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ARTICLE

The impact of national educational policies on student achievement: a European study

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ABSTRACT

This paper investigates the impact of national policies for improving teaching and the school learning environment (SLE) on student achievement. In each participating country (i.e., Belgium/Flanders, Cyprus, Germany, Greece, Ireland, and Slovenia), a sample of at least 50 schools was drawn and tests in mathematics and science were administered to all Grade 4 students ($N = 10,742$) at the beginning and end of school year 2010–2011. National policies were measured through (a) content analysis of policy documents, (b) interviews with policymakers, and (c) head-teacher questionnaires. Multilevel analyses revealed that most aspects of national policies for teaching and SLE were associated with student achievement in each subject irrespective of the source of data used to measure them. Implications are, finally, drawn.

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Educational effectiveness; national policy; quality of teaching; school learning environment; multilevel modelling techniques

Introduction

During the last three decades, several comparative studies focusing on educational achievement in different outcomes of schooling have been conducted. Findings of studies such as the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) reveal variation in the performance of students in different countries. Thus, policymakers need to respond to criticisms about the effectiveness of their educational systems. In recent years, national policies have also been adopted in many educational systems to improve the quality of education through promoting educational accountability, quality of the curriculum, teacher selection, provision of teacher initial and in-service training, and use of resources to improve schooling.

Educational policy at the national level is regarded as an important component of the efforts to improve low-performing schools and enhance student outcomes (Reynolds et al., 2014). It is, thus, fundamentally important for each organisation/system to develop policies which connect its vision and goals to its internal operations. The term policy refers to a course or principle of action adopted or proposed by an organisation or individual (Cohen & Hill, 2001). Given that educational systems can be seen as complex organisations, policymakers are

expected to propose a set of actions that school management teams and other school stakeholders (e.g., teachers, students, and parents) should undertake to promote student learning. This set of actions is captured in educational laws and/or official documents published by the national/local governing bodies to designate regulations and roles of different stakeholders towards the effective functioning of schools both inside and outside the classroom. Beyond the announcement of the official policies in documents (including the publication of non-statutory guidelines), educational systems (irrespective of whether they are centralised or decentralised), develop relevant mechanisms (including the appointment of civil servants and/or external advisors) to clarify the policy guidelines and regulations to the school management team and other school stakeholders. In most systems, the school management team is also held accountable for the implementation of the national policy. Although there is not much empirical evidence about the impact of national policies on promoting student learning outcomes, one could argue that national policies are likely to have indirect effects on student learning outcomes (Kyriakides, Creemers, Antoniou, Demetriou, & Charalambous, 2015). One could also argue that national policies are expected to set the frame for improving learning outcomes, but local school systems are more than mere implementers of top-down educational policies (Spillane, 2005). Schools actually respond to national policy initiatives by developing and adopting their own distinct policies (Flessa, 2012). The main belief is that increasing schools' authority and flexibility will allow for the development of better and more effective educational processes which are more likely to correspond to local needs (Nir & Ben Ami, 2005). However, despite the importance of policy development at the school level, the overall emphasis in the research literature has been focused on policymaking at the state and national levels (e.g., Cohen & Hill, 2001; Honig, 2006; Spillane, Reiser, & Reimer, 2002). Additionally, none of these studies searched for the impact of national policies on improving student learning outcomes.

International comparative studies such as TIMSS and PISA are mainly concerned with student-level factors (e.g., student background characteristics, motivation, and learning opportunities) and to some extent with school-level factors (e.g., teaching practices and school climate), and so secondary analyses of these studies search for the impact of other than system-level factors on student achievement (e.g., Caro & Lenkeit, 2012; Isac, Maslowski, & Van der Werf, 2011; Marks, Cresswell, & Ainley, 2006; Mohammadpour & Ghafar, 2014). The system-level variables that are available are mainly concerned with the structure of the system and school autonomy, rather than with the national educational policy. In this context, this paper attempts to identify the extent to which national educational policies for improving learning (inside and outside the classroom) can explain variation in student achievement. To achieve this aim, we draw from educational effectiveness theories (Creemers & Kyriakides, 2008; Reynolds et al., 2014; Scheerens, 2013) and define the aspects of national policy that are seen as possible factors associated with student learning.

National policy for improving teaching and the school learning environment: the study's constructs

Educational effectiveness research (EER) attempts to identify factors associated with student learning outcomes operating at different levels: student, classroom, school, and educational system. During the last three decades, integrated models of educational effectiveness have been developed (e.g., Creemers, 1994; Scheerens, 1992; Stringfield &

Slavin, 1992). These theoretical models acknowledge the importance of teacher factors and especially the teacher behaviours in classrooms that can promote student learning (Muijs et al., 2014). Factors operating at school and system levels are seen as indirectly related with student achievement, mainly through improving learning which takes place inside and outside the classroom (Creemers & Kyriakides, 2008; Scheerens, 2013). Therefore, in the first part of this section we look at national policies for teaching which may contribute to improving the quality of teaching at the classroom level and, through that, learning; in the second part, we discuss the importance of national policy for improving the school learning environment (SLE).

National policy for improving teaching

Meta-analyses of factors associated with student achievement show that concepts such as teaching quality, time on task, and opportunity to learn are key factors for explaining variation in student outcomes (Hattie, 2009; Scheerens, Seidel, Witziers, Hendriks, & Doornekamp, 2005). Recent theoretical models of EER (Creemers & Kyriakides, 2015; Scheerens, 2016) refer to factors related to these key concepts at all different levels (i.e., student, classroom, school, and system). Therefore, three aspects of national policy for teaching are taken into account: (a) quantity of teaching, (b) provision of learning opportunities, and (c) quality of teaching. National policy on quantity of teaching is concerned with regulations and guidelines offered to schools to ensure that quantity of teaching is kept to a maximum level and with the support provided to schools to keep teaching time to a maximum level. For example, different ways of dealing with teacher absenteeism were identified through the policy document analyses. Particularly, in almost all states/countries, schools were asked to keep records of teacher absences, and this was seen as a way of discouraging teacher absenteeism. In some countries, however, schools were encouraged to fire teachers for being absent for any unacceptable reason. Apart from discouraging teacher absenteeism, national/state policies also referred to ways of replacing the lost time. In few states/countries, schools were only encouraged to replace some of the lost time, while in others, teachers/substitute teachers were obligated to substitute for an absent colleague.

The importance of quantity of teaching is stressed in early educational effectiveness models (e.g., Carroll, 1963; Creemers, 1994) and meta-analyses of studies demonstrating the impact of considering quantity of teaching when investigating characteristics of teacher and school effectiveness (e.g., Hattie, 2009; Kyriakides, Creemers, Antoniou, & Demetriou, 2010; Scheerens et al., 2005). In this paper, we test the assumption that national policies on quantity of teaching have an effect on student achievement especially since maximising teaching time was found to be related with achievement and thereby the national and local agencies are expected to support schools and teachers in their attempt to maximise the use of teaching time. Similarly, national policy on the provision of learning opportunities is expected to be associated with student achievement gains by supporting teachers and schools in their attempt to enrich the learning opportunities of their students. In analysing national policy on the provision of learning opportunities, we examine not only policies on the national curriculum of each country but also policymakers' attempts to support/encourage students/teachers/schools to undertake extracurricular activities that contribute to the achievement of

the curriculum aims. Early researchers saw policy on quantity of teaching and on the provision of learning opportunities as closely related (e.g., Anderson, 1995; Oser & Baeriswyl, 2001). However, in recent studies the factor concerned with learning opportunities is not restricted to the opportunities offered to students associated with formal teaching, but also refers to extracurricular activities that may constitute a basis for learning (e.g., Creemers & Kyriakides, 2010; Reynolds et al., 2014; Scheerens, 2013). The third aspect of policy for teaching has to do with the guidelines and the support that is offered to teachers in their attempt to use effective teaching practices (Muijs et al., 2014; Scheerens, 2016). It was found that some states/countries did not have a policy on quality of teaching, that others had specified standards of teaching, and in other states/countries not only standards of teaching were defined but also teachers were evaluated based on these standards. In the cases in which standards of teaching were identified, one could examine whether these are in line with educational effectiveness research results (see section on methods).

National policy for improving the SLE

Since learning takes place not only inside but also outside the classroom, the paper also examines national policy on improving the SLE, which may affect student learning (e.g., through providing students with learning opportunities when they are outside the classroom) as well as learning of other stakeholders (i.e., teachers, parents, school management team). Over the past four decades, the work on the SLE has rapidly expanded, covering issues such as the interpersonal relationships between school personnel and management team, as well as the support provided to students (e.g., Lüftenegger et al., 2012; Mainhard, Brekelmans, & Wubbels, 2011). From this array of elements, here we focus on policy initiatives only if they aim to improve stakeholders' learning and, through that, student learning. This is accomplished by focusing on the following four aspects of national policy for improving the SLE, which were systematically found to be associated with student learning outcomes (Kyriakides et al., 2010; Reynolds et al., 2014; Scheerens et al., 2005):

- (1) student behaviour outside the classroom;
- (2) collaboration and interaction between teachers;
- (3) partnership policy (i.e., relationships between school and community, parents and advisors);
- (4) provision of sufficient learning resources to students and teachers.

