Chapter 6

Key Findings and Policy Implications

This chapter summarises the findings and policy implications of this research. Although the patterns of teaching practices and participation in professional practice are strongly influenced by the specific interaction between traditions, culture and educational policy in each education system. Across systems, however, it is clear that high-quality instruction must surpass teacher-centred instruction: its vocation is to stimulate and challenge students. Student motivation is enhanced by both autonomy and social relatedness, as well as structured teaching and good classroom management. This report suggests that the main driver for advancement in teachers' professional practices lies with developing a large repertoire of classroom teaching practices and granting autonomy and isolation to co-operatively reflect pedagogical practice.

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Highlights

- High-quality instruction is reflected in the use of a variety of classroom teaching practices, allowing for both teacher-directed and self-regulated learning. Although this is seen in every country examined, only a minority of teachers reports a comparatively diverse and frequent use of classroom teaching practices.
- Theoretically, a professional learning community exists when all five aspects examined in this report are realised in a school or within a certain group of teachers. The results show this is not the case for all teachers. In many countries, basic forms of co-operation among staff are common, but participation in reflective inquiry and de-privatisation, where teachers work together on the core of their professional activities are much less common.
- Teachers who use more diverse teaching practices and who participate more actively in professional learning communities also report higher levels of self-efficacy, receive more feedback and appraisal on their instruction, and report being more involved in professional development activities outside of schools.
- While teachers in smaller schools were on average more likely to show diverse and frequent use of teaching practices, participation in co-operative practices that involve de-privatisation was more frequent in larger schools.
- Longer working hours was associated with diverse and frequent use of teaching practices and with participation in co-operative practices, suggesting that high-quality teaching and intensive forms of co-operative professional learning can be time-consuming.

In the globalised knowledge economy, education has gained significance both for the well-being of individuals and for the prosperity of whole societies. Apart from influences of the family and social background, it is especially teachers who shape students' learning environments and help them reach their intellectual potential. Thus, it is important for educational policy makers to understand and monitor educational processes in schools.

This report set out to describe the use of teachers' professional practices in different educational systems. The analysis has established profiles of classroom teaching practices and professional learning communities separately for the 23 countries that participated in TALIS 2008. It has also shed important light on the relationship between the profiles of professional practices and teachers, as well as school-level input and process variables. In the following sections, these findings are summarised in turn. Finally, conclusions and policy implications are discussed.

CROSS-NATIONAL COMPARISONS OF LATENT PROFILES OF PROFESSIONAL PRACTICES

Chapters 4 and 5 described profiles of classroom teaching practices and participation in professional learning communities separately for each of the countries that participated in TALIS 2008. Considerable cross-national differences in the profiles were observed, but also some similarities.

For classroom teaching practices, the profiles were based on factor scores for three dimensions: structuring, student orientation and enhanced activities. The latter two dimensions represent strategies rooted in socio-constructivist theories, such as self-directed and self-regulated learning, co-operative and problem-based learning, adaptive instruction, group discussions and project-based learning. In combination with structuring practices, such as stating learning goals, summarising the lesson and checking student understanding, they operationalise the three basic dimensions of instructional quality suggested by Klieme, Pauli and Reusser (2009).

Latent profile analysis based on these indicators identified three parallel profiles of classroom teaching practices within each of the countries. The respective profile lines did not cross. Rather, teachers had either high, medium or low means for each of the three scales. In other words, the distinctions in latent profiles are in level, not so much in kind. Hence, teachers within each of the countries can be distinguished along their overall frequency of using prescribed teaching practices rather than based on their specific preference for one type or another. The highest percentage of teachers was found in Profile A – the profile with the lowest means for all three classroom teaching practice dimensions – and the lowest percentage in Profile C, or the profile with the highest means for all three dimensions. Hence, only a minority of teachers constitute the profile that reports a comparatively diverse and frequent use of classroom teaching practices. These findings were consistent across all education systems that participated in TALIS 2008.

In contrast, the shape of the profiles varied considerably among countries. Four groups of countries emerged from the data are:

- In Belgium (Fl.), Ireland, Italy and Malta, all three profiles had above average scores in structuring and relatively low scores in student orientation and enhanced activities.
- In Austria, Bulgaria, Hungary, Lithuania, Poland, the Slovak Republic and Slovenia, we found a peak for student orientation.

