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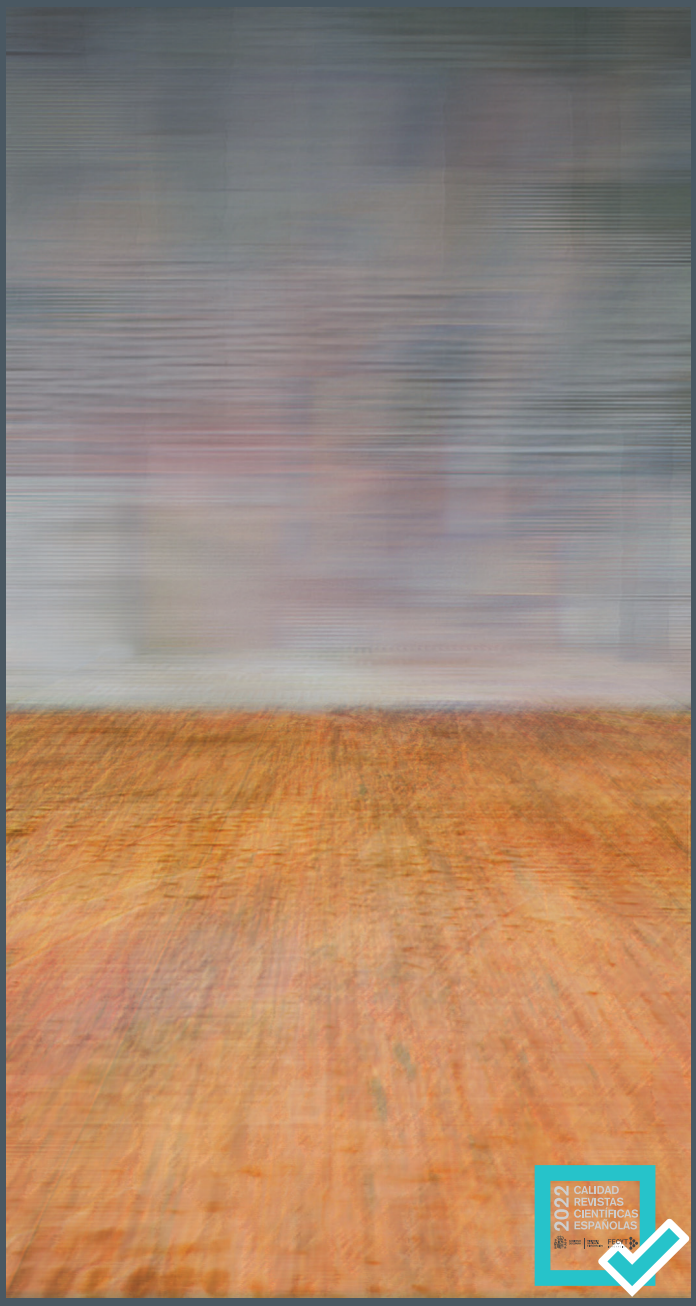

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A quantitative SWOT analysis for Spanish education

Un análisis DAFO cuantitativo para la educación española

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Abstract

This paper aims to contribute to the strategic analysis of the Spanish system with the ultimate goal of helping to guide the improvement of its educational policy. In the field of education, SWOT analyses have so far focused on university institutions and, to a lesser extent, on schools. However, available SWOT analyses of national education systems are scarce and deficient. Two procedures have been used: a qualitative SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) and the subsequent application of the quantitative technique of the Analytic Hierarchy Process (AHP). The preparation of the SWOT matrix has been carried out at two hierarchical levels: that of the sub-factors and that of the indicators. For internal factors (WS), resources, processes/policies (governance) and results have been taken as the basis. For external factors (TO), the PESTEL model has been adopted, limited to the political, socio-economic and technological categories. The specification of the sub-factors in indicators has been supported by the results of a significant number of national and international research and statistics. The subsequent application of the AHP technique has identified relative priorities based from comparisons within the multilevel hierarchical structures. The initial 38 SWOT indicators have been reduced to 17, of which, with a global priority of more than 0.050 and a low consistency ratio, the following stand out: intergenerational transmission of the educational level of parents, new technological tools for improving performance, Next Generation funds, lack of a

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basic political agreement, and low level of excellence. Based on the results, the discussion focused on analysing the strategies of the *maxO-minW* and *minT-maxO* types and on formulating evidence-based recommendations aimed at implementing the resulting strategies.

*Keywords: e*ducational governance, Sstrategic planning of education, education policy, SWOT analysis, analytic hierarchy process.

Resumen

El presente trabajo pretende contribuir al análisis estratégico del sistema español con la finalidad última de servir de ayuda para orientar hacia la mejora su política educativa. En el ámbito educativo, los análisis DAFO se han centrado, hasta ahora, en las instituciones universitarias y, en menor medida, en los centros escolares. Pero son escasos y deficientes los análisis DAFO disponibles sobre sistemas educativos nacionales. Se ha recurrido a dos procedimientos concatenados: un análisis DAFO (Debilidades, Amenazas, Fortalezas y Oportunidades) de carácter cualitativo y la aplicación posterior de la técnica cuantitativa del *proceso de jerarquía analítica* (AHP). La elaboración de la matriz DAFO se ha efectuado en dos niveles jerárquicos: el de los subfactores y el de los indicadores. Para los factores internos (D, F), se ha tomado como base las categorías de recursos, procesos/políticas (gobernanza) y resultados. Para los factores externos (A, O), se ha adoptado el modelo PESTEL, limitado a las categorías de lo político, lo socioeconómico y lo tecnológico. La concreción de los subfactores en indicadores ha estado avalada por los resultados de un número apreciable de investigaciones y de estadísticas, tanto nacionales como internacionales. La aplicación subsiguiente de la técnica AHP ha determinado prioridades relativas a partir de comparaciones dentro de las estructuras jerárquicas multinivel. Se han reducido los 38 indicadores DAFO iniciales a 17, de los cuales, con una prioridad global mayor de 0,050 y una baja ratio de consistencia, destacan: transmisión intergeneracional del nivel educativo de los padres, nuevas herramientas tecnológicas para la mejora del rendimiento, fondos *Next Generation,* falta de un acuerdo político básico, y bajo nivel de excelencia. A partir de los resultados, la discusión se ha centrado en analizar las estrategias de los tipos *maxO-minD* y *minA-maxO* y en formular recomendaciones inspiradas en evidencias y destinadas a implementar las estrategias resultantes.