Apart from the first element, which is directly related to student learning, the next two elements underscore how student learning can be facilitated through two main additional stakeholders: teachers and parents. For example, the provision of guidelines/rules and the establishment of strategies that support *teacher collaboration* within a school and help schools establish networks to support each other may not only contribute to teacher professional development (i.e., teacher learning) but also have an effect on teaching practice and thereby may improve student learning (Goddard, Goddard, & Tschannen-Moran, 2007). Similarly, national policy on encouraging schools to develop their *partnership policies* may contribute indirectly to student learning through

improving the SLE (e.g., when parents provide teachers with information regarding their children or bring human and other resources to the school) and to some extent the home learning environment (e.g., when parents are informed on how to support/supervise their children when doing their homework) (Fan & Chen, 2001; Kyriakides, 2005).

Finally, educational systems may provide resources to schools for improving their SLE. These could refer to the financial support that is provided to schools and/or to other types of support associated with learning (e.g., provision of in-service training to the school staff, school advisory systems, teaching aids, and other learning resources). The availability of learning resources in schools may not only have an effect on student learning but may also encourage teachers' own learning (Hattie, 2009). For example, the availability of computers and software for teaching geometry might contribute to teacher professional development since it may encourage teachers to use the software in their teaching to become more effective. In this paper, we move a step forward and, rather than just searching for the impact of school policies and actions taken to improve the four aspects of the SLE mentioned previously, we also search for the impact of the system level in supporting schools to improve their SLE. For example, in regard to the policy on partnership, in some countries schools were encouraged to collaborate with parents, while in others, schools were expected not only to collaborate but also to help parents understand their role so as to improve the home learning environment.

Measuring quantitative and qualitative characteristics of the national policies – research aims

This paper draws from the dynamic model of educational effectiveness (Creemers & Kyriakides, 2008) to search for the impact of national policy on student learning outcomes. One essential difference of this model from the integrated models developed in the 1990s has to do with its attempt to introduce a framework for measuring both quantitative and qualitative characteristics of effectiveness factors (see Kyriakides & Creemers, 2008). Specifically, the model assumes that each factor can be defined and measured in relation to five dimensions: *frequency*, *stage*, *focus*, *quality*, and *differentiation*. The *frequency* dimension refers to the number of times that an activity associated with a factor is present in a system, school, or classroom. This is probably the easiest way to measure the effect of a factor on student achievement, and almost all studies used this dimension to define effectiveness factors (Kyriakides, 2008). Two aspects of the *focus* dimension are taken into account. The first one refers to the specificity of the activities, which can range from specific to general. The second aspect of this dimension addresses the purpose for which an activity takes place. An activity may be expected to achieve a single or multiple purposes. Third, the activities associated with a factor can be measured by taking into account the *stage* at which they take place. Factors need to take place over a long period of time to ensure that they have a continuous direct or indirect effect on student learning (Levin, 2005). Fourth, the *quality* refers to the properties of the specific factor itself as discussed in the literature. For instance, policy on assessment can be measured by looking at the extent to which the formative rather than the summative purpose is served (Black & Wiliam, 2009; Marshall & Drummond, 2006). Finally, *differentiation* refers to the extent to which activities associated with a factor are implemented the same way for all subjects involved with it. Despite the fact that educational practice remained basically fixed and non-adaptive in most countries,

research into differentiated effectiveness reveals that teachers and schools may be differentially effective in promoting the learning of different groups of students.

In this context, this paper aims to make use of these five dimensions in measuring the national policy for teaching and the SLE in six European countries. It also investigates the extent to which each aspect of national policy for improving teaching and the SLE and their dimensions are related to student achievement gains in mathematics and science. Implications for the design of international large-scale studies and for policy and practice in education are also drawn.

Methods

Participants

To search for the effect of national policies on improving teaching, we drew data from an effectiveness study conducted in six European countries: Belgium/Flanders, Cyprus, Germany, Greece, Ireland, and Slovenia. From each country, a sample of at least 50 primary schools was drawn ($N = 334$), and written tests in mathematics and science were administered to all Grade 4 students ($N = 10,742$) at the beginning and at the end of school year 2010–2011. Data taken from schools in Germany were aggregated not at the level of the country but at the level of the state (see Kyriakides, Creemers, & Panayiotou, 2012). Specifically, it was possible to distinguish nine states/districts within Germany, but it was only possible to generate representative data on student achievement from three of these regions/states.

Dependent variables: student achievement in mathematics and science at the end of Grade 4

Data on student achievement in mathematics and science were collected at the beginning and the end of school year 2010–2011 by using external forms of assessment. For the construction of the tests used to measure student achievement, permission was obtained from the International Association for the Evaluation of Educational Achievement (IEA) to use the released items of TIMSS 2007. The properties of each item and its relation with the curricula of Grades 3 and 4 in each country were taken into account for developing the two types of tests. For the estimation of the achievement data in each of the two subjects, data scaling was conducted by applying the partial credit model (Masters & Wright, 1997) as implemented in the software ConQuest (Wu, Adams, & Wilson, 1998). As estimation algorithm, an adaptation of the quadrature method described by Bock and Aitken (1981) was used. Thus, for each student two different scores for his/her achievement in each subject (at the beginning and the end of Grade 4) were generated.

Independent variables at the system level: measures of national/state policy for teaching and improving the SLE

Three different sources of data on national/state policy for improving teaching and the SLE were collected through (a) content analysis of policy documents, (b) interviews with policymakers, and (c) head-teacher questionnaires measuring their perceptions about the national/state policy. In this way, we were able to measure not only the official policy

as it is stated in documents and guidelines sent to schools but also the actions taken by policymakers in their attempt to promote the implementation of the national policy at the school level. In addition, we looked at the impact of the policy and especially the perceptions of head-teachers about the national policy, since head-teachers are responsible for ensuring the implementation of the national policy at the school level.

Content analysis of policy documents

A content analysis was conducted of all the official educational documents of each country/state that included regulations and guidelines (national and state policy) on aspects related to (a) policy on teaching and (b) policy on the SLE. Table 1 presents the specific aspects of the factors concerned with policy on teaching and policy on SLE which were examined. Readers can see that in the case of the policy for quantity of teaching we examined policy in relation to student absenteeism, teacher absenteeism, management of time at the school and classroom levels, dropout, and long-term planning which may affect the ability of teachers and schools to use teaching time in an efficient way. A detailed description of the aspects of the factors concerned with policy on teaching and SLE presented in Table 1 can be found in Creemers and Kyriakides (2008).

For each aspect of each system-level factor, a profile was established by studying all the regulations and guidelines that are sent to schools as well as the educational law. We put down the suggestions/regulations given to schools and then evaluated them in order to generate scores per each dimension. Specifically, the team had to examine each policy suggestion by taking into account (a) the time period that was initially established and the changes thereafter (i.e., stage dimension); (b) its clarity and the extent to which

Table 1. Aspects of each system-level factor concerned with policy for improving teaching and the SLE examined in analysing policy documents.

System-level factors	Aspects of each factor
National/State policy for improving teaching	
a) Quantity of teaching	Teacher absenteeism Student absenteeism Long-term planning of the teachers Dropout Management of time at classroom and/or school level
b) Quality of teaching	Quality of instruction
c) Provision of learning opportunities	Extracurricular activities Support/further opportunities provided to student with special needs
National/State policy for improving the SLE	
a) Student behaviour outside the classroom	Student behaviour outside the classroom
b) Teacher collaboration	Team teaching – staff support Exchange of visits – observation of teaching Mentoring system Promoting school networking
c) Providing resources	Teacher training Teaching aids and resources School library Advisory bodies
d) Partnership	Reporting assessment results to the parents Organising learning activities for parents Active participation of parents Using facilities available in the community for teaching Use of expertise within the community to support teaching

it was in line with the literature (i.e., quality dimension); (c) the status of the suggestion by looking at the extent to which schools were encouraged to undertake relevant actions, or were required to do so, or even were held accountable (i.e., the first aspect of focus dimension); (d) the stakeholders which were addressed by each suggestion (i.e., the second aspect of the focus dimension); and (e) the extent to which there was any kind of differentiation in the suggestion and the relevant actions that emerged from it (i.e., differentiation dimension). To measure the frequency dimension, the number of policy guidelines per factor was taken into account in order to find out the emphasis that each system gives to each factor.

The format of the profiles, and the process used to analyse the documents and generate scores per dimension and factor, are provided in [Appendix 1](#) and are also available on the web page of the project (see www.ucy.ac.cy/esf). [Appendix 1](#) includes examples of how the documents were scored, and to facilitate understanding, a specific example is provided on how the analysis of policy documents helped us generate scores for each dimension of the factor concerned with teacher absenteeism for one state/country. The figures for each aspect of each system factor (including teacher absenteeism presented in [Appendix 1](#)) were entered in an SPSS data file. In the SPSS sheet, we had as many columns as types of actions to measure the frequency dimension. For instance, in the case of teacher absenteeism we had six columns. For each factor of the policy for teaching and improving the SLE, two different national groups were asked to rate the country profiles and generate scores per dimension so as to examine the inter-rater reliability. The generated scores were found to be comparable (i.e., the inter-rater reliability was higher than 0.85) and were used in searching for the impact of policy on student achievement gains.