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- Malaysia and Turkey, on the other hand, had comparatively high levels of enhanced activities and student orientation.
- Finally, a peak for enhanced activities was observed in Brazil, Denmark, Iceland, Korea, Mexico, Norway and Spain.

Australia, Estonia and Portugal did not show any specific focus, as they have fairly similar means for all scales.

Thus, the ratio of frequencies of one practice compared to the others seems to be specific for certain geographical regions. An interesting finding is the similarity between Scandinavian countries and non-European countries, which both showed peaks in reported enhanced activities. Presumably, similar profiles with a focus on enhanced activities can be ascribed to different motives and country-specific developments.

Profiles of co-operative practices in schools were based on six items representing the five central features of professional learning communities: co-operation, shared vision, a focus on learning, reflective inquiry and de-privatisation of practice (Hord, 2004; Kruse, Louis, and Bryk, 1995).

Two types of co-operative hands-on activities were distinguished: the exchange of material, and teaching jointly as a team. While the former can be expected to be common in most countries, teaching jointly as a team requires a higher level of co-ordination and reflection. All other characteristics were represented by a single item.

A shared vision refers to common goals and a common mind-set to work for them. The questionnaire asked about staff meetings as one setting to develop such a shared understanding.

A focus on student learning implies a regular evaluation of whether this goal has been achieved, which can be realised through systematic assessments.

Reflective inquiry takes place when teachers have detailed and critical discussions about teaching practices and their experiences in classrooms. Professional learning activities within schools, such as team supervision, are one setting where such reflection can take place.

Finally, de-privatisation of practice implies that teachers observe each other, give feedback, and act as mentor, advisor or specialist (Lomos, Hofman, and Bosker, 2011).

According to theory, a professional learning community exists only when all five aspects are realised in a school or within a certain group of teachers. Latent profile analysis shows this is not the case for all teachers. In fact, some of the practices are reported to be used infrequently. Moreover, in contrast to the profiles of classroom teaching practices, the curves for professional learning communities intersect in a number of countries. Thus, for participation in professional learning communities, the differences among profiles are not only in level, but also in kind.

Results also showed that the profiles were mainly separated by three of the six items, while there was less variation among profile groups with regard to the other practices. In 20 of the 23 countries, the main differences among profiles were found with regard to team teaching, a rather sophisticated form of teacher co-operation. For half of these countries, there was also considerable variation in the average frequency of observation visits with mutual feedback

about instruction. In many of the countries, the profiles were further defined by reflective inquiry in the context of school internal professional learning activities; for example, team supervision.

Thus, the latent profiles could be distinguished mainly through practices that involve de-privatisation and reduction of autonomy with regard to the core of teachers' everyday work: instructing students in classrooms. There was, however, one exception. In Korea, the profiles were rather separated by differences in the frequency of attending staff meetings in order to discuss the vision and the mission of the school. This is in line with previous research showing that team-teaching and classroom observations have a longer-standing tradition in East Asia than in Europe or the United States (*e.g.* Paine and Ma, 1993; Stigler and Hiebert, 1999).

REGRESSIONS OF LATENT PROFILES ON TEACHER- AND SCHOOL-LEVEL VARIABLES

In addition to the profile shape, the prediction of profile membership by several teacher- and school-level characteristics and processes was analysed. The literature review in Chapter 2 suggested associations of classroom teaching practices with school leadership and co-operation among staff at the school level, and with professional development, feedback and appraisal, beliefs about the nature of teaching and learning, and teacher self-efficacy beliefs at the individual teacher level. Professional learning communities were expected to correlate with school size, autonomy, management and with a culture of feedback at the school level.

We used all predictors in regressions of both profiles, expecting the former group of variables to be more closely associated with classroom teaching practices and the latter to better predict participation in professional learning communities. By and large, the results confirmed our hypotheses. The profile that reports the most frequent use of all three dimensions of classroom teaching practices also agrees more with constructivist beliefs about the nature of teaching and learning, holds stronger self-efficacy beliefs, reports a more frequent attendance of professional development activities outside of school, and receives feedback and appraisal more often.

