23.2	1.2	− 3.4	2.3
D13-knowledge of the curriculum	9.6	1.5	8.4	0.9	1.2	1.7
D3-student evaluation and assessment practice	17.9	1.5	22.7	1.4	− 4.8 (*)	2.1
D4-ICT skills for teaching	29.7	2.2	37.5	1.8	− 7.8 (*)	2.8
D5-student behaviour and classroom management	23.7	1.9	25.0	1.3	− 1.3	2.3
D14-school management and administration	9.7	1.3	11.0	1.0	− 1.4	1.6
D6-approaches to individualised learning	14.5	1.5	19.5	1.3	− 5.1 (*)	2.0
D7-teaching to students with special needs	24.7	2.2	27.5	1.5	− 2.8	2.7
D8-teaching in a multicultural or multilingual setting	24.3	1.8	26.4	1.5	− 2.1	2.3
D9-teaching cross curricular skills	21.5	1.7	22.5	1.3	− 1.0	2.2
D10-approaches to developing cross-occupational competencies for future work/studies	21.5	1.8	19.9	1.1	1.7	2.1
D11-new technologies in the workplace	39.2	2.0	35.0	1.8	4.2	2.7
D12-student career guidance and counselling	18.9	1.6	19.0	1.2	− 0.1	2.0

A positive value of the difference indicates that in Italy, in a given domain, teachers of vocational subjects declare higher needs for professional development than teachers of general subjects. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 8 Teachers of vocational subjects (Group C) declaring a high level of need for professional development by domain: differences with Group A of teachers, in percentage points (pps) and standard error of the difference (s.e.), Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Domain for professional development	Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with no VET programme (Group A)		Difference (C) − (A)	
	%	s.e.	%	s.e.	pps	s.e.
D1-knowledge and understanding of my subject(s)	20.3	1.7	21.6	1.2	− 1.2	2.1
D2-pedagogical competencies in teaching my subject(s)	19.8	2.0	24.1	1.4	− 4.4	2.4
D13-knowledge of the curriculum	9.6	1.5	8.4	1.0	1.2	1.8
D3-student evaluation and assessment practice	17.9	1.5	25.4	1.5	− 7.5 (*)	2.1
D4-ICT skills for teaching	29.7	2.2	38.7	1.6	− 9.0 (*)	2.7
D5-student behaviour and classroom management	23.7	1.9	18.8	1.3	5.0 (*)	2.3
D14-school management and administration	9.7	1.3	9.9	0.8	− 0.2	1.5
D6-approaches to individualised learning	14.5	1.5	17.3	1.2	− 2.8	1.9
D7-teaching to students with special needs	24.7	2.2	22.9	1.5	1.8	2.7
D8-teaching in a multicultural or multilingual setting	24.3	1.8	25.7	1.3	− 0.9	2.1
D9-teaching cross curricular skills	21.5	1.7	20.7	1.1	1.4	2.2
D10-approaches to developing cross-occupational competencies for future work/studies	21.5	1.8	19.4	1.1	2.2	2.1
D11-new technologies in the workplace	39.2	2.0	33.6	1.3	5.6 (*)	2.4
D12-student career guidance and counselling	18.9	1.6	19.9	1.2	− 1.0	2.0

A positive value of the difference indicates that in Italy, in a given domain, teachers of vocational subjects declare higher needs for professional development than teachers of general subjects. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 9 Teachers of vocational subjects (Group C) perceiving barriers to their professional development: differences between Italy and other countries, in percentage points (pps) and standard error of the differences (s.e.), 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Barrier	Australia		Denmark		Finland		Mexico		Norway		Poland	
	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.	pps	s.e.
B1-do not have the pre-requisites	9.5 (*)	2.9	9.8 (*)	3.3	12.5 (*)	3.0	− 8.4 (*)	3.4	13.3 (*)	2.3	9.0 (*)	2.6
B2-too expensive—unaffordable	9.8 (*)	4.2	28.0 (*)	4.7	39.7 (*)	2.7	10.4 (*)	3.2	25.0 (*)	3.3	1.4	3.5
B3-lack of employer support	27.3 (*)	3.5	20.0 (*)	4.2	28.5 (*)	3.7	− 2.3	3.4	26.2 (*)	3.6	26.0 (*)	3.0
B4-conflicts with work schedule	− 3.9	3.2	1.1	3.5	11.5 (*)	5.2	11.4 (*)	3.0	9.2 (*)	3.4	21.9 (*)	3.4
B5-family responsibilities	2.3	3.1	23.1 (*)	2.3	10.2 (*)	3.3	13.6 (*)	2.7	4.4	2.9	− 9.0	3.5
B6-there is no relevant offer	46.9 (*)	3.4	27.6 (*)	5.6	39.7 (*)	3.7	16.7 (*)	3.7	52.6 (*)	2.7	17.7 (*)	3.3
B7-there are no incentives for participating	40.3 (*)	3.0	38.7 (*)	8.1	43.9 (*)	3.1	18.3 (*)	3.4	55.6 (*)	3.1	36.5 (*)	2.8