Palabras clave: administración de la educación, planificación educativa, política educativa, análisis DAFO, proceso de jerarquía analítica.

Introduction

Comparative analyses, based on international indicators, have revealed a worrying stagnation of the Spanish education system over the last two decades, in comparison with other neighbouring countries which, starting from similar or even inferior situations, have been able to react with determination and success (OECD, 2019; European Commission, 2020; López Rupérez & García García, 2020; OECD, 2021).

One of the facts that needs to be incorporated into the new global equation is that, as a result of an underlying complexity in which interdependencies proliferate and unexpected phenomena emerge (López Rupérez, 2021), education has become an indisputable part of the interactions between the global economy and society, and it is essential to manage it well in policy terms.

In this context, the use of so-called strategic thinking is a necessary condition for qualitative improvement. According to the Center for Management & Organization Effectiveness (2019):

> Strategic thinking is simply an intentional and rational thought process that focuses on the analysis of critical factors and variables that will influence the long-term success of a business, a team or an individual (...) Strategic thinking requires research, analytical thinking, innovation, problem-solving skills, communication and leadership skills, and decisiveness (p. 1).

The aim of this paper is to contribute to the strategic analysis of the Spanish education system with the ultimate aim of helping to guide its educational policy towards improvement. To this end, two concatenated procedures have been used: a qualitative SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and the subsequent application of the quantitative technique of the analytical hierarchy process (AHP).

Since its origins in the last century (Codina Jiménez, 2011; Santos-Caballero & Gil-LaSource, 2017; Benzaghta et al., 2021), the number of articles published on SWOT analysis has been accelerating, particularly since the beginning of this century (Santos-Caballero & Gil-LaSource, 2017). In education, the focus has been on university institutions and, to a lesser extent, on schools (Benzaghta et al., 2021). Khalid et al. (2017) have conducted a SWOT study on higher education in Pakistan, and

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Velmonte (2020) has applied this technique to the education system in the Philippines, albeit with a very limited analytical focus. In Spain, the Autonomous Community of Castile and León has conducted a qualitative SWOT analysis of its education system as part of its *II Plan de atención a la diversidad en la educación* [II Care plan for Diversity in Education] (BOCYL, 2017). However, we have not found quantitative SWOT analyses of national education systems that are sufficiently rigorous and complete. For this reason, and despite the exploratory nature of our study, it opens up a way to introduce this type of analysis into the highly difficult task of strategic governance of education systems (López Rupérez & García García, 2022).

Methods

Applying the SWOT technique to the Spanish education system

Within what is understood as strategic management (Koontz et al., 2012), SWOT analyses are regarded, in the world of organizations, as a considerably useful means for the subsequent formulation of strategies and their eventual implementation. Figure I show the main conceptual elements of a SWOT analysis.

In the present study, the application to the Spanish education system of the procedural scheme represented in figure II has been carried out at two levels of concreteness in addition to that of the factors: that of the sub-factors and that of the indicators. As far as internal factors are concerned, their expression at the level of sub-factors has been based on the systemic approach, as is characteristic of the world of international education indicators (CERI-OECD, 1992), albeit centred on the three categories: resources, processes/policies (governance) and results. Regarding the external factors, we have based ourselves on the PESTEL model (Shilei &Yong, 2009; Yüksel, 2012; Jadan, 2020), but limiting this to the political, socio-economic, and technological categories. The general criterion for selecting the sub-factors in terms of indicators was relevance, which is supported by the results of a considerable amount of research and statistics, both national and international.

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FIGURE I. Graphical representation of the typical factor matrix structure of a SWOT analysis

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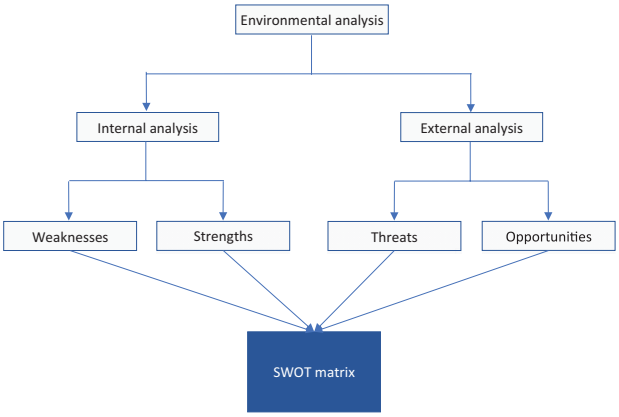
FIGURE II. Outline of the procedure for the elaboration of a SWOT matrix



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Applying the analytical hierarchy process to the SWOT matrix

The *Analytic Hierarchy Process* (AHP) is a mathematical procedure created by Saaty (1980) and applicable in multi-criteria decision making, which allows a complicated problem to be broken down into a multi-level hierarchical structure of objectives, criteria, and alternatives (Sharma et al., 2008).

The transformation of the qualitative SWOT strategic analysis into a quantitative analysis using AHP (Kurttila et al., 2000) overcomes two limitations of the former: that it does not allow determining the relative importance of factors and sub-factors, and that it does not consider the combinations of the numerous criteria that can be considered, as well as their potential interdependencies (Pesonen, et al., 2001).

The absolute scales of factors and sub-factors are transformed by the AHP procedure into relative priorities based on comparisons within multilevel hierarchical structures (Saaty &Vargas, 1996). This is done based on a comparative scale –developed by Saaty to represent the relative importance of criteria, factors, or sub-factors– which is shown in Table I.

