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Ragnar F. Ólafsson, Allyson Macdonald  
and Auður Pálsdóttir

# **Teacher efficacy and country clusters**

## **Some findings from the TALIS 2008 survey**

TALIS is an international comparative study carried out by OECD in 23 countries on the self-evaluated professional competence of lower secondary teachers, measures of self-efficacy, related beliefs and attitudes to teaching and learning, professional activities and classroom practices. The aim of this paper is to explore responses to selected items from the 2008 survey in relation to international results and to interpret them in the context of theories and findings related to collective teacher efficacy. In all, 53 items from 11 sets of questions in the survey were selected for further analysis and as being relevant to the aim of this exploration of teaching practice and efficacy in an international context. Multidimensional scaling was used to identify three dimensions in the data and the results also indicated clusters of countries which were further explored with Hierarchical cluster analysis. An important finding is the fact that the clusters of countries identified reflected largely their geographical location, suggesting that the educational practices assessed in this selection of TALIS questions are a reflection of fundamental cultural characteristics and broader regional differences. The dimensions and clusters differentiated between responses to the selected items on the TALIS teacher questionnaire. Dimension 1, A culture of observation, feedback and improvement, distinguished mainly between Western, Southern and Northern Euro-pean country clusters on the one hand and Eastern European (with American and Asian countries) on the other. Such a culture of feedback seemed to be more prominent in Eastern Europe and Asia/America compared with other areas. Dimension 2 represented a focus on working together, and Dimension 3 was related to certain professional development needs.

Ragnar F. Ólafsson works at the Educational Testing Institute, Allyson Macdonald is professor at the School of Education, University of Iceland and Auður Pálsdóttir is adjunct, also at the School of Education, University of Iceland.

**Munurinn á trú kennara á eigin getu eftir löndum: Rannsókn byggð á gögnum TALIS 2008**

TALIS 2008 er alþjóðleg samanburðarrannsókn sem gerð var á vegum OECD í 23 löndum og fjallar um viðhorf og starfshætti kennara á unglingastigi, hugmyndir þeirra um eigin getu, viðhorf til náms og kennslu, starfshætti og kennsluaðferðir.

Markmið greinarinnar er að kanna svör við völdum spurningum úr TALIS-könnuninni frá 2008 og túlka þær í ljósi fræða og rannsóknarniðurstaðna um trú kennara á sameiginlega getu samstarfshópsins. Valin voru samtals 53 atriði úr 11 spurningaflokkum könnunarinnar sem tengdust markmiðinu að kanna starfshætti og trú kennara á eigin getu í alþjóðlegu samhengi. Með fjölvíddakvörðun (e. *multi-dimensional scaling*) voru greindar 3 víddir í gögnunum og nokkrir landahópar sem einnig voru greindir með klasagreiningu (e. *cluster analysis*). Mikilvæg niðurstaða er sú að mismunur milli landa endurspeglar að miklu leyti landfræðilega stöðu þeirra, sem bendir til þess að kennsluhættir sem metnir eru í TALIS eigi sér dýpri menningarlegar rætur í ólíkum landsvæðum. Meginvíddin, vídd 1, sem kalla mætti „hefð fyrir áhorfi, endurgjöf og umbótum“, greinir á milli landa þar sem annars vegar er fylgst beint með kennslu og komið með tillögur að endurbótum sem leiða til bættra starfshátta, og hins vegar landa sem gera þetta í minna mæli. Í ljós kom að þessi vinnubrögð eru meira stunduð í Austur-Evrópu, Asíu/Ameríku en í Vestur-Evrópu, þar á meðal Norðurlöndunum. Vídd 2 stendur fyrir áherslu á samvinnu og samkenndu, og vídd 3 sem tengist þörf fyrir starfsþróun á ákveðnum sviðum.

Ragnar F. Ólafsson er verkefnastjóri við Námsmatsstofnun, Allyson Macdonald er prófessor á Menntavísindasviði Háskóla Íslands og Auður Pálsdóttir er aðjúnt, einnig á Menntavísindasviði Háskóla Íslands.

## Introduction

The Teaching and Learning International Survey (TALIS) is an international comparative study of teachers and their self-efficacy, beliefs and attitudes on teaching and learning, professional activities and classroom practices. In 2008 the first survey of lower secondary (ISCED level 2) teachers was carried out in 23 countries, and in Iceland the survey was sent to all teachers in compulsory schools. The main Icelandic results from TALIS 2008 have been published elsewhere (Ólafsson & Björnsson, 2009). The study reported here forms part of a larger project entitled *Collective teacher efficacy in emerging curriculum areas* (hereafter EmergeCTE).

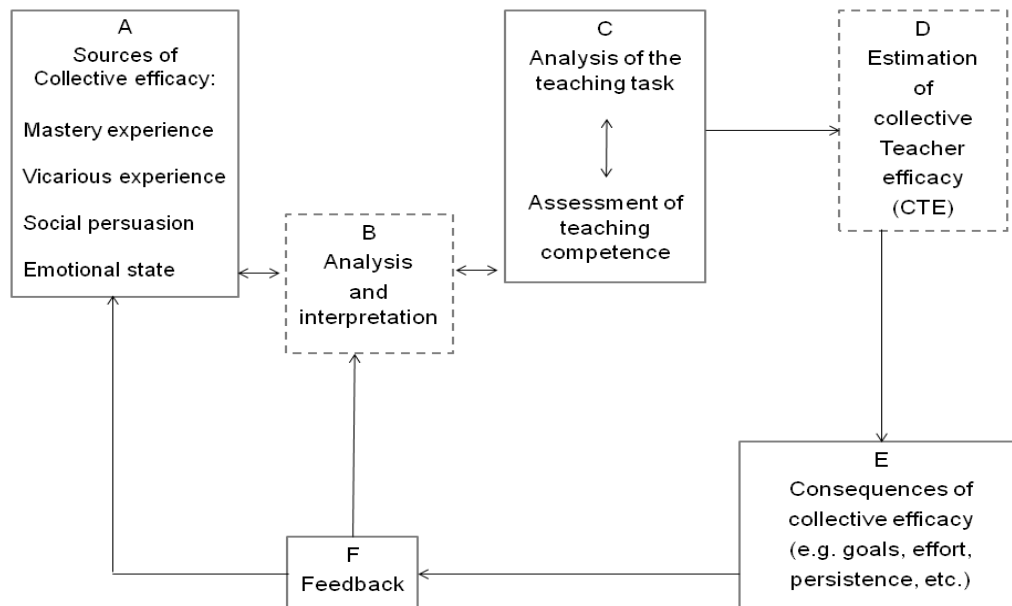
In this article we explore TALIS results because they relate to our interest in understanding the construct of collective teacher efficacy (CTE) and the work of teachers. Bandura, the author of this construct, claims that

... many of the contemporary conditions of life undermine the development and maintenance of collective efficacy. ... Social efforts to change lives for the better require merging diverse self-interests in support of common core values. ... The magnitude of human problems also undermines perceived efficacy for finding solutions for them. (Bandura, 2001, p. 17, 18)

Understanding the efficacy beliefs of teachers and how to develop them so that learning is supported is an important educational problem.

The constructs of perceived collective efficacy and self-efficacy depend on assumptions made in social cognitive theory, namely that decisions are made through the exercise of agency and that people are more likely to work with goals that seem “challenging, rewarding, and attainable” (Bandura, 1997; Goddard, Hoy & Hoy, 2004). Choices made by individuals or organisations in exercising their agency are affected by the strength of their efficacy beliefs (Schunk, Pintrich & Meece, 2010). Thus collective teacher efficacy (CTE) is believed to be an important factor in the work of a school. “For schools, collective [teacher] efficacy refers to the perceptions of teachers in a school that the efforts of the faculty as a whole will have positive effects on students” (Goddard, 2002, p. 100).

A model of CTE (*Figure 1*) includes components of information available to teachers and how they are used (Box A) and on how teachers view the teaching task (Box B). The TALIS data give us a window into the feedback (information) available to teachers from others (Box A), teaching practices (the teaching task) (Box B) and a perceived need for professional development (how feedback and a view of the teaching task are related to improvement). Curriculum demands in the 21<sup>st</sup> century mean that teachers need more than ever to believe in their ability to carry out new educational tasks, such as sustainability education, working with ICT across the school and innovation education, which are all emphasised in the new national curriculum in Iceland (MESCI, 2011).



**Figure 1 – Basic model of collective teacher efficacy,  
adapted from Goddard, Hoy and Hoy (2000).**

Teacher efficacy is always related to the ability of teachers to bring about learning and to their belief in that ability (Bandura, 2001). It is not enough that a teacher possesses the skills needed for a teaching task, but he or she must also believe in the value of the task for student learning and that the learners can carry it out. Fundamental to models of collective efficacy are the judgements teachers make based on information from different sources (*Figure 1*, Boxes A, B). In order to promote school development, it is important to know what information is available to teachers on their teaching and the work of the school, as well as whether this information is used (TALIS data on feedback).

Collective efficacy is not simply a measure of the self-efficacy of individual teachers; it is dependent on both competence and context:

... expectations for attainment depend both on perceived competence to perform a given task and the context in which the task will take place. In other words, collective efficacy depends on the interaction of these two factors.  
(Goddard, 2002, p. 100)

The analysis and interpretation of information about one's own teaching, or that of others in the school, is related to analysis of the *teaching task* (*Figure 1*, Boxes A, B, C). Survey questions assessing collective efficacy are judgements about groups of teachers, e.g.