Interviews with policymakers

Semi-structured interviews with policymakers and other stakeholders holding key positions regarding the promotion of the national policy at the school level were conducted. Initially, open-ended questions concerned with national policies and actions taken to improve teaching and the SLE were designed together with a checklist that enabled us to generate data on each dimension and aspect of the policy for teaching and the SLE mentioned in [Table 1](#). In some countries, different actors from different levels of the educational system are responsible for promoting specific aspects of the policy for teaching and the SLE, whereas in more centralised systems, such as Cyprus, Greece, and Slovenia, a specific group of officials (e.g., school inspectors) were able to answer all the questions. For each aspect of policy, we collected interview data from at least three policymakers from each country, who were randomly selected. After the transcription of the interviews, members of two different national teams analysed the interview data and generated scores for each dimension of each aspect of the national policies for teaching and the SLE. The results were then compared, and the inter-rater reliability was found to be satisfactory (i.e., higher than 0.87). The structure of the interview, the guidelines for analysing the interview data, and the record sheet for documenting the scores for each aspect of the national policy can be found in [Appendices 2 to 4](#), respectively.

Head-teacher questionnaire: perceptions about national policy and its impact

Finally, a questionnaire measuring the perceptions of head-teachers about the national policy and the impact that this policy has was designed (see [Appendix 5](#)). At the end of the school year 2010–2011, the questionnaire was administered to all head-teachers of the school sample ($N = 334$) of the six participating countries. The response rate was satisfactory (i.e., 56.3%) compared with other within-nation surveys of head-teachers. To test the generalisability of the data, a one-way analysis of variance was conducted, which revealed that the data can be generalised at the system level, as for all the items the between-group variance was higher than the within-group variance (see Kyriakides et al., 2012). Confirmatory factor analysis (CFA) was conducted for each of the system factors of the dynamic model, that is, (a) national policy on quantity of teaching, (b) national policy on provision of learning opportunities, (c) national policy on quality of teaching, (d) student behaviour outside the classroom, (e) teacher collaboration, (f) providing resources, and (g) partnership, measured by the head-teacher questionnaire by using the EQS software (Byrne, 1998). CFA was used as the objective was to test whether the data fit a hypothesised measurement model; in this case, the assumption of the dynamic model in regard to measuring each system factor in terms of five dimensions (i.e., frequency, focus, stage, quality, and differentiation). The results of the across-country CFA confirmed the construct validity of the questionnaire. In each case, the scaled chi-square was statistically significant but the values of the root mean square error of approximation (RMSEA) were smaller than 0.05 and the values of the comparative fit index (CFI) were greater than 0.95. This implies that each analysis met the criteria for an acceptable level of fit (Kline, 1994). Moreover, the standardised factor loadings were all positive and moderately high. Their standardised values ranged from 0.62 to 0.87, and the great majority of them were higher than 0.68. Thus, for each country, the scores of the factors concerned with each aspect of the national policy for teaching and the SLE and their dimensions were generated by aggregating at the country level the factor scores that emerged from head-teachers' responses to the questionnaire. Since the number of head-teachers per country answering the questionnaire is relatively small, it was not possible to test for factorial invariance at the national/state level. Further research is therefore needed to test whether measures emerged from the questionnaire carry the same meaning across different countries/states.

Results

To investigate the impact of national policy as measured from documentary analyses, interviews, and head-teacher questionnaires on student achievement in mathematics and science, multilevel modelling regression techniques (Goldstein, 2003; Snijders & Bosker, 1999) were used since the data were nested; namely, students within classrooms/schools and classrooms/schools within countries. Due to the fact that most of the sample's schools in the participating countries comprised only one classroom per year group, it was not possible to distinguish the two levels (i.e., classroom and school). Since the number of countries involved in this project is relatively small ($N = 8$), it was decided to model the country effects by adding relevant dummy variables to the empty model and not to consider the country as an extra level of the data. Therefore, two separate multilevel analyses were used to search for the impact of national policies (as measured

by each of the three methods: policy documents, interviews, head-teacher questionnaires) on each of the two subjects (mathematics and science). For the analysis of the data, the first step was to run a two-level model (school and student level) without any explanatory variables (empty model) to determine the variance at each level (see Model 0). The variance for mathematics was 23.7% at the school level and 76.3% at the student level, whereas the variance for science was 30.9% at the school level and 69.1% at the student level (see Table 2). The variance at each level was statistically significant, and this implies that multilevel analysis can be carried out in order to identify the impact of each factor. In Model 1, the seven dummy variables (with the German federal state of Mecklenburg-Vorpommern as the reference group) and the student context variables were added to the empty model. As we can observe from the figures of the third column of Table 2, both students' prior achievement and average prior achievement at the school level had a statistically significant effect at the .05 level on each outcome. Country effects are also reported, but one should bear in mind that none of the country samples was nationally representative, so we cannot draw conclusions about the effectiveness status of these eight countries/states. We can also see that Model 1 explained approximately 48% of the total variance of student achievement in mathematics and 44% in science and most of the explained variance was at the student level.

At the next step of the analysis, for each student outcome (mathematics and science), different versions of Model 2 were established. In each version of Model 2, the score of each aspect of national policy per dimension (as emerged from each source of data) was added one by one to Model 1. The fitting of each of these models was tested against Model 1. Table 2 also presents the parameter estimates and the standard errors that emerged by adding the scores of the quality dimension of the national policy for quantity of teaching from each of the three sources of data (i.e., policy documents – Model 2a, interviews with policymakers – Model 2b, and head-teacher questionnaires – Model 2c). All three measures of this dimension of the quantity of teaching factor were found to be associated with student achievement gains in each subject. Moreover, for each subject, the likelihood statistic (X^2) showed a significant change between Model 1 and each version of Model 2 ($p < .001$). By following the same approach and adding each time a single measure of the national policy (for teaching and SLE) in Model 1, it was found that most aspects of educational policy were associated with student achievement gains in each subject (mathematics and science) irrespective of whether one is looking at the official policy (i.e., data on content analysis), the actions taken by policymakers to promote the policy (i.e., interview data), or the perceived policy (i.e., head-teacher questionnaire data). Finally, we can observe that each version of Model 2 explains approximately 50% of the total variance of student achievement in mathematics and 45% of the total variance of student achievement in science.

In order to estimate the relative importance of each aspect of national policy, the effect sizes of the relevant factor on student achievement in mathematics and science from each source of data were estimated (see Tables 3 and 4). Specifically, the fixed effects obtained with multilevel analysis were converted to standardised effects or Cohen's d by following the approach proposed by Elliot and Sammons (2004), which describes the change on the outcome measure that will be produced by $\pm$ one standard deviation on the continuous predictor variable, standardised by the within-school standard deviation adjusted for covariates in the model. Thus, the relative strength of

Table 2. Parameter estimates and (standard errors) for the analysis of student achievement in each subject considering the impact of the quality dimension of national policy on quantity of teaching emerged from each source of data (policy documents, interviews with policymakers, head-teacher questionnaire).

System Factors	Mathematics					Science				
	Model 0	Model 1	Model 2a	Model 2b	Model 2c	Model 0	Model 1	Model 2a	Model 2b	Model 2c
Fixed part (intercept)	330.5(2.0)	33.7(10.0)	26.9(10.1)	43.3(11.1)	-61.4(19.3)	318.0(2.0)	40.4(10.1)	9.6(11.0)	53.1(0.01)	-110.4(21.1)
Student Level										
Prior achievement		0.67(0.01)	0.67(0.01)	0.67(0.01)	0.68(0.01)		0.54(0.01)	0.54(0.01)	0.53(0.01)	0.54(0.01)
School Level										
Prior achievement		0.32(0.04)	0.24(0.04)	0.28(0.04)	0.28(0.03)		0.39(0.04)	0.40(0.04)	0.29(0.04)	0.36(0.03)
System Level										
Belgium		7.64(3.13)	7.62(3.12)	7.65(3.13)	7.66(3.11)		N.S.S.	N.S.S.	N.S.S.	N.S.S.
Cyprus		N.S.S.	N.S.S.	N.S.S.	N.S.S.		-25.17(3.6)	-25.12(3.3)	-25.11(3.5)	-25.18(3.4)
Greece		9.14(3.11)	9.11(3.10)	9.13(3.10)	9.12(3.10)		-39.20(3.7)	-39.18(3.5)	-39.19(3.6)	-39.17(3.6)
Ireland		8.32(3.08)	8.32(3.07)	8.31(3.07)	8.31(3.07)		N.S.S.	N.S.S.	N.S.S.	N.S.S.
Slovenia		-16.87(3.9)	-16.88(3.9)	-16.86(3.8)	-16.86(3.8)		10.33(2.9)	10.31(2.8)	10.31(2.7)	10.32(2.7)
Quantity of teaching (Quality dimension)										
Policy documents										
Interviews			15.7(2.2)	5.9(2.1)				13.7(1.8)	18.9(2.8)	77.2(9.2)
Head teacher Questionnaires										
Variance components										
School	23.7%	4.0%	3.1%	3.4%	3.2%	30.9%	6.8%	6.2%	5.4%	5.0%
Student	76.3%	47.5%	46.3%	47.5%	47.5%	69.1%	49.0%	48.9%	48.2%	49.0%
Explained		48.5%	50.6%	49.1%	49.3%		44.2%	44.9%	46.4%	46%
Significance test										
Log-likelihood	103,307	98,542	98,533	98,517	98,514	99,395	95,786	95,757	95,746	95,728
Reduction		4765	9	25	28		3609	29	40	58
Degrees of freedom		6	1	1	1		6	1	1	1
p value		0.001	0.001	0.001	0.001		0.001	0.001	0.001	0.001

Notes: For each alternative Model 2 (i.e., Models 2a–2c for mathematics and science), the reduction is estimated in relation to the deviance of Model 1. The federal state of Mecklenburg-Vorpommern (Germany) was treated as a reference group. The other federal states of Germany are not included in the table because they did not statistically significantly differ from the reference state either in mathematics or in science.