NB: Data refer to upper secondary teachers. Positive values of the difference indicate that proportionally more teachers of vocational subjects in Italy than in the benchmark country considered a given element as a barrier to their professional developments The (*) indicates that the difference is statistically significant at 95% level of significance

Table 10 Teachers of vocational subjects (Group C) perceiving barriers to their professional development: differences with Group D of teachers, in percentage points (pps) and standard error of the difference (s.e.), Italy 2013 (Source: Author's calculations based on OECD, TALIS 2013)

	Teachers of vocational subjects in schools with VET programmes subjects (Group C)		Teachers of general subjects in schools with VET programmes (Group D)		Difference (C) − (D)	
	%	s.e.	%	s.e.	pps	s.e.
B1-do not have the pre-requisites	18.4	2.1	11.9	1.0	6.5(*)	1.9
B2-too expensive—unaffordable	57.7	2.4	52.7	1.5	5.0 (*)	2.3
B3-lack of employer support	54.9	2.2	44.5	1.7	10.4(*)	2.5
B4-conflicts with work schedule	58.0	1.9	62.2	1.4	− 4.2 (*)	2.0
B5-family responsibilities	32.3	1.9	42.3	1.5	− 10.0 (*)	2.1
B6-there is no relevant offer	70.3	2.2	69.8	1.6	0.5	2.1
B7-there are no incentives for participating	85.2	1.5	85.3	1.1	0.0	1.6

NB: Data refer to upper secondary teachers. Positive values of the difference indicate that in Italy the element is considered as a barrier to professional development proportionally more by VET teachers' of VET subjects. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 11 Teachers of vocational subjects (Group C) perceiving barriers to their professional development: differences with Group A of teachers, in percentage points (pps) and standard error of the difference (s.e.), Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Barrier	Teachers of vocational subjects in schools with VET programmes (Group C)		Teachers of general subjects in schools with no VET programme (Group A)		Difference (C) − (A)	
	%	s.e.	%	s.e.	pps	s.e.
B1-do not have the pre-requisites	18.4	2.1	14.2	1.6	4.2	2.6
B2-too expensive—unaffordable	57.7	2.4	53.4	1.8	4.3	3.0
B3-lack of employer support	54.9	2.2	45.9	1.8	9.0 (*)	2.9
B4-conflicts with work schedule	58.0	1.9	64.7	1.5	− 6.6 (*)	2.4
B5-family responsibilities	32.3	1.9	42.5	1.7	− 10.2 (*)	2.5
B6-there is no relevant offer	70.3	2.2	71.0	1.7	− 0.7	2.8
B7-there are no incentives for participating	85.2	1.5	86.9	1.0	− 1.7	1.9

NB: Data refer to upper secondary teachers. Positive values of the difference indicate that in Italy the element is considered as a barrier to professional development proportionally more by VET teachers' than by teachers of general subjects. The (*) indicates that the difference is statistically significant at 95% level of significance

Table 12 Background variables (regressors) used in logistic regression models (Source: Author's recoding based on OECD, TALIS 2013)

