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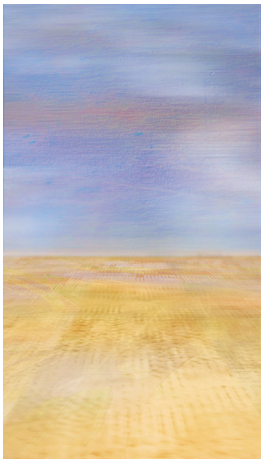

Research section

The educational reform of Marcelino Domingo. Implementation of New School ideas in Republican Spain

La reforma educativa de Marcelino Domingo. La implementación de los postulados de la Escuela Nueva en la España republicana

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Abstract

The aim of this research is to reveal the relationship between the educational ideas of Marcelino Domingo, Minister of Public Instruction during the first government of the Second Republic, and the principles of the New School, understanding that his educational reform intended to develop an educational system based on the postulates of this pedagogical movement. To carry out this research, we have chosen an interdisciplinary approach and a qualitative methodology, based on Documentary Content Analysis (DCA). From the analysis of the essays and speeches, we have been able to identify the main pedagogical ideas in the political thought of Marcelino Domingo, related to the New School. The regulation that shaped the new educational system, reflected principles such as coeducation, the active school and creativity. The conclusion of this article is that Domingo was the point of connection between the republican movement and the New School in Spain, since it went from being a minority pedagogical current restricted to private initiatives, to constituting the foundations of the public and official educational system in the Second Republic.

Keywords: New School, Spain, educational innovation, political thought, educational policy, republicanism.

Resumen

El objetivo principal de este artículo es revelar la relación existente entre las ideas educativas de Marcelino Domingo, primer ministro de Instrucción Pública durante la Segunda República, y los principios de la Escuela Nueva, entendiendo que la reforma emprendida por el nuevo ministro estaba destinada a desarrollar un sistema educativo basado en los postulados de esta corriente pedagógica. Para llevar a cabo esta investigación, se ha optado por una perspectiva interdisciplinar y una metodología cualitativa, basada en el Análisis de Documental de Contenido (ADC). A partir del análisis de sus ensayos y discursos, se han podido identificar las principales ideas pedagógicas en el pensamiento político de Marcelino Domingo, relacionadas con la Escuela Nueva. Principios tales como coeducación, la escuela activa y la creatividad fueron trasladados a los decretos que dieron forma al nuevo sistema educativo. La conclusión final de este artículo es que Domingo significó el punto de enlace entre el movimiento republicano y la Escuela Nueva en España, pues pasó de ser una corriente pedagógica minoritaria y restringida a iniciativas privadas, a constituir las bases del sistema educativo público y oficial en la Segunda República.

Palabras clave: Escuela Nueva, España, innovación educativa, pensamiento político, política educativa, republicanismo.

Introduction and State of the Art

Studying the education system during the Second Republic provides valuable insights into the significance Republicans placed on democratic values such as equality, freedom, and prosperity, as well as the advancement of knowledge and the government's commitment to its citizens. As Antonio Molero pointed out in 1977, the interest in understanding the reforms of the first Republican government stems from the fact that the early 1930s witnessed the most profound transformations in the field of education. Therefore, it is of analytical relevance to examine the ideas that Marcelino Domingo, the first Minister of Education, held on this matter.

The first works on education during the Republic were published as early as the 1970s, with notable books including Mariano Pérez Galán's (1975), *La enseñanza en la Segunda República Española*; Antonio Molero's (1977), *La reforma educativa en la II República. Primer Bienio*;, Mercedes Samaniego's (1977), *La política educativa de la II República durante el bienio azañista*, and Claudio Lozano's (1980), *La educación*

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republicana, 1931-1939. These early studies shed light on a period of recent Spanish history that had been silenced by the dictatorship, especially in identifying the key elements of Republican education policy. These landmark studies delved into concepts such as coeducation, active schooling, secularism, and the modernization of *Escuelas Normales*, and they continue to be regarded as important reference works to this day. Building upon these, numerous publications focused on specific aspects of education during the Second Republic, such as pedagogical missions (Otero, 1982; Canes, 1993; Otero, 2006); primary education (Molero, 1984; Vicente, 2018); the religious question and education in the Republic (Barrios, 1999; Moreno-Seco, 2003; Ostolaza, 2009); teacher training (Lantero, 1978; Molero, 2009; Alejo, 2015; Menguiano and Del Pozo, 2021); and even educational inspection during this period (Martí, 2003). In addition to these studies, it is worth mentioning Antonio Sánchez-Rodríguez's book (2003), which focuses on the constitutional foundations that allowed for educational reform, and Herminio Barreiro's article (2008) on the legacy of educational reform during this historical period. There were also numerous publications on the implementation of this social policy in specific regions and communities (Rodríguez, 1974; Navarro, 1979; Ortega, 1982; Benvenuty, 1987; Palmero, 1990; Berruezo, 1991; Domínguez, 1999; García Salmerón, 2003; Asensio, 2007). These local studies reveal the challenges faced by the Republicans in the implementation and execution of their education policy, thus providing significant value to our understanding of education during the Second Republic.

