

## **PISA 2015: When Significant Responsibility of School Principals and Teachers for Management Decisions Make a Difference in the Indexes**

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### **Abstract**

*PISA student's performance survey has been a subject for education researchers, especially in those countries whose results are below the average. Since some have long term objectives for national policies regarding education attached to PISA indexes, identifying whose variables have influence on student's performance is key to sketch more assertive plans. The objective of this paper is to verify if there are correlations among PISA student's performance indexes and key responsibilities of several actors (principal, teachers, governing board, local/ regional or national education authorities) in decisions regarding school administration: human resources, budget management, student disciplinary and assessment policies, pedagogic subjects definition. The results show positive correlations among PISA indexes and several subjects where principals and teachers have significant responsibility for decisions. Conversely, negative correlations were verified among PISA indexes and significant responsibility of the national education authorities in all subjects, highlighting the need for decentralization in decision-making processes regarding education management*

**Keywords:** School management, PISA, decentralization

### **1. Introduction**

Every time the results from PISA student's performance survey are released, together with the corresponding ranking of countries, it becomes a favorite subject for education researchers, especially in those countries below the average or close to the bottom line. Since some countries have long term objectives for national policies regarding education anchored to PISA indexes, there is an interest in understanding whose variables have influence on student's performance, so they could be part of an action plan aimed to have a significant growth in next surveys. This paper intends to be a contribution in this sense. It does not have the intention to find the "Holy Graal" of PISA indexes improvement. Instead it proposes to generate some insights from a very simple data analysis, and the findings shown here may be examined in-depth in other works or by other researchers. The objective of this paper is to understand if there are correlations among the PISA student's performance index and the key responsibility of several actors (principal, teachers, governing board, local/ regional or national education authorities) in the decisions regarding school administration: human resources and budget management, student disciplinary and assessment policies, pedagogic subjects definition.

If the responsibility of the principal, teachers and governing boards have significant positive correlation with PISA indexes, this may be an indication that countries whose schools have more power to decide about some subjects have better indexes than countries whose education systems are entirely dependent from national policies, whose tendencies are to standardize and normalize decisions no matter the differences among local cultures.

### **1. Background**

Education is an essential right of every individual and represents a political act. It is an essential right of each individual because it is through it that anyone can acquire the knowledge of the other rights, being, therefore, the initial step so that their realization takes place. This notion connects with another one: the notion of human dignity, which, inherent in all people, implies the equality of their rights and their inclusion in the legal system, without any kind of discrimination (Riscal, 2009, p. 31). If education is associated with human dignity by the exercise and realization of rights, then its meaning goes beyond individual knowledge or know-how. By making people aware of their rights and duties, it prepares an individual for socializing. Therefore, education represents a political act, which is connected to the achievement of freedom and well-being as a social construction (Paro, 2001, p.2). The political dimension of education is also related to the access to the inheritance of about ten thousand years of knowledge accumulated by humanity, with the development of reasoning and the ability to decide autonomously. The subject that is thus constituted has the conditions to change his/ her history and the society in which it is inserted through the rational (and social) use of this knowledge.

According to this reasoning and considering the existence of interactions between educator and students, we may conclude that the knowledge transmission will not necessarily be neutral, because values, concepts and visions of the world are transmitted as well. Here, the political dimension of the act of educating is evident, since the systematic retransmission of values to the students creates conditions for modeling society around a set of conceptions (Riscal, 2009). Consequently, when these conceptions are determined by political groups or social and economic segments, alienating others, education ceases to fulfill its role as a human right and becomes an instrument of domination. In some countries, the educational agenda is based on the reaffirmation of the role of the State as provider of the minimum levels of education and a homogenizing vision of education as a means of raising social and development Markets in a globalized economic context.

According to Riscal (2009, p. 64), this conception makes education an object for results-oriented management, a concept originated from the administration of private corporations. It becomes a consumption article like any other. The processes of knowledge transmission are rationalized and systematized through techniques and methods that most resemble those of an assembly line. It is easy to see that this approach deprives the student of the possibility of expanding his knowledge beyond the limits of the "utility": one learns what is necessary and sufficient to become part of a contingent of manpower, masses of producers-consumers of goods, neglecting the role of education in the historical-cultural updating of individuals (Paro, 1999, p.11). With this, the school community is alienated from the decision-making processes and the school manager, in turn, is devoid of any political and pedagogical relevance (Riscal, 2009, p.65). This expropriation of the community and the school manager constitutes a political act for the emptying of the political role of the school. Repudiate this true suicide of the school's political role means to establish school management principles that include all those involved (students and their parents/ guardians, teachers, school management staff, and community members of the neighborhood).

Possibly, the most visible face of the school administration is the management of the "hard" aspects of the institution. According to Libaneo (2013), this function is the one which deals, for example, with the whole technical-administrative routine of the school (documentation, bookkeeping of the school and its employees, attendance to the public through the secretariat, etc.), by services (Janitorial, maintenance, security and safety, kitchen, etc.) and multimedia services, which have supporting role on educational activities (library, reading room, laboratories, auditorium, etc.). This is a work which involves a considerable degree of formalism in relations, through official documents, requirements, forms and memorandums, standardized communication tools which show the weight and volume of the command chain. Within this routine, the relations are based on obedience to the rules and conventions established in the school regiment and are based on a formal investiture of powers and attributions.