Regressors: variables, (number of categories) and (reference) categories
R1: Teachers group (3 categories)
Teachers of general subjects in schools with no VET programmes (Group A)
Teachers of general subjects in schools with VET programmes (Group D)
Teachers of vocational subjects in schools with VET programmes (Group C and reference category)
R2: Gender (2 categories)
Male
Female (reference category)
R3: Age (2 categories)
< 50 years
50+ years (reference category)
R4: Education (2 categories)
ISCED 5B and below
ISCED 5A and above
R5: Permanency of the job (2 categories)
Fixed term contract
Permanent contract; (reference category)
R6: Intensity of work (2 categories)
Part time
Full time (reference category)
R7: Prevalence of students with a first language different from that of instruction (2 categories)
10% or less
More than 10% (reference category)
R8: Prevalence of students with special needs in the school (2 categories)
10% or less
More than 10% (reference category)
R9: Prevalence of students from disadvantaged homes in the school (2 categories)
30% or less
More than 30% (reference category)
R10: Extent to which the lack of resources for professional development of teachers (PD) in the school limits principal effectiveness (2 categories)
Not at all/very little
To some extent a lot (reference category)

NB: Data refer to upper secondary teachers. Group C: teachers of vocational subjects in schools with VET programmes. Group A: teachers of general subjects in schools with no VET programme

Table 13 Non participation in teachers' professional development: results of the logistic regression models, regressors R1–R10, all countries including Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Country	Factor	B	b.se	b.wald	b.sig	b.exp
Australia	Constant	− 4.55	0.78	34.132	0.000	0.011
Australia	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.54	0.75	0.528	0.468	1.719
Australia	Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.72	0.34	4.435	0.035	2.045
Australia	Gender—male	0.60	0.25	5.998	0.014	1.822
Australia	Age—50+	0.00	0.32	0.000	0.999	1.000
Australia	Education—ISCED5B or below	− 17.63	0.57	942.869	0.000	0.000
Australia	Permanency of the job—fixed term contract	− 0.41	0.69	0.354	0.552	0.665
Australia	Intensity of work—part time	1.17	0.51	5.174	0.023	3.221
Australia	Prevalence of students with a first language different from that of instruction in the school—10% or less	− 0.18	0.38	0.223	0.637	0.836
Australia	Prevalence of students with special needs in the school—10% or less	− 0.06	0.54	0.013	0.908	0.939
Australia	Prevalence of students from disadvantaged homes in the school—30% or less	0.16	0.48	0.115	0.734	1.178
Australia	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.26	0.47	0.316	0.574	1.299
Denmark	Constant	− 2.96	0.62	23.156	0.000	0.052
Denmark	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 1.47	0.38	15.096	0.000	0.231
Denmark	Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.23	0.38	0.369	0.544	1.260
Denmark	Gender—male	0.92	0.32	8.255	0.004	2.518
Denmark	Age—50+	0.33	0.39	0.722	0.395	1.396
Denmark	Education—ISCED5B or below	0.31	0.44	0.494	0.482	1.364
Denmark	Permanency of the job—fixed term contract	1.02	0.44	5.303	0.021	2.761
Denmark	Intensity of work—part time	1.11	0.54	4.217	0.040	3.021
Denmark	Prevalence of students with a first language different from that of instruction in the school—10% or less	0.52	0.40	1.689	0.194	1.677
Denmark	Prevalence of students with special needs in the school—10% or less	0.70	0.35	4.050	0.044	2.012
Denmark	Prevalence of students from disadvantaged homes in the school—30% or less	− 0.73	0.61	1.449	0.229	0.480
Denmark	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.26	0.35	0.568	0.451	0.770
Finland	Constant	− 3.99	1.12	12.712	0.000	0.018
Finland	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.74	0.40	3.407	0.065	2.106
Finland	Teachers Group—teachers of general subjects in schools with VET programmes (Group D)	0.31	0.65	0.228	0.633	1.363
Finland	Gender—male	0.10	0.15	0.465	0.495	1.104
Finland	Age—50+	0.26	0.27	0.917	0.338	1.298
Finland	Education—ISCED5B or below	0.44	0.43	1.019	0.313	1.551
Finland	Permanency of the job—fixed term contract	− 0.01	0.26	0.003	0.958	0.987
Finland	Intensity of work—part time	1.35	0.51	7.063	0.008	3.844
Finland	Prevalence of students with a first language different from that of instruction in the school—10% or less	0.40	0.19	4.311	0.038	1.488
Finland	Prevalence of students with special needs in the school—10% or less	− 0.27	0.24	1.266	0.260	0.766
Finland	Prevalence of students from disadvantaged homes in the school—30% or less	1.52	1.04	2.133	0.144	4.588