Table 3. Effects of each dimension of policy for teaching on student achievement in mathematics and science (as expressed by Cohen's *d*) from each source of data (policy documents; interviews with policymakers, head-teacher questionnaire).

Scales per source of data	Measurement Dimensions									
	Frequency		Stage		Focus		Quality		Differentiation	
	Maths	Science	Maths	Science	Maths	Science	Maths	Science	Maths	Science
<i>Quantity of teaching</i>										
a) Policy documents	0.13	0.15	N.S.S.	N.S.S.	N.S.S.	0.15	0.17	0.18	0.15	0.16
b) Interviews	0.11	0.12	0.16	0.15	N.S.S.	0.18	0.19	0.19	N.S.S.	0.18
c) Head-teacher questionnaires	N.S.S.	N.S.S.	N.S.S.	N.S.S.	0.11	0.12	0.16	0.15	N.S.S.	N.S.S.
<i>Provision of learning opportunities</i>										
a) Policy documents	0.14	N.S.S.	N.S.S.	N.S.S.	0.13	0.11	N.S.S.	N.S.S.	0.15	N.S.S.
b) Interviews	0.16	N.S.S.	0.19	0.17	0.15	0.15	0.17	0.18	N.S.S.	0.10
c) Head-teacher questionnaires	0.17	0.21	N.S.S.	N.S.S.	0.19	0.17	0.16	0.15	0.11	0.12
<i>Quality of teaching</i>										
a) Policy documents	N.S.S.	0.15	N.S.S.	N.S.S.	0.14	0.16	0.14	N.S.S.	0.12	N.S.S.
b) Interviews	0.12	N.S.S.	N.S.S.	N.S.S.	0.12	0.15	0.11	0.13	N.S.S.	N.S.S.
c) Head-teacher questionnaires	0.15	0.16	0.15	0.16	0.15	0.16	0.15	0.16	0.18	0.15

the effects of each aspect of national policy can be compared more easily across the two outcome measures. The following observations arise from [Tables 3](#) and [4](#).

First, all aspects of the national policy for improving teaching and their dimensions were found to have an effect on both student learning outcomes, and their effect sizes were ranging from 0.10 to 0.21. Although the reported effect sizes can be considered as small, they correspond to the average effect sizes reported by meta-analyses of studies searching for the impact of school policies on student outcomes (see Kyriakides et al., 2010; Scheerens et al., 2005). Since we are not aware of any study investigating the impact of national policies on student learning outcomes, it could be claimed that the results of this project reveal that national policies are neither less nor more important for promoting student learning outcomes than school policies for improving teaching and the SLE. Second, although in some cases no statistically significant effects on student learning outcomes are reported, we cannot find any aspect of policy for improving teaching or improving the SLE where at least one of its dimensions was associated with student outcomes across the three sources of data. Moreover, data emerging from each method measuring policy for a specific factor were found to be associated with student learning outcomes at least in one of the dimensions of this factor. These results seem to reveal the importance of considering different sources of data to measure national policies and use more than one dimension to evaluate national policies for teaching and the SLE. Finally, for most aspects of national policy, the frequency dimension was found to have relatively smaller effect sizes than the other dimensions (especially the quality dimension) irrespective of the source of data that was used to measure each aspect of national policy.

Implications

This study seems to reveal that the national policies for improving teaching and the SLE are associated with student achievement gains. Although this study collected data from only eight states, the multilevel analyses revealed statistically significant associations of factors measuring the national policy for teaching and the SLE with student achievement. In running this project, we first of all found that the national policies of the participating countries/states could be described in relation to the factors and the five measurement dimensions included in the dynamic model. Although the study was conducted in only eight countries/states, substantial variations in the quantitative and qualitative characteristics of the national policies across these countries/states were observed. As a consequence, we were in a position to detect relations between the national policy and student achievement despite the small number of countries participating in the study.

Second, the value added of using the five dimensions to measure national policy for teaching and the SLE has been demonstrated since not only the quantitative characteristics (i.e., frequency) but also the qualitative characteristics (i.e., stage, focus, quality, and differentiation) of national policies were found to be associated with student achievement gains. Moreover, by including all five dimensions of each factor in a single model, more variance of student achievement was explained (i.e., almost 55% in mathematics and more than 50% in science), and this model was found to fit better to the data than any other model where only a single dimension of each aspect of policy was included. It is also important to note that in most cases the qualitative characteristics of the national policies were found to explain more

Table 4. Effects of each dimension of policy for improving the SLE on student achievement in mathematics and science (as expressed by Cohen's *d*) from each source of data (policy documents, interviews with policymakers, head-teacher questionnaire).

Scales per source of data	Measurement Dimensions									
	Frequency		Stage		Focus		Quality		Differentiation	
	Maths	Science	Maths	Science	Maths	Science	Maths	Science	Maths	Science
<i>Partnership policy</i>										
a) Policy documents	0.14	0.15	N.S.S.	N.S.S.	0.13	0.12	0.20	0.17	N.S.S.	N.S.S.
b) Interviews	0.17	0.14	N.S.S.	0.15	0.14	0.15	0.15	0.12	N.S.S.	0.12
c) Head-teacher questionnaires	0.14	0.19	0.14	0.18	0.14	0.17	0.14	0.18	0.14	0.18
<i>Provision of learning resources</i>										
a) Policy documents	N.S.S.	0.11	0.12	N.S.S.	0.14	0.13	0.12	0.16	N.S.S.	N.S.S.
b) Interviews	N.S.S.	0.15	N.S.S.	0.14	N.S.S.	0.15	N.S.S.	0.18	N.S.S.	0.14
c) Head-teacher questionnaires	0.10	N.S.S.	0.11	N.S.S.	0.12	N.S.S.	0.13	0.17	0.21	0.13
<i>Teacher collaboration</i>										
a) Policy documents	0.13	0.16	N.S.S.	N.S.S.	0.10	0.13	0.15	0.14	N.S.S.	N.S.S.
b) Interviews	0.12	0.13	0.11	0.11	0.14	N.S.S.	0.14	N.S.S.	N.S.S.	0.12
c) Head-teacher questionnaires	0.13	0.15	0.13	0.15	0.13	0.15	0.13	0.15	0.12	0.15

variance in student achievement than the frequency dimension, and relevant differences can be found in the effect sizes reported in [Tables 3 and 4](#). This implies that in developing national policies for improving teaching and the SLE, policymakers should take into account the rationale behind each measurement dimension and define policies accordingly. For example, the stage dimension implies that policies and actions taken to improve teaching and the SLE should take place over a long period of time to have an effect, and policies may have to be redefined from time to time and adapted to the various challenges schools may face in different time periods. In this way, continuity in the implementation of the policy and its effects on learning may be achieved. Similarly, the focus dimension implies that a balance between general and more specific policy guidelines should exist. The importance of investigating this dimension was demonstrated in this study, and this finding could be attributed to the synergy theory. If all policy efforts address a single purpose, then the chance to achieve this purpose is probably high, but other purposes are not likely to be achieved, and thereby synergy may not exist. Policymakers should therefore realise the benefits of achieving a balance in terms of the focus dimension of their policies for improving teaching and the SLE both in terms of the specificity of their guidelines and the number of aims addressed by each policy initiative.

Third, the study followed a specific approach in measuring the national policy and the actions taken to improve teaching and the SLE. We did not restrict ourselves to a content analysis of the policy documents since it was considered equally important to measure the perceptions of those who are expected to promote the national policy at schools and provide relevant support to school stakeholders to implement the national policy. This group of officers and external agents are expected to clarify the content of the policy and provide suggestions to schools on how to link the national policy with the problems/challenges that each school is facing. Conducting interviews with them implies that publishing formal documents to express the national policy is not enough since actions should also be taken by public officers and/or external agents to support schools in their attempt to implement the national policy (Kyriakides et al., 2015). We also examined the perceptions of

head-teachers since they are seen as the ones who should make sure that the policy guidelines are followed in their schools. Head-teachers are also in a position to refer to the impact that national policies may have on improving teaching and the SLE since they can see how the implementation of a national policy may affect the policy and practice in their schools. By conducting separate analyses of each source of data, we found that each of these three sources of data helped us to detect effects of national policies on student learning outcomes. Moreover, by comparing the data from these three sources, we found that there was a higher (than assumed) consistency in the generated data about the qualitative characteristics of the national policies. It was initially assumed that in analysing only the policy documents, we would not have had the chance to detect effects since the messages that schools receive from policy documents might not be clear and might be misinterpreted. However, the analysis of policy documents revealed that some countries did not have any policy on specific aspects of teaching and the SLE, and in these countries policymakers did not provide any guidelines or support to the schools on how to deal with relevant challenges they are facing. What is even more important is that head-teachers in these countries were not only in the position to detect the lack of policy but also critical about their national policy in regard to these aspects. As a consequence, the multilevel analyses revealed effects on achievement of the scores of national policies emerging from each source of data (see [Tables 3](#) and [4](#)). The use of these three sources of data helped us to have a comprehensive picture of the policies in each country, but it should also be acknowledged that perspectives of other school stakeholders (e.g., teachers, parents, students) could also be examined in future studies.

