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Reflective and Inquary Thinking in Education. Aspects to consider in teacher education

Pensamiento reflexivo e investigador en educación. Aspectos a tener en cuenta en la formación del profesorado

Fernández-Fernández, Samuel[(1)]; Arias-Blanco, José-Miguel[(1)]; Fernández-Alonso, Rubén[(1) (2)]; Burguera-Condon, Joaquín[(1)] & Fernández-Raigoso, Marcelino[(1)]

(1) University of Oviedo (Spain) (2) Department of Education and Culture, Asturias (Spain)

Abstract

Training teachers as reflective practitioners and researchers should be a priority for an educational system that seeks to improve their students in managing complex information and solving problems creatively and divergently The reflective educator, as perceived by the Spanish teachers participating in TALIS, has been distributed on a scale or TRI index that allows us to show the frequency of participation in educational activities that facilitate a reflective professional development (DPR). Thus we see that half of the sample believes that his professional development includes occasionally training activities of reflective character. Identified by multilevel analysis, the personal and school factors associated with the reflective teacher educator profile, correspond to an individual attribute but linked to a collaborative network for training teacher around a school center with instructional leadership and evaluative control. This means for teachers more dedication and intensity, but also results in a self-perception of professional effectiveness and control over the processes of teaching and learning using with their students. DPR index is shown as consisting in the representation of a teaching profile that favors the effectiveness of classroom processes. According to the situation of Spain in estimating the DPR index, we consider of interest to evolve the current model of initial and continuing teacher education towards an approach that enhances the reflective and collaborative research capabilities of our faculty and students.

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Resumen

Formar al profesorado como profesionales reflexivos e investigadores debe ser una prioridad para un sistema educativo que busca la mejora de su alumnado en el manejo de información compleja y la resolución de problemas de forma creativa y divergente. El educador reflexivo, tal como es percibido por el profesorado español que participa en el estudio TALIS (OECD, 2014), ha sido distribuido en una escala o índice TRI que permite mostrar la frecuencia de participación en actividades formativas que facilitan un "Desarrollo profesional reflexivo" (DPR). La mitad de la muestra considera que su desarrollo profesional incluye actividades formativas ocasionales de carácter reflexivo. Se identifican, mediante análisis multinivel, los factores individuales y de centro asociados al perfil docente de educador reflexivo, que se corresponden con un atributo individual vinculado a una formación en red o de colaboración docente en torno a un centro con liderazgo pedagógico y control evaluativo. Esto supone para el docente una mayor dedicación e intensidad, una autopercepción de efectividad profesional y dominio sobre los procesos de enseñanza-aprendizaje que utiliza con su alumnado. El índice DPR se muestra consistente en la representación de un perfil docente que favorece la efectividad de los procesos de aula. Por la situación que presenta España en la estimación del índice DPR, consideramos de interés hacer evolucionar los modelos de formación inicial y continua del profesorado hacia un enfoque que potencie las capacidades reflexiva, investigadora y colaborativa de nuestro profesorado y estudiantes.

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Autor de contacto / Corresponding author

Burguera-Condon, Joaquín Departamento de Ciencias de la Educación. Universidad de Oviedo (Spain).
burguera@uniovi.es

Conclusions from international diagnostic evaluations of the educational performance of students have shown the need to make changes in the variables that most affect learning. They likewise show that professional teacher training is one of the main issues that need to be addressed.

Improvement in educational results requires changes in teaching and therefore it is worth commencing this topic by reviewing the results of research on the factors with the highest influence on performance. Hattie (2003) stated that the main sources of variance can be divided into six factors. First, what students contribute personally to the learning process, i.e. their ability, with an influence of 50%. Second, teachers, who have an influence of 30%. Third, influencing factors at home, measured by the level of expectations and family support, which contributes some 5 to 10% of the variance. The characteristics of the school, such as class size and available resources, and the influence of fellow students, put into practice in a positive manner through co-teaching, and in a negative manner via problems of co-existence, contribute in a similar way to the aforementioned factor with 5 to 10%, respectively.

Therefore, teachers, with an influence of 30%, constitute the area in which research suggests improvements need to be made. As Hattie shows, although almost everything that is done in the name of education has a positive effect on performance, the biggest gains are in relation to teachers: feedback (size of effect: 1.13 standard deviations), targeted teaching (0.82), corrective support (0.65), classroom atmosphere (0.56), peer mentoring (0.50), quality of homework (0.43), and teaching style (0.42), in particular, scientific inquiry (Anderson, 2002).

As to the style and methodology of teaching, achieving a clear balance between student-centred teaching and learning content is considered a characteristic of expert teachers. In other words, being concerned that your teaching is considered useful, and looking for new classroom working methods to ensure that students spend more time on tasks than actually listening to the teacher.

In the 1930s, John Dewey outlined his approach for the teaching community as reflective professionals as well as the need to build a theory through practice. According to Dewey, education is more appropriate if it follows a process of inquiry and also when the teacher uses a scientific approach in said analysis (Niemi & Nevgi, 2014). He also holds that the teacher plays a dual role in the classroom, that of educator and problem solver (of real problems), which should come about through overcoming possible obstacles in order to be able to both understand and work through them.

Twenty years later, Stenhouse argued that educators should be competent enough to evaluate his theory on teaching with the aim of changing teaching itself. From that point on, many authors have advocated the need to reflect on what is being done for all those professionals (architects, lawyers, teachers, etc.) who work with complex real-life problems.