Table 13 (continued)

Country	Factor	B	b.se	b.wald	b.sig	b.exp
Finland	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.19	0.25	0.565	0.452	0.826
Italy	Constant	− 1.84	0.19	94.538	0.000	0.159
Italy	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 0.08	0.17	0.210	0.647	0.927
Italy	Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.09	0.12	0.623	0.430	1.095
Italy	Gender—male	0.07	0.09	0.637	0.425	1.076
Italy	Age—50+	0.42	0.10	16.512	0.000	1.517
Italy	Education—ISCED5B or below	0.63	0.14	19.161	0.000	1.882
Italy	Permanency of the job—fixed term contract	0.49	0.12	16.924	0.000	1.636
Italy	Intensity of work—part time	0.14	0.12	1.337	0.248	1.151
Italy	Prevalence of students with a first language different from that of instruction in the school—10% or less	0.26	0.15	3.150	0.076	1.295
Italy	Prevalence of students with special needs in the school—10% or less	0.11	0.18	0.350	0.554	1.111
Italy	Prevalence of students from disadvantaged homes in the school—30% or less	− 0.15	0.14	1.284	0.257	0.856
Italy	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.14	0.11	1.544	0.214	1.153
Mexico	Constant	− 3.76	1.30	8.331	0.004	0.023
Mexico	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.39	0.34	1.263	0.261	1.470
Mexico	Teachers Group—teachers of general subjects in schools with VET programmes (Group D)	0.12	0.32	0.134	0.715	1.123
Mexico	Gender—male	0.38	0.22	3.168	0.075	1.468
Mexico	Age—50+	0.59	0.26	5.103	0.024	1.797
Mexico	Education—ISCED5B or below	0.99	0.37	7.186	0.007	2.678
Mexico	Permanency of the job—fixed term contract	0.15	0.28	0.264	0.608	1.157
Mexico	Intensity of work—part time	0.14	0.20	0.508	0.476	1.151
Mexico	Prevalence of students with a first language different from that of instruction in the school—10% or less	− 0.12	0.65	0.034	0.854	0.886
Mexico	Prevalence of students with special needs in the school—10% or less	0.20	1.09	0.035	0.853	1.224
Mexico	Prevalence of students from disadvantaged homes in the school—30% or less	0.07	0.28	0.061	0.805	1.073
Mexico	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.09	0.25	0.145	0.703	1.098
Norway	Constant	− 3.91	0.93	17.475	0.000	0.020
Norway	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.11	0.46	0.058	0.810	1.117
Norway	Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.11	0.21	0.242	0.623	1.111
Norway	Gender—male	0.66	0.21	9.645	0.002	1.936
Norway	Age—50+	0.59	0.23	6.355	0.012	1.796
Norway	Education—ISCED5B or below	0.36	0.44	0.657	0.418	1.429
Norway	Permanency of the job—fixed term contract	− 0.58	0.45	1.659	0.198	0.560
Norway	Intensity of work—part time	0.61	0.22	7.485	0.006	1.834
Norway	Prevalence of students with a first language different from that of instruction in the school—10% or less	0.22	0.35	0.379	0.538	1.242
Norway	Prevalence of students with special needs in the school—10% or less	− 0.22	0.31	0.473	0.492	0.806
Norway	Prevalence of students from disadvantaged homes in the school—30% or less	0.54	0.91	0.347	0.556	1.710

Table 13 (continued)

Country	Factor	B	b.se	b.wald	b.sig	b.exp
Norway	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.22	0.26	0.712	0.399	1.242
Poland	Constant	− 3.54	0.45	62.267	0.000	0.029
Poland	Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.37	0.40	0.884	0.347	1.452
Poland	Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.17	0.41	0.178	0.673	1.186
Poland	Gender—male	0.45	0.25	3.242	0.072	1.575
Poland	Age—50+	0.59	0.17	12.260	0.000	1.806
Poland	Education—ISCED5B or below	0.73	0.64	1.315	0.251	2.072
Poland	Permanency of the job—fixed term contract	0.52	0.19	7.325	0.007	1.678
Poland	Intensity of work—part time	0.43	0.18	5.772	0.016	1.531
Poland	Prevalence of students with special needs in the school—10% or less	0.17	0.22	0.594	0.441	1.183
Poland	Prevalence of students from disadvantaged homes in the school—30% or less	0.11	0.19	0.352	0.553	1.122
Poland	Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.04	0.18	0.043	0.836	0.964