Fourth, all effect sizes reported in [Tables 3](#) and [4](#) are rather small and quite similar (ranging from 0.10 to 0.21). The fact that small effect sizes are reported is in line with findings of effectiveness studies revealing that the teacher level is more important than the school and system levels (Muijs et al., 2014). Moreover, secondary analyses of international comparative studies reveal that the school level has a bigger effect on student outcomes than the system level (Kyriakides et al., 2015). Furthermore, quantitative syntheses of school effectiveness studies report small effect sizes of school factors concerned with policies and actions to improve teaching and the SLE (see Kyriakides et al., 2010; Scheerens, 2013). Specifically, similar direct effects were found in a meta-analysis conducted by Kyriakides et al. (2010) searching for school-level factors associated with student achievement. In this quantitative synthesis of 67 school effectiveness studies, the effect sizes of the factors concerned with different aspects of the policy for teaching and the SLE were also quite uniform and ranged from 0.13 to 0.18. One could therefore claim that this uniformity of small effect sizes of system-level factors is to be expected. One could also attribute this finding to the problem of multicollinearity, which may, to some extent, affect the uniformity of the effect sizes since the factors included not only at the system level of the dynamic model but also at the lower levels (e.g., school level) are inter-related (Antoniou & Kyriakides, 2011; Creemers & Kyriakides, 2015).

We should also acknowledge a significant limitation of not only this study but also the studies included in the meta-analyses which has to do with the fact that direct effects of national/states policies on student achievement were examined whereas the dynamic model assumes that system and school-level factors are expected to have mainly indirect effects. Even though in most studies only the direct effect of the school factors was depicted, in cases where the indirect effects were examined larger effects were identified (Kyriakides

et al., 2015). A longitudinal study collecting data on both school policies and stakeholders actions for three consecutive school years identified larger total effects of school policies and actions taken to improve teaching and the SLE on student learning outcomes (see Kyriakides et al., 2015). Further research is therefore needed to examine both direct and indirect effects of national policies in order to have a better understanding of how (and through which mechanisms) the national policy may promote student learning outcomes.

Fifth, since this longitudinal study took place in a small number of countries within Europe, the generalisability of the findings of this study should be further investigated. These findings can be seen as a starting point for international studies which may help us to search for the impact of national educational policies on student achievement. These studies may also need to collect data from countries outside Europe and see if national policies have similar effects on student outcomes in countries with different political and sociocultural contexts. To further understand the impact that educational systems may have on student learning outcomes, we need international large-scale studies measuring both the national policies for teaching and the SLE and the political and sociocultural context of each country which partly defines the wider educational environment in which students, teachers, and schools operate (Creemers & Kyriakides, 2008).

Sixth, international studies such as PISA and TIMSS use a repeated series design approach in collecting data associated with factors affecting student achievement in different outcomes. If data on national policies for teaching and the SLE are collected, it will be possible to not only examine the extent to which national policies for teaching and the SLE explain variation of student achievement in different countries but also test the criterion consistency and the time stability of their associations with achievement (at different time points and for different learning outcomes). One could also search for the extent to which changes in the functioning of educational policies are associated with changes in the effectiveness status of the educational systems. To achieve these aims, international comparative studies should collect data on national policies for improving teaching and the SLE and search for the impact of national policies on student learning outcomes. Finally, it should be acknowledged that in measuring the policies for teaching and the SLE, it was not possible to cover all aspects of policy that are related to the constructs of our study.

Despite the limitations of this study, effects of national policies for teaching and the SLE on student achievement gains were identified. Given the small number of participating countries, one could claim that the results are rather positive about the impact that national policies may have on student learning outcomes. This study seems also to reveal that when organisations such as the IEA and the Organisation for Economic Co-operation and Development (OECD) conduct international comparative studies, they should examine the national policies for improving teaching and the SLE more systematically, rather than just looking at other characteristics of educational systems, such as the structure of the system and the extent to which schools are autonomous.

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Appendix 1. Analysis of policy documents

At the first stage, we developed a profile for each country by studying all the regulations and guidelines that are sent to the schools by the ministries of education/states, including the educational laws that exist in each country/state. When we studied the regulations, we looked for aspects that were related to each factor of the dynamic model. The aspects that were covered per factor are shown in Table 1.

More specifically, one table for each aspect of each system-level factor had to be developed. See Table A1 for the format of the table. We had to put down each suggestion that was relevant to the factor as it was stated in the document. Each suggestion was accompanied by specific information. Specifically, we had to put down whether the suggestion was found in a document that provided guidelines to schools or was stated in the law (i.e., it had a compulsory status). In the third column, we had to record the phase of education (e.g., primary education, secondary education, or specific age group) that was addressed. Then we had to state which stakeholders were involved in implementing this policy recommendation. Additionally, the researcher had to rate the suggestion by considering whether the suggestion was in line with the literature (i.e., the theoretical background upon which the dynamic model was based) or not. In case there was any aspect of differentiation, it was mentioned in the sixth column. Finally, we had to write down the exact period that this suggestion was introduced. Table A1 provides an example of the format of the table that was used in the case of teacher absenteeism. The same format was used for every aspect of each factor. In this way, we developed a profile for each country, where one could find information about the suggestions that are included in the policy documents for each aspect of the system-level factors that are stated in Table 1.

To generate scales for measuring each factor and its dimensions, we had to go through the profiles of the countries and list all the suggestions/types of actions which were included under each aspect of factor. The first column of Table A2 presents the types of actions related with teacher absenteeism that were found in the six participating countries. We can observe that the first three types of actions attempt to reduce the phenomenon, whereas the others are concerned with actions that schools can take to replace the lost teaching time. Then we had to look at the profile of each country and measure how many suggestions were included in the profile for each type of action concerned with teacher absenteeism. When there was no suggestion related to a specific type of action, the number 0 was written in the

Table A1. An example of a suggestion on how to deal with teacher absenteeism and codes emerged by analysing the content of this suggestion.

Suggestion	Guideline (optional) or law (compulsory)	For primary/secondary education	Groups/persons that are involved	In line with the model/literature Impact	Differentiation according to the age/group of teachers	Period of establishment/change of suggestion
In cases of short periods of absence, head-teachers can allocate and reassign teachers by giving them an additional workload or extra teaching hours. Not more than 5 hr per week.	Law	Primary secondary	Teachers Head-teachers	In line with the model	–	1995

Table A2. Scores on how to deal with teacher absenteeism per type of action resulting from analysing the suggestions included in the policy documents.

STATE/NATIONAL POLICY ON QUANTITY OF TEACHING					
Type of actions	No policy	No clear policy	Encouragement	Requirement	Accountability
(A) Schools should <i>keep records</i> on teacher absenteeism	0				
(B) <i>Punishment – Discouragement of teacher absenteeism</i> : Schools can fire teachers who are absent for an unacceptable reason			1 Suggestion Specificity: 0 Differentiation: 0		
(C) Teachers who are absent should <i>inform</i> the head-teacher on time about their absence (e.g., some days before)			2 Suggestions 1 specific and 1 general Differentiation: 0	2 Suggestions Specificity: 0 Differentiation: only in one suggestion	
(D) Students of a teacher who is absent are <i>kept busy</i> but the lost teaching time is not replaced (e.g., students are formed into small groups and join other classrooms, they are asked to work in the school library)	0				
(E) Part of the lost teaching time is replaced				1 Suggestion Specificity: 0 Differentiation: 1	
(F) All lost teaching <i>time is replaced</i> (e.g., teachers are obliged to substitute for a colleague who is absent, substitute teachers are employed)			1 Suggestion Specificity: 0 Differentiation: 0	1 Suggestion Specificity: 0 Differentiation: 0	

second column (i.e., **no policy**). When a number of suggestions were identified, each one was evaluated by taking into account whether it was clear or not. If a certain number of suggestions was unclear, then this number was put down in the third column (i.e., “**no clear policy**”). Those suggestions that were clear and encouraged schools to undertake specific actions were recorded in the fourth column (i.e., **encouragement**). If the schools were not only encouraged but also required to implement a specific type of action, the suggestion(s) was/were recorded in the fifth column (i.e., **requirement**). If there was a mechanism within the system that examines whether the required national/state policy was implemented, the number was put in the last column (i.e., **accountability**) which implies that schools not only are required to implement this action but also are accountable for it. Then, for each suggestion we had to record some extra information, as can be seen in the next columns.

Table A2 gives an example to help the readers understand how the analysis of policy documents helped us to generate the scores for each dimension. Specifically, this table presents the results of a country where eight suggestions on how to deal with teacher absenteeism were found in its profile. None of them was related with action types A or D (as a consequence, the number 0 was recorded in the second column of the relevant rows). There was a suggestion which was in line with type B, and schools were only encouraged to take this action. For this reason, this suggestion was recorded in the fourth column of the row concerned with action B. It is indicated that this suggestion is not too specific, so the number 0 is given. Also, no differentiation was found, and for this reason number 0 is given. Similarly, in this country we found four relevant suggestions in line with type C action. Two of them were reported in the fourth column (i.e., under encouragement), whereas the other two were put down in the fifth column (requirements). By looking at the figures given in column 4, one can see that one of them was too specific and one more general and none of them encouraged differentiation (i.e., number 0 was given).