It clearly constitutes a relation of power between chiefs and subordinates in the school technical-administrative structure, with the characteristics of a rational and impersonal domination (Weber, 2002, p. 176). However, the work of the school management also involves a pedagogical function, which concerns the learning process of the students, such as the definition of contents to be developed during the school year, the assignment and definition of classes, definition of teaching and lesson plans, and, more generally, the planning of school activities throughout this period.

While the technical function of the school management is based on a clear hierarchical division of the roles, within an impersonal bureaucratic model, on the other hand, the pedagogical function involves, as a key element, the mediation, which according to Paro (2010) consists in the orientation of the work with a view to achieving one purpose. Paro (2010) also highlights that the school principal is the power holder within the educational institution, the responsible to ensure its functioning *according to a philosophy and an education policy*. The principal's mediation work should then ensure that all resources available to the school are used in a rational way to achieve its purposes. This involves the articulation, around school planning, of several characters (students, teachers and school staff), who constitute the subjective resources that the principal has at his disposal to achieve the purposes for which the school project is proposed. According to Paro (2010), the coordination of human efforts is complex because it depends on the will of the subjects, their interests, values and culture, thus having essentially a political nature.

Paro (2008) warns that it is common to understand the school administration as something restricted to the technical-administrative routines, which serve as the basis or support of the educational action. The mediating aspect of the administration would then have as its objective the realization of the purposes and, therefore, there would be no sense in establishing a separation between the administrative and the pedagogical sides of the school management:(...) from the viewpoint of the administration as mediation, there is nothing more authentically administrative than pedagogical matters, because it is through them that the purposes of education are achieved. But when a precise concept of administration is not present, what is usually done is to identify it with a bureaucratized activity that is actually the opposite of the administrative activity. It can only be understood in this sense as long as it serves as mediation for the attainment of goals. When it renounces this condition to be a purpose itself, it degrades itself in bureaucratized practice which denies the mediating character that good administrative practice should have (Paro, 2008, p.4).

If we consider the principal's role as a mediator, which is to ensure that the objective and subjective resources available to the school are used in a rational way to achieve its purposes (Paro, 2010), it is easy to see that, conceptually, it is not incompatible with the strengthening of the school as a space for democratic management, if we consider the school community (school management staff, teachers, students and their parents/ guardians) is one (and perhaps the most powerful) of the resources that the school has in order to achieve its purposes. As the legal domination defined by Weber (2002) implies impersonality, *without hate and without passion*, then the redistribution of the power and authority of the school principal does not imply his/her weakening, but, on the opposite way, it increases the potential for the school community, of which the principal is a part, to fulfill its objectives. Therefore, it does not make sense, conceptually, to think of an emptying of the principal's power. If, on the other hand, we return to the vision of Paro (2015) who refers to school as an enterprise aimed at the formation of autonomous individuals, it is clear that this objective is not aligned with a centralizing attitude of the school management, which would left no space for the exercise of autonomy and participation. Hence, the centralization of powers aligns with another kind of school, with other purposes than the formation of autonomous individuals.

## 2. Methodology

This analysis uses the data from school background questionnaires applied in the latest survey of PISA (Programme for International Student Assessment), conducted in 2015 within a set of 71 countries<sup>i</sup>. The results from the PISA school questionnaires, as well as the PISA student's performance for Mathematics, Science and Reading by country, were obtained from PISA website<sup>ii</sup>. In order to investigate the relationships amongst school management subjects and PISA student's performance results, the following questions from the school background questionnaire were selected (OECD, 2016a):

SC010 – Regarding your school, which has a considerable responsibility for the following tasks? (Please select as many boxes as appropriate in each row) SC010Q01 - Selecting teachers for hire: Principal, Teachers, School governing board, Regional or local education authority

SC010Q02 - Firing teachers: Principal, Teachers, School governing board, Regional or local education authority

SC010Q03 - Establishing teachers' starting salaries: Principal, Teachers, School governing board, Regional or local education authority

SC010Q04 - Determining teachers' salary increases: Principal, Teachers, School governing board, Regional or local education authority

SC010Q05 - Formulating the school budget: Principal, Teachers, School governing board, Regional or local education authority

SC010Q06 - Deciding on budget allocations within the school: Principal, Teachers, School governing board, Regional or local education authority

SC010Q07 - Establishing student disciplinary policies: Principal, Teachers, School governing board, Regional or local education authority

SC010Q08 - Establishing student assessment policies: Principal, Teachers, School governing board, Regional or local education authority

SC010Q09 - Approving students for admission to the school: Principal, Teachers, School governing board, Regional or local education authority

SC010Q10 - Choosing which textbooks are used: Principal, Teachers, School governing board, Regional or local education authority

SC010Q11 - Determining course content: Principal, Teachers, School governing board, Regional or local education authority

SC010Q12 - Deciding which courses are offered: Principal, Teachers, School governing board, Regional or local education authority

We notice that 71 countries participated in the PISA survey in 2015, however data from three countries, namely Cyprus, Kazakhstan and Malaysia, are not available in the school background questionnaire. Hence, these countries were left out of this analysis.

Correlations were computed among PISA student's performance indexes at country level and the national results from the selected variables from the school background questionnaire. The data were weighted according to the guidelines of OECD for data analysis of PISA (OECD, 2009), which advises to merge the school background questionnaires dataset into the main student's data file, since the school characteristics should be interpreted as student-related variables instead than school related-ones: Although the student's samples were drawn from within a sample of schools, the school sample was designed to optimize the resulting sample of students, rather than to give an optimal sample of schools. For this reason, it is always preferable to analyze the school-level variables as attributes of students, rather than as elements in their own right. (Gonzalez and Kennedy, 2003, apud OECD, 2009). Spearman's Correlation Coefficient was chosen, since it does not have any specific requirement regarding the shape of the data distribution (Siegel, 1956).