NB: Data refer to upper secondary teachers. Logit models for: non participation in teachers professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B); b.wald (Wald's statistics) b.sig (significance) b.exp (odds ratio). The model for Poland does not include the variable on prevalence of students with a first language different from that of instruction in the school

Table 14 Non participation in teachers' professional development: results of the logistics regression models, models information, all countries including Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

IDCNTRY	LL	CSR	NKR	LL.se	CSR.se	NKR.se
Australia	15,034.81	0.01	0.04	2345.79	0.01	0.03
Denmark	5685.40	0.05	0.14	683.38	0.01	0.04
Finland	16,805.52	0.05	0.09	1541.78	0.04	0.06
Italy	268,505.31	0.02	0.03	8269.81	0.01	0.01
Mexico	77,343.90	0.01	0.04	7923.72	0.01	0.02
Norway	8094.35	0.02	0.05	1137.65	0.01	0.02
Poland	74,746.20	0.02	0.05	5751.22	0.01	0.02

NB: Data refer to upper secondary teachers. Logit models for: non participation in teachers professional development as a binary outcome variable. NB: LL (− 2 Log likelihood coefficient); CSR (Cox and Snell R^2 coefficient); NKR (Nagelkerke R^2 coefficient); LL_SE (standard error of the − 2 Log likelihood coefficient); CSR_SE (standard error of the Cox and Snell R^2 coefficient); NKR_SE (standard error of the Nagelkerke R^2 coefficient)

Table 15 Selected characteristics of upper secondary teachers population, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

IDCNTRY	Age 50+		Fixed term contract		Low educational attainment (ISCED 5b or below)	
	%	s.e.	%	s.e.	%	s.e.
Australia	36.4	1.4	10.1	0.8	0.4	0.1
Denmark	42.4	1.4	8.0	0.8	10.6	1.0
Finland	43.6	1.7	17.7	1.4	13.3	2.0
Italy	53.9	0.9	21.4	1.1	10.7	0.5
Mexico	26.8	1.3	40.1	2.5	7.3	0.8
Norway	43.9	1.7	9.1	0.8	4.8	0.6
Poland	27.1	1.2	16.9	0.9	1.3	0.3

NB: Data refer to upper secondary teachers

Table 16 Declaring high needs for professional development in the domain of students behaviour and classroom management, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	− 0.94	1	0.19	23.391	0.000	0.390
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 0.22	1	0.16	2.084	0.149	0.799
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.03	1	0.15	0.050	0.823	1.033
Gender—male	− 0.08	1	0.11	0.527	0.468	0.926
Age—50+	− 0.04	1	0.11	0.132	0.717	0.960
Education—ISCED5B or below	− 0.03	1	0.19	0.017	0.897	0.975
Permanency of the job—fixed term contract	0.25	1	0.13	3.688	0.055	1.288
Intensity of work—part time	0.10	1	0.13	0.608	0.436	1.111
Prevalence of students with a first language different from that of instruction in the school—10% or less	− 0.29	1	0.14	4.383	0.036	0.748
Prevalence of students with special needs in the school—10% or less	− 0.01	1	0.15	0.005	0.946	0.990
Prevalence of students from disadvantaged homes in the school—30% or less	− 0.06	1	0.13	0.197	0.657	0.942
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.09	1	0.10	0.756	0.385	1.093

NB: Data refer to upper secondary teachers. Logit models for: declaring high needs for professional development in the domain of students behaviour and classroom management as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 262,473.09 (s.e. 9838.11); CSR (Cox and Snell R^2 coefficient) = 0.01 (s.e. 0.00); NKR (Nagelkerke R^2 coefficient) = 0.02 (s.e. 0.01)