The figures for each aspect of the system-level factors put down in Table A2 were entered in an SPSS data file. In the SPSS sheet, we had as many columns as types of actions to measure the frequency dimension. For instance, in the case of teacher absenteeism we had six columns. Then we had to count how many suggestions per type were included. In the case of the country presented in Table A2, the number 0 was recorded under the first column. For the second column, we put down the number 1, whereas for the third column the number 4, and so forth. In this way, we could estimate the frequency dimension of each type of action. Then, we had to complete six columns for the differentiation dimension (i.e., one column per type of action). The average number was recorded and indicated how many suggestions out of the total number of suggestions asked for differentiation. For instance, in the case of this country, the differentiation is 0 for types A, B, D, and E of teacher absenteeism. For type C, one out of four suggestions includes differentiation, so the differentiation score is 0.25. Type F has two suggestions, one encouragement and one requirement. One out of the two includes aspects of differentiation, so the score for differentiation is 0.5. To fill in the focus column of each type of action, we followed the same procedure. For type C, one out of four suggestions is specific so the focus score for this type of action was 0.25.

Appendix 2. Structure of the interview

Question 0 (Optional – although this question was included to “break the ice” at the beginning of the interview):

I would like first of all to thank you for taking time to give us an interview. According to your view, what kind of actions does your educational system take in order to improve the quality of education?

Note: In case the interviewee gives examples of actions associated with a specific factor of the model raised by any of the questions 1 up to 7, move to this question first and then to the rest of the questions dealing with factors that are not mentioned.

Question 1a:

First, we would like to know which policies and actions are taken in order to encourage primary teachers and schools to maximise teaching time in your educational system. Teacher absenteeism can be seen as an aspect concerned with the use of teaching time. Is there any national policy on how teacher absenteeism should be dealt with?

Question 1b:

Let's move now to students' absenteeism. Is there any national policy about students' absenteeism or any guidelines given to schools on how to develop their own policy on student absenteeism?

Question 1c:

What about the dropout phenomenon ... to what extent is this a problem in your country? What actions are taken by the system to reduce drop out?

Question 1d:

What is the official national policy in relation to the long- and short-term planning?

Follow-up question: Does the system take any other action beyond those that you have already mentioned in relation to the maximisation of the teaching time?

Question 2a:

We would like to know whether your system has any policy in regard to quality of teaching in primary schools; for example, official pedagogy, guidelines offered by advisors, or other professional groups.

Instructions: Please put a tick on the points that are mentioned by the interviewee. Some interviewees may describe practices included in the checklist, without using the specific words. Where you are not sure about the aspects that are referred by the person, please ask additional questions to clarify their views.

Question 2b:

Are there any standards of teaching in place? And if so, which aspects of teaching are considered as characteristics of effective teaching?

Checklist:

Structuring

Orientation

Application

Questioning

Management of Time

Classroom Assessment

Strategies for Learning

Establishment of the learning environment of the classroom:

- (a) Teacher–Student interactions
- (b) Interactions among students
- (c) Dealing with misbehaviour
- (d) Competition
- (e) Cooperation among students (cooperative learning)

Question 3a:

We would like to know which policies and actions are taken in order to encourage teachers and schools to provide learning opportunities to their students. Could you please refer to the national curriculum of your country and specifically to:

- (a) its structure
- (b) the aims
- (c) the suggested methods – pedagogy and
- (d) student assessment – evaluation methods and techniques

Question 3b:

When did the last curriculum reform take place and which procedures were followed in adopting the specific curriculum reform?

Question 3c:

To what extent is differentiation of teaching taken into account in developing your national policy on the provision of learning opportunities? For example, we would like to know if the curriculum promotes differentiation in teaching and how.

Question 3d:

What is the official policy on textbooks in your country? Are there official nationally prescribed textbooks or do teachers have to choose their own material?

Question 3e:

What about the national policy on extracurricular activities or the type of guidelines that may be given to schools on providing extracurricular activities?

Question 3f:

Please refer to the official policy and the actions supposed to be taken by the schools in order to provide sufficient learning opportunities to students with special needs.

Question 4a:

We would like to know whether your system has any policy aiming to encourage teachers to collaborate in order to improve their teaching.

Question 4b:

To what extent are the schools in your country encouraged by policymakers or other actors to cooperate with each other?

Question 5a:

What kind of educational resources are provided to schools by the Ministry of Education?

Question 5b:

To what extent is the active participation of the parents encouraged?

Question 5c:

We would like to know who is offering initial training to teachers serving in your country and whether the system attempts to monitor the quality of initial teacher training.

Question 5d:

We would like to know who is offering in-service training to the teachers and whether the system attempts to monitor the quality of in-service teacher training.

Question 6a:

Partnership is another factor that we like to examine. Could you please tell us if your educational system encourages schools to establish close relations with the parents and, if so, tell us what actions are taken to encourage partnership?

Question 6b:

Does the system expect or even require the schools to provide information about school policy and curricular activities to the parents?

Question 6c:

Does the system expect the schools to organise learning activities for the parents?

Question 6d:

What kind of actions does the system take to encourage schools to establish close relations with the community?

Question 6e:

To what extent are the schools encouraged to use facilities available in the community for their teaching and/or to use the expertise in the community to support teaching?

Question 7a:

Please refer to the mechanisms that are available in your educational system with respect to teacher and school evaluation.

Question 7b:

Which actions are followed for the establishment and the evaluation of the reforms that take place in your country? Can you give us an example of a recent reform which was evaluated and what kind of evaluation was conducted?

Question 7c:

It would be useful if you could give us information about the dominant practices that are followed for the evaluation of the system.

How frequently are evaluation projects undertaken?

Sources of data (e.g., views of different stakeholders, impact on learning) used in evaluating the national policy

Focus of evaluation on investigating:

- (a) perceptions of different stakeholders about the appropriateness of the policy
- (b) abilities of stakeholders to implement the policy
- (c) impact of policy on student learning.

Period in which the evaluation data are collected: Is there a continuous evaluation system or is a cross-sectional approach used?

Processes that are used in order to control the validity of evaluation instruments

Follow-up question (7d): To what extent do policymakers review their evaluation mechanisms and adapt them in order to improve the quality of the evaluation data?

Follow-up question (7e): Please tell us whether, depending on the situation of your system, more emphasis is given to conducting evaluation for a specific reason. For example, if there is a problem with drop out, then you concentrate on that.

Closing question:

Finally, I would like to thank you for your support and for taking time to talk with us about the educational policy in your country. I would also like to ask you whether you have any other comment on the educational policy in your country and the actions taken to help schools improve their effectiveness.

Appendix 3. Guidelines for analysing the interview data

For the analysis of the interview data, we need to have a record for each interviewee. For each interviewee, we aim to find out what his/her view is on each factor of the dynamic model. Specifically, three different types of information are needed. First, we like to know what the status of the school policy is (column 2). In regard to the status of the policy, we see five different categories that show for each aspect of each factor whether:

- (a) there is *no policy* (0);
- (b) there is *no clear policy* (1);
- (c) the policy is clear but schools are only *encouraged* to implement it (2);
- (d) the policy is clear and schools are required to implement it (3);
- (e) schools are not only required to implement the policy but there is also a control mechanism that ensures that the policy is implemented (4).

Second, we would like to have a score for each dimension of each aspect of the factor (columns 3–6). This type of information is obviously relevant when there is a policy. Below, you can see the four dimensions (i.e., stage, focus, quality, and differentiation) looking at qualitative characteristics of the factor that we should use to classify the policy for each aspect of the system-level factors included in the dynamic model.

- (a) **Quality:** We would like to know whether the policy is in line with the assumptions of the dynamic model. For each factor, we give below explanations when the policy is in line with the dynamic model and how to code the policy.
- (b) **Focus:** We would like to have a measure about the specificity of the policy (i.e., to know if the policy is too specific or too general). None of the two extreme points are seen as helpful, so both of them get the code 0. There is also the option that the interviewees' comments show that the policy is neither too specific nor too general (code 1). Thus, some guidelines are given but the professional autonomy of the school stakeholders is respected and schools are encouraged to identify their own ways to deal with the problem.
- (c) **Stage:** In regard to this dimension, we expect you to find out if the system from time to time attempts to redefine the policy and/or take decisions in order to adapt the policy to the special problems the schools are facing (code 1). If the policy was established too many years ago and never reconsidered, give a 0 score. For example, if the policy has been established 5 years ago and since then never redefined give a code 0.
- (d) **Differentiation:** It examines whether the policy is expected to be implemented in the same way by all the stakeholders that are addressed (code 0) or if the special characteristics of some groups are taken into account and are therefore expected to implement the policy in a different way from others (code 1). When differentiation is observed, we expect to see its positive way of functioning. For example, special resources might be provided to schools that need them most (i.e., schools in disadvantaged areas) or special arrangements for training younger teachers are available.