*Teachers in this school have a sound knowledge of key scientific concepts* (Boxes C, D). The estimation of collective teacher efficacy then affects the way in which teachers continue to tackle the teaching task in the light of student performance. Teachers, school principals or district administrators take action to strengthen teacher efficacy to enhance learning.

Information affecting perceived efficacy is derived from mastery experiences, vicarious experiences, social/verbal persuasion and affect/physiological arousal (Henson, 2001; Goddard, et al., 2004) (*Figure 1*, Box A). Mastery experiences represent the past performance of the collective (Adams & Forsyth, 2006). Mastery experiences are the most influential sources of information for teachers but access to such information with regard to an emerging curriculum area such as citizenship education is problematic, precisely because it is an 'emerging' area, and the evidence on what promotes successful learning is still being accumulated. Vicarious experiences might come from observation and modelling, as well as collaboration and mentoring relationships within the organisation. The TALIS survey provides data on *information received from others* in the form of appraisal and feedback. We are interested in finding out the extent to which information is available and is used as feedback to improve the efficacy of teaching.

It is also important to understand perceptions of the *teaching task* (*Figure 1*, Boxes B, C). In the EmergeCTE research on emerging curriculum areas, the teaching task includes the selection of *content*, choice of *pedagogy* and nature of *assessment*. In the TALIS survey, measures of teacher beliefs, attitudes and practices provide quantitative information on aspects of the teaching task as perceived by teachers.

Further information on *teaching practices* and pedagogical information is now available from OECD (Vieluf, Kaplan, Klieme & Bayer, 2012). In each country, teachers were divided into three groups according to profiles depending on the relative use a structured approach, student-oriented practice and enhanced activities such as projects or debates. In Iceland only nine per cent of teachers use enhanced activities to any substantial degree. Similarly, the OECD research found that it was possible to divide teachers into three or four groups in each country according to indicators of their professional practice. In most countries, very few teachers showed strong evidence of deprivatisation of practice (letting other teachers into their professional space) and in keeping with this finding, few teachers engage in joint teaching.

Qualitative interviews in the EmergeCTE research indicate that Icelandic teachers have difficulty in articulating the nature of the *teaching task* (Pálsdóttir & Macdonald, in preparation). Yet teachers in Iceland show the strongest preference of all countries in the TALIS survey for constructivist beliefs in teaching, which are reflected in the survey as an emphasis on active learning and problem-solving, rather than direct instruction (*Figure 4.2*, TALIS, n.d.). This result would indicate that in general Icelandic teachers have a view of the teaching task which would require teachers to provide many opportunities for active engagement of students rather than a more passive role of listener, but this does not seem supported by findings reported in Vieluf, et al. (2012).

The interaction of teaching task and context is also important. Adams and Forsyth (2006) assessed whether the analysis of the teaching task operated as a source of efficacy producing information and what effect *contextual variables* have on teachers' collective beliefs. They argued that information on which efficacy is built comes not only from past experiences but also from the current or actual situation, and suggest reclassifying efficacy sources of information as remote (in the **past**), and proximate (in the *present*), both of which have a role in influencing teacher beliefs about their own or future performance.

Some proximate sources of efficacy are manipulable, such as structure/ethos and resources, and some non-manipulable, such as the socioeconomic status of learners. Sources of information on perceived efficacy can both limit or enable perceptions of ability to carry out the teaching task.

It is often assumed that teacher collaboration will lead to increases in student achievement, but research in this area is still weak (Klassen, Tze, Betts & Gordon, 2011). Yet, in a recent Dutch study, the mediating role of collective efficacy beliefs in collaborative work and student learning was investigated in 53 schools (Moolenaar, Sleegers & Daly, 2012) and it was found that strong networks were linked to high levels of efficacy and in turn to student achievement.

The leadership of the principal is also important in school development (Brinson & Steiner, 2006). According to Fullan (2007) and Goleman (2000), leadership is found in positive communication, a clear vision of where to go and the setting of milestones. The role of the principal is mainly to build up a team within the school community that is given a mandate to change working methods in order to improve student learning (Donaldson, 2006; Sergiovanni, 2006).

Collective teacher efficacy has been the subject of much research in the US but less in other countries, and cross-cultural comparisons are needed as well as determining the effect of context on efficacy (Klassen et al., 2011). Also, little is known about how efficacy beliefs are formed in school settings. The TALIS study can be of assistance in meeting these gaps in research. Thus, an examination of the overall structure of similarities among all 23 participating countries is useful, and of interest in itself.

In other OECD related research Olsen (2005) conducted a cluster analysis on item by country interactions (item p-value residuals) on scientific literacy cognitive items in PISA 2003 (Program for International Student Assessment). He identified six main clusters containing geographically neighbouring countries. The country clusters were East Asian countries, English speaking countries, North-West European countries, South American countries (+Portugal), developing countries and East European countries. He pointed out that the countries in each cluster shared many characteristics linguistically, politically, historically etc. and stated that “these underlying characteristics may influence school policy in general and in effect they might even influence science curricula” (Olsen, 2005, p. 18). Both the PISA results and that of the personality results suggest that country clusters are worth exploring in the TALIS 2008 data, as teachers’ beliefs and practices, as assessed in TALIS, are also likely to be influenced by personal, political or historical characteristics of geographical regions. A more recent publication (Vieluf, et al., 2012) has analysed TALIS data at the country level and has in some cases considered similarities among some countries.

In this article some results from the TALIS survey (TALIS, n.d.) are examined with regard to the construct collective teacher efficacy (*Figure 1*) and the possibility of country clusters. The aim of the research was to explore the TALIS data for indications of

- the *feedback* available to teachers on their work in schools and whether it is used to improve their teaching,
- teacher understanding of the *teaching task* as evidenced by their beliefs, attitudes and practices towards *working together and with students*,
- teacher involvement in and perceived need for *professional development activities*, and
- *country clusters* and *dimensions* that differentiate between countries on the selected variables.

## Research methodology

In this study, the focus is on selected aspects of teacher efficacy which are discussed first in terms of geographical clusters identified in the data. Then sources of teacher appraisal and feedback and the extent to which they have led to or involved changes in the work of teachers are presented. Third, the focus is on teaching practices, beliefs and attitudes with special attention to how the teachers work with each other and with students. Then, the manner in which teachers assess their own professional development activities and needs is presented. Finally, connections between participation rates in TALIS and measures of cooperation as well as with student achievement are presented.

## Participants

Teachers at lower secondary (ISCED 2) level in 23 countries participated in the TALIS survey in 2008: Australia, Austria, Belgium (Flanders), Brazil, Bulgaria, Denmark, Estonia, Hungary, Iceland, Ireland, Italy, Republic of Korea, Lithuania, Malaysia, Malta, Mexico, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain and Turkey.

The target participation rates were 75 per cent of the sampled schools, and 75 per cent of teachers within those schools. A representative sample of 200 schools, 20 teachers in each school, was taken in each country. To attain the desired sample size, teachers in smaller countries were oversampled, e.g. in Iceland all ISCED 2 level schools and teachers were included in the sample. The average participation across countries in TALIS was 78 per cent. Overall, 73,584 teachers from 4,401 schools participated. Further information about the population and sampling options, as well as teacher and school participation rates, are available in the TALIS 2008 International report (OECD, 2009).

## Materials

The TALIS questionnaire (<http://www.oecd.org/edu/preschoolandschool/43081350.pdf>) includes questions on Background Information, Professional Development, Teacher Appraisal and Feedback, Teacher Practices, Beliefs and Attitudes and questions that focus on teaching in a particular class during the week the survey was completed. For the present analysis, 53 items were selected in accordance with components of the collective teacher efficacy model (*Figure 1*). The 11 questions and items of interest in this study appear (paraphrased) in *Table 1*.

## Procedure

The questionnaires were administered on paper and/or online to teachers in participating countries from October to December 2007 for southern hemisphere countries and from March to May 2008 in northern hemisphere countries. It took about 45 minutes to complete.

## Statistical analysis in this study

Country means or percentages were computed (with the IDB Analyzer, see <http://www.iea.nl/data.html>) for the 53 items, using weights appropriate to the sampling design in each country. Subsequent analyses were conducted with PASW Statistics 18.

A multidimensional scaling analysis (MDS), based on Euclidean distance, was conducted on the means and percentages (rescaled) to identify dimensions that differentiate between countries and/or groups of countries. A 3-dimensional solution (Kruskal's stress 1 = 0.08111) was opted for (stress < 0.1 = fair) while the stress value for a 2-dimensional solution was considered too high (0.14059). The results are shown in *Figure 2*. Correlations between each of the three dimensions and each of the 53 variables were computed to assist the interpretations of the dimensions (*Table 1*).

A hierarchical cluster analysis (HCA) was then conducted to group the European countries (and Australia) on the basis of these countries' scores on the three dimensions identified by the MDS. Ward linkage and Squared Euclidean distance were used. A five-cluster solution was opted for and is shown in *Figure 3*.

## Results

The results are presented in five parts. First the dimensions emerging from the data are presented and described. The country groupings appearing in the MDS were investigated further for 19 of the 23 countries. Then the results for each main item are presented in the next three sections and briefly discussed. Finally there is some data on participation rates and a relationship to PISA results.