Table 17 Declaring lack of employer support as a barrier to professional development, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	0.26	1	0.16	2.711	0.100	1.295
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 0.18	1	0.13	1.856	0.173	0.835
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	− 0.35	1	0.09	15.765	0.000	0.703
Gender—male	0.20	1	0.08	6.803	0.009	1.218
Age—50+	0.25	1	0.08	9.925	0.002	1.282
Education—ISCED5B or below	0.05	1	0.14	0.114	0.736	1.049
Permanency of the job—fixed term contract	0.23	1	0.15	2.274	0.132	1.257
Intensity of work—part time	− 0.32	1	0.14	4.873	0.027	0.727
Prevalence of students with a first language different from that of instruction in the school—10% or less	− 0.03	1	0.13	0.049	0.825	0.971
Prevalence of students with special needs in the school—10% or less	− 0.16	1	0.15	1.063	0.302	0.854
Prevalence of students from disadvantaged homes in the school—30% or less	− 0.23	1	0.14	2.764	0.096	0.796
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.08	1	0.10	0.562	0.454	0.925

NB: Data refer to upper secondary teachers. Logit model for: Declaring lack of employer support as a barrier to professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 335,192.08 (s.e. 10,821.71); CSR (Cox and Snell R^2 coefficient) = 0.02 (s.e. 0.01); NKR (Nagelkerke R^2 coefficient) = 0.02 (s.e. 0.01)

Table 18 Declaring lack of pre-requisites as a barrier to professional development, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	− 1.94	1	0.24	64.214	0.000	0.143
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 0.14	1	0.22	0.384	0.536	0.871
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	− 0.37	1	0.18	4.153	0.042	0.688
Gender—male	− 0.34	1	0.14	5.954	0.015	0.712
Age—50+	0.31	1	0.12	7.171	0.007	1.363
Education—ISCED5B or below	0.31	1	0.13	6.149	0.013	1.365
Permanency of the job—fixed term contract	0.39	1	0.17	5.135	0.023	1.481
Intensity of work—part time	0.41	1	0.13	10.781	0.001	1.512
Prevalence of students with a first language different from that of instruction in the school—10% or less	0.30	1	0.19	2.605	0.107	1.349
Prevalence of students with special needs in the school—10% or less	0.23	1	0.17	1.790	0.181	1.253
Prevalence of students from disadvantaged homes in the school—30% or less	− 0.16	1	0.26	0.366	0.545	0.856
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.16	1	0.17	0.877	0.349	0.853

NB: Data refer to upper secondary teachers. Logit model for: Declaring lack of pre-requisites as a barrier to professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 192,314.06 (s.e. 9882.43); CSR (Cox and Snell R^2 coefficient) = 0.02 (s.e. 0.01); NKR (Nagelkerke R^2 coefficient) = 0.04 (s.e. 0.01)

Table 19 Declaring cost as a barrier to professional development, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	0.26	1	0.17	2.380	0.123	1.302
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	− 0.10	1	0.15	0.476	0.490	0.900
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	− 0.17	1	0.12	2.100	0.147	0.840
Gender—male	0.02	1	0.09	0.052	0.819	1.020
Age—50+	0.00	1	0.08	0.002	0.965	1.003
Education—ISCED5B or below	0.12	1	0.14	0.798	0.372	1.130
Permanency of the job—fixed term contract	0.29	1	0.10	8.443	0.004	1.332
Intensity of work—part time	− 0.15	1	0.13	1.240	0.265	0.863
Prevalence of students with a first language different from that of instruction in the school—10% or less	0.09	1	0.14	0.375	0.540	1.091
Prevalence of students with special needs in the school—10% or less	− 0.03	1	0.14	0.042	0.838	0.971
Prevalence of students from disadvantaged homes in the school—30% or less	− 0.13	1	0.13	0.997	0.318	0.874
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.07	1	0.11	0.371	0.542	1.071

NB: Data refer to upper secondary teachers. Logit model for: Declaring cost as a barrier to professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 337,729.98 (s.e. 10,987.38); CSR (Cox and Snell R^2 coefficient) = 0.01 (s.e. 0.00); NKR (Nagelkerke R^2 coefficient) = 0.01 (s.e. 0.00)