### 3. Results

The results of the correlation index are shown in Table 1. We first notice that a significant responsibility of the principal in most attributes is positively correlated to higher PISA student's performance in general. The exceptions are "Establishing teachers' starting salaries" and "Determining teachers' salary increases". In these cases, there is a positive correlation among the student's performance and a significant responsibility of the local or regional education authorities, and negative correlations with the significant responsibility of the national education authority. In other words, the average proportion of students whose schools mentioned a significant responsibility of the regional authorities in the defining teachers' remunerations is higher among countries with better performance in PISA, while the proportion of students whose schools mentioned this responsibility lies over the national education authority, is lower within these countries by comparison to countries below the median of PISA indexes. This is shown by figures 1 and 2. On the other hand, within the group of countries whose indexes in PISA are above the median, the proportion of students whose schools mentioned significant responsibilities of the principals and teachers for hiring, and the principal for firing teachers, is also higher by comparison to countries with lower performance in PISA. The figures 3 and 4 illustrate this.

These two results suggest that better performances in PISA may be associated to public education management policies in which local and regional authorities retain the responsibility for defining teacher's remuneration and giving to the principal, nevertheless, some degree of freedom to hire and dismiss teachers, and allowing teachers to participate in the hiring process of their peers. The budget definition also has positive correlation with a significant responsibility of both the Principal and the local or regional education authorities. This result remarks the need of a joint definition of the school budget, Principal and local/ regional authorities working together to define the amount of resources to be allocated to the school unit. On the other hand, significant responsibilities of principal and teachers for the budget allocation within the schools are associated with higher scores of PISA. Indeed, countries with best results in PISA have higher proportion of students whose schools allow teachers to participate in budget allocation decisions. In any of these attributes, the correlation of PISA with a significant responsibility of the national education authority is negative. Figures 5 and 6 show these results.

The student's management is another important side of the school administration. Our analysis shows that a significant responsibility of the principal in establishing student disciplinary policies, establishing student assessment policies and approving students for admission to the school have positive correlations with PISA indexes. Indeed, the proportions of students whose schools have the principal as a significant responsible for these three aspects of the school life are higher amongst countries whose PISA indexes are above the median. Establishing student disciplinary policies and student assessment policies are also positively correlated with teachers' significant responsibilities, while in any case, the responsibility of the national education authority has negative correlation. Refer to figures 7, 8 and 9 to see a graphic representation of these results.

Finally, the pedagogic subjects of the school management have also a relationship with PISA indexes. Indeed, the set of countries with best performance in PISA has higher proportion of students whose schools entrust principal and teachers with responsibilities on the decision of which courses should be offered, as well as their contents and the choice of textbooks to be used. On the other hand, the group of countries with lower PISA indexes of student performance has also higher proportion of students whose schools mention that the national education authority has significant responsibility on these subjects. Figures 10, 11 and 12 illustrate these results.

#### **4. Discussion**

The results obtained from the correlations among PISA indexes and the proportions of students whose schools have significant responsibilities assigned to different actors (principal, teachers, and governing board, local, regional and national authorities) point out the group of countries with best student performances tend to have decentralized responsibilities on some matters. In our analysis, none of the topics covered by this section of the PISA school background questionnaires showed a positive relationship among key responsibility of the national education authority and PISA student's performance. On the contrary, the group of countries with poorer performance has higher proportions of students whose schools mention the national education authority as one of the responsible for these subjects.

According to Abranches (1998, p. 34), decentralization is a transfer of legal and political authority (to plan, coordinate, organize and control functions) from more centralized government agencies to other units (governmental or nongovernmental). The author distinguishes two approaches to decentralization (Abranches, 1998, p. 34): transference of authority within the state itself, moving from a more central government sphere to other spheres or to public entities - for example, from the federal government to states, from states to the municipalities or from the federal government to regulatory agencies - and the transfer of power to civil society.

Ciseski (1997) draws an important distinction between de-concentration and decentralization: de-concentration does not substantially alter decision-making structures, as it merely redistributes tasks, reaffirms the authority of centralizing power, and has no means of social control in the decision-making process. On the other hand, decentralization implies the transfer and redistribution of responsibilities, in structural changes in both transferring and receiving agencies, and includes mechanisms to control actions and results as well. Also in communicative processes there are notable differences, because while the de-concentration does not constitute a communication process of entities with sufficient autonomy, decentralization must have channels that ensure its bidirectionality, admitting the manifestations of society in its decision-making processes.

According to our analysis, within a decentralization process of education management, the main responsibility for some subjects should migrate from national centralized decision-making structures to other actors, namely:

- *Local or regional education authority*: defining initial remuneration and salary increase policies for teachers.
- *Local or regional education authority together with school principal*: formulating the school budget
- *Principal*: firing teachers, approving students for admission to the school
- *Principal and teachers*:
- *Management of human resources*: Selecting teachers for hire;
- *Resources management*: deciding on budget allocations within the school;
- *Student management*: establishing student disciplinary policies, establishing student assessment policies;
- *Pedagogical subjects*: choosing which textbooks are used, determining course content, deciding which courses are offered.