The pairwise comparison, whose elements represent alternatives, is arranged in a matrix that subsequently makes it possible to calculate the relative importance of the criteria, factors or sub-factors (Görener et al., 2012), and to determine the consistency ratios (Saaty &Vargas, 1996) that

TABLE I. AHP scale for a pairwise comparison of criteria, factors or attributes

Degree of importance	Description
1	Both criteria contribute equally to the objective.
3	Experience and judgement lean slightly in favour of one over the other.
5	Experience and judgement lean strongly in favour of one over the other.
7	Judgement is strongly favoured and its predominance is demonstrated in practice.
9	Extreme or absolute importance of one attribute over the other.
2, 4, 6 and 8	Used to represent trade-offs between the assessments described above.

Source: Saaty, 1980; Görener, Toker and Uluçay, 2012.

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make it possible to assess the degree of consistency of the judgements with respect to that which would be provided by a large sample of purely random judgements[1].

Results

The resulting SWOT matrix for the Spanish education system

In accordance with the structure of factors and sub-factors described in the Methods Section, and based on empirical information derived from research and national and international statistics, the SWOT matrix described below has been developed.

- Weaknesses
  - *Inputs* (resources)
    - WI1. Low public education expenditure relative to GDP (López Rupérez & García García, 2020; OECD, 2021; Montes-Pineda & López Rupérez, 2022).
    - WI2. Low cumulative expenditure per pupil (6 years to 15 years) (OECD, 2021).
    - WI3. Notable territorial inequality (López Rupérez et al., 2018a; 2018b)
  - Governance (policies)
    - WG1. Insufficient attention to evidence in the formulation and implementation of education policies (López Rupérez et al., 2017; López Rupérez et al., 2020 a; López Rupérez, 2022).
    - WG2. Insufficient attention to accountability (López Rupérez et al., 2017).
    - WG3. Deficient initial and in-service teacher training systems (López Rupérez et al., 2021).
    - WG4. Deficient systems for access to school leadership and professional development (Leithwood et al., 2006; Hanushek et al., 2016; Pont Ferrer, 2017).
  - Results (*outputs*)
    - WR1. Underachievement in basic skills (European Commission, 2020).

[1] For a detailed description of the mathematical procedure and its calculation algorithms, see Coyle (2004)

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- WR2. Low level of excellence (OECD, 2016; OECD, 2019).
- WR3. High early educational dropout (European Commission, 2020).

- Strengths
  - *Inputs* (resources)
    - SI1. Scholarships and study grants system[2] (OECD, 2021).
    - SI2. Level of teachers' salaries (Eurydice, 2021; OECD, 2021).
    - SI3. Educational expenditure in private institutions (OECD, 2021).
    - Governance (policies)
    - SG1. A consolidated educational bureaucracy.
    - SG2. Formal mechanisms for cooperation between education administrations[3]
    - SG3. A plural educational offer (Sainz & Sanz, 2021).
  - Results *(outputs)*
    - SR1. High rates of early childhood education (European Commission, 2021).
    - SR2. High enrolment rates in primary and secondary education.
    - SR3. High rates of tertiary education graduates (ISCED 5-8) (European Commission, 2021).

- Threats
  - Political
    - TP1. The lack of a basic political agreement.
    - TP2. Weak political opposition on education.
    - TP3. The comparative advantage, in terms of education policy, of competing countries (Council of Europe, 2021; OECD, 2010; López Rupérez & García García, 2020).
  - Socio-economic
    - TS1. A clear change in the economic and financial policy of the EU and the ECB.
    - TS2. The increase in social spending due to population ageing (INE, 2020).

[2] Statistics on Grants and Study Aids. General Subdirectorate of Statistics and Studies of the Ministry of Education and Vocational Training.

[3] https://www.educacionyfp.gob.es/mc/conferencia-sectorial-educacion/funcionamiento.html

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- TS3. The failure to integrate young people into the labour market[4,5]
- TS4. The effects of pandemics (Alimi et al., 2021; Sanz et al., 2020).

– Technological
- TT1. A pressure on the system as an indirect effect of the reduction of jobs (Berggruen &Gardels, 2012; Baldwin, 2019).
- TT2. Risk of depersonalization of the teacher-student relationship.
- TT3. Interferences, due to improper use of technologies, with basic learning processes (OMS, 2022).

■ Opportunities

– Political
- OP1. Expectations of political change (López Rupérez, 2021).
- OP2. EU pressure on education (Consejo de la Unión Europea, 2002; Consejo Europeo, 2021).
- OP3. The growing international information on successful educational policies (López Rupérez & García García, 2021).

– Socioeconomic
- OS1. The Next Generation EU funds[6].
- OS2. The demographic reduction in the number of pupils (INE, 2020).
- OS3. Intergenerational transmission of parents' educational attainment (INE, 2019; OECD, 2021).

– Technological
- OT1. Remote and global interactions between education actors.
- OT2. New technological tools for improving student performance (Patrick et al., 2013; Luckin & Issroff, 2018; López Rupérez, 2020).
- OT3. Operational development of learning analytics (Ferguson et al., 2016).

[4] http://estadisticas.mecd.gob.es/EducaDynPx/educabase/index.htm?type=pcaxis&path=/laborales/insercion/afil&file=pcaxis&l=s0

[5] https://www.universidades.gob.es/portal/site/universidades/menuitem.78fe777017742d34e0acc310026041a0/?vgnextoid=b747122d36680710VgnVCM1000001d04140aRCRD

[6] https://www.lamoncloa.gob.es/temas/fondos-recuperacion

The result of the quantitative analyses

Applying the AHP procedure, with the determination of each matrix of weights — which have been independently assessed by the two authors, based on the pairwise comparisons carried out on the basic Saaty scale (table I) — has yielded the coinciding results shown in the tables in the annex, which refer to the three groups of variables corresponding to the respective hierarchical levels (see figure III).

The following three figures (IV, V and VI) show the results of the multilevel quantitative analysis. Thus, figure IV shows the SWOT factors and their sub-factors (levels 1 and 2), together with the figures representing the partial and global – or composite– priorities resulting from taking into consideration the different levels analysed. The highest relative values for each stage of analysis are highlighted in bold.