Cochran-Smith and Lyttle (2009) described two types of research educators, those who are conceptual and those who are experimental. The former are theoretical and work with interpretative analysis; the latter explore and analyse data. However, both are reflective, analytical and critical of their own teaching, and also more open-minded regarding their professional development.

This characterisation points to the importance of the professional profile which we call ***researching, inquiring or reflective educators*** (Schön, 1987; Cochran-Smith & Lyttle, 2009). In the same sense, Stremmel (2007) highlights the value of the research teacher, as teaching should be considered a process requiring a constant stance of analysis and change. Acting as a researching teacher implies thinking about and reconstructing the meaning of being an educator, ways of working with students, understanding how teaching methods work and developing a more

experience-based learning process. Teachers should thus be, first and foremost, researchers combining the use of reflection (thinking) and action in their teaching.

Reflection and research in teacher training

The concept of 'reflective thought', attributed to Dewey, is described as a processing of the idea that education should make an effort to grow, and has been developed as a four-level taxonomy (Kember, McKay, Sinclair, & Wong, 2008): regular or non-reflective action, understanding, reflection, and critical reflection. The first occurs in professional practice which follows a routine procedure, involving no scrutiny. The second category is typical of theory classes and implies the intent to understand a certain concept, e.g. the underlying meaning of a written or spoken expression. This assumes a low level of retention or assimilation in the person's consciousness, as personal involvement and practice of what has been understood is not analysed. The process of reflection supposes working with a concept in relation to personal experiences that require putting the theory into practice and hence adjustments and inferences which go beyond mere understanding. Finally, critical reflection involves a transforming perspective, which these authors consider more appropriate for a student in training than for professionals with well-founded beliefs and routines.

In *The Reflective Educator's Guide to Classroom Research*, Dana and Yendol-Hoppey (2009) introduce techniques to foster inquiring practices in teachers, for both collaborative work and information gathering, and the development of a series of steps including the description, making sense and interpretation of the information, and participation in its analysis. Research teachers first use qualitative methodologies that allow them to study teaching practice from within. Direct observation, taking notes or keeping an incident log, diary writing and the carrying out interviews are considered appropriate to understand the complex nature of teaching and learning. Once again according to Dewey (1985), the education system achieves better results when educators use a scientific method to question and improve teaching practice in such a way that through the dual role of classroom teacher and researcher, real problems are addressed which allow educators to understand and evaluate on a day-today basis why things are as they are.

Evidence suggests that teachers who have received training in educational research and have used it in their teaching practices keep a more reflective and open focus during classroom work, and are willing to undertake more active professional development (Rust, 2007). As Stremmel (2007) pointed out, the real value of getting involved with classroom research, at any educational level, is that it allows a rethinking and rebuilding of the relationship with students. The research approach by teachers has the potential to show that learning to teach is inherent in learning by discovery, and that the main aim of classroom research is to enable teachers to understand teaching through reflective research[1]. In any case, the process of reflection and research on the part of teachers should be robust and take on board the value criteria of the research: credibility before those who are competent enough to be able to judge the work; the ability to be transferred, which enables the exchange of teacher experiences; process reliability and consistency of results and achievements through objective confirmation.

The theoretical discussion in education regarding reflective practices is wide-ranging. Schön (1987) defined the concept precisely by considering it as a socio-professional activity through which teachers adapt knowledge to specific situations. Research on areas of

[1] The educational references on training teachers to be researchers, inquirers and reflective professionals are abundant in scientific journals such as The Journal of Education Inquiry & Action Education (http://digitalcommons.buffalostate.edu/jiae/vol4/iss3), Studying Teacher Education: a journal of self-study of teacher education practice (http://www.tandfonline.com/loi/cste20#.Uo3ibyduGKw) , and Networks: an online journal for teacher research (http://journals.library.wisc.edu/index.php/networks).

reflective and collaborative professional development shows that, by using these strategies, teachers are able to improve their teaching practices to a greater extent than when attempting to do so alone or via traditional ongoing training (Darling-Hammond & Bransford, 2005).

Sparks-Langer and Berstein (1991) cite the following three factors, considered as important for the development of reflective thinking by teachers. First, the cognitive element, which outlines how the teacher processes information and makes decisions. Second, the critical element, focused on experiences, beliefs and values, and social implications, as ingredients which lead to thought. Third, the reflective element, made up of the accounts of teachers reflecting the interpretation of events, which take place in their particular context.

As for cognitive reflection, they suggest that it is possible to teach new teaching staff the patterns of experienced teachers, but that this would subvert what was previously learned from the standpoint of constructivism, namely that everyone should create their own meaning, and also the contextual cognition approach, as experienced teachers would attach these patterns to their own experiences.

The fostering of reflective accounts is based on the importance of grouping expressions and concepts through the human ability to tell stories. Trainee teachers create stories from reflecting on their experiences as they demonstrate what motivates action and, at the same time, provide a detailed case study of teaching and, in particular, of the clarity of ideas due to self-analysis of their teaching.

Nevertheless, training teachers to work via reflective teaching is more than just a technical issue, as new competencies need to be acquired and the role of learning manager has to be adopted, in which the cultural aspect of the school context plays an important role. Given that reflective teacher training is considered one of the main objectives in modern teacher training (NCATE, 2008), the demands for a change in training models are aimed at the promotion of research in teaching and reflection on teaching practices, with the emergence of proposals such as that of Freese (2006), who suggests that initial teacher training should be based on the introduction of a discovery which allows students to analyse teaching through reflection.