On the other hand, the key role for the national education authority should be to guarantee the decentralization of decision-making processes and put in force public policies in order to transfer power to the school, allowing it to manage those subjects according to a political pedagogical project defined by the school together with the school community (managing team, teachers, students, parents and the surrounding community).

### 5. Final considerations

Retrieving the objectives described in the introduction, we consider the negative correlations verified among PISA indexes and a significant responsibility of the national education authorities in all subjects as an evidence of the need for decentralization in the decision-making processes regarding education management. Indeed, the results suggest that public policies should, instead, strive to guarantee the autonomy of schools, through principals, teachers and governing boards as well, to take relevant responsibility in building their very own political pedagogical project, one which makes sense for the school community and totally aligned to the local reality. Worth to mention that some key responsibilities of the local or regional education authority, regarding teacher remuneration and budget definition, are not incompatible with decentralization, since the local/ regional authority, in theory, must know the specific characteristics as well as the challenges faced by the community or municipality it represents, so it is located in a half way between the total decentralization (key responsibility for the decision lies on the school) and the total centralization (the national authority is the key decision-maker). In any case, it's a subject for further investigations the role of a decentralized school management process as a way for improvement of PISA indexes in countries whose results have been shy so far.

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## Tables and Figures

**Table 1 – Spearman correlation coefficients among PISA national indexes and nationwide proportions of students whose schools mentioned that a significant responsibility for some management subjects lies on the principal, teachers, governing board, local/ regional or national education authorities**

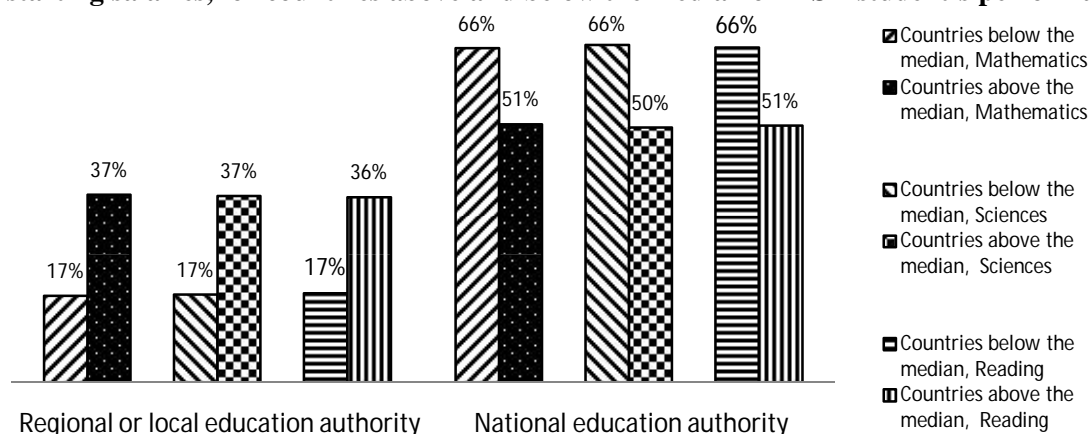
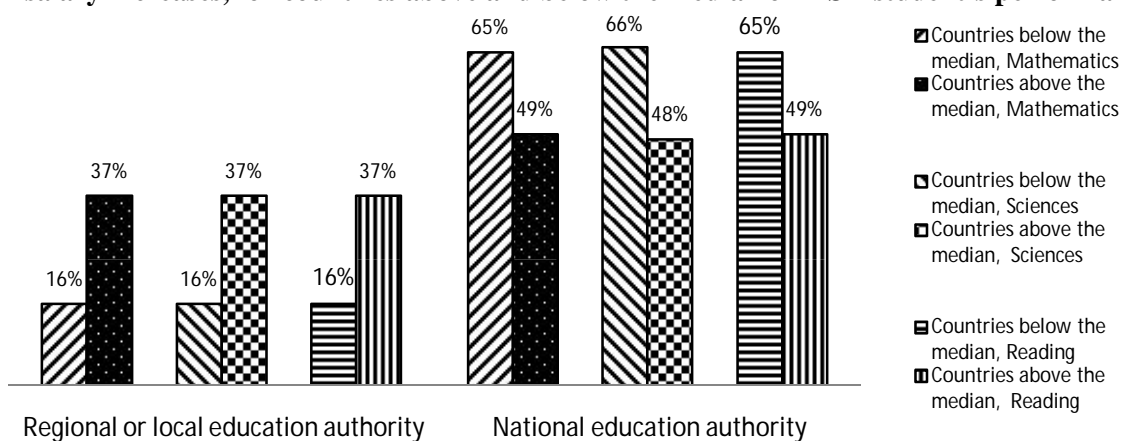
|  |                                       | PISA student's performance index |          |          |
|--|---------------------------------------|----------------------------------|----------|----------|
|  |                                       | Mathematics                      | Science  | Reading  |
| Selecting teachers for hire                      | Principal                             | 0,369**                          | 0,337**  | 0,373**  |
|  | Teachers                              | 0,267*                           | 0,278*   | 0,209    |
|  | National education authority          | -0,444**                         | -0,478** | -0,418** |
| Firing teachers                                  | Principal                             | 0,277*                           | 0,238*   | 0,245*   |
|  | National education authority          | -0,376**                         | -0,391** | -0,335** |
| Establishing teachers' starting salaries         | Regional or local education authority | 0,328**                          | 0,335**  | 0,324**  |
|  | National education authority          | -0,268*                          | -0,277*  | -0,221   |
| Determining teachers' salary increases           | Regional or local education authority | 0,387**                          | 0,400**  | 0,382**  |
|  | National education authority          | -0,289*                          | -0,315** | -0,239   |
| Formulating the school budget                    | Principal                             | 0,247*                           | 0,257*   | 0,280*   |
|  | Regional or local education authority | 0,358**                          | 0,358**  | 0,356**  |
|  | National education authority          | -0,407**                         | -0,427** | -0,402** |
| Deciding on budget allocations within the school | Principal                             | 0,459**                          | 0,459**  | 0,510**  |
|  | Teachers                              | 0,275*                           | 0,276*   | 0,280*   |
|  | National education authority          | -0,523**                         | -0,554** | -0,517** |
| Establishing student disciplinary policies       | Principal                             | 0,405**                          | 0,427**  | 0,463**  |
|  | Teachers                              | 0,365**                          | 0,332**  | 0,408**  |
|  | National education authority          | -0,435**                         | -0,407** | -0,381** |
| Establishing student assessment policies         | Principal                             | 0,518**                          | 0,508**  | 0,566**  |
|  | Teachers                              | 0,344**                          | 0,298*   | 0,372**  |
|  | National education authority          | -0,436**                         | -0,420** | -0,393** |
| Approving students for admission to the school   | Principal                             | 0,304*                           | 0,285*   | 0,314**  |
|  | School governing board                | -0,399**                         | -0,376** | -0,396** |
|  | National education authority          | -0,288*                          | -0,305*  | -0,254*  |
| Choosing which textbooks are used                | Principal                             | 0,377**                          | 0,334**  | 0,386**  |
|  | Teachers                              | 0,378**                          | 0,394**  | 0,464**  |
|  | National education authority          | -0,552**                         | -0,562** | -0,587** |
| Determining course content                       | Principal                             | 0,309**                          | 0,285*   | 0,288*   |
|  | Teachers                              | 0,515**                          | 0,485**  | 0,532**  |
|  | National education authority          | -0,467**                         | -0,483** | -0,412** |
| Deciding which courses are offered               | Principal                             | 0,551**                          | 0,562**  | 0,620**  |
|  | Teachers                              | 0,467**                          | 0,462**  | 0,470**  |
|  | National education authority          | -0,500**                         | -0,570** | -0,490** |