Figures V and VI show the sub-factors (level 2), their expression in indicators (level 3) as well as the corresponding figures for partial and global priorities, calculated in a similar way to that used in the previous phase. The complexity of the level 3 display required the use of two charts, one for the display of internal factors (W and S) and the other for external factors (T and O).

FIGURE III. Structure in hierarchical levels of the SWOT matrix

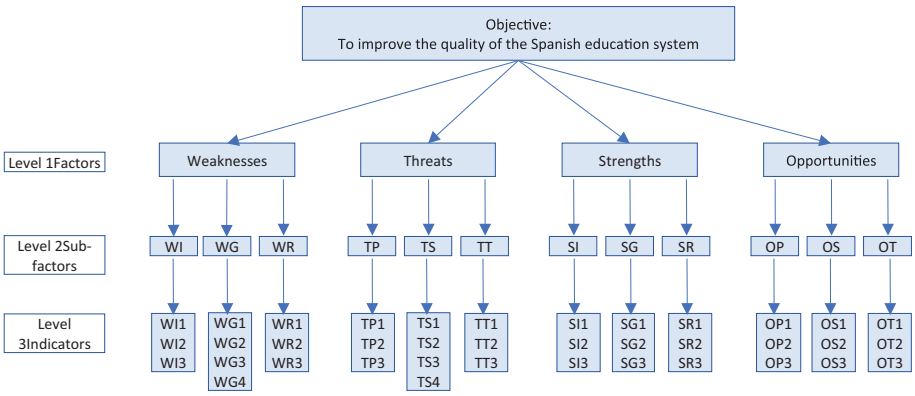

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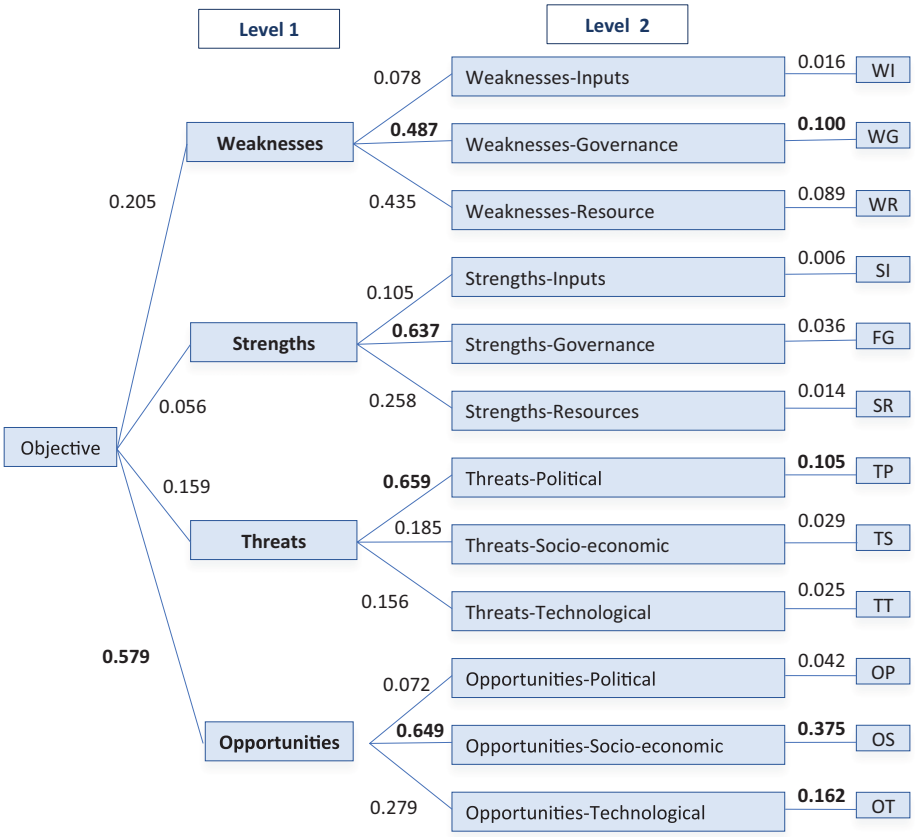
FIGURE IV. Overall scores for factors, sub-factors and SWOT indicators. Factors and sub-factors



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On the other hand, Table II provides a synthetic view of those indicators whose global priorities are equal to or higher than 0.010, together with their corresponding figures, as well as the CR consistency ratios, which will be useful in the discussion of strategic elements to be addressed later.

FIGURE V. Overall scores of factors, sub-factors and SWOT indicators. Internal factors, sub-factors and indicators