### Dimensions and country clusters

Three dimensions emerged in the data:

- Dimension 1 (COFI): A culture of observation, feedback and improvement
- Dimension 2 (WT): Working together
- Dimension 3 (PD): Professional development needs in certain areas

The dimensions were interpreted and labelled by examining questionnaire items that correlate (preferably uniquely) with each of the dimensions. The three dimension scores are independent, as correlations between dimensions ranged from  $-0.01$  to  $-0.04$ . In *Table 1* correlations between the three dimensions (MDS) and individual items are shown.

#### Dimension 1: A culture of observation, feedback and improvement (COFI)

This dimension has the highest correlations with items overall. It correlates most strongly with items assessing whether the principal or other in management team observes teaching in classes and gives suggestions on how to improve teaching. It also correlates with items assessing the teacher's confidence in the principal's methods to determine whether the teacher is performing well or badly. Also, it correlates with measures of the frequency and effect of feedback received, for example, on their understanding of their main subject field, instructional practices, teaching in multicultural setting, and whether feedback led to the development of a training plan to improve teaching, and whether innovative teaching is rewarded.

#### Dimension 2: Working together (WT)

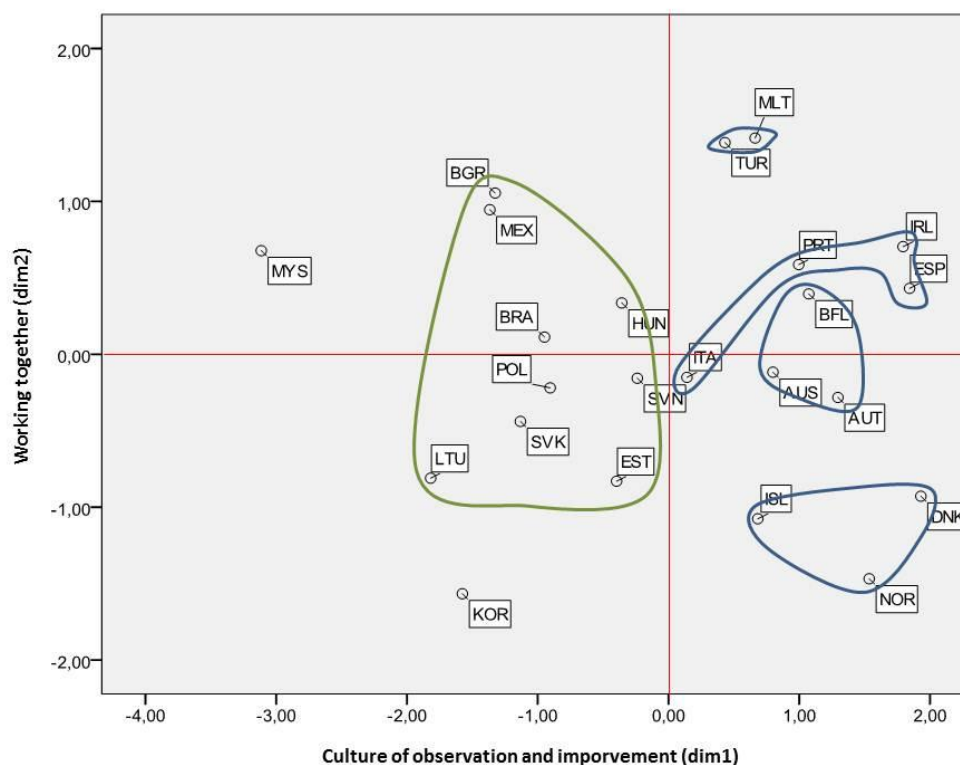
The highest correlations with this dimension are observed on items which concern teaching jointly as a team and attending team conferences for age groups they teach. Countries with teachers scoring highly on the above items reject the ideas that instruction should be about problems with clear correct answers, ideas that most students can grasp quickly, or that good teachers demonstrate the correct way to solve a problem. Dimension 2 also has correlations with items expressing need for professional development in various areas (e.g. assessment practices, knowledge and instructional practices in main subject field and classroom management) but these aspects of the dimension also overlap with Dimension 1, and are therefore less specifically characteristic of Dimension 2.

#### Dimension 3: Professional development needs in certain areas (PD)

Teachers in countries that are high on this dimension express a need for professional development in certain areas such as teaching in a multicultural setting, management and administration, and (less strongly) in ICT skills for teaching, or teaching students with special learning needs. They also express infrequent reading of professional literature.



The MDS indicates that countries are grouped along Dimensions 1 and 2 in a manner reflecting largely their geographical position (*Figure 2*), roughly Western Europe (right side) and Eastern Europe (left side). Within Western Europe the Nordic countries (Norway, Denmark and Iceland) form one group, the Mediterranean countries form another (with Turkey and Malta forming a subgroup within those). Austria and Belgium (Flanders) (and Australia) are also in close proximity between north and south. Brazil and Mexico join the Eastern European group. Malaysia and Korea are placed at the extremities of dimensions 1 (COFI) and dimensions 2 (WT) respectively.



**Figure 2 – Multidimensional scaling analysis of responses, by country.**  
Dimensions 1 (COFI) and 2 (WT) of a 3-dimensional solution are presented,  
with circles around country clusters from HCA.

Table 1 Correlations between each of the three dimensions (MDS) and individual (rescaled) TALIS questionnaire items			
Items (paraphrased)	Dim1 COFI	Dim2 WT	Dim3 PD
<b>Teacher appraisal and feedback</b>			
<b>Frequency of feedback about work from the following people:</b>			
Principal (btg21a)	-.75**	0.06	-0.31
Other teachers or members of a school management team (btg21b)	-.53**	-0.34	-0.21
External individual or body (e.g. external inspector) (btg21c)	-.55**	0.33	0.12
<b>Extent to which appraisal/feedback has led to change in:</b>			
Knowledge and understanding of main subject field (btg24b)	-.91**	0.18	0.20
Knowledge and understanding of instructional practices in main subject field (btg24c)	-.93**	0.22	0.16



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Development or training plan to improve own teaching (btg24d)	-.90**	0.22	0.14
Own teaching of students in a multicultural setting (btg24g)	-.75**	0.38	0.36
<b>How the teacher describes appraisal or feedback:</b>			
It involved judgment about the quality of my work (btg25a)	-.60**	0.12	-0.39
It contained suggestions for improving aspects of own work (btg25b)	-.79**	.46**	0.09
<b>Teacher opinions about appraisal and feedback in general in this school:</b>			
Poor performance of a teacher would be tolerated by other staff (btg28b)	0.27	-0.24	0.29
Principal uses effective methods to determine whether teachers are performing well or badly (btg28d)	-.70**	.47*	-0.24
A development/training plan is established to improve teachers' work (btg28e)	-.68**	0.21	-0.17
Innovation in teaching leads to monetary or non-monetary rewards (btg28h)	-.76**	0.22	-0.19
The review of teachers' work is largely done to fulfill administrative requirements (btg28i)	-0.04	0.13	0.35
The review of teachers' work has little impact upon the way teachers teach in the classroom (btg28j)	.63**	-0.37	0.18
<b>Items (paraphrased)</b>	<b>Dim1 COFI</b>	<b>Dim2 WT</b>	<b>Dim3 PD</b>
<b>Teaching practices, beliefs and attitudes</b>			
<b>Personal beliefs on teaching and learning</b>			
Effective/good teachers demonstrate the correct way to solve a problem (btg29a)	0.03	.46*	-0.02
My role as a teacher is to facilitate students' own inquiry (btg29d)	0.08	-0.25	-0.08
Students learn best by finding solutions to problems on their own (btg29f)	0.08	0.19	-0.22
Instruction should be about problems with clear, correct answers, ideas that most students can grasp quickly (btg29g)	-.58**	.70**	0.19
Learning depends on background knowledge, that is why teaching facts is so necessary (btg29h)	-.45*	0.33	.43**
Students should be allowed to think of solutions to practical problems, before teacher shows them the solution (btg29i)	0.05	0.26	-0.08
<b>Teacher collaboration. How often does the teacher:</b>			
Exchange teaching materials (btg30d)	.42*	-0.31	0.02
Attend team conferences for age group s/he teaches (btg30e)	0.05	-.73**	0.01
Teach jointly as a team in the same class (btg30h)	-0.05	-.73**	0.17
Observe other teachers' classes and provide feedback (btg30j)	-.56**	-.57**	-0.35
Engage in joint activities across different classes and age groups (e.g. projects) (btg30k)	-0.02	-0.36	-0.39
<b>Self-efficacy</b>			
I feel I am making a significant educational difference in the lives of my students (btg31b)	0.15	0.04	0.18
If I try really hard, I can make progress with even the most difficult and unmotivated students (btg31c)	-0.29	0.02	0.32
I am successful with the students in my class (btg31d)	0.36	0.00	0.02
I usually know how to get through to students (btg31e)	0.25	0.08	0.07
<b>School management. How often do these activities take place?</b>			
Principal or someone else in management team observes teaching in classes (btg32c)	-.82**	0.01	-.50**