\* significant (p<0,05)

\*\* significant (p<0,01)

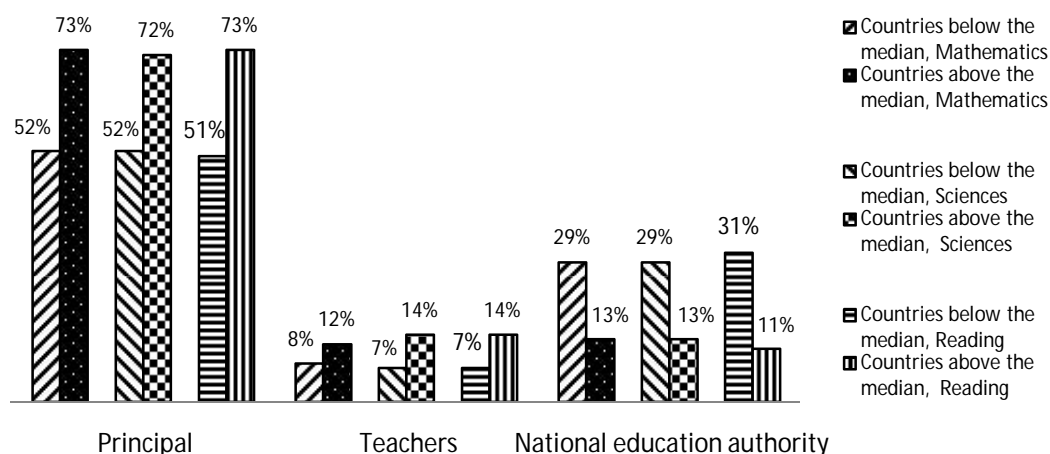
**Table 2: Variables whose correlation with the PISA national indexes were not significant**

|  |                                       |  |                                       |
|--|---------------------------------------|--|---------------------------------------|
| Selecting teachers for hire              | School governing board                | Deciding on budget allocations within the school | School governing board                |
|  | Regional or local education authority |  | Regional or local education authority |
| Firing teachers                          | Teachers                              | Establishing student disciplinary policies       | School governing board                |
|  | School governing board                |  | Regional or local education authority |
|  | Regional or local education authority |  | School governing board                |
| Establishing teachers' starting salaries | Principal                             | Approving students for admission to the school   | Regional or local education authority |
|  | Teachers                              |  | Teachers                              |
|  | School governing board                |  | Regional or local education authority |
| Determining teachers' salary increases   | Principal                             | Choosing which textbooks are used                | School governing board                |
|  | Teachers                              |  | Regional or local education authority |
|  | School governing board                |  | School governing board                |
| Formulating the school budget            | Teachers                              | Determining course content                       | Regional or local education authority |
|  | School governing board                |  | School governing board                |
|  |                                       | Deciding which courses are offered               | School governing board                |
|  |                                       |  | Regional or local education authority |