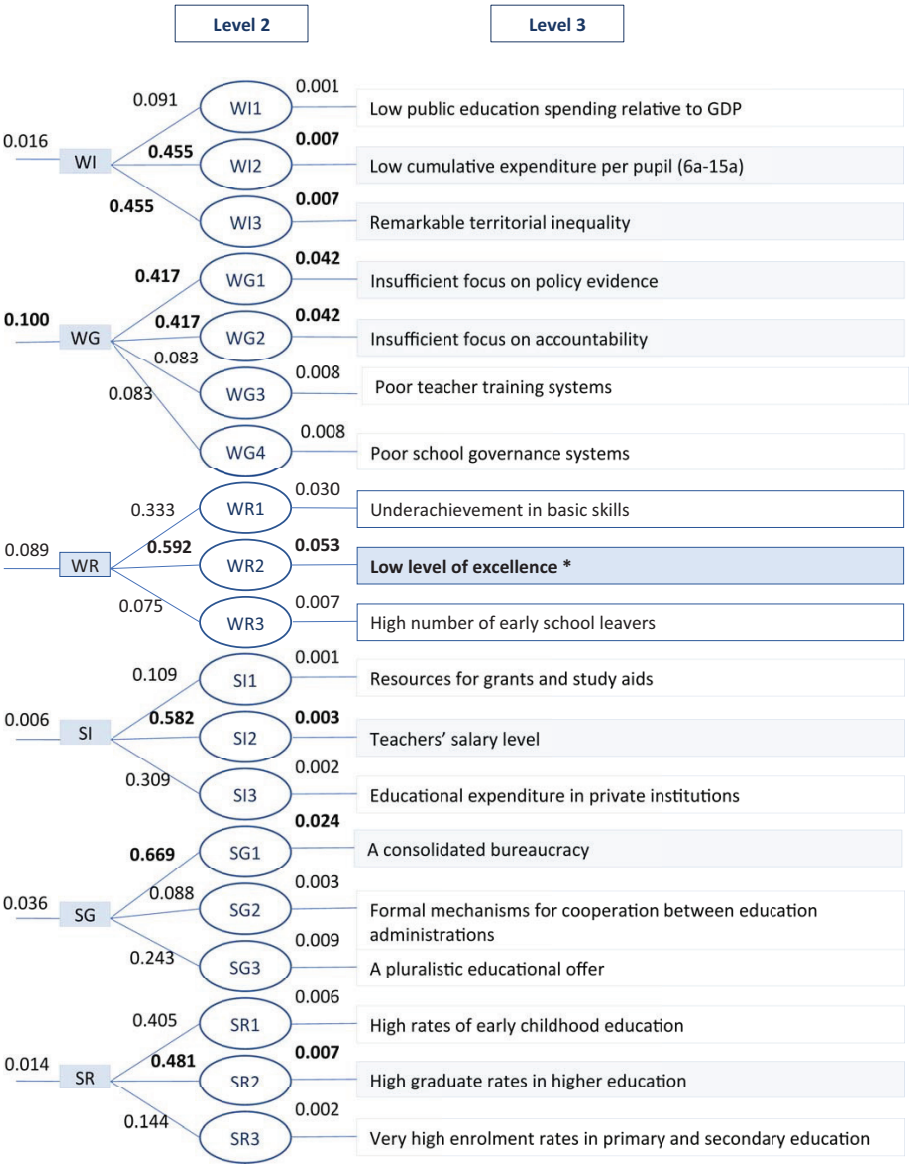

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FIGURE VI. Overall scores for factors, sub-factors and SWOT indicators. External factors, sub-factors and indicators

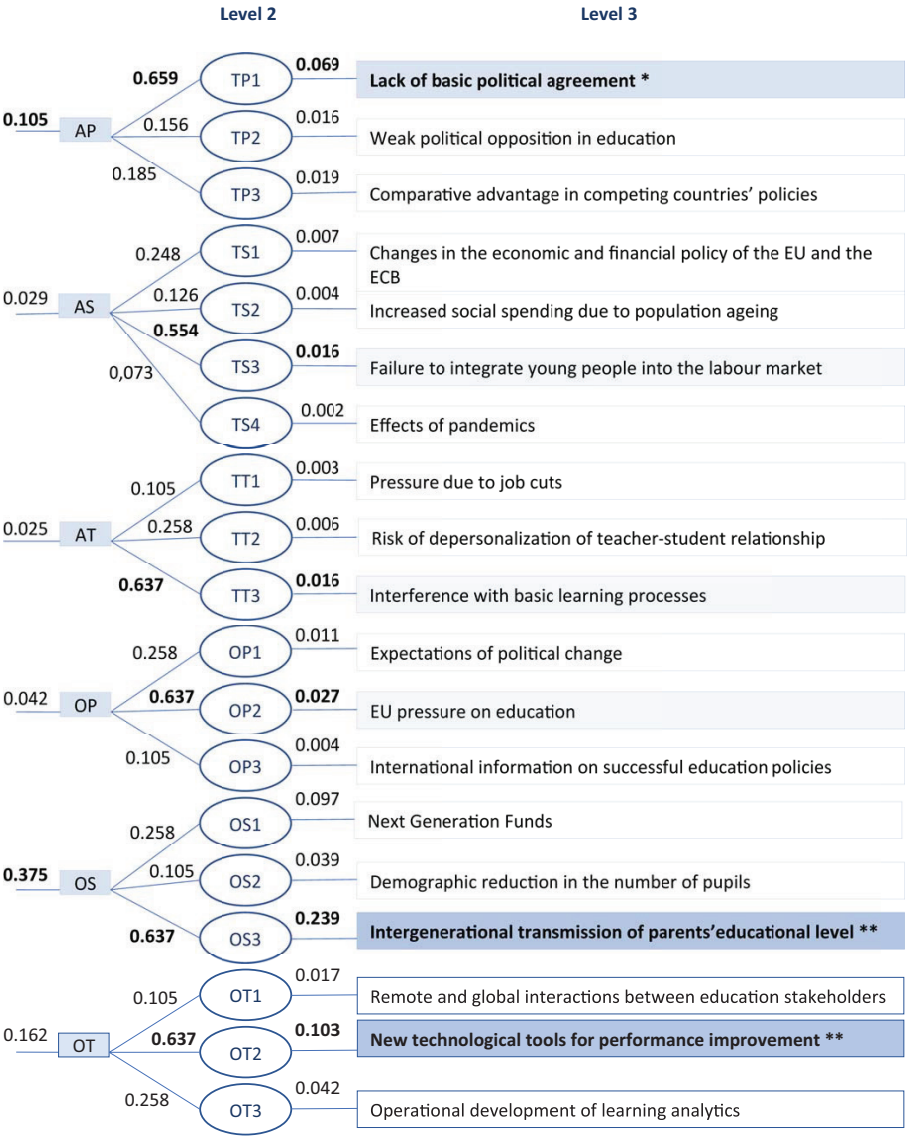

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TABLE II. Summary, in terms of priorities, of the quantitative analyses carried out on the SWOT matrix and its different hierarchical levels[7]