This deliberative and reflective practice is characterised by identifying problems and generating and experimenting with solutions. Reflection is also considered as the interaction between experiences and the analysis of beliefs regarding those experiences (Newell, 1996). As highlighted by Etscheidt, Curran, and Sawyer (2012), further approaches have been added to the basic model put forward by Schön (1987), such as those by Jay and Johnson (2002) and Ward and McCotter (2004). The former consider a descriptive mode of reflection for the personal assessment of classroom activity; a comparative mode, which proposes different points of view; and a critical mode, which questions the moral and political aspects of education. The latter highlight basic reflection, which studies the impact of teaching practice or experience on teacher training, but with little personal reflection; teaching practice, which values and promotes reflection on specific teaching themes; dialogue, which brings out diverging views; and finally, transforming reflection, which brings out cultural, historic, ethical and moral factors in order to create awareness of changes in teaching practices.

Methodology

Objectives

For all the above reasons, it is believed that the promotion of effective changes in the classroom and schools requires the development and evaluation of the theory via a deliberate and systematic study with the aim of improving the understanding of teaching/learning processes as the educational effects considered to follow reflective or research teaching are clear in the improvement of cognition (Scruggs & Mastropieri, 1994).

This role change in teaching methodology implies ascertaining, first of all, the perception of teachers regarding their professional development. For this purpose, an analytical model has been created based on the TALIS study, both on an individual level and for the school as a whole, using input, process and product variables, in accordance with the methodological design presented later in this paper.

This current study has four main objectives:

- To analyse Spain's position in the effective professional development (TEFFPROS) international scale, as estimated in the TALIS evaluation.
- Create a parallel scale for the Spanish sample, which allows for a description of the RPD model.
- Consider the effect that RPD has amongst Spanish secondary school teaching staff.
- Analyse the personal and professional factors that are associated with teaching staff which score highly on the RPD scale.

Population and Sample

In this report, the answers from the Spanish sample of teachers participating in the TALIS study are used. Their main characteristics are shown in Table 1. The teachers who have responded have in the main been female, one-third are over 50 years old, with a great deal of teaching experience (40% had over 20 years' experience), and a relatively long association with the school (one-third had spent more than 11 years at the same school).

The variables relative to schools correspond to the answers given by the head teachers of the schools that took part in the same study. An initial analysis of these variables shows that these organisational functions are carried out by teachers with a great deal of experience (more than two-thirds have been teaching for more than 20 years). Stability and specialisation in these functions stand out, (a quarter have been a head teacher for more than 11 years) and an interesting point is the prevalence of males carrying out these tasks, when the majority of teaching staff are female.

Instrument

Dependent variable: reflective professional development

With reference to the teacher profiles under study here, RPD was defined on the basis of the information provided by the TALIS survey regarding participation in training activities which displayed the following characteristics:

- Training is aimed at improving the organisation of the school and at developing methods or resources in a specific area or subject. Therefore, it does not arise from a particular interest on the part of the teachers, considered individually, but rather relates to activities which are carried out along with other colleagues at the same school or in the same subject.
- Training is in line with the very theories of learning which demand that teachers actively participate and grow their own knowledge base, requiring that the aforementioned training is inseparable from studies and research on the theme of interest.
- It is a systematic and planned activity, which for its development requires time for study and should not be limited to sporadic or isolated activities.

In order to evaluate to what extent ongoing teacher training activities fulfil the aforementioned characteristics, the TALIS questionnaire asked four related questions. The results allow us to confirm that Spanish teachers are concerned with taking part in ongoing training activities, given that 80% stated they had taken part in some form of training activity in the 12 months prior to the survey, while 15% stated they had not taken part in any such activity.

However, despite ongoing training being commonplace, the results show that not all training activities in which teachers take part display the characteristics which we have

shown as being part of the RDP. Only 21% of the teachers surveyed stated that their training activities included, as a rule, joint studies or research. Likewise, only one out of every four teachers surveyed stated that their ongoing training activities had been sustained over a certain period of time. All this reinforces the idea that, even though Spanish teachers invest time and effort in their ongoing training, not all of the training on offer or chosen meets the conditions required to foster reflective professional development.

Independent variables

In accordance with the above, the predictors are classified on two levels: individual (teachers) and institutional (school).

Among the individual variables, we highlight input and/or context factors and process variables. The former are: gender, teaching experience, subject or subject matter taught, and level of teachers' qualifications.

We likewise include 14 process variables which we group into five categories: professional perceptions, management of classroom instruction processes, ongoing teacher training, teacher participation and cooperation, and time spent.

As occurs with the teaching level variables, the institutional factors measured by school distinguish between input and process variables. The former are type of school, size, the school's socio-economic and cultural level, and the teacher/student ratio. The latter are average hours worked per school, use of evaluation to give feedback, curricular autonomy, school management autonomy (contracts and salaries), and educational leadership.

Analysis of data

In order to achieve the **first objective**, a comparison of the average scores on the effective professional development (TEFFPROS) scale was carried out, identified in the TALIS survey. The TEFFPROS scale was created with the same factors that make up the RPD model of the present study.

The **second objective of the project** consisted in validating a scale parallel to TEFFPROS, but focused on the Spanish sample. This scale aims to express the probability of Spanish teachers participating in training activities that foster RPD.