Similar effects were observed for professional learning communities: only constructivist beliefs were shown to be less relevant for this kind of practice. Classroom teaching practices were further shown to be more subject-specific than were co-operative professional learning activities. Fewer significant effects were observed at the school level, especially for classroom teaching practices. Interpretation of these associations is limited by the cross-sectional design of TALIS that does not allow for causal inferences. Nevertheless, a few conclusions can be drawn.

Associations with professional development, as well as those with feedback and appraisal, suggest that teachers using all dimensions of classroom teaching practices more frequently and who are more involved in collaborative practices that reduce autonomy are also more involved in professional learning outside of schools and receive more systematic advice. Either these programmes help teachers establish co-operative forms of professional learning within schools and provide instrumental support for improving instruction, or teachers who use more diverse teaching practices and co-operate more within schools are also more inclined to seek additional external support for improving their professional practice. This raises the question whether programmes that support teachers' professional learning reach those most in need

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of them. Given the survey nature of the data, however, it cannot be ruled out that the group of teachers with the highest means are simply those with the strongest tendency to provide socially desirable answers.

At the school level, school size, attendance of teachers and the parents' socio-economic background all predicted the average probability to be in profiles with higher average means for different indicators of professional practices. While teachers in smaller schools were on average more likely to be in profiles with higher reported frequency of classroom teaching practices, profile membership for participation in co-operative practices that involve de-privatisation was positively associated with school size. Thus, an average school size may be optimal if the aim is achieving both a culture of professional learning and diversification of classroom teaching practices. The only exceptions were Australia and Austria, where a positive relation with school size was found for both profiles, and Mexico, where more diverse classroom teaching practices and the willingness to give up autonomy and work co-operatively were both higher in smaller schools.

For working hours, positive regression coefficients were observed predicting membership in both profiles. This stresses that high-quality teaching and intensive forms of co-operative professional learning can be time-consuming.

Positive regression coefficients for the socio-economic background suggests that teachers actively try to engage students growing up in non-academic environments by using a wide repertoire of practices, and it supports the claim that adapting to student characteristics is an inherent aspect of pedagogy.

Interestingly, the parents' educational background had dissimilar effects on the average participation in professional learning communities internationally: while a higher average education of parents is associated with an increase in the schools' average odds of being in profiles with high reported frequencies for participation in professional learning communities in Australia, Austria, Belgium (Fl.), Denmark, Ireland and Italy, the opposite was found in Brazil, Norway, Portugal and Spain. This may suggest that in the former countries, teachers working under more difficult conditions rather tend to support each other while, in the latter, teachers in more advantaged environments showed a higher level of co-operation. In most Eastern European countries as well as in Korea, no effect of the student composition on teacher collaboration was observed.

In contrast, neither school autonomy nor school leadership had a significant effect in more than a handful of countries. Previous research had suggested that school autonomy, especially with regard to the selection of teachers, would facilitate teachers' co-operation (Louis, Marks, and Kruse, 1996). Moreover, school autonomy is also considered an important factor in PISA reports on successful schools (OECD, 2010b). This could not be supported with TALIS data, however.

Longitudinal research examining the process of developing a professional learning community internationally may help explain this finding. The expected positive effect of instructional leadership on both classroom teaching practices (*e.g.* Bryk *et al.*, 2010) and participation in professional learning communities (*e.g.* Leithwood and Louis, 1998; Louis and Kruse, 1995; Hord, 1997) was also not observed. This could suggest either that leadership is less relevant for teachers' professional practices than theoretically expected or that the non-significance is

attributable to the TALIS design. International longitudinal and experimental studies are needed to clarify the reason for the unexpected results.

Individual teacher background variables may be less malleable through educational policy than school policies and thus not a relevant starting point for policy makers. Nevertheless, the effects of teacher background on professional practices shown in Appendix C are interesting from a research point of view. First of all, we observed considerable gender effects. For future studies it would be worthwhile to examine whether these differences influence the actual quality of instruction or whether, on the contrary, they are functional for producing similar student outcomes under different conditions.

Gender effects were also found for participation in professional learning communities, but they vary among countries. Based on previous research (Kruse, Louis, and Bryk, 1995), we had expected more women than men to participate often in professional learning communities. This hypothesis was confirmed in seven countries, but in eight countries we observed the opposite.

Other than gender, significant coefficients were found in 10 countries for regressions of profile membership regarding classroom teaching practices on teaching experience. These suggest that change might be taking place, with younger teachers being prepared differently during initial education and learning more diverse instructional methods.