Factor	Level 1 Priority	Sub-factor	Indicator	Global priority
Weaknesses RC = 0.011	0.205	Governance RC = 0.000	Insufficient attention to evidence on policies	0.042
			Insufficient focus on accountability	0.042
		Results RC = 0.007	Low level of excellence	0.053 (*)
Strengths RC = 0.033	0.056	Governance RC = 0.006	A consolidated bureaucracy	0.024
Threats RC = 0.025	0.159	Political RC = 0.025	Lack of basic political agreement	0.069 (*)
			Weak political opposition in education	0.016
			Comparative advantage in political advantage of competitor countries	0.019
		Socio-economic RC = 0.073	Failure of young people to enter the labour market	0.016
		Technological RC = 0.033	Interferences in basic learning processes	0.016
Opportunities RC = 0.039	0.579	Political RC = 0.033	Expectations of political change	0.011
			EU pressure on education	0.027
		Socio-economic RC = 0.033	Next Generation EU funds	0.097 (*)
			Demographic decline in pupil numbers	0.039
			Intergenerational transmission of parental education level	0.239 (**)
		Technological RC = 0.033	Remote and global interactions between educational actors	0.017
			New Technological tools for performance improvement	0.103 (**)
			Operational development of learning analytics	0.042

Source: Compiled by author

[7] Note: (**) Global priority above 0.100; (*) Global priority between 0.050 and 0.100. Indicators with global priorities below 0.010 have been ignored in this Table.

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Discussion

Applying the AHP technique allows SWOT analyses to be completed on a quantitative basis. These quantitative analyses aim to facilitate the adoption of strategic decisions informed by a multiplicity of criteria of different nature and relevance with varying degrees of interdependence. This SWOT enriched by AHP is a way of shedding light on a complex forest of relevant factors.

Table II highlights the prominent role of the Opportunities and provides a first reduction in complexity when suggesting strategies, since the systematic application of the AHP technique has reduced the initial thirty-eight relevant variables to less than half. Nevertheless, a series of heuristics –or guidelines based on experience– should be enunciated in order to advance in the problem of selecting relevant strategies resulting from the quantitative SWOT. What follows is a list, albeit not a full one, of those guidelines or orientations that we will apply:

- Start from a broad view of the available information (Gallego-Ayala &Juízo, 2011) (a).
- Focus on the most relevant pair of SWOT factors (Pesonen et al., 2001) (b).
- Rely mainly on offensive strategies (OF) and adaptive strategies (OD) (Weihrich, 1989; Codina Jiménez, 2011; Koontz et al., 2012) (c).
- Take into account the most important variables first (Gallego-Ayala &Juízo, 2011) (d).
- Assess consistency ratios together with the overall priority figures (Pesonen et al., 2001) (e).
- Test, on the basis of the study, the definition of an alternative strategy (Görenger et al., 2012) (f).

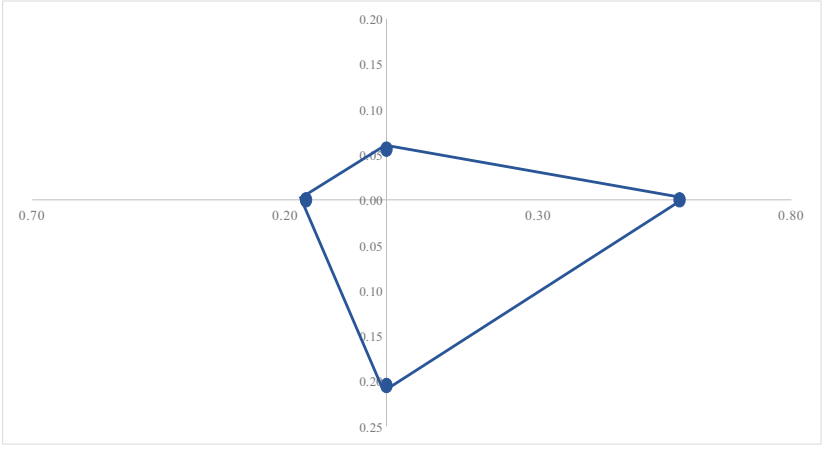
Based on the overview provided by Table II (orientation a), we now proceed to apply orientation b). Figure VII shows the figures for the priorities of level 1, the level corresponding to the SWOT factors. In accordance with the relative priority values of this first level, the strategies that revolve around opportunities, namely *maxO-maxS* (offensive strategy) and *maxO-minW* (adaptive strategy), are chosen (Koontz et al., 2012). The consideration of orientations c), d) and e) recommends focusing on the *maxO-minW* adaptive strategies, in accordance with the following approach:

- On the side of Opportunities:
  - Intergenerational transmission of parents' educational attainment.
  - New Technological tools for performance improvement.
  - Next Generation Funds.
- On the side of Weaknesses:
  - Low level of excellence.
  - Insufficient attention to evidence on policies.
  - Insufficient attention to accountability.

The inclusion of the selected governance indicators in the weaknesses group (see Table II) is justified, on the one hand, by the proximity of their priority scores to those of the results indicators and, on the other hand, by the advantage of this first group of indicators in terms of consistency (orientation e).

Finally, in view of the different scores in Table II, the application of orientation f) leads to an alternative and atypical strategic approach along the following lines: *minT-maxO*. In other words, minimizing the impact of the threats and maximizing the use of the opportunities, which means addingfrom the side of the Threats: Lack of basic political agreement.

FIGURE VII. Graphical representation of the priority scores obtained for the different level 1 SWOT factors.



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It is now a matter of complementing this approach towards *what* should be done with an approach towards *how* to achieve it, and of formulating recommendations, as evidence-based as possible, to the public authorities, which help to implement the strategies that emerge from the orderly application of the heuristics.

Maximizing the use of intergenerational transmission

It is clear that all internal factors that contribute to this educational transmission from families will contribute to seizing this opportunity. According to the available empirical evidence, improving the quality of teachers and improving the quality of school leadership are the two most critical factors (Hattie, 2003; Leithwood et al., 2006; Hanushek et al., 2016; López Rupérez, 2021) for school success. In addition, a third factor, which lies at the heart of the process of intergenerational cultural transmission itself, is parental involvement (Castro et al., 2015), which is facilitated by successful cooperation between family and school.

How to take advantage of new technological tools for performance improvement

Two orientations would make it possible to take advantage of this opportunity. The first is to use digital technologies for the effective development of personalized –or learner-centred– teaching that reaches all students and addresses their needs and the particular characteristics of their learning process (López Rupérez, 2020). The second, closely related to the previous one, is to take advantage of what we know about the effectiveness of Mastery Learning with its precise and rigorous teaching sequences that ensure that all students master what they learn (López López, 2006).