Principal gives teachers suggestions on how they can improve their teaching (btg32d)	-.90**	0.11	-0.29
Principal ensures that teachers are informed about possibilities for updating knowledge and skills (btg32f)	-0.40	0.11	-.52*
Principal and teacher work on school development plan (btg32h)	-0.35	0.13	-0.26
Principal and teachers act to ensure that education quality issues are a collective responsibility (btg32k)	-.48*	0.24	-0.38
<b>Items (paraphrased)</b>	<b>Dim1 COFI</b>	<b>Dim2 WT</b>	<b>Dim3 PD</b>
<b>Professional development</b>			
<b>Professional development activities during the last 18 months</b>			
Observation visits to other schools (btg11dA)	-.52*	-.48*	0.12
Impact of visits to other schools on development as teacher (btg11dB)	-0.21	0.27	0.01
Mentoring/peer observation/coaching as part of formal school arrangement (btg11gA)	-.68**	-0.27	-0.24
Impact of mentoring/peer observation/coaching on development as teacher (btg11gB)	-0.21	0.18	0.02
<b>Less formal professional development activities during the last 18 months</b>			
Reading professional literature (btg17aA)	-0.14	-0.08	-.85**
Impact of reading professional literature on development as a teacher (btg17aB)	-.54*	0.09	-0.40
Engaging in informal dialogue with colleagues on how to improve own teaching (btg17bA)	-0.24	-0.17	0.031
Impact of informal dialogue with colleagues on professional literature on development as a teacher (btg17bB)	-0.02	-0.11	-0.15
<b>Areas of Professional Development Needs</b>			
Content and performance standards in main subject field (btg18a)	-.58**	-.41*	0.39
Student assessment practices (btg18b)	-.43*	-.48*	.46**
Classroom management (btg18c)	-.61**	-.44*	0.40
Knowledge and understanding of main subject field(s) (btg18d)	-.60**	-.50*	0.29
Knowledge and understanding of instructional practices in main subject field (btg18e)	-.59**	-.46*	0.33
ICT skills for teaching (btg18f)	-0.40	-0.25	.57**
Teaching students with special learning needs (btg18g)	0.24	-0.04	.43*
Student discipline and behaviour problems (btg18h)	-.51*	-0.36	0.40
School management and administration (btg18i)	-0.40	0.27	.76**
Teaching in a multicultural setting (btg18j)	-0.20	0.23	.82**

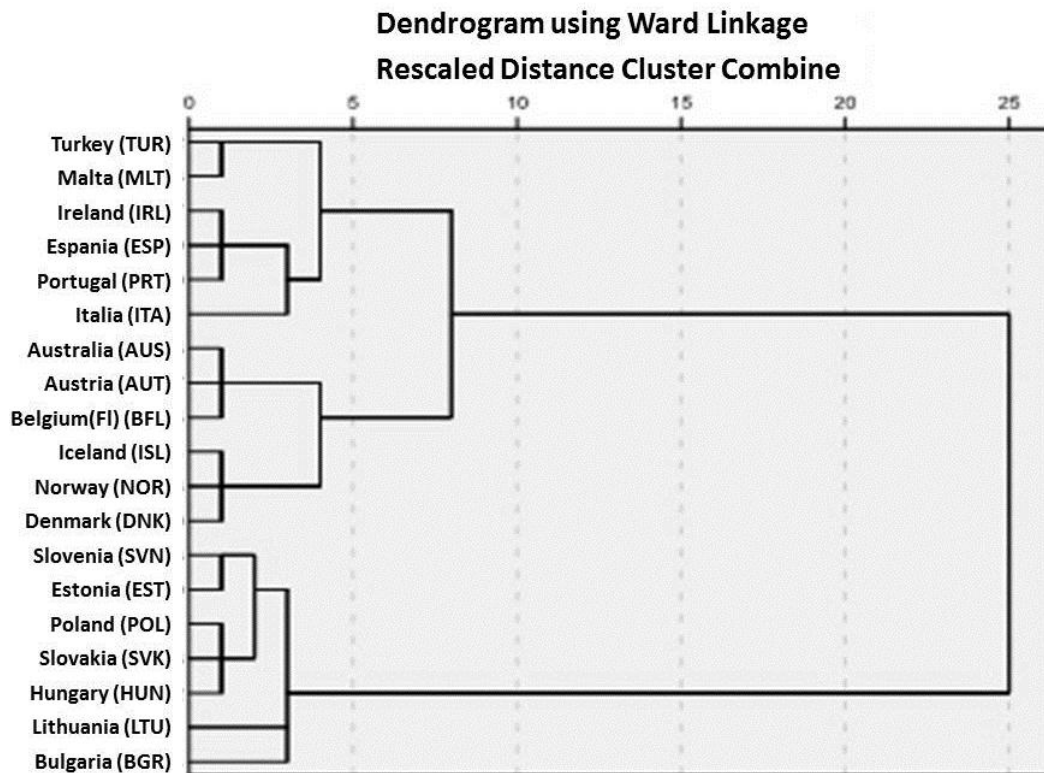
\*Significant at the 0.05 level (2-tailed); \*\*Significant at the 0.01 level (2-tailed).

COFI=Culture of observation, feedback and improvement;

WT=Working together;

PD=Professional development needs.

The hierarchical cluster analysis (HCA), conducted with the European countries (and Australia), supported the classification identified in the MDS in terms of geographical position (*Figure 3*). The HCA differentiated at the 2-cluster level between Eastern and Western Europe. The latter cluster is further divided into Nordic (Norway, Denmark, Iceland), Anglo/Germanic (Austria, Belgium (Flanders) and Australia), Latin (Spain, Portugal, Italy – albeit with Ireland), and Turkey/Malta forming a sub-cluster alongside the other mostly Mediterranean countries.

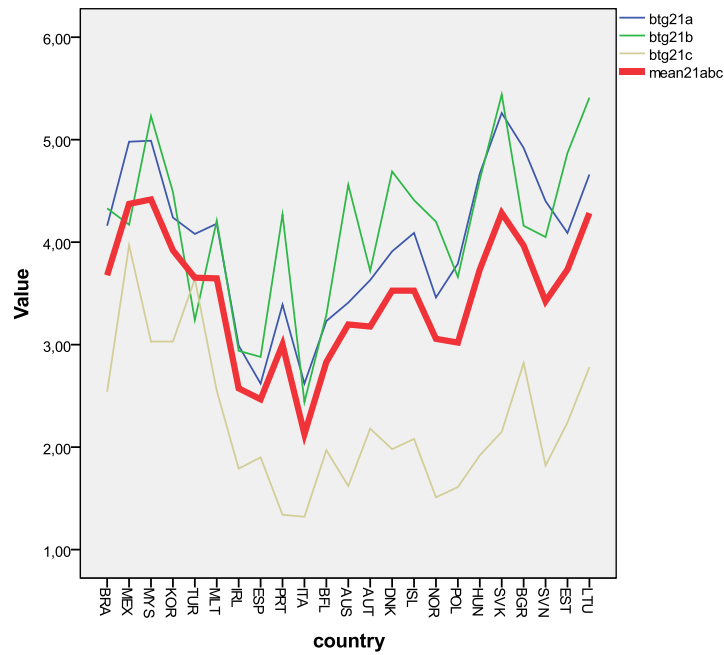


**Figure 3 – Hierarchical cluster analysis of countries, based on country scores on each of the 3 dimensions identified in the MDS.**

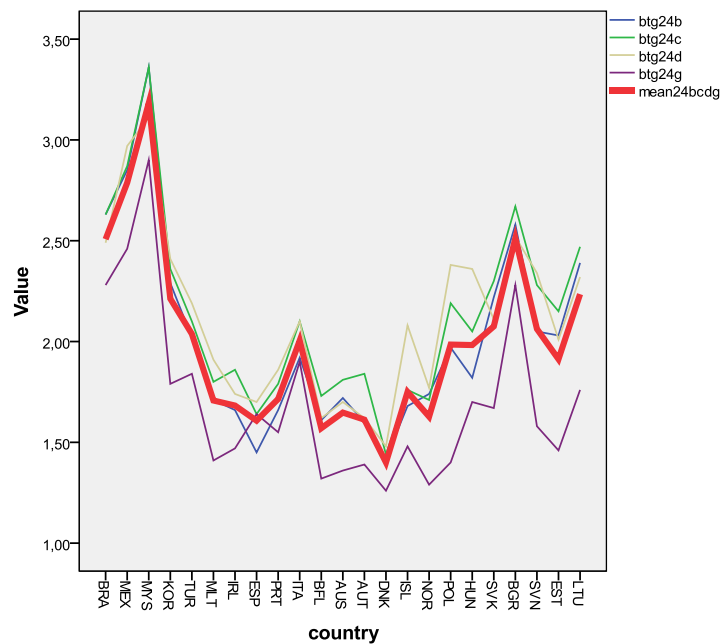
The MDS and HCA made it possible to group the countries in a manner reflecting their response patterns. This grouping is broadly consistent with geographical position. We now compare means and percentages of country clusters (and/or individual countries) for each of the 11 questions, at item level. Each question contains more than one item. Countries are arranged by country clusters, except the Latin-American (Brazil and Mexico) and Asian countries (Malaysia and Korea) which were not included in the cluster analysis. The clusters are shown in *Figures 2 and 3*.

### Teacher appraisal and feedback

*Figure 4* below shows that feedback is most frequent in the American/Asian countries and the Eastern-European countries. It is the lowest in the Latin-Mediterranean countries, notably in Italy. Feedback from an external individual or body (c) is however almost universally low, apart from America/Asian countries.