Profiles of classroom teaching practices were, furthermore, subject-specific. While reading teachers were most likely to belong to the profile with the highest means, mathematics teachers were the least likely and science teachers were in between. Thus, reading instruction appears more variable in terms of teaching practices than science or mathematics instruction.

Significant associations of classroom teaching practices with constructivist beliefs about the nature of teaching and learning replicate previous findings. Beliefs are considered to guide teachers' professional practice (*e.g.* Leuchter, Pauli, Reusser and Lipowsky, 2006). Therefore, the findings suggest it might also be worthwhile to address beliefs in actions aimed at improving teaching practices.

Generally, the results confirm that teachers' beliefs are more closely related to their classroom teaching practices, and that school-level conditions are more relevant for professional learning communities. Thus, we could replicate previous research on the nomological network of teachers' professional practices at the teacher level, but only partly for the school level. Most of the associations can – at least to a certain extent – be generalised across countries. The effect sizes vary cross-nationally, but the pattern of associations is consistent.

SUMMARY

TALIS provides data on two foci of school development, with considerable variation within countries: classroom teaching practices and participation in professional learning communities. These can be considered prime candidates for further innovation in schools.

High-quality instruction is often defined as the use of a variety of classroom teaching practices, allowing for both teacher-directed and self-regulated learning. As described in Chapter 2, this definition is substantiated by philosophies of education and empirical research: constructivist philosophies of teaching and learning suggest that students need diverse opportunities to

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develop their understanding of the subject matter and to find solutions to problems on their own. This requires teaching practices that go beyond teacher-centred instruction, that are cognitively activating (Mayer, 2004) and that confront students with challenging content (Brown, 1994).

Student motivation and other affective outcomes may be best addressed by supporting autonomy, competence and social relatedness (Deci and Ryan, 1985). But these dimensions are insufficient for learning. Research suggests strong effects of well-structured instruction and good classroom management on cognitive and – probably to a lesser extent – non-cognitive outcomes (Creemers and Kyriakides, 2008; Harris and Chrispeels, 2006; Hopkins, 2005; Scheerens and Bosker, 1997). Thus, a combination of different practices is most promising for supporting both cognitive and non-cognitive student development: (a) enhanced activities including challenging tasks and content, (b) student-oriented, supportive practices and (c) teacher-directed practices that provide structure and clarity.

Findings of the present report show that this conception of instructional quality as the diverse use of practices can, in fact, be identified across all participating countries: profiles of classroom teaching practices were not defined by preferences for one dimension of practices over the other, but could rather be separated along the average reported frequency for all of the three dimensions. A small group of teachers in each country reports a more frequent use of all three practices, while two larger groups report lower ones.

The latent profile with the highest means also reported higher self-efficacy, reported receiving more feedback and appraisal on their instruction, and reported being more involved in professional development activities outside of schools. Thus, the conception of instructional quality as diversity of practices also reflects teachers' self-perception.

For educational policy and teacher education, the findings support calls for a good balance among the three dimensions of classroom teaching practices; that is, structuring, student orientation and enhanced activities. Propagating solely the use of enhanced activities would not match the complexity of teaching and learning processes. Rather than promoting a single type of activity, it is advisable to regularly evaluate whether the ratio of structuring, student orientation, and enhanced activities is optimal.

The second focus of this report was on professional learning communities. The concept was developed during the 1990s and has received considerable attention. Central features of professional learning communities are (a) co-operation, (b) shared vision, (c) a focus on learning, (d) reflective inquiry and (e) de-privatisation of practice (Hord, 2004; Kruse, Louis and Bryk, 1995). Practices that help to realise these features within a school exist across different education systems, as this report shows.

In many countries, developing a shared vision and a focus on student learning, but also the exchange of materials, as a fairly basic form of co-operation among staff is similarly common in most profiles. Variation within schools was mainly found with regard to participation in reflective inquiry and de-privatisation, where teachers work together on the core of their professional activities.

The finding of stronger within-school differences on these practices replicates previous research showing that practices involving a reduction of autonomy are more difficult (less common)

than a simple exchange of materials or co-ordination in the preparation of instruction (*e.g.* Steinert *et al.*, 2006). It is also in line with studies in school development that advocate the improvement of instruction (*e.g.* Bryk *et al.*, 2010).