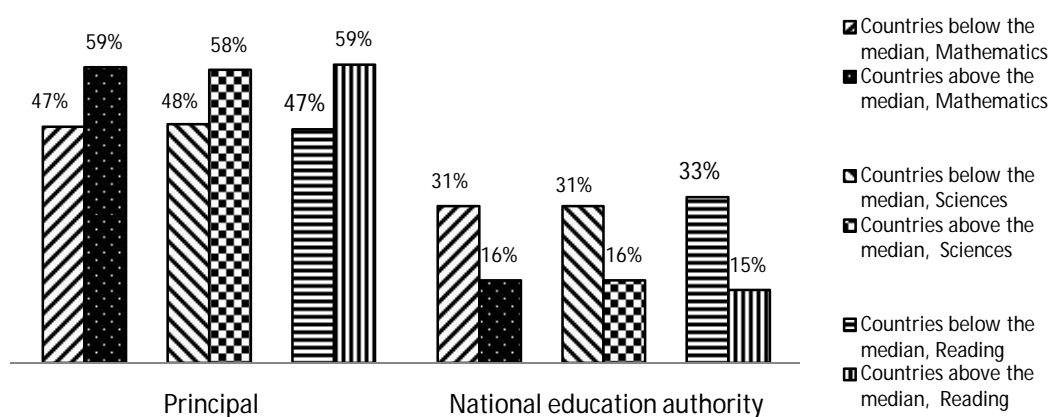
**Figure 1: Average Proportion of weighted mentions to significant responsibility in establishing teachers' starting salaries, for countries above and below the median of PISA student's performance****Figure 2: Average Proportion of weighted mentions to significant responsibility in determining teachers' salary increases, for countries above and below the median of PISA student's performance**



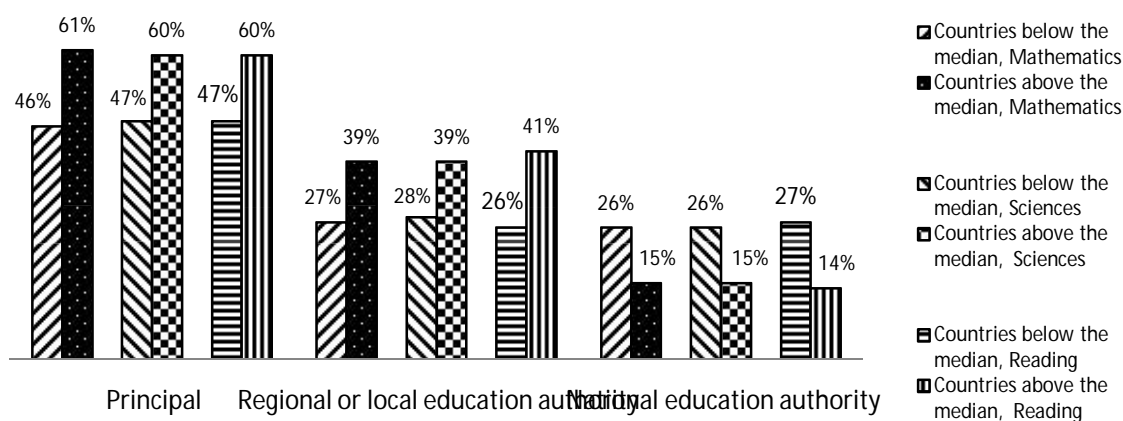
**Figure 3 – Average Proportion of weighted mentions to significant responsibility in selecting teachers for hire, for countries above and below the median of PISA student's performance**



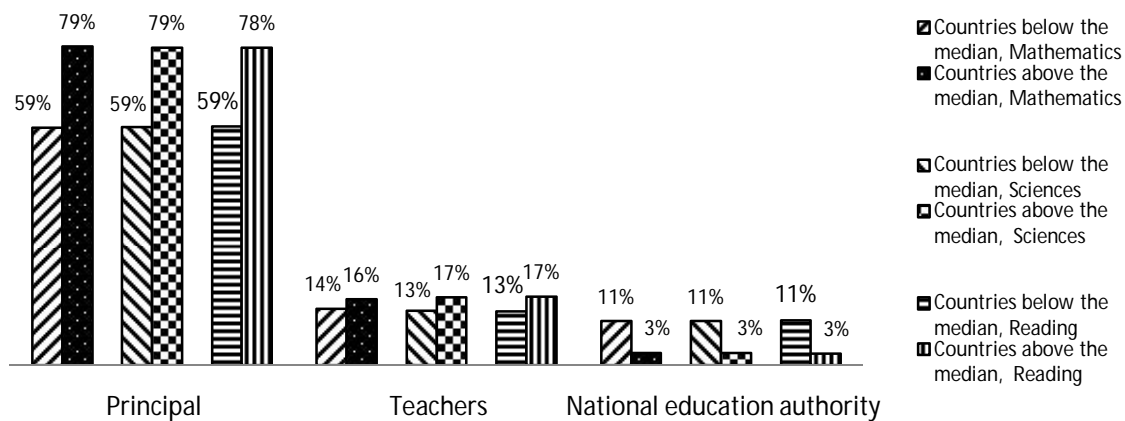
**Figure 4: Average Proportion of weighted mentions to significant responsibility in firing teachers, for countries above and below the median of PISA student's performance**