Once the reflective professional development scale was completed via the IRT adjustment, the **third objective** of the study was addressed, namely that of estimating the incidence that this model has amongst secondary school teaching staff in Spain. To do so, the cut-off points which allow each teacher to be assigned to a group according to his or her scores on the aforementioned scale must be defined. Once the cut-off points had been established, three categories were created according to the level of compatibility with the definition of RPD. The teacher categories or groups are defined as follows:

- *With no evidence of training compatible with RPD*. The teachers in this group take part in short and sporadic training activities, with no relation to the interests of the school, in which they adopt the role of the listener, without carrying out additional studies or research.
- *Some evidence of training compatible with reflective professional development*. This group includes teaching staff who on some occasions take part in training activities which coincide with the school's strategic objectives and who carry out studies and research together with other teachers.
- *Training tailored to RPD*. This group includes teaching staff who regularly take part in training activities that use active methodology, in conjunction with other teachers, which respond to communal objectives (shared by the school or teaching staff of a certain discipline) and who carry out research and investigation as a team.

Once the teachers had been assigned to the established categories, a frequency analysis was carried out to determine the percentage distribution of teaching staff according to their level of compatibility with the RPD model.

The **final objective** of the study consisted in identifying the factors or variables associated with the profile of teachers that demonstrate reflective professional development. To do so, the RPD index was introduced as a dependent variable in a hierarchical linear model (Raudenbush & Bryk, 2002) in order to check the fit of the experimental data to the theoretical model, which is shown in Figure 1.

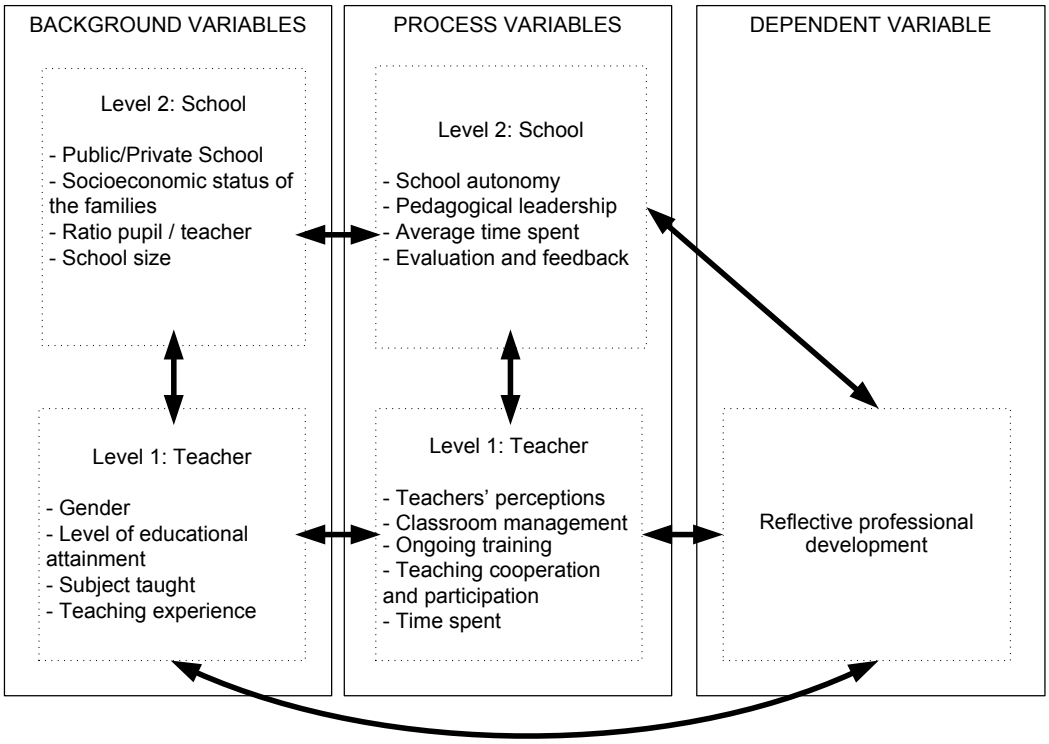

Figure 1. RPD theoretical model

This model is based on the following assumptions:

- There is a group of teachers who systematically take part in reflective professional development activities within the framework of a medium- to long-term training policy aimed at the development of the educational organisation to which they belong.
- This group is linked to certain teaching characteristics: sociological (age, experience, subject matter, etc.), psychological (perception of one's own ability, teaching beliefs, etc.) and professional (ongoing training, feedback, etc.).
- The school's characteristics (size of school, educational level of families) and the processes which take place there (curricular autonomy, leadership style, workload, etc.) can foster or hinder RPD.
- The teacher's characteristics and those of the school are related to and interact with each other, requiring the use of a dual level model with variables on both an individual (the teacher) and an institutional (the school) level.

There are many educational assertions which illustrate this last assumption. Amongst these, the claims that new teachers generally occupy positions at schools which are on the periphery and are not very attractive; that small schools have factors which favour the development of certain projects; or that the management style influences the feedback that the teaching staff receives.

Results

The main results of the study are ordered according to the objectives set out above. First, the position of Spanish teachers is shown in relation to the group of countries which took part in the TALIS survey. Second, the analysis carried out to confirm the structure of the RPD scale is introduced. Subsequently, the results of the multilevel analysis adapted to the available data from the hypothesised theoretical model relating to teachers' reflective professional development are introduced. Finally, personal and school characteristics associated with this profile are identified.

The status of Spanish teachers in effective professional development practices

The study's first objective was to analyse the situation in Spain in an international context according to the average of countries observed in the original scale estimated by TALIS. Figure 2 introduces the participating countries ordered according to their average score on the TEFFPROS scale. It appears that the Spanish average is significantly lower than the TALIS average. The score is significantly higher than 16 countries, lower than 10 others and does not show significant differences with six others. A clear pattern does not emerge, as within the three groups there are countries with great social, cultural and economic diversity.