Third, we need to know if there are some aspects of policy associated with each factor that are not covered by the interview but are relevant to the factor. This type of information comes from the answers to specific follow-up questions (see the first follow-up question after Question 1d). If the interviewee refers to specific aspects, these have to be mentioned in the record sheet that you are expected to produce for each interview (see [Appendix 4](#)).

Beyond these three types of information, we will also need to record some background information about the interviewee such as his/her role/position/status in the system (e.g., inspector, civil servant in the ministry, etc.) and his/her years of experience in this position.

Finally, we would like to remind you that we are interested in what the policymakers believe that the policy is and not in their views of the appropriateness of the policy. For us, it will also be important to compare the data from the interviews to see if the policymakers agree among themselves about the way their educational system is functioning and use the data in the multilevel analysis.

Below, you can find some more specific information on how the analysis of each question is expected to be done. An issue that needs special attention is when the policy for each factor is seen as in line with the dynamic model (quality dimension).

Questions 1a–1d: quantity of teaching

These four questions are concerned with the quantity of teaching, and we would like to know the status of the policy for each aspect of this factor, that is, teacher absenteeism (1a), student absenteeism (1b), drop out (1c), long- and short-term planning (1d), and give a code for each dimension. In the case of quality dimension: The policy in regard to each aspect is expected not only to reduce the phenomenon (Code 1) but also to help schools find ways to replace the lost teaching time (Code 2). You may find out that in some cases the policy may not refer at all to the importance of reducing lost teaching time or replacing the lost time but may deal with administrative issues (Code 0) that may not help schools maximise the use of teaching time.

In regard to his/her responses to the follow-up question, you need to put down the type of aspects that are covered and for each of them (if any) to give information about the status of the policy and a score for each dimension.

Questions 2a–2b: quality of teaching

In regard to the quality dimension of the quality of teaching factor, we simply need to know whether and, if so, how many teacher factors are covered. If only structuring is referred, give 1 as a score for the relevant aspect of quality of teaching. So, at the end we will get a number from 0 to 12 indicating how many teaching factors are covered. The list of factors is shown in Question 2b.

Questions 3a–3f: opportunity-to-learn factor

The quality dimension of this factor is concerned with the extent to which each aspect of the factor (e.g., guidelines for extracurricular activities) aims to ensure that opportunities to help students learn are offered and that this is done in a way that does not reduce the teaching time offered to the official curriculum (Code 1).

Questions 4a–4b: teacher collaboration and networking

In this case, we would like to know whether teacher collaboration and school networking aim to help teachers/school stakeholders learn from each other. In this way, the teaching practice or the school learning environment may be improved (Code 1). If collaboration only aims to build better relations among teachers, you give 0.

Questions 5a–6e: partnership and use of resources

If a positive answer to each question is given, put 1 to the quality dimension (if not, put 0). This does not apply to Question 6d, which aims to find out if other actions not mentioned in the interview are taken by the system.

Questions 7a–7e: evaluation

In this part, you can see specific questions that refer to each dimension of the factor.

In regard to the status of the evaluation, a similar approach is used in recording the interview data. A score from 0 to 4 has to be given, and the coding is as follows:

- **0** in case there is no attempt to conduct any evaluation in regard to each aspect mentioned by Questions 7a to 7c. (no evaluation);
- **1** in case there is no systematic (clear) attempt to evaluate schools/reforms/system (no systematic evaluation);
- **2** when evaluation takes place but stakeholders are only encouraged to take into account the findings of the evaluation (encouraged to take them into account);
- **3** when evaluation takes place and stakeholders must take into account the findings of the evaluation either for formative or for summative reasons (required to take them into account);
- **4** in case the evaluation takes place and stakeholders are not only expected to take into account the evaluation results but there is also a mechanism to check if the results have been taken into account (hold accountable for using evaluation data).

In regard to the quality dimension, we need to have information about the purpose of evaluation. A score from 0 to 1 should be given. Give 1 if the evaluation is done for formative reasons and 0 if it is done for summative reasons. For example, under Question 7b we expect to see if the evaluation data were used to improve the policy. If the system attempts to achieve both formative and summative purposes using the same instruments, then give a 0 score, since we know from the literature that the two purposes cannot be achieved by using a single system. Next to each aspect of the evaluation, put a number to indicate how many sources of data are used. This is an indication of the quantitative dimension, so the number has to be put only on the first column.

Appendix 4. Record sheet for the analysis of the interview data

Interviewee: Position of the interviewee: Years of Experience

Aspects of each factor covered	Status	Quality	Focus	Stage	Differentiation
Quantity of Teaching					
Teacher absenteeism (Q1a)					
Student absenteeism (Q1b)					
Dropout (Q1c)					
Long- and short-term planning (Q1d)					
<i>Other aspects covered (please describe):</i>					
Quality of Teaching					
Pedagogy (Q2a and Q3a aspect c)					
Standards of teaching (Q2b)					
<i>Other aspects covered (please describe):</i>					
Opportunity to learn					
Differentiation of teaching (Q3c)					
Textbooks (Q3d)					
Extracurricular activities (Q3e)					
Students with special needs (Q3f)					
<i>Other aspects covered (please describe):</i>					
Collaboration among teachers					
Teacher collaboration (Q4a)					
Networking (Q4b)					
<i>Other aspects covered (please describe):</i>					

Resources					
Educational resources (Q5a)					
Initial training (Q5c)					
In-service training (Q5d)					
<i>Other aspects covered (please describe):</i>					
Partnership					
Active participation of parents (Q5b)					
Providing information to parents (Q6b)					
Learning opportunities for parents (Q6c)					
Relations with wider community (Q6d)					
Using community resources for teaching (Q6e)					
Evaluation					
School Evaluation (Q7a)					
Evaluation of reforms (Q7b)					
Evaluation of the system (q7c)					

Notes:

1) For **Status**, the coding is from 0 to 4.

Specifically, the coding is:

- 0 in case there is no policy in regard to a specific aspect of a factor;
- 1 in case there is no clear policy;
- 2 in case the policy is clear but schools are only encouraged to implement it;
- 3 in case the policy is clear and schools are required to implement it;
- 4 in case schools are not only required to implement the policy but there is also a control mechanism that ensures that the policy is implemented.

However, in the case of the factor concerned with “evaluation”, the coding is:

- 0 in case there is no attempt to conduct any evaluation in regard to each aspect mentioned (no evaluation);
- 1 in case there is no systematic (clear) attempt to evaluate schools/reforms/system (no systematic evaluation);
- 2 in case evaluation takes place but stakeholders are only encouraged to take into account the findings of the evaluation (encouraged to take them into account);
- 3 in case evaluation takes place and stakeholders must take into account the findings of the evaluation (required to take them into account);
- 4 in case the evaluation takes place and stakeholders are not only expected to take into account the evaluation results but there is also a mechanism to check if the results have been taken into account (hold accountable for using evaluation data).

2) For **Quality**, the coding is from 0 to 1:

- 0 in case the policy is not in line with the assumptions of the dynamic model;
- 1 in case the policy is in line with the assumptions of the dynamic model.

However, in the case of the factor concerned with “quality of teaching” we need a number from 0–12 to indicate how many teacher factors are covered (for the list of teacher factors, see Question 2b).

3) For **Focus**, the coding is from 0 to 1:

- 0 in case the policy is too specific or too general;
- 1 in case the policy is neither too specific nor too general.

4) For **Stage**, the coding is from 0 to 1:

- 0 in case the policy was established too many years ago and has *never been reconsidered*;
- 1 in case the policy is *redefined and adapted* to the special problems the schools are facing.

5) For **Differentiation**, the coding is from 0 to 1:

- 0 in case the policy is expected to be implemented in *the same way* by all the stakeholders that are addressed;
- 1 in case the special characteristics of some groups are taken into account and are therefore expected to implement the policy in a *different way* than others.

Appendix 5. Questionnaire for head-teachers

This questionnaire has been developed for a study that aims to capture head-teachers' opinions about the national/state education policy on teaching and the broader learning environment of primary schools. The following three aspects of teaching and the school learning environment (SLE) are taken into account in the questionnaire:

A. Usage of teaching time

Time management, student absenteeism, teacher absenteeism, homework, school timetabling, and teaching time spent on extracurricular activities.

B. Provision of learning opportunities

Use of visual materials and technological equipment in classrooms, dealing with students with special educational needs (e.g., gifted children, children with learning difficulties, children with special interests), and teachers' long-term planning.

C. Quality of teaching

Student assessment and evaluation, lesson structuring, orienting students to achieve specific goals, application exercises, using questions as a teaching technique, use of learning strategies, time management, and the classroom as a learning environment.

The questionnaire also asks for your views on the national/state policy for improving the broader learning environment of primary schools. Specifically, four aspects of the school learning environment (SLE) are taken into account: (a) school policy on student behaviour outside the classroom, (b) teacher collaboration, (c) relations with parents and the wider community, and (d) use of school and local community resources.

The questionnaire consists of three parts: Part A covers the national/state policy and your school policy, Part B covers the impact of national/state policy on school practices, and Part C covers the evaluation of the national/state policy.

Completing the questionnaire will take approximately **20 minutes**.

Thank you very much for your help.

PART A: THE NATIONAL/STATE POLICY AND YOUR SCHOOL POLICY

Part A provides statements about the relationship between the national/state policy and your school policy. Please circle one number that you think applies to each statement, based on the following scale:

- 1 = No national/state policy OR the content of the national/state policy is not clear.
- 2 = Schools are encouraged to implement the national/state policy.
- 3 = Schools are required to implement the national/state policy.
- 4 = An accountability system exists to ensure that the national/state policy is implemented.