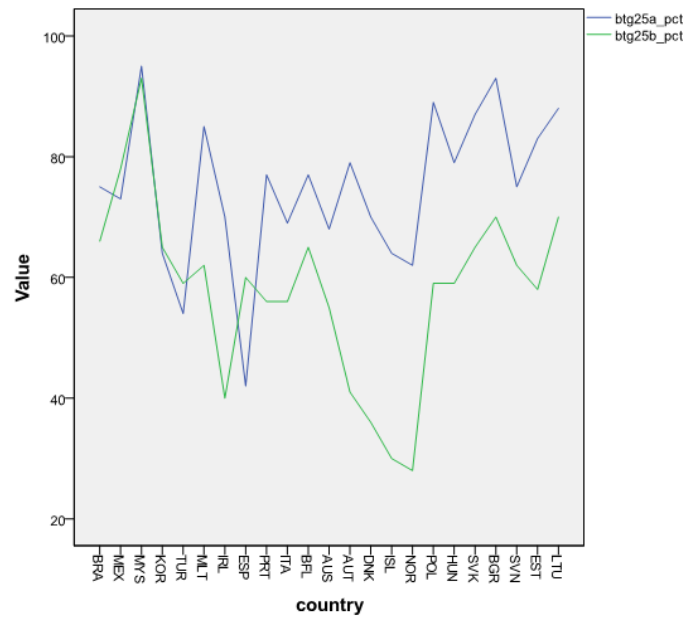


**Figure 4 – Frequency of feedback from (Q21):  
Principal (a), Other teachers or school management team (b),  
External individual or body (c).  
(1=never; 8=more than once per month).**



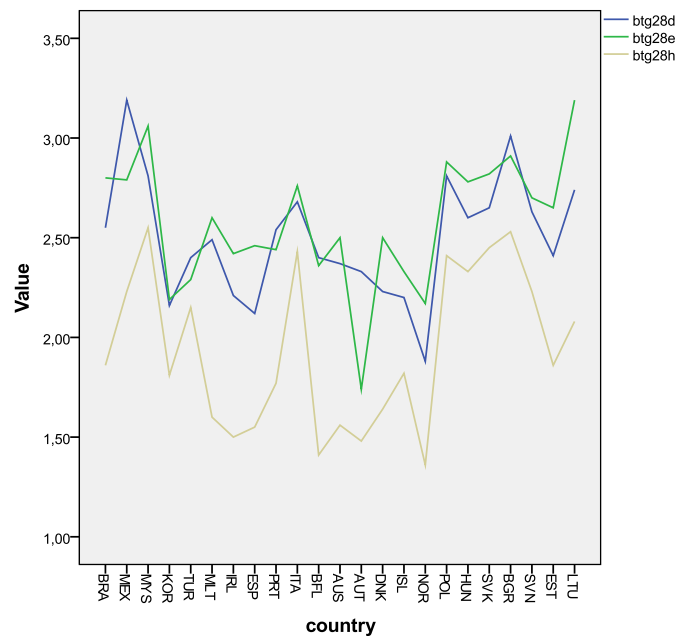
**Figure 5 – Extent to which appraisal/feedback has led to change (Q24):  
In knowledge and understanding of main subject field (b),  
of instructional practices in main subject field (c),  
development of training plan to improve own teaching (d),  
own teaching in multicultural setting (g).  
(1=no change; 4=a large change).**

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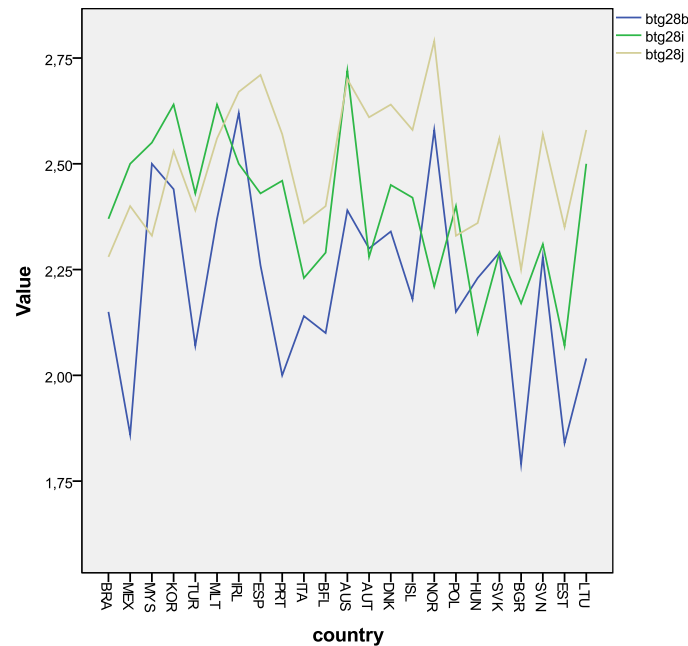


**Figure 6 – Percentage of teachers (Q25) who say that feedback contains judgment about quality of their work (a) and/or suggestions for improving aspects of their work (b). (1=yes; 2=no).**

The Nordic, Germanic and Mediterranean clusters do not report much change following appraisal (*Figure 5*). Change in the teachers' own teaching in a multicultural setting following feedback is smallest of all (mostly between "no change" and "a small change"), even in the Eastern European countries. "Moderate change" or more is however reported following feedback in the American/Asian group.



**Figure 7 – Teachers' beliefs about appraisal and feedback of teachers' work (Q28): Positive statements: Principal determines effectively whether teachers are performing well (d), a development plan is established to improve the work (e), innovation is rewarded (h). (1=strongly disagree; 4=strongly agree).**



**Figure 8 – Teachers' beliefs about appraisal and feedback of teachers' work (Q28).**  
**Negative statements: Poor performance is tolerated (b),**  
**review of teachers is largely done to fulfill administrative requirements (i),**  
**the review has little impact on the way teachers teach (j).**  
**(1=strongly disagree; 4=strongly agree).**

From *Figure 6*, it is apparent that feedback contains suggestions for improvement of teachers' work the least often in the Nordic countries. *Figure 7* shows that innovation in teaching is rewarded mostly in Eastern Europe, in Italy and Malaysia (h). It is largely in these same countries that teachers state that a development plan to improve teachers' work is established following feedback and appraisal (e). Teachers in these countries also believe that the principal uses effective methods to determine whether teachers are performing well or badly (d). The whole of Western Europe, with the exception of Italy, tends to be neutral or disagree with the positive statements on appraisal and feedback, and especially with the idea that innovation in teaching is rewarded.

The questions above correlated highly with Dimension 1.

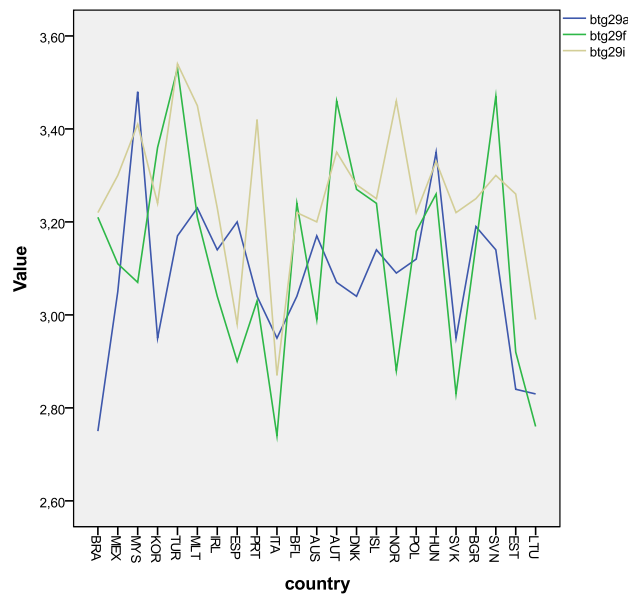
*Figure 8* shows items on appraisal and feedback that express negative views on the utility and effect of appraisal and feedback. Highest on these items are Malaysia, Korea, Malta and Ireland, and to a certain degree the Germanic and Nordic countries. Conversely, the Eastern European countries reject these assertions. However, overall, differences between countries are not great.

Overall, the data presented in the figures above (*Figures 4 to 8*), and assessed under the heading *Teacher appraisal and feedback* in the questionnaire, suggest that in Eastern Europe, Italy and Malaysia, a culture of effective assessment exists of teachers' work and feedback, leading to training plans for improved teaching.