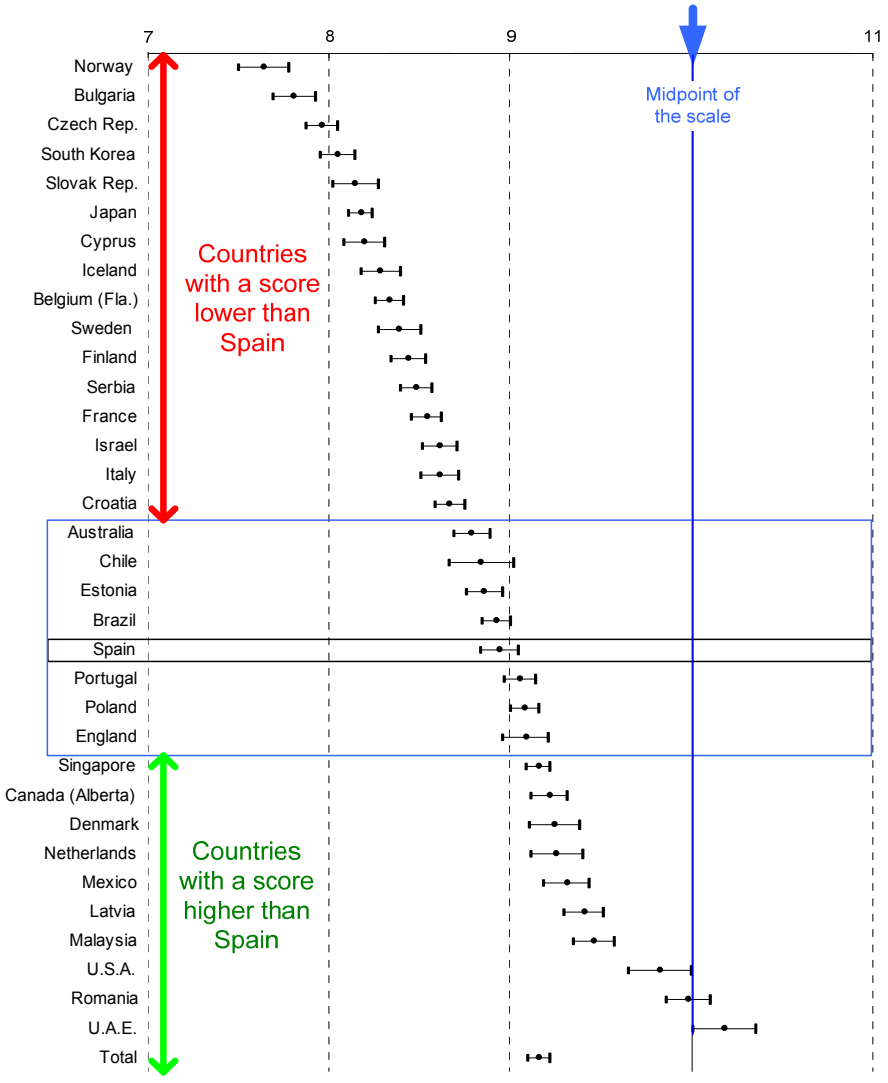

Figure 2. The status of Spain on the effective professional development (TEFFPROS) international scale

The midpoint of the Likert scale has also been highlighted in Figure 2 after rescaling the results. This midpoint is the minimum score at which teaching staff tended to show more agreement with the affirmations which make up this scale. This shows that, in the group of participating countries, professional development practices which employ active learning methods require carrying out research activity with other teachers and are carried out over a prolonged period of time.

In order to verify the affirmations contained in the above paragraph, those teachers with a score similar to the TALIS average were chosen. With the chosen set of teachers, equivalent to more than 50,000 teachers in participating countries, the distribution of frequency of the four topics in question were analysed. This analysis shows the characteristics of the training activities in which teachers with scores around the international average took part. These are:

- Taking part in professional development activities along with other teachers at the same school or who teach the same subject is, as yet, not widely practised (only one in every four teachers). In other words, the results seem to show that teachers take part in professional development activities which are not linked to the general interests of the school.
- The training is not usually based on active learning methods, as half of the teachers state that in the activities in which they take part they usually adopt a passive role where they generally just listen to either an expert or a speaker.
- The professional development activities lack research focus, or at best only contain a small part devoted to research (only one in four teachers).
- Training tends to be sporadic or of a limited duration. Three out of every four teachers state that training activities are never (or rarely) long lasting.

Design of the reflective professional development scale

The initial exploratory study offers guarantees that it is possible to reduce the four questions raised in the TALIS questionnaire to a synthetic scale. The weightings of each item on the RPD scale are shown along with the correlations between items. The confirmatory analysis was carried out via the adjustment of a structural equation model. Both the exploratory and confirmatory analyses allow the data to be summarised along a single dimension. The data can thus be fitted to an item response model.