How to optimize the use of Next Generation Funds in the educational field

If a Paretian approach to priority setting is adopted, then teacher-centred and school leadership-centred policies should be inexcusably part of the

objectives of *Lever VII. Education and knowledge, lifelong learning, and capacity development*.[8]

How to raise standards of excellence

Two empirically grounded recommendations can be made to achieve this goal: the first is to raise the level of teaching demands; the second is to strengthen non-cognitive skills, particularly those related to perseverance, resilience and a sense of effort (López Rupérez &García, 2017). It is clear that both recommendations are interlinked, because while raising the level of teaching demands must go hand in hand with raising the level of teacher competence, this will be insufficient if students are not simultaneously encouraged to develop these skills, which are generally associated with character development (Lickona &Davidson, 2005; Bernal et al., 2015).

How to enhance the role of knowledge and evidence in education policies

Two recommendations emerge from the decisive role of knowledge and evidence in defining policies and educational reforms in high-performing countries (López Rupérez, 2022). Firstly, an epistemological shift towards a critical rationalism that considers the principle of reality and respect for facts. It is a matter of introducing educational policies into the territory of rational-scientific approaches.

The second recommendation is of an instrumental nature, and consists of recovering the practice of 'white papers', which has been abandoned in Spain since the last century. No educational reform should be able to be included in the Official State Gazette without the prior drafting of a white paper which, together with the objectives, would provide a justification for the reforms based on facts and not on mere rhetorical formulations; an effort should be made to explain –at least by means of plausible conceptual models with some empirical basis and, if possible, by means of causal models – the mechanisms through which the reform is expected to achieve

[8] https://www.lamoncloa.gob.es/temas/fondos recuperacion

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its objectives; and an impact assessment plan should also be included in order to check whether or not these forecasts are being fulfilled.

How to strengthen accountability

Two recommendations for strengthening accountability are essential. The first is to include the overall assessment model of the education system among the elements of a basic political consensus that blocks piecemeal changes. This will guarantee the stability of the model, facilitate the comparability of time series and ensure that useful and minimally reliable inferences can be made.

The second recommendation is to make the institution responsible for the evaluation of the education system independent of the government, with high academic prestige and technical solvency, and accountable to Parliament. This is what the Portuguese government did with the creation of an Institute for Educational Evaluation as an autonomous and independent body (Crato, 2020).

How to minimize the impact of the lack of a basic political agreement

From the analysis of experience, two recommendations arise and are justified below. The first is to introduce the aforementioned rationality in the formulation of the policies. This essential attribute makes it possible to get it right; but it also makes the stability of educational reforms more likely, which is a necessary condition for their success. The second is to progress towards a social pact rather than a political pact. Social expectations in Spain regarding the need to articulate an educational pact are in the majority and, therefore, the obstacles may well be of a lower calibre than in the strictly political sphere.

Both strategies are interrelated. Spanish society as a whole is more sensitive to rational arguments than its political class and, of course, much less sensitive to those that respond to a logic of power. The fact that the social agreement comes before the political pact will be a stimulus for the latter not to become disengaged and will generate a certain opportunity for its materialization.

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Limitations of the study

The margin of subjectivity inherent in the method used in this study could be reduced by increasing the number of experts involved either in the selection processes of sub-factors and indicators, or in the processes of assigning weights by pairs, or in both. The application of the Delphi procedure of expert consultation (Landeta, 1999) could be one such possibility for methodological consolidation.

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Annex

Level 1. Pairwise comparison of SWOT factors

TABLE A.1. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the SWOT factor group

SWOT Group	W	S	T	O	Degree of importance
Weaknesses (W)	1	5	1	1/3	0.205
Strengths (S)	1/5	1	1/3	1/7	0.056
Threats (T)	1	3	1	1/5	0.159
Opportunities (O)	3	7	5	1	0.579
RC = 0.039					

Source: Compiled by author

Level 2. Pairwise comparison of the groups of sub-factors in which each SWOT factor is expressed

TABLE A.2. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the subgroup for the Weakness (W) factor.

WEAKNESSES Group	I	G	R	Degree of importance
Inputs (I)	1	1/7	1/5	0.078
Governance (G)	7	1	1	0.487
Results (A)	5	1	1	0.435
RC =0.011				

Source: Compiled by author

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TABLE A.3. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the subgroup corresponding to the Strength (S) factor.

STRENGTHS Group	I	G	R	Degree of importance
Inputs (I)	1	1/5	1/3	0.105
Governance (G)	5	1	3	0.637
Results (A)	3	1/3	1	0.258
RC = 0.033				

Source: Compiled by author

TABLE A.4. Pairwise comparison matrix, degrees of importance and Consistency Ratio for the Threats (T) factor subgroup.

THREATS Group	P	S	T	Degree of importance
Political (P)	1	3	5	0.659
Socio-economic (S)	1/3	1	1	0.185
Technological (T)	1/5	1	1	0.156
RC = 0.025				

Source: Compiled by author

Level 3. Pairwise comparison of the groups of indicators in which each of the sub-factors – Inputs, Governance and Results, and Political, Socio-economic, and Technological – are expressed

TABLE A.5. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators corresponding to the Weaknesses-Inputs (WI) sub-factor.

WEAKNESSES-INPUTS Subgroup	WI1	WI2	WI3	Degree of importance
Low public education expenditure relative to GDP (WI1)	1	1/5	1/5	0.091
Low cumulative expenditure per pupil (WI2)	5	1	1	0.455
Notable territorial inequality (WI3)	5	1	1	0.455
RC = 0.000				

Source: Compiled by author

TABLE A.6. Pairwise comparison matrix, degrees of importanace and Consistency Ratio of the set of indicators for the Weaknesses-Governance (WG) sub-factor

WEAKNESSES-GOVERNANCE Subgroup	DG1	DG2	DG3	DG4	Degree of importance
Insufficient attention to evidence on policies (WG1)	1	1	5	5	0.417
Insufficient attention to accountability (WG2)	1	1	5	5	0.417
Weak teacher education systems (WG3)	1/5	1/5	1	1	0.083
Weak school leadership systems (WG4)	1/5	1/5	1	1	0.083
RC = 0.000					

Source: Compiled by author

TABLE A.7. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators corresponding to the Weaknesses-Results (WR) sub-factor.