Table 20 Declaring conflict with work-schedule as a barrier to professional development, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	0.61	1	0.18	11.328	0.001	1.834
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.24	1	0.13	3.453	0.063	1.274
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.13	1	0.11	1.411	0.235	1.134
Gender—male	− 0.08	1	0.08	0.962	0.327	0.920
Age—50+	0.05	1	0.10	0.323	0.570	1.056
Education—ISCED5B or below	− 0.24	1	0.13	3.605	0.058	0.786
Permanency of the job—fixed term contract	− 0.26	1	0.10	6.967	0.008	0.768
Intensity of work—part time	− 0.21	1	0.11	3.811	0.051	0.813
Prevalence of students with a first language different from that of instruction in the school—10% or less	− 0.24	1	0.13	3.710	0.054	0.783
Prevalence of students with special needs in the school—10% or less	0.03	1	0.13	0.043	0.836	1.026
Prevalence of students from disadvantaged homes in the school—30% or less	0.03	1	0.12	0.077	0.781	1.035
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	0.06	1	0.09	0.469	0.493	1.061

NB: Data refer to upper secondary teachers. Logit model for: Declaring conflict with work-schedule as a barrier to professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 323,734.81 (s.e. 10,596.62); CSR (Cox and Snell R^2 coefficient) = 0.01 (s.e. 0.00); NKR (Nagelkerke R^2 coefficient) = 0.02 (s.e. 0.01)

Table 21 Declaring family responsibilities as a barrier to professional development, results of the logistic regression model, regressors R1–R10, Italy, 2013 (Source: Author's calculations based on OECD, TALIS 2013)

Factor	B	df	b.se	b.wald	b.sig	b.exp
Constant	− 0.56	1	0.18	9.952	0.002	0.574
Teachers group—teachers of general subjects in schools with no VET programmes (Group A)	0.28	1	0.12	5.198	0.023	1.322
Teachers group—teachers of general subjects in schools with VET programmes (Group D)	0.37	1	0.11	10.495	0.001	1.447
Gender—male	− 0.23	1	0.09	6.883	0.009	0.796
Age—50+	− 0.42	1	0.09	20.961	0.000	0.657
Education—ISCED5B or below	0.00	1	0.14	0.000	0.992	1.001
Permanency of the job—fixed term contract	− 0.27	1	0.12	5.051	0.025	0.765
Intensity of work—part time	0.27	1	0.13	4.460	0.035	1.308
Prevalence of students with a first language different from that of instruction in the school—10% or less	0.09	1	0.09	0.805	0.370	1.089
Prevalence of students with special needs in the school—10% or less	0.02	1	0.12	0.025	0.875	1.019
Prevalence of students from disadvantaged homes in the school—30% or less	0.18	1	0.10	3.009	0.083	1.195
Lack of resources for PD of teachers in the school limiting principal effectiveness—not at all/very little	− 0.09	1	0.10	0.776	0.378	0.916

NB: Data refer to upper secondary teachers. Logit model for: Declaring family responsibilities as a barrier to professional development as a binary outcome variable. NB: B (beta regression coefficient for the logit); b.se (standard error for B). NB: Model performance: LL (− 2 Log likelihood coefficient) = 326,689.54 (s.e. 10,587.61); CSR (Cox and Snell R^2 coefficient) = 0.02 (s.e. 0.01); NKR (Nagelkerke R^2 coefficient) = 0.03 (s.e. 0.01)

Abbreviations

EU: European Union; Eurostat: Statistical Office of the European Union; IDB Analyzer: International Database Analyzer; IEA: International Association for the Evaluation of Educational Achievement; ISCED: International Standard Classification of Education; ISFOL: Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori; OECD: Organisation for Economic Co-operation and Development; TALIS: Teaching and Learning International Survey; UNESCO: United Nations Educational Scientific and Cultural Organisation; VET: Vocational Education and Training.

Authors' contributions

The author read and approved the final manuscript.

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Availability of data and materials

The data used in this article have been downloaded from the OECD website in October 2014 in the form of anonymised public use micro-data files (http://stats.oecd.org/Index.aspx?datasetcode=talis_2013%20). The output resulting from their processing i.e. the dataset(s) supporting the conclusions of this article is (are) included within the article.

Competing interests

The author declares that he has no competing interests.

Consent for publication

Survey respondents provided their consent to use of their anonymised data for research purpose.

Ethics approval and consent to participate

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