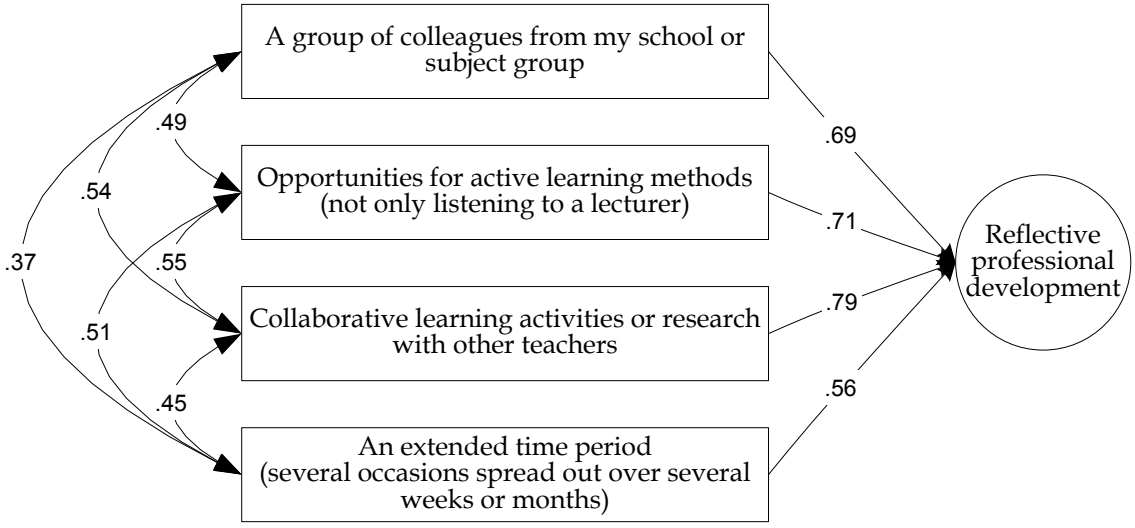

Figure 3. Summary of the fit of items to design the RPD scale

Incidence of the reflective professional development profile

The characteristic curve for the RPD scale is shown below. The frequency distribution according to the scores achieved by teachers is superimposed on the curve. Two cut-off points have been established on the test's characteristic curve. These are defined a priori as a function of the possible responses to the four items on the scale, and generate the following groups: teachers whose teaching style scarcely shows signs of activities compatible with reflective professional development; teachers who show some signs of the aforementioned activities; and teachers who predominantly display a higher inclination towards reflective teaching practices.

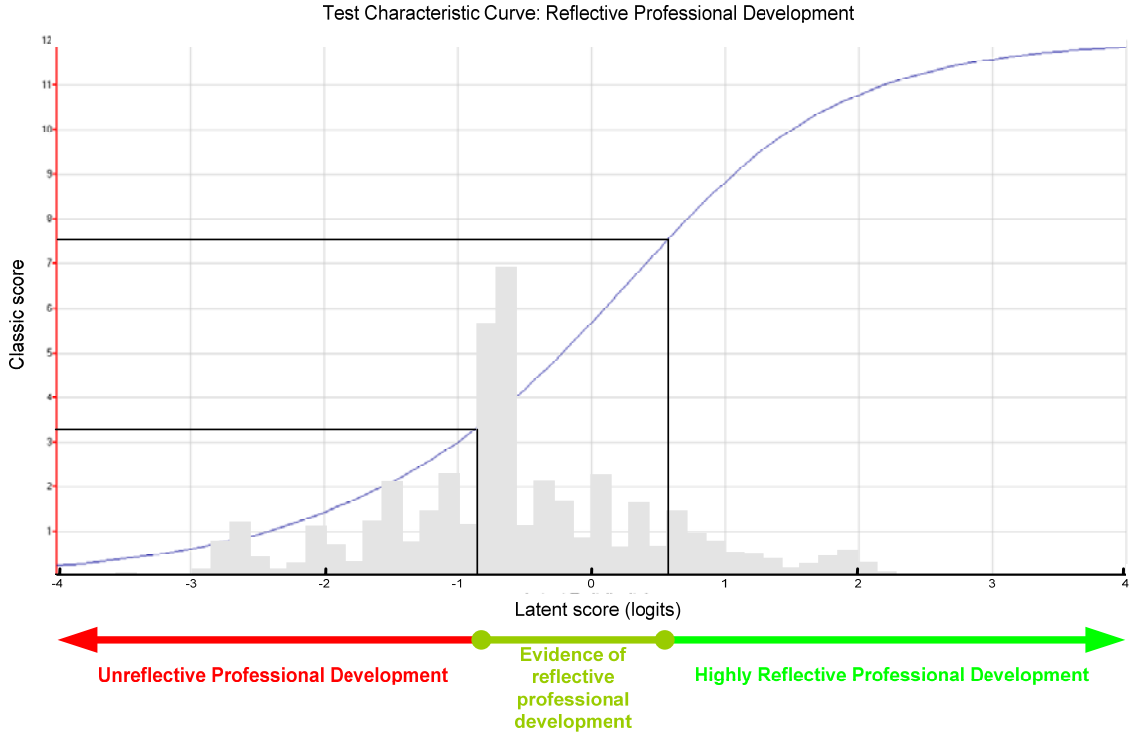

Figure 4. Test's RPD characteristic curve

Having established the cut-off points, the percentage distribution of the categories defined on the scale was then obtained. It shows that three of every 10 teachers do not present a reflective professional development profile. The most common situation (approximately half the sample) is that of teachers whose professional development activities can occasionally be considered to be reflective, while the group of teachers whose professional development is clearly reflective is in the minority.

Thus, there are few teachers in what would be considered an optimal position. Even though half of the teachers are in acceptable mid-level positions, it is worth highlighting that almost a third show a level of professional development far removed from the reflective approach.

Factors associated with the reflective professional profile

The results of the hierarchical linear analysis are now shown to identify the contextual factors (input and process) corresponding to the personal and institutional levels related to the RPD profile.