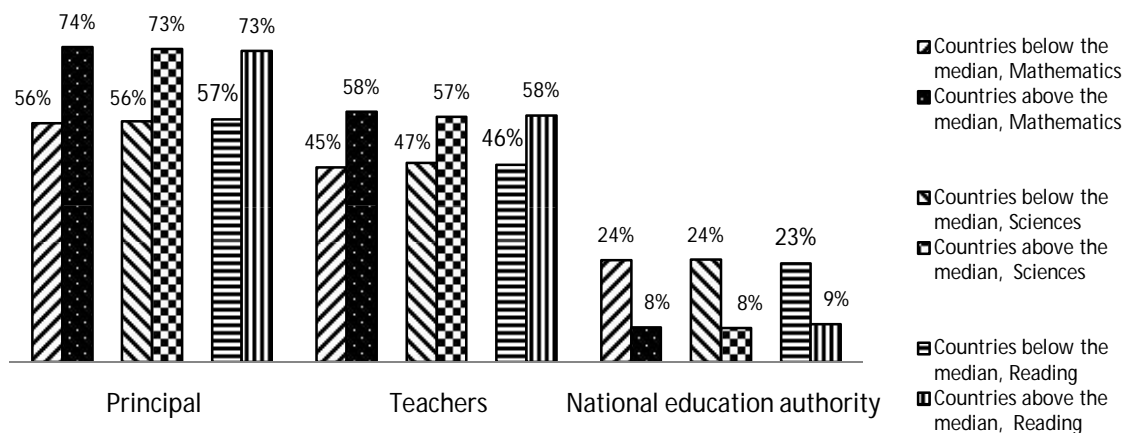
**Figure 5: Average Proportion of weighted mentions to significant responsibility in formulating the school budget, for countries above and below the median of PISA student's performance**



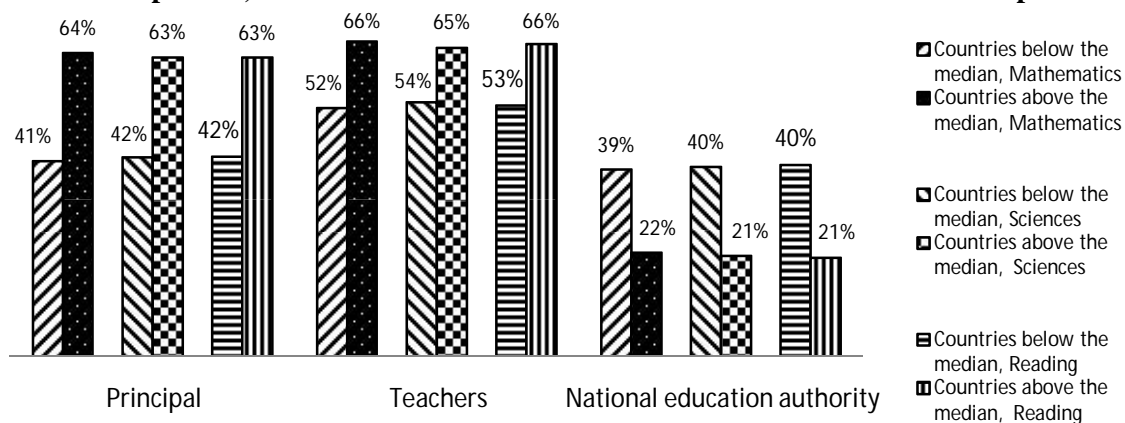
**Figure 6: Average Proportion of weighted mentions to significant responsibility in deciding on budget allocations within the school, for countries above and below the median of PISA student's performance**



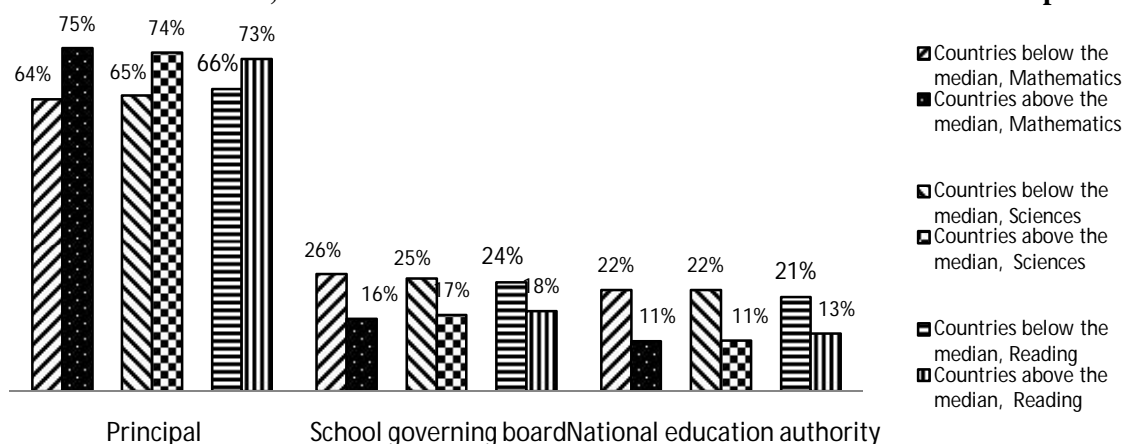
**Figure 7 – Average Proportion of weighted mentions to significant responsibility in establishing student disciplinary policies, for countries above and below the median of PISA student's performance**