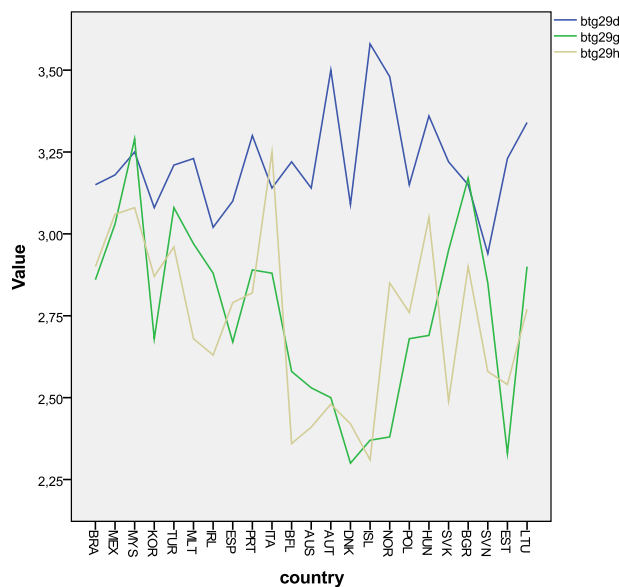
### Teaching practices, beliefs and attitudes

Responses to the items in *Figure 9*, that assess direct transmission in teaching, do not align strongly with the geographical clusters identified in the MDS and HCA. This is reflected in the rather jagged lines on the graph. Among the Nordic countries, the idea that students learn best by finding solutions themselves (f) is upheld in Denmark but rejected

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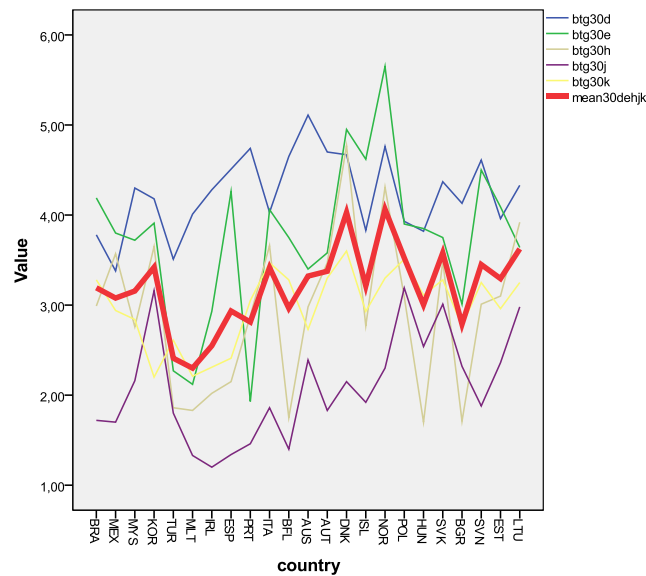
**Figure 9 – Beliefs on teaching and learning (Q29). Effective teachers demonstrate the correct way to solve problem (a), Students learn best by finding solutions on their own (f), Students should be allowed to think of solutions before teachers shows how (i). (1= strongly disagree; 4= strongly agree).**



**Figure 10 – Beliefs on teaching and learning (Q29). Teacher's role is to facilitate students' own inquiry (d), Instruction should be about problems with clear, correct answers, that students can grasp quickly (g), Teaching facts necessary (h). (1=strongly disagree; 4= strongly agree).**

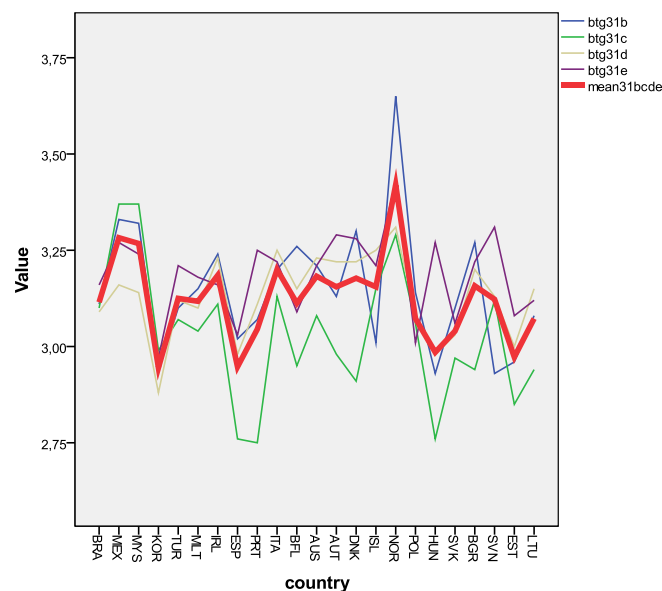
in Norway, with Iceland in between. Small differences exist between these countries on the other two items. *Figure 10* shows another set of items assessing constructivist or direct transmission ideas about learning. Items placing an emphasis on correct answers and teaching facts (g and h respectively) correlate most strongly with Dimension 1 of observation, feedback and improvement. The Nordic countries and Anglo/Germanic embrace the constructivist item (d), but reject the other two.





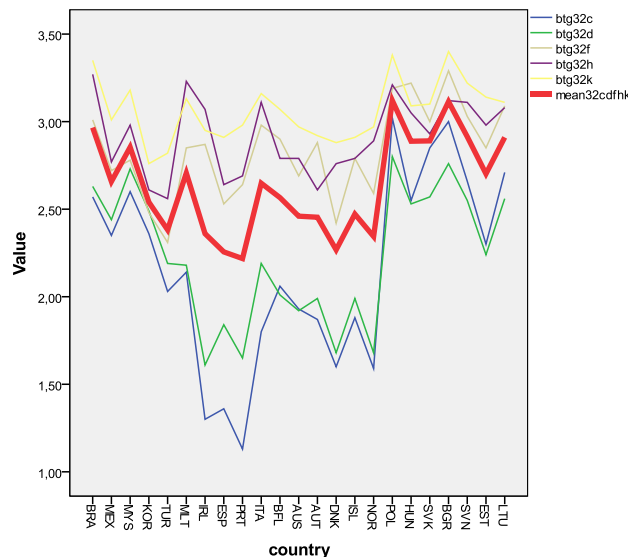
**Figure 11 – Teacher collaboration (Q30): Exchange materials with colleagues (d), Attend team conferences for age group (e), Teach jointly in same class (h), Observe others teaching and provide feedback (j), Engage in joint activities across different classes and age groups (e.g. projects) (k). (1= never; 6=weekly).**

Teacher collaboration appears highest in Denmark and Norway, but lowest in Turkey and Malta (*Figure 11*). Observing teachers' classes to provide feedback (j) is the least frequent overall. Only in Korea and Poland does it happen as often as once per year on average. This is also the only item on which Denmark and Norway are relatively low.



**Figure 12 – Self-efficacy (Q31): I am making a significant educational difference in the lives of my students (b), can make progress with most difficult and unmotivated students (c), I am successful with students in my class (d), I usually know how to get to students (e). (1=strongly disagree; 4=strongly agree).**

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**Figure 13 – Frequency of certain school management activities (Q32):**  
Principal or someone else in management observes teaching in classes (c),  
Principal gives teachers suggestions on how to improve teaching (d), Principal ensures  
teachers are informed about possibilities to update knowledge and skills (f),  
Principal and teacher work on school development plan (h), and ensure that education  
quality is a collective responsibility (k). (1=never; 4=very often).

The self-efficacy items (*Figure 12*) do not correlate highly with any of the three dimensions identified in the MDS. Therefore, the order of the countries on the x-axis does not reflect any pattern of self-efficacy responses between groups of countries. Self-efficacy is highest in Norway, but low in Korea, Spain, Estonia and Hungary.

*Figure 13* shows relatively little differences between countries and groups of countries on most items, while the two items assessing direct involvement of principal or management team as observers of classroom teaching (c) and/or providers of suggestions on how to improve teaching (d) are much lower in the Mediterranean, Western European and Nordic countries, while this is practiced more often in the Eastern European countries and Asian/American countries.

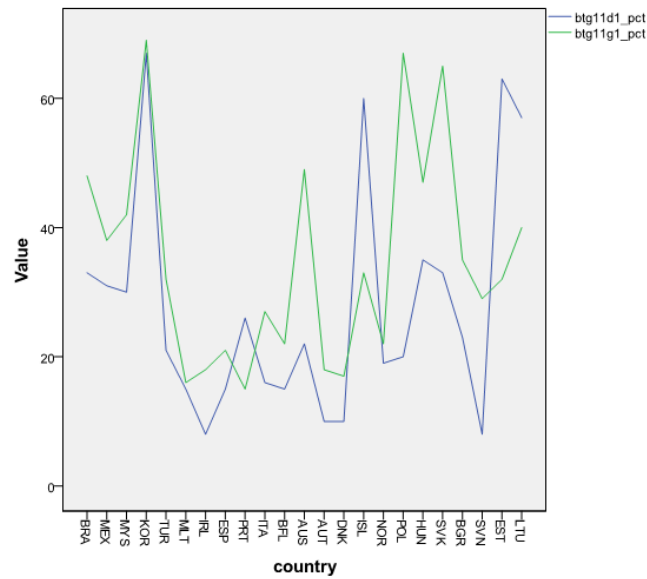
### Professional development activities and needs

Country means and percentages of items pertaining to professional development activities and needs are presented in *Figures 14 to 18*.

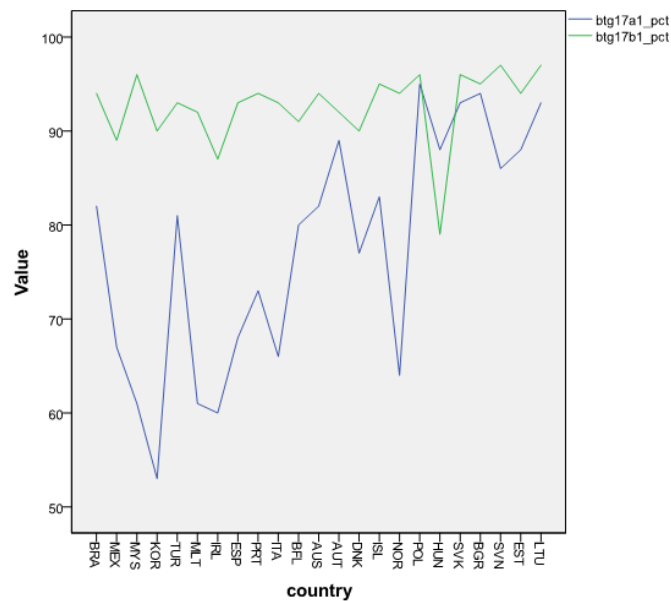
*Figure 14* shows that Korea, Iceland, Estonia and Lithuania stick outlead as greater practitioners of observation visits to other schools.