Empirical support for the value of de-privatising practice comes from the finding that teachers who report being involved in such activities regularly to also have higher self-efficacy. However, it remains open in which direction this effect operates.

Ultimately, evaluating the effectiveness of the profiles of classroom teaching practices and participation in co-operative professional learning activities would require more information on students' views of their teacher's instruction as well as their cognitive and non-cognitive outcomes – preferably from longitudinal or even experimental studies. Currently, there is too little knowledge about the effects of educational processes on outcomes on a large scale, and especially about their cross-national comparability. One reason is that international surveys like TALIS and PISA have a cross-sectional design. Thus, they can describe instruction and examine correlations with background characteristics and other processes and outcomes at the classroom, school and country level. They cannot, however, examine effects of instruction on students' development.

Apart from conclusions about patterns of teachers' practices and their nomological networks, the results also allow for evaluating the appropriateness of the method used. While factor analysis and item response theory scaling require items to be ordered on a single continuum that is obligatory for all participants, latent profile models allow for modelling heterogeneity within the population (Eid, Langeheine and Diener, 2003). Like latent class and cluster analysis, latent models describe typologies instead of dimensions. Classification approaches have been used in previous studies examining both types of professional practices. For example, Kobarg *et al.* (2011) identified three profiles of science teaching: a blended pattern in which all types of scientific enquiry are frequently encountered, a focused pattern with ample opportunity for scientific enquiry but less frequent involvement in experiments, and a restricted pattern in which students report being seldom involved in scientific inquiry. For professional learning communities Lomos, Hofman and Bosker (2011) conducted cluster analysis and found four clusters. The first cluster had the highest scores for reflective dialogue, collaborative activity, shared sense of purpose and a focus on student learning. A second cluster was identified with relatively high scores for de-privatisation of practices and collaborative activity, and a third had high scores only for collaborative activity. The fourth cluster showed lower scores for all of the five characteristics.

These studies suggested that latent profile analysis may be more adequate for describing teachers' professional practices than a dimensional model. With TALIS data, we could only partly confirm this hypothesis. For classroom teaching practices we rather observed parallel profile lines, suggesting that the teachers' responses within a school vary quantitatively rather than qualitatively. This may, however, be because we analysed a second order model based on three factor scores instead of using single items. Teachers within a school may vary more with respect to specific practices than to dimensions of practices. For professional learning communities, on the other hand, we observed intersecting profile lines. Thus, for this construct, latent profile analysis better represents the observed heterogeneity in patterns of practices within countries.

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The findings of this study also bear upon the cross-national comparability of teachers' professional practices. Previous research had suggested that it is not so much the instructional strategies that vary among countries, but rather the sequencing of lessons (Stigler and Hiebert, 1999) and their deep structure (Mok *et al.*, 2001). Therefore, rather small cross-national differences in the profiles of the use of self-reported classroom teaching practice were expected. There is little cross-national research examining professional learning communities. Thus, the analyses were rather exploratory for this construct.

The results of multilevel latent profile regressions suggest some similarities in the structure and function of both types of practices. Across countries, three profiles were identified for classroom teaching practices that differed rather in level than in type. Three or four profiles were observed for professional learning communities that were differentiated mainly by three items: classroom observations, teaching jointly as a team and participating in school-internal professional development activities. In the vast majority of countries, profile membership regarding both types of practices was further associated with professional development activities outside of schools, receiving feedback and appraisal for innovative teaching, and teacher self-efficacy.

At the same time, we also found considerable differences. First, the shape of the profiles varied among countries. For classroom teaching practices some countries showed peaks for structuring, others for student orientation, and again others for enhanced activities. Profile shapes for participation in professional learning communities varied even more fundamentally among countries. The grouping for profiles of participation in professional learning communities is also different from that for classroom teaching practices and is not linked to geography. Thus, the structure of both types of professional practices is clearly country-specific, which limits their comparability. Comparing profile sizes across countries and building an overall latent profile model would have required equivalence of the number of profiles and of the profile-specific means. Concluding that the typological structure is similar would also have required similar profile sizes (Eid, Langeheine and Diener, 2003).