In your view, what is the impact of the national/state policy on the following?

	No Policy	Encouragement	Requirement	Accountability
1. Keeping systematic school records relating to:				
A. Student absenteeism.	1	2	3	4
B. Teacher absenteeism.	1	2	3	4
C. Special educational needs of students.	1	2	3	4
D. Long-term planning by the teachers.	1	2	3	4
E. Organisation of extracurricular activities (e.g., trips, visits, and other activities).	1	2	3	4
F. Disciplinary problems involving students during breaks.	1	2	3	4
G. Taking advantage of educational resources available in your school (e.g., maps, software, etc.).	1	2	3	4
2. School participation in programmes aimed at:				
A. Making good use of teaching time.	1	2	3	4
B. Providing learning opportunities beyond those offered by the formal curriculum.	1	2	3	4
C. Improving teaching quality (e.g., structuring, questioning, orientation).	1	2	3	4
3. Designing the school timetable so that sufficient time is allowed for students to move around classrooms/buildings and prevent the loss of teaching time.	1	2	3	4
4. Your school policy on:				
A. Encouraging all school staff to maximise teaching time and minimise disruptions to classes.	1	2	3	4
B. Regaining any lost teaching time by offering extra class time for learning.	1	2	3	4
C. Ensuring that lessons start and finish on time.	1	2	3	4
D. Ensuring that there are no interruptions of lessons (e.g., for announcements).	1	2	3	4
E. Developing a policy on homework that provides guidelines about the:				
1) Amount of homework given to students.	1	2	3	4
2) Type of homework.	1	2	3	4
3) Role of parents in supervising homework.	1	2	3	4
4) Feedback on homework assignments.	1	2	3	4
F. Providing learning opportunities to students beyond those offered by the formal curriculum.	1	2	3	4
G. Supporting students with special needs (e.g., children with learning difficulties, gifted children, children with special interests).	1	2	3	4
H. Establishing a school policy on the characteristics of effective teaching.	1	2	3	4
I. Establishing a school policy about teachers' role in supervising students during breaks.	1	2	3	4
J. Ensuring that teachers make use of different educational tools available in the school.	1	2	3	4
5. Differentiating teaching according to students' needs and abilities.	1	2	3	4
6. Providing incentives for teachers and students to implement the school policy on teaching (e.g., your school rewards teachers who spend extra time giving support to students and/or feedback to parents).	1	2	3	4
7. Promoting cooperation among teachers within schools on professional development issues (e.g., exchanging teaching materials, experiences from participating in different projects).	1	2	3	4
8. Creating networks between schools for teacher professional development purposes.	1	2	3	4
9. Using the results of school evaluations to identify school improvement priorities.	1	2	3	4
10. Promoting the pedagogical role of the head-teacher as an instructional leader (e.g., observing lessons and giving feedback to class teachers).	1	2	3	4

In your view, what is the impact of the national/state policy on the following?

	No Policy	Encouragement	Requirement	Accountability
11. The role of teaching staff in promoting the school's learning environment (e.g., establishing relations with the parents and the school community).	1	2	3	4
12. The role of staff meetings in promoting teacher professional development (e.g., discussing issues on effective teaching and on dealing with students that have special educational needs).	1	2	3	4
13. Providing resources to the school for offering in-service training for specific groups of teachers (e.g., newly appointed teachers).	1	2	3	4
14. Conducting school self-evaluation for improvement purposes.	1	2	3	4
15. Promoting equity in education by providing extra learning opportunities to those who need them.	1	2	3	4
16. Providing extra resources to students from more disadvantaged backgrounds.	1	2	3	4

PART B: THE IMPACT OF NATIONAL/STATE POLICY ON SCHOOL PRACTICES

Part B refers to statements relating to the impact that the national/state policy may have on the actions taken to improve educational practice in your school. For each statement, please choose a **number from 1 to 4 of the scale below** to show how much you agree or disagree with each statement about the impact of national/state policy. **Where there is no national/state policy on a specific issue (or if you are unaware of such a policy), please place an X in the "Not applicable" box on the right.**

1	2	3	4
Absolutely disagree	Disagree	Agree	Absolutely agree

To what extent do you agree or disagree with the following?

1. I feel <i>positively</i> influenced by the national/state policy to establish our school policy in relation to the following aspects:	Absolutely disagree	Disagree	Agree	Absolutely agree	Not applicable
A. Managing teaching time.	1	2	3	4	☐
B. Dealing with student absenteeism.	1	2	3	4	
C. Dealing with teacher absenteeism.	1	2	3	4	☐
D. Assigning and correcting homework.	1	2	3	4	☐
E. Making good use of time spent on extracurricular activities.	1	2	3	4	☐
F. Using visual aids and technological equipment in the classroom.	1	2	3	4	☐
G. Dealing with students with special education needs.	1	2	3	4	☐
H. Long-term planning of teaching.	1	2	3	4	☐
I. Assessing students.	1	2	3	4	☐
J. Establishing a school policy on promoting effective teaching practices.	1	2	3	4	☐
K. Duties for teaching staff during breaks (e.g., supervising students, organising learning activities).	1	2	3	4	☐
L. Organising parent-teacher meetings and/or lectures concerned with how parents can help deal with problems that include:					☐
1) Student absenteeism.	1	2	3	4	☐
2) Homework.	1	2	3	4	☐
3) Dealing with students with special educational needs.	1	2	3	4	☐

Questions 2–7 refer to the actions taken by the national/state ministry of education to improve the quality of primary schooling. Using the same scale as above, please indicate the extent to which you agree or disagree with each statement. As before, **where no action is taken (or if you are unaware of any action), please place an X in the “Not applicable” box on the right.**

1	2	3	4
Absolutely disagree	Disagree	Agree	Absolutely agree

To what extent do you agree or disagree with the following?

	Absolutely disagree 1	Disagree 2	Agree 3	Absolutely agree 4	Not applicable
2. Extra incentives provided by the national/state ministry of education to teachers working in disadvantaged areas have a positive effect on appointing effective teachers in these areas.					☐
3. The national/state ministry of education offers incentives to schools that succeed in raising student achievement outcomes and help these schools to become even more effective.	1	2	3	4	☐
4. Students of specific age groups take national/state tests considered important for students' academic success and career development.	1	2	3	4	☐
5. The national/state ministry of education provides performance indicators that help primary teachers to:					☐
A. Focus their teaching on specific outcomes.	1	2	3	4	☐
B. Develop instruments to assess student performance.	1	2	3	4	☐
6. By allocating more resources to schools in disadvantaged areas, the ministry of education helps the students of these schools reach national standards.	1	2	3	4	☐
7. The teacher appointment process ensures that those who are appointed at primary schools have a sufficient level of:					☐
A. Subject-matter knowledge in the core subjects of the primary curriculum (i.e., Languages and Mathematics).	1	2	3	4	☐
B. Subject-matter knowledge in Science.	1	2	3	4	☐
C. Pedagogical knowledge.	1	2	3	4	☐

PART C: EVALUATION OF THE NATIONAL/STATE POLICY

Part C seeks your views on the evaluation of the national/state education policy regarding primary schooling. To answer Questions 1–11 of Part C, please circle a number from 1 to 4, based on the scale below, to show how often the following practices relating to the evaluation of national/state policy are observed:

1	2	3	4
Never	Rarely	Often	Very often

In your view, how often do the following practices happen?

	Never	Rarely	Often	Very Often
1. The ministry of education collects information for the evaluation of the national/state policy relating to teaching and/or the learning environment.	1	2	3	4
2. To evaluate the implementation of the national/state policy on teaching, the ministry of education collects information about...				
A. Teachers' perceptions of the state/national policy and actions taken to improve teaching.	1	2	3	4
B. The impact of the state/national policy on promoting student learning.	1	2	3	4
C. Students' perceptions of the state/national policy and actions taken to improve teaching.	1	2	3	4
D. Parents' perceptions of the state/national policy and actions taken to improve teaching.	1	2	3	4
3. Evaluation of teachers' ability to implement the national/state policy on teaching,	1	2	3	4
4. Information collected during evaluation of the national/state policy on teaching is used for re-designing the policy and/or for making new decisions.	1	2	3	4
5. The results of evaluations of national policy on teaching are used for teacher appraisal purposes (e.g., career development purposes).	1	2	3	4
6. Information collected on the school learning environment during evaluation of the national/state policy is used to re-design school policy.	1	2	3	4
7. Aspects of the national/state policy <i>on teaching</i> which are considered problematic are evaluated <i>more often</i> and/or <i>in more detail</i> .	1	2	3	4
8. Aspects of the national/state policy <i>on the school learning environment</i> which are considered problematic are evaluated <i>more often</i> and/or <i>in more detail</i> .	1	2	3	4
9. The ministry of education ensures that new national/state reforms are evaluated as soon as the reform begins.	1	2	3	4
10. The ministry of education reviews their evaluation mechanisms and adapts them in order to improve the quality of the evaluation process.	1	2	3	4

Finally, in the space provided below, please write down anything you consider important for **the development and evaluation of school policy** relating to the teaching and the learning environment of your school.

Thank you very much for your contribution.