WEAKNESSES-RESULTS Subgroup	WR1	WR2	WR3	Degree of importance
Low performance in basic skills (WR1)	1	1/2	5	0.333
Low level of excellence (WR2)	2	1	7	0.592
High level of early school leavers (WR3)	1/5	1/7	1	0.075
RC = 0.007				

Source: Compiled by author.
Note: The clear preponderance in the assessment of indicator WR2 over WR3 is mainly justified by the different nature of the underlying data source: the former are derived from objective evidence, the latter are of purely administrative origin and therefore modulable.

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TABLE A.8. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the indicator set for the Strengths-Inputs (SI) sub-factor.

STRENGTHS-INPUTS Subgroup	SI1	SI2	SI3	Degree of importance
Resources for Scholarships and Grants (SI1)	1	1/5	1/3	0.109
Level of teachers' salaries (SI2)	5	1	2	0.582
Educational expenditure on private institutions (SI3)	3	1/2	1	0.309
RC = 0.003				

Source: Compiled by author
Note: The lower relative strength of the SI1 indicator in the allocation of weights is a reflection of the evidence in the international comparison.

TABLE A.9. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the indicator set for the Strengths-Governance (SG) sub-factor.

STRENGTHS-GOVERNANCE Subgroup	SG1	SG2	SG3	Degree of importance
A consolidated bureaucracy (SG1)	1	7	3	0.669
Formal mechanisms of cooperation between educational administrations (SG2)	1/7	1	1/3	0.088
A plural educational offer (SG3)	1/3	3	1	0.243
RC = 0.006				

Source: Compiled by author

TABLE A.10. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the indicator set for the Strengths-Results (SR) sub-factor.

STRENGTHS-RESULTS Subgroup	SR1	SR2	SR3	Degree of importance
High rates of early childhood education (FR1)	1	1	3	0.405
High rates of tertiary education graduates (FR2)	1	1	5	0.481
Very high enrolment rates in primary and ESO (FR3)	1/3	1/5	1	0.114
RC = 0.025				

Source: Compiled by author
Note: The lower relative weight of the SR3 indicator is justified because, although it represents an intrinsic strength of the system, in comparative terms it is widespread in developed countries.

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TABLE A.11. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators for the Threats-Political (TP) sub-factor.

THREATS-POLITICAL Subgroup	TP1	TP2	TP3	Degree of importance
Lack of basic political agreement (TP1)	1	5	3	0.659
Weak political opposition in education (TP2)	1/5	1	1	0.156
Comparative advantage in political advantage of competing countries (TP3)	1/3	1	1	0.185
RC = 0.025				

Source: Compiled by author
Note: Evidence shows how often the lack of political agreement leads to instability in education reforms in Spain.

TABLE A.12. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators for the SocioEconomic Threats (SE) sub-factor.

THREATS-SOCIOECONOMIC Subgroup	TS1	TS2	TS3	TS4	Degree of importance
Changes in the economic and financial policy of the EU and the ECB (TS1)	1	3	1/3	3	0.248
Increased social spending due to ageing of the population (TS2)	1/3	1	1/5	3	0.126
Failure of young people to enter the labour market (TS3)	3	5	1	5	0.554
Effects of pandemics (TS4)	1/3	1/3	1/5	1	0.073
RC = 0.073					

Source: Compiled by author

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TABLE A.13. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators for the Threats-Technological (TT) sub-factor.

THREATS-TECHNOLOGICAL Subgroup	TT1	TT2	TT3	Degree of importance
Pressure due to job cuts (TT1)	1	1/3	1/5	0.105
Risk of depersonalization of the teacher-student relationship (TT2)	3	1	1/3	0.258
Interferences with basic learning processes (TT3)	5	3	1	0.637
RC = 0.033				

Source: Compiled by author
Note: The attribution of pairwise weights has taken into account the indirect nature of the effects of TT1 versus the direct and extensive nature of TT3.

TABLE A.14. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators corresponding to the Opportunities-Political (OP) sub-factor.

OPPORTUNITIES-POLITICAL Subgroup	OP1	OP2	OP3	Degree of importance
Expectations of policy change (OP1)	1	1/3	3	0.258
EU pressure on education (OP2)	3	1	5	0.637
International information Successful education policies (OP3)	1/3	1/5	1	0.105
RC = 0.033				

Source: Compiled by author
Note: The attribution of peer weights has taken into account the increasing EU pressure on education as a consequence of the parallel importance given to education and training, according to the policy approaches of the European Council.

TABLE A.15. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators for the Socio-Economic Opportunities (OS) sub-factor.

OPPORTUNITIES- SOCIOECONOMIC Subgroup	OS1	OS2	OS3	Degree of importance
Next Generation Funds (OS1)	1	3	1/3	0.258
Demographic reduction of pupil numbers (OS2)	1/3	1	1/5	0.105
Intergenerational transmission of parents' educational level (OS3)	3	5	1	0.637
RC = 0.033				

Source: Compiled by author
Note: The attribution of pairwise weights has taken into consideration the robust predictability of the OS3 indicator.

TABLE A.16. Pairwise comparison matrix, degrees of importance and Consistency Ratio of the set of indicators corresponding to the Opportunities-Technological (OT) sub-factor.

OPPORTUNITIES-TECHNOLOGICAL Subgroup	OT1	OT2	OT3	Degree of importance
Remote and global interactions between educational actors (OT1)	1	1/5	1/3	0.105
New Technological tools for performance improvement (OT2)	5	1	3	0.637
Operational development of learning analytics (OT3)	3	1/3	1	0.258
RC = 0.033				

Source: Compiled by author

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