The proposed strategy considers four models. One null model, with no independent variables, and three models in which context and input variables, individual level process variables and institutional level process variables are introduced.

The null model shows that the reflective profile is one of the teacher's individual attributes, as the vast majority of total variances on the RPD scale (to be precise 94.8%) are due to differences among teachers, while only 5.2% are due to differences amongst schools.

Model 1 includes the input and context variables (Figure 1); in other words, the background factors which could condition reflective professional development. This model explains little variance: just over 4% of the variance amongst schools and less than 2% of the variance amongst teachers. As a consequence, the sociological characteristics of teachers and the rest of the background variables are independent of RPD at an institutional level (school), and practically non-existent in the development of this profile on an individual level (teachers). In any case, the results show that RPD is more likely amongst women, teachers with more experience and holders of the maximum qualification of a university degree (as opposed to PhDs or other qualifications below ISCED level 5). As far as the school's context factors are concerned, only the teacher/student ratio is significant. RPD tends to be higher in those schools with a lower ratio, which suggests that an excessive student load can hinder reflection of the teaching practices.

Model 2 incorporates the process variables included at a teacher level, as well as the variables from the previous model. It has a higher predictive power than model 1 and is more revealing in terms of results. The variables shown also explain approximately half of the differences amongst schools and a little more than 11% of the differences amongst teachers. The professional characteristics, which the variables show in model 2, seem to be the most relevant group in terms of explaining RPD. These results corroborate the relative independence between RPD and the sociological characteristics of the teachers and the schools.

Model 3 includes the processes measured at a school level. It does not better explain the variance amongst schools, but it does explain the 10% in variance amongst teachers. The two variables that are most significant, educational leadership in school management and the use of evaluation to provide teacher feedback, show that certain characteristics of the organisation could improve RPD. In this sense, it seems reasonable to expect that schools with strong educational leadership and which at the same time use the results from teacher evaluations to provide feedback for teaching practices, aid the development of these reflective processes for teachers.

In accordance with these results, RPD is considered to be strongly linked to ongoing teacher training. The variable with the largest effect on the dependent variable is participation in a professional development network. In addition, the scale also appears positively related to those teachers who clearly prioritise training needs and negatively related to those who show less inclination to take part in ongoing training activities. As a whole, the introduction in model 2 of these three variables shows that teachers who take part more regularly in ongoing training activities have more chance of developing reflective teaching.

On the other hand, model 2 also shows that teachers who score highly on the RPD scale take part in teaching cooperation activities more frequently and see more opportunities in joining in with school life. This highlights the fact that teaching collaboration and the responsibility for decision making are practices which are linked to the development of reflective thinking, though this also appears linked to a higher overall work load. This would appear consistent with the fact that reflecting on teaching implies effort and investment in terms of weekly hours devoted to teaching.

It also highlights a certain positive relationship between RPD and educational efficiency. The teachers who score highest on the RPD scale tend to invest less classroom time in disciplinary activities and devote more time to teaching and learning activities. Furthermore, they see themselves as more

efficient when it comes to fostering learning on the part of their students.

Finally, the relationship between RPD and certain professional perceptions does not provide conclusive results. The only variable that links teacher perceptions to RPD is positive valuation of personal relationships at the school.

The overall picture of the three models allows the specification of the following results in relation to the RPD scale.

- A clear profile of a school associated with a higher level of teacher RPD is not likely to be found. This teaching situation may be more closely linked to individual teachers' work.
- The traits associated with RPD are: participation in ongoing training networks, teacher cooperation and, to a lesser extent, those variables linked to efficient teaching practice, such as hours worked per week and certain teacher perceptions.
- Even though it is difficult to establish the profile of a school which fosters RPD, there are certain traits, which relate the score on the RPD scale with some of the schools' organisational characteristics, such as the role of leadership and the use of evaluation for organisational improvement.
- The group of variables studied in this analysis explain less than 10% of the variation among teachers and nearly 60% of variations amongst schools. RPD can thus be seen to be a highly complex construct whose explanation requires further study.

Conclusions and proposals

The RPD scale has been shown to be suitable for establishing different teacher profiles whose characteristics influence the effectiveness of educational processes. These profiles can be used to develop proposals for teacher training models.

Relative to the objectives of this study, the main conclusions can be summarised as follows:

- In the group of countries which took part in TALIS, the responses from teachers show that training activities respond to the particular interests of the teachers concerned, they tend to be of short duration and the participants play a passive role in these activities and do not consider taking part in joint research or inquiry with other teachers. Spain shows a significantly lower score than the average, although there are several countries which show even lower scores (e.g. Italy, France, Sweden, Belgium, etc.)
- The results show that teachers who pursue RPD are in the minority. Although a high percentage of teachers take part in training activities with some traits typical of reflective development, the possibilities of improvement are evident, seeing as those who do not fit the profile at all represent almost a third of all teachers.
- Those teachers with an individual profile more suited to RPD can be distinguished by their teaching experience and esteem, being female, having clear training priorities and an interest in ongoing training. Their teaching model is effective and efficiently and actively handles student learning times.

In order to increase the proportion of teachers whose profiles fit the characteristics of the RPD model, we believe that their training should adapt itself to a research model with an active focus, organised via a network and which works on school training projects or those which are closely linked to teaching material. The ideal model requires collaboration and cooperation by teachers on a school project to which they devote their working time and in which they responsibly take part in organisational decisions.