Korea, Poland, Slovakia, and to some extent Australia, have mentoring, peer observation and coaching as part of their formal school arrangements. With few exceptions, Western Europe is low on both practices, while non-European and Eastern European countries are relatively high on one or both practices.

*Figure 15* shows that engaging in informal dialogue with colleagues on how to improve teaching is practiced by around 90% per cent or more of teachers in each country (Hungary is slightly lower). Reading professional literature for the same purpose is most frequent in the East-ern European cluster, followed by Australia and the Germanic cluster. The Nordic countries (except Norway) are high on this item.



**Figure 14 – Percentage of teachers in each country (Q11) who have made observation visits to other schools (d) and/or taken part in mentoring/peer observation/coaching as part of formal school arrangement (g) during the last 18 months.**

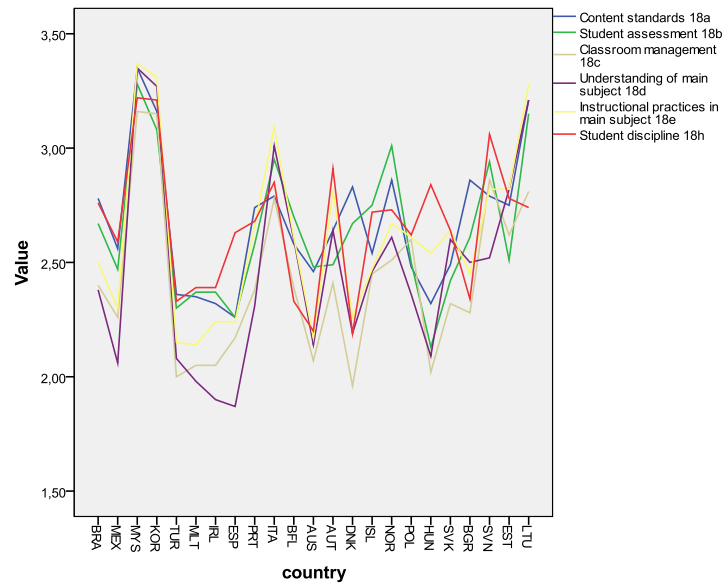


**Figure 15 – Percentage of teachers in each country (Q17) who engage in less formal professional activities: Reading professional literature (a) and/or informal dialogue with colleagues on how to improve own teaching (b).**

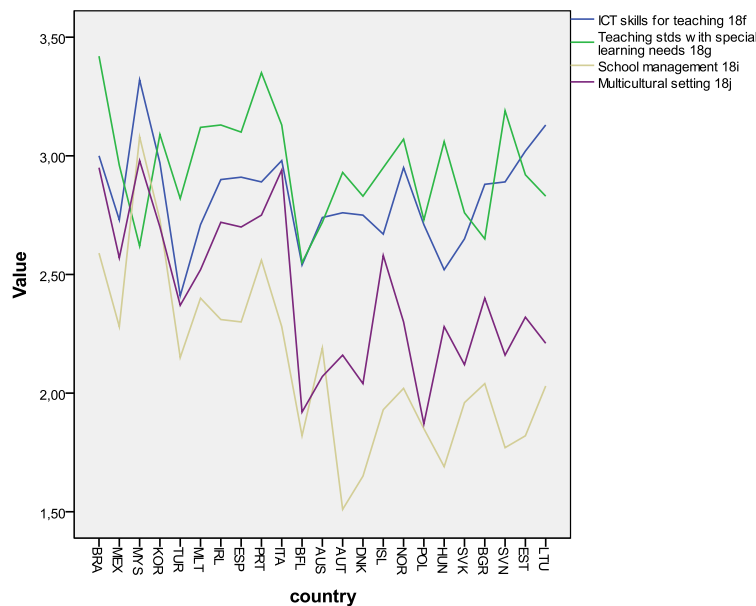
Figure 16 shows that the Asian countries express relatively high school-wide needs for professional development in all the areas that correlated with Dimension 1. The lowest needs are expressed in the Mediterranean countries (with the exception of Italy).

Figure 17 indicates that the need for professional development in teaching students with special needs is highest in the Mediterranean countries and Brazil. The need for more ICT skills and skills for teaching students with special learning needs is somewhat similar

across all countries. A difference is encountered between the Asian/American countries and Mediterranean on the one hand and the Anglo/Germanic, Nordic and Eastern-European clusters on the other, as the latter express much lower needs for professional development in the areas of multicultural teaching needs and school management. Within that group of countries however, Icelandic teachers express the greatest need for training for teaching in a multicultural setting.



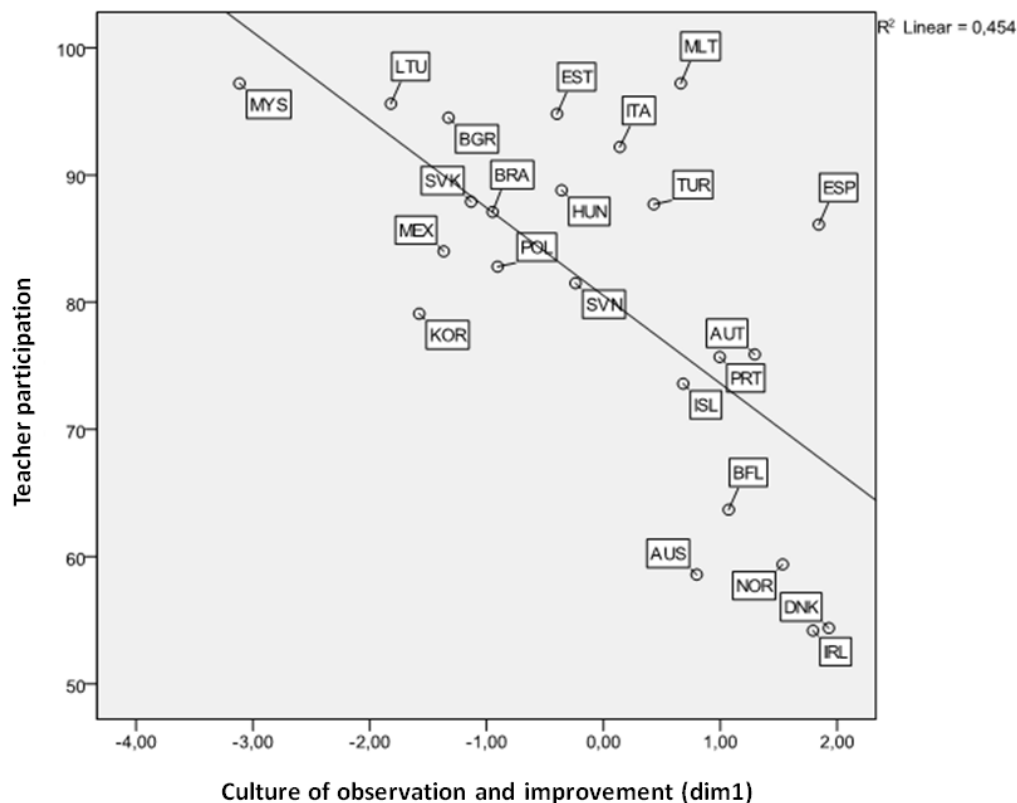
**Figure 16 – Areas of professional development needs (Q18):**  
Content and standards in main subject field (a), Student assessment practices (b),  
Classroom management (c), Understanding of main subject (d),  
Understanding of instructional practices in main subject (e),  
Student discipline (h). (1=no need at all; 4=high level of need)



**Figure 17 – Areas of professional development needs (Q18):**  
ICT skills for teaching (f), Teaching students with special learning needs (g),  
School management and administration (i), Teaching in a multicultural setting (j).  
(1=no need at all; 4=high level of need).

### Teacher participation rates

Country scores on Dimension 1 (assessing a culture of observation, feedback and improvement) were correlated with teacher participation rates in TALIS in each country (Figure 18). Pearson's correlation was  $r=-0.67$  indicating that participation in TALIS was highest in countries which show high involvement in the culture of observation, feedback and improvement. This is not surprising, and may serve as an indication of validity for the Dimension 1 scale, because willingness of a teacher to participate in TALIS can well be a manifestation of his/her adherence to the culture of observation, feedback and improvement, identified in Dimension 1. Participation is overall better in the Eastern European countries.