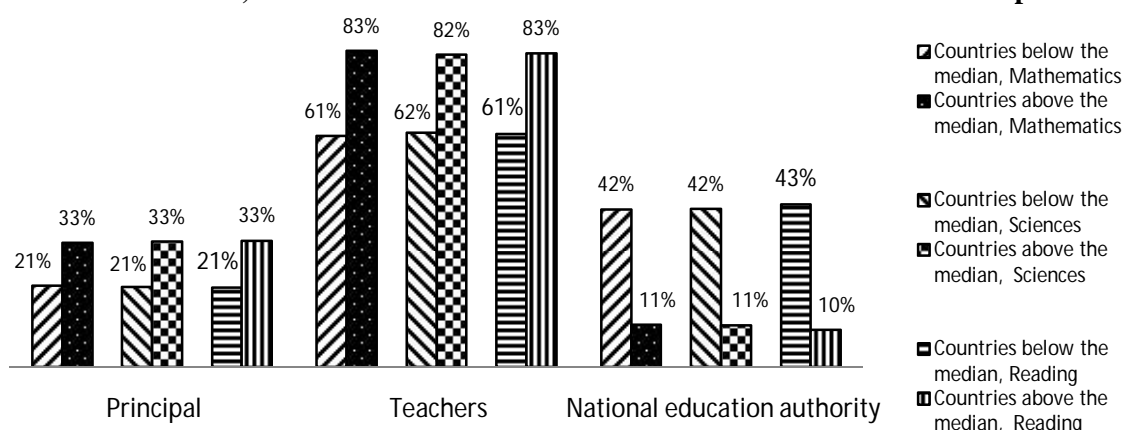
**Figure 8: Average Proportion of weighted mentions to significant responsibility in establishing student assessment policies, for countries above and below the median of PISA student's performance**



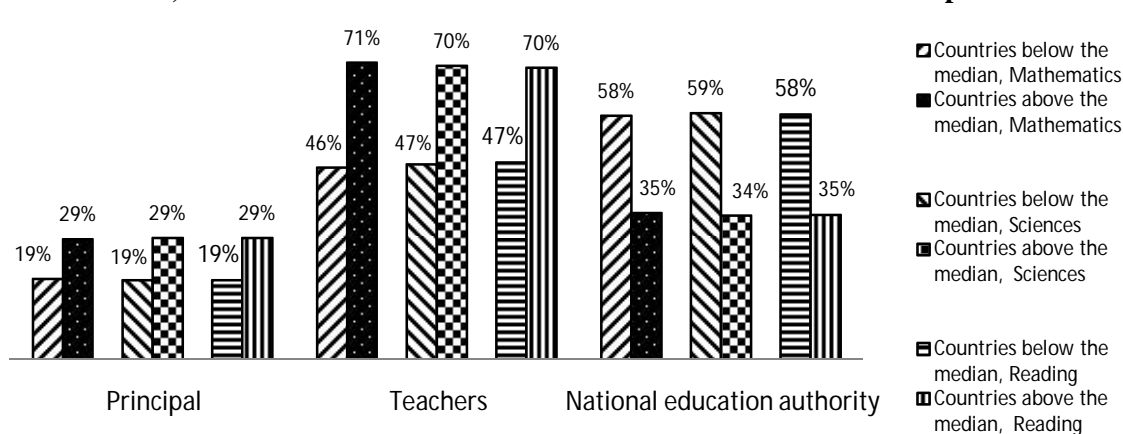
**Figure 9: Average Proportion of weighted mentions to significant responsibility in approving students for admission to the school, for countries above and below the median of PISA student's performance**



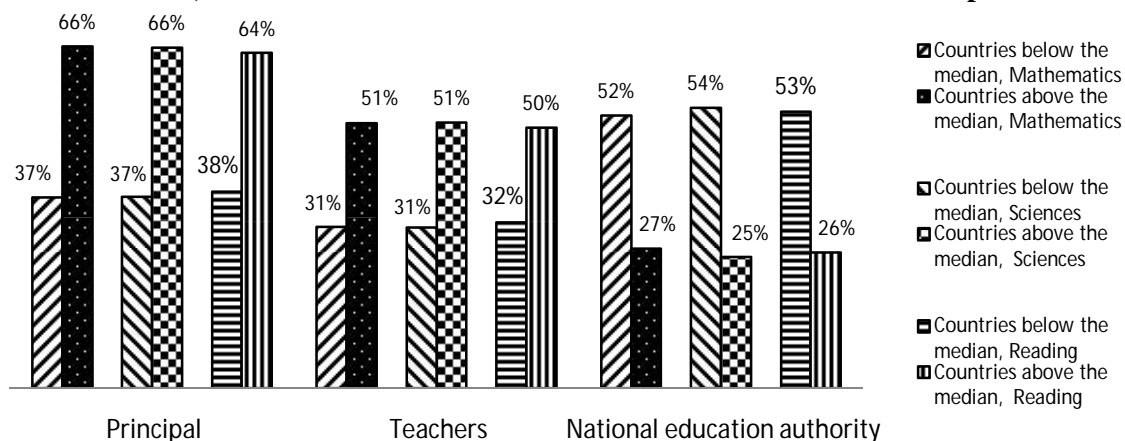
**Figure 10: Average Proportion of weighted mentions to significant responsibility in choosing which textbooks are used, for countries above and below the median of PISA student's performance**



**Figure 11: Average Proportion of weighted mentions to significant responsibility in determining course content, for countries above and below the median of PISA student's performance**



**Figure 12: Average Proportion of weighted mentions to significant responsibility in deciding which courses are offered, for countries above and below the median of PISA student's performance**



### Notes

<sup>i</sup> A full list of PISA 2015 participants is found on <https://www.oecd.org/pisa/aboutpisa/pisa-2015-participants.htm>

<sup>ii</sup> The school questionnaires dataset is found on <http://www.oecd.org/pisa/data/2015database/>