Analogously, equivalence can be tested for factor models. Only when the factor structure and loadings are equivalent can correlations be made across countries, and a comparison of mean scores also requires equal intercepts (Fontaine, 2008; Vandenberg and Lance, 2000). Analyses of cross-cultural equivalence of factors of classroom teaching practices and collaboration among staff are described in the TALIS Technical Report (OECD, 2010a). Equivalence of factor loadings was established, but intercepts were found to vary. Hence, correlations can be compared across countries, but mean score comparisons are hard to interpret (OECD, 2010a). Findings reported here suggest that latent profiles are not more comparable. This further suggests that country-specific conditions and traditions are responsible for the differences in profiles of practices. It remains open whether the higher visibility of enhanced activities and higher average frequencies for different co-operative activities in some countries reflect higher innovativeness, different pedagogical traditions or other practical reasons, *e.g.* larger class sizes that require students to work more self-reliantly. Clearly, the results reinforce previous calls for more culture-specific definitions and analyses of innovation in education (*e.g.* Scheerens, 2001).

What do these results tell us about innovation in education? In Chapter 2, it was argued that cross-sectional survey data are not appropriate for discovering radically new ideas in education,

nor for examining the process of innovation. Rather, they are better suited for an implementation check; that is, for determining whether rather recent developments in educational research and policy have found their way into teachers' everyday practice. But even here, caution is advised to consider national and regional traditions and cultures when evaluating the profiles. Thus, we mainly leave it up to the reader to decide whether or not the observed practices suggest that policy foci are well-implemented.

Under the premise that professional practices based on socio-constructivist theories examined by TALIS are considered innovative and beneficial for student learning and non-cognitive outcomes, the results suggest that the main driver for advancement is developing a large repertoire of classroom teaching practices as well as taking collective responsibility and working co-operatively to improve instruction. Teachers who are less involved in such activities should especially be the focus of policy and on-site intervention.

CONCLUSIONS

- Multilevel latent profile regression analysis served to characterise profiles of classroom teaching practices and professional learning communities and their nomological networks in 23 countries.
- Across all countries we found three parallel profiles of classroom teaching practices. These were not defined by preferences for one dimension of practices over the other, but could rather be separated along the average reported frequency for all of the three dimensions. Qualitative differences of profile shapes were, however, observed among countries.
- For participation in professional learning communities, three or four latent profiles were identified. Differences were both quantitative and qualitative. Profiles were separated mainly by three items that all measure co-operative practices involving a reduction of autonomy. Only in the Korea was this pattern not observed; there, it was rather staff meetings for discussing the vision and mission of the school that define profiles. Generally, cross-national variation in profile shapes was even stronger than for classroom teaching practices.
- Profile membership regarding both latent profiles was associated with external professional development, feedback and appraisal on innovation in instruction, and self-efficacy beliefs. This pattern was observed cross-nationally. School-level effects are, on the other hand, significant only in individual countries.
- The TALIS design does not allow for causal inferences. Ultimately, an evaluation of the teaching practices profiles and participation in co-operative professional learning activities as effective would require additional information.
- The findings suggest that:
  - The structure of the profiles is country-specific. Thus, patterns of self-reported professional practice are strongly influenced by the specific interaction between traditions, culture and educational policy in each education system. This variation limits the cross-national comparability of profiles and their correlations with other variables.

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– Teachers vary considerably within schools with regard to their patterns of professional practices. For participation in professional learning communities, types of teachers with preferences for different practices were identified. Latent profile analysis is more appropriate for modelling this within-country heterogeneity for patterns of participation in professional learning communities, while factor or IRT (item response theory) models may serve well for scaling classroom teaching practices.

– Latent profiles are not more comparable across countries than are factor models.

– Under the premise that professional practices based on socio-constructivist theories examined by TALIS are considered innovative and beneficial for student learning and non-cognitive outcomes, the main driver for advancement in teachers' professional practices lies with developing a large repertoire of classroom teaching practices and granting autonomy and isolation to co-operatively reflect pedagogical practice.

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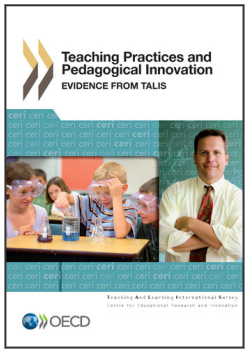

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