**Figure 18 – Relationship between scores on Dimension 1 assessing Culture of observation, feedback and improvement and participation rates in TALIS in each country.**

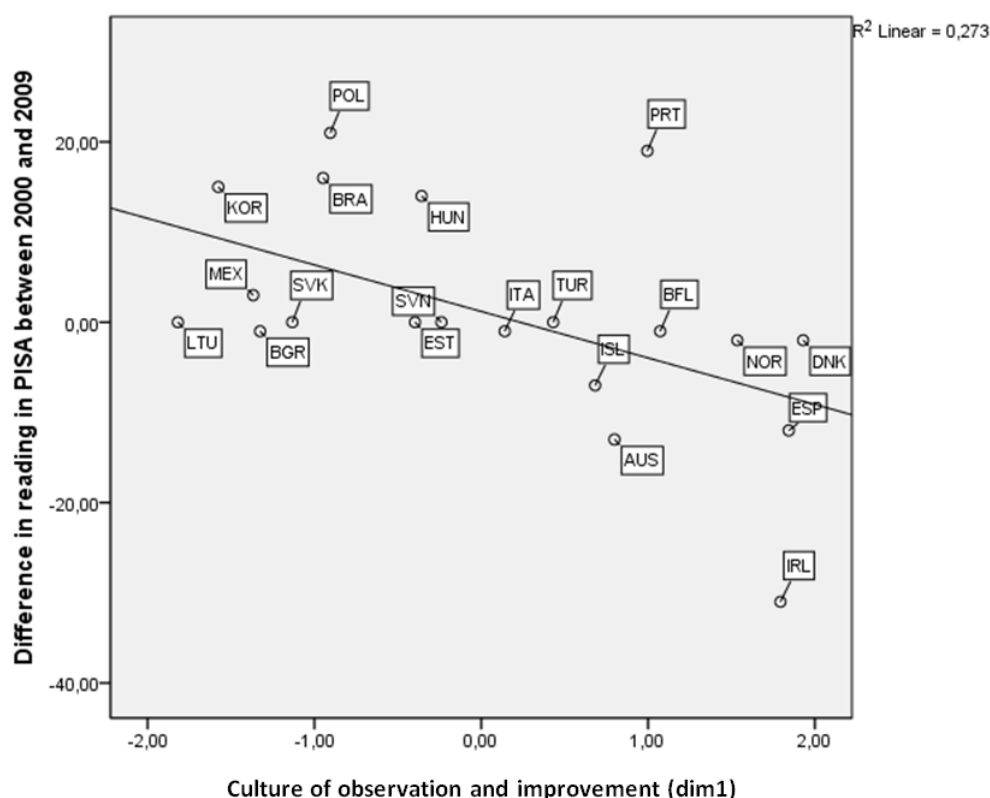
**X-axis: Left=Strong Culture of observation, feedback and improvement (COFI)**

**Right=Weak Culture of observation, feedback and improvement (COFI)**

**Y-axis: Top=Greater teacher participation; Bottom=Lower teacher participation**

### Progress in Reading Literacy (PISA 2000 to 2009)

Country scores on Dimension 1 were correlated with an indicator of Progress in Reading Literacy on PISA between 2000 and 2009 (Figure 19). The Spearman correlation between these variables was  $-0.62$ , indicating that countries that are high on COFI show greater progress in reading literacy over this period than countries that are low on COFI. Further study of the link between COFI and academic progress is needed, but this gives an indication that the culture of observation, feedback and innovation is affecting educational outcomes.



**Figure 19 – Relationship between scores on Dimension 1 assessing Culture of observation, feedback and improvement (COFI) and Progress in Reading Literacy in PISA between 2000 and 2009.**

**X-axis:** Left=Strong Culture of observation, feedback and improvement (COFI)  
Right=Weak Culture of observation, feedback and improvement (COFI)

**Y-axis:** Top=More progress in PISA from 2000 to 2009  
Bottom=Less progress in PISA from 2000 to 2009

## Summary and discussion

### Dimensions and country clusters

Multidimensional Scaling and Hierarchical cluster analysis were used to identify three dimensions as well as clusters of countries. These dimensions differentiated among responses to 53 items selected from the TALIS 2008 teacher questionnaire in the 23 participating countries.

The dimensions were interpreted by examining the correlations between the dimensions and the individual variables selected for analysis. The main dimension in a three dimensional solution was labelled *A culture of observation, feedback and improvement (COFI)*. Dimension 1 reflected the degree to which management observed and gave feedback on how to improve teaching in classes, whether the evaluation was perceived as useful and whether teachers trusted such an assessment of their own performance.

The first dimension distinguished mainly between Western European country clusters on the one hand and Eastern European (with American and Asian countries) on the other. A culture of feedback seems to be more prominent in Eastern Europe and Asia/America compared with other areas. For example, on the main dimension, teachers' responses in Nordic and Anglo/German countries as defined in the cluster analysis (*Figure 3*) are seldom characterised by suggestions based on observation by peers or principals on how to

improve aspects of their work, compared with teacher responses in Eastern European countries, where such observations are more frequent.

An indication of the validity of Dimension 1 identified (COFI) is the fact that it is associated with high participation rates in TALIS. Participation in TALIS may indeed be a manifestation of adherence to the culture of observation, feedback and improvement assessed by COFI. Another indication of its validity is reflected in its association with students' improvement scores in reading literacy at country level measured in PISA. Progress is greater in countries which are high on COFI. Future research should further explore the validity of this dimension in relation to achievement tests between and within countries.

The second and third dimension were labelled *Working together* and *Professional development needs*. Relatively few items correlated with these two dimensions. Korea and the Nordic countries are among the highest in *Working together* (Dimension 2), but in other countries teacher collaboration (with each other and with students) is relatively rare. The collaborative practices are associated with teachers rejecting beliefs that teaching is about problems with clear correct answers. This is important for emerging curriculum areas in which there may be a need for working together in areas such as sustainability education in which various viewpoints and forms of knowledge need to be considered. The third dimension correlated mostly with items reflecting *Professional development needs* in the areas of school management and administration and teaching in a multi-cultural setting.

An important finding of this study is that the composition of groups identified by the cluster analysis reflects geographical location, as seen in other studies (Olsen, 2005; Allik & McCrae, 2004). This suggests that the educational practices assessed in this selection of TALIS questions could be a reflection of fundamental cultural characteristics and broader regional differences.

It is worth researching why teachers in the Eastern European countries seem to expect less tolerance for poor performance than teachers in the other countries, and reflect on learning and work more than teachers in other country clusters. Reflection is a valuable part of professional development (Bredeson, 2003; Senge et al., 2000). Teachers in Eastern Europe work in schools in which feedback is provided that influences change in teaching practice.

### **Teacher efficacy and teaching practices**

Perceived collective efficacy builds on access to information, both remote and proximate. The results of this study seem to indicate that teachers in Western Europe do not work in a culture of observation to the same degree as teachers in Eastern European countries. Hence, they may not have opportunities to receive or use information and advice on their teaching from others. This raises concerns about whether teachers in Western European countries have access to the sort of information that might strengthen an understanding of the teaching task. This result is also interesting in the light of the analyses of teaching practices and learning communities by Vieluf, et al. (2012), where one of the variables in the learning community profiles relates to the deprivatisation of practice which is low in most countries but higher in a few countries such as Austria, Denmark, Australia, Korea and Portugal. This would indicate that although observations are perhaps more common in Eastern European countries, this practice might be more a part of monitoring rather than deprivatisation. It is worth exploring Dimension 1 (COFI) more closely in the light of the present study and the results presented by Vieluf, et al. (2012).

Mastery experiences are the most influential sources of information affecting perceived efficacy (Henson, 2001, Goddard, et al., 2004) and it may be difficult to assess mastery.



But, as Adams and Forsyth (2006) have argued collective efficacy is also built on information from the current or actual situation, the context. This means that principals, schools and school districts all have a part to play in providing sources of information on competence and opportunities for professional development, and this will be important in emerging curriculum areas.

Vicarious information about working in curriculum areas could be obtained from school visits or observing other teachers, either formally or as part of observations or especially joint teaching. Joint teaching activities are however not common (Vileuf, et al., 2012). More opportunities for working together would be important for work in emerging areas, especially if this type of learning is complemented by support for mastery, encouraging group competence and understanding the demands of the teaching task.

It could be said that the TALIS results raise worrying questions regarding teacher efficacy and emerging curriculum areas: What types of information from peers would teachers consider useful? How are these views related to the culture of the country? Here, further work on the COFI dimension is essential given that many school systems, such as those in the Nordic countries, require self-evaluation, the development of school curricula and supporting professional development. Is information which strengthens teaching being produced, in what manner, and is it being used? The actual and working age and levels of motivation of teachers in undertaking innovation and development are also important to keep in mind (Evers, Brouwers & Tomic, 2002; Jensen et al., 2012).

Characteristics of the ways in which teachers work together are reflected in the geographical clusters identified. Items placing emphasis on correct answers and teaching facts that correlate with the COFI dimension are rejected (relatively) by teachers in the Western countries. The latter groups of teachers seem though to have less access to information from their peers or management about their performance and do not receive many suggestions about how to improve their teaching. It is worth considering more closely some aspects of Dimension 2 *Working together* in the light of the results of Vileuf, et al. (2012) on pedagogical innovations.

The country clusters identified in the present study replicate broadly the clusters identified by Olsen (2005) on the PISA cognitive science literacy data. The countries in these two studies are of course not all the same, limiting the possibilities for direct comparison. Yet, the structures in both studies indicate that similarities and differences within and between country groups may be explained by broader underlying characteristics of these countries. In order to influence and change teachers' practices, it would be useful to examine further how they may be derived from broader political, socioeconomic, religious, linguistic and historical realities in each country and country group. These issues are worth investigating with the full set of TALIS responses, including the results from the questionnaire administered to principals, which were not under study in the present analysis.

It should not be forgotten that the TALIS results are self-reported. It is thought provoking that although some of the Western countries do not report a level of activities that would strengthen teacher efficacy they do report the highest levels of self-efficacy, of which Norway and Iceland are good examples. Does the relative absence of feedback lead to higher measures of self-efficacy and what implications does this have for perceived collective efficacy? Hargreaves and Fullan (2012, p. 93) have introduced the notion of 'decisional capital' which they say is the essential third ingredient in developing 'professional capital,' the other two being human capital and social capital. They claim that professionalism is the ability to make discretionary judgements, which itself is at the core of collective teacher efficacy.

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