As maintained by Linda Darling-Hammond, a professor at Stanford University,

in the foreword to the report by the Singapore National Institute of Education (NIE, 2009), university teacher training programmes should have the following attributes: a compact set of courses offering a coherent training experience; well-defined standards of practice and academic achievement; a basic programme focused on student learning, assessment and educational content; a problem-based teaching methodology; active assessment through case studies and portfolios; and practical activities accompanied by expert teachers, offered in the early courses of the teaching degree.

This theoretical model of training for reflective, inquiring teachers can be seen in some university systems. Finland requires its teachers to hold a Master's degree, while Singapore aims to improve the professionalization of teaching by offering a line of admission aimed at attracting the brightest students to the teaching profession (the top 10% grades gain access to a pathway leading to Bachelor's degree in Education and a Master's degree).

The Singapore model is based on three basic principles: awareness of the diversity of students and the idea that everyone can learn if their styles are taken into consideration and the means are organised in consonance with these; maintaining high achievement goals in relation to the rapid changes occurring in education; and, thirdly, serving the profession and the community, which requires a commitment to collaborative work and an attitude of continuous improvement for the benefit of society.

The teacher education program at the University of Northern Iowa includes a technical reflection method (Etscheidt, Curran and Sawyer, 2012). In a first phase, students plan a curricular unit that, once imparted, is subjected to self-evaluation in three aspects: planning, development and defence of the results, under the supervision of a tutor. The second phase of the programme, focused on deliberative reflection (Lee, 2008), aims to analyse alternative scenarios and justify decisions by means of divergent thinking about teaching beliefs. This objective is developed through video analysis which allows the deconstruction of educational activities in the classroom and the keeping of a diary on specific events such as student assessment, the relationship between teachers, behaviour management and family/school relationship. These analyses are sent weekly to the tutor, who provides feedback taking into consideration possible alternatives. In a third and final phase, emphasis is placed on critical analysis of the specific socio-educational setting.

In these university models considered examples of "best practice", experiential learning situates the trainee teacher in the phenomenon to be studied through activities incorporated in the Practicum. An e-portfolio and the teaching project are used to reinforce this experiential learning and provide evidence for monitoring and assessment. The former allows students to record and develop reflections on their learning. The latter is a graduation requirement that responds to practical approaches that allow them to demonstrate their skills in analysing, transforming, creating and applying knowledge, systematically develop studies on teaching/learning issues and lead the implementation and development of learning communities. One of the main components of this project is the teacher's portfolio, which includes a critical reflection on everything learned and individual assignments from different areas.

This model of teacher training based on reflective professional development (RPD) is not widespread, although the results hint towards the importance it may have in the future for education policy.

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Authors / Autores	To know more / Saber más
Fernández-Fernández, Samuel (samuel@uniovi.es). Chair at the University of Oviedo, Department of Sciences of Education. Area of Methods of Research and Diagnosis in Education (MIDE, in Spanish acronym). Maintains a line of research on Quality and Educational Evaluation. In recent years he has led a European project (QAHECA) and a regional project on school absenteeism. National and international evaluator of university programs of Education, has published articles on methodological development in evaluation of programs in attention to people with disabilities. Mailing address: Facultad de Formación del Profesorado y Educación. C/Aniceto Sela s/n, 33005-Oviedo, Asturias (Spain)	ORCID 0000-0003-3934-1390
Arias-Blanco, José-Miguel (arias@uniovi.es) PhD in Pedagogy. Professor in the MIDE area of the University of Oviedo. His main lines of research are: research methodology in social sciences, professional competences, methodology of teaching and learning and innovation in higher education, evaluation of higher education. Mailing address: Facultad de Formación del Profesorado y Educación. C/Aniceto Sela s/n, 33005-Oviedo, Asturias (Spain).	ORCID 0000-0002-2361-3200 Google académico ResearchGate
Fernández-Alonso, Rubén fernadezaruben@uniovi.es. Doctor in Psychometry by the University of Oviedo. Coordinator of Evaluation and Quality Studies in the Department of Education and Culture of the Government of Asturias and associate professor of the Department of Educational Sciences of the University of Oviedo. His main lines of research and specialization are: the analysis models applied to the evaluation of the educational system, the construction of indexes and educational indicators and the school homeworks. Mailing address: Consejería de Educación y Cultura del Gobierno del Principado de Asturias. Plaza de España, 5, 4ª, 33005 - Oviedo, Asturias (Spain).	ORCID 0000-0002-7011-0630 ResearchGate
Burguera-Condon, Joaquín (burguera@uniovi.es). PhD in Pedagogy. Assistant Professor of the Department of Educational Sciences, (in the MIDE Area) at the University of Oviedo. His main lines of research are: external-practicum practices, teaching methodology and innovation in education, research methodology in social sciences, evaluation of socio-educational programs and tutoring and educational guidance. Postal address: Faculty of Teacher Training and Education. C / Aniceto Sela s / n, 33005 - Oviedo, Asturias (Spain).	ORCID 0000-0001-5944-2012
Fernández-Raigoso, Marcelino raigoso@unovi.es Titular of University School by the University of Oviedo in the MIDE area of the Department of Sciences of the Education. Coordinator of research on training needs and competencies in different professional fields. Member of research groups on digital competence, practices in higher education and the improvement of professional activities in education. It has carried out studies related to the professional insertion of university students, both at regional and European level. Mailing address: Facultad de Formación del Profesorado y Educación. C/Aniceto Sela s/n, 33005-Oviedo, Asturias (Spain).	ORCID 0000-0002-4963-2362 Google académico ResearchGate

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