Various studies have explored the methodological shifts in teaching (Fernández, 1985; Molero, 1988; Del Pozo, 2004, 2007; Esteban, 2016), and pedagogical initiatives that emerged prior to the Second Republic and were highly influential during this period, such as the *Institución Libre de Enseñanza* (ILA), the *Junta para la Ampliación de Estudios* (JAE), or the *Instituto Escuela*. The publications that focus on these initiatives address topics related to the New School movement, as well as the influence that the ILA had on the pedagogical ideas of the Second Republic (Millán, 1983; Palacios, 1988; Viñao, 2000).

This interest in understanding the educational model of the Second Republic led to the analysis of both primary and secondary political figures who played a relevant role in the reforms. An initial comparative analysis of all the Ministers of Public Instruction was published in 1991, examining their social background, foreign studies, professional activity,

political career, and ministerial mobility from a sociological perspective (Cuenca and Miranda, 1991). However, most studies on these ministers have been published in the form of biographies. Fernando de los Ríos has received the most attention in this regard (Zapatero, 1974, 1999; Cámara, 2000a; Ruiz-Manjón, 2007). Moreover, his complete works were edited, and a special issue of the *Boletín de la Institución Libre de Enseñanza* dedicated to the socialist minister was published in 2000, analyzing the educational reform carried out by his ministry (Cámara, 2000b). Another Minister of Public Instruction who has been the subject of study is Filiberto Villalobos, who held the position during various periods of the second biennium (Rodríguez, 1985, 2005; Robledo, 2005). Salvador de Madariaga, who served as the head of this ministry from March to April 1934, has also been the subject of numerous publications (Molina, 1987; Preston, 1987; Derungs, 2009; Grandío, 2017), although these did not focus on his role as Minister of Public Instruction. The ministerial work of the remaining heads of Public Instruction, excluding Domingo, has been addressed in more general works (Alba, 1975; Álvarez, 2000; Pérez Galán, 2000).

In the case of Marcelino Domingo, several works have been published that explore different political and personal aspects of his life, such as his involvement in Catalanism (Poblet, 1978) or his political career (Carod Rovira, 1990; Subirats, 1995; Pujadas, 1996). Although these works mention his position as Minister of Public Instruction, they do not delve into his specific initiatives. While ample attention has been given to numerous publications explaining the changes seen in the field during the first biennium of the Second Republic, there is no study to date on Domingo's role in the educational reforms or the influence of new pedagogical trends on his political proposals.

Based on these premises, the main objective of this article is to analyze the relationship between Marcelino Domingo's educational proposals and the contributions of the New School movement in the Republican education system. A coherent secondary objective is to identify the educational reforms implemented in Spain during the first period of the Second Republic under Domingo's leadership. An interdisciplinary approach was adopted to carry out this study on educational reforms in the early months of the Republic, on the basis of its capacity to provide a more comprehensive understanding of the educational reforms. This involves a convergence of pedagogy, political history and public policies, and

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political thought. In essence, this study aims to fill a gap identified in the research on educational reform during the Republic by focusing on the role of Marcelino Domingo and his influence on the course of education in the Republican regime.

Theoretical Background

Educational reform during the first two years of the Republic embraced the majority of principles developed by the New School pedagogical movement. This movement emerged in the latter half of the 19th century, primarily in the United States and Europe, as an alternative to the traditional school model that had prevailed until then. Its development was closely linked to the expansion of democratic ideas and the establishment of compulsory education for all boys, and occasionally also girls, guaranteed by the State. Access to education for children from all social classes led to the emergence of educational proposals that advocated for the implementation of differentiated pedagogical methods, with the aim of achieving a similar level of knowledge for all. The New School was one of the major proponents of these differentiated methods (Rude, 1937; Ferreire, 1972; García, 1991; Fernández-Soria & Pérez, 2014), utilizing various approaches such as Montessori or Decroly, which were spreading rapidly across the Old Continent (Negrín & Vergara, 2005; Del Pozo, 2007; Lara, 2014).

The expansion of this pedagogical movement in the early 20th century heightened concerns about maintaining common and coherent principles across the various new schools emerging worldwide. To address this, a meeting was held in Calais in 1921 to define and solidify these innovative ideas, which were ultimately documented in thirty postulates grouped according to their impact on school organization, intellectual development, or the moral and aesthetic education of children. Following this congress, and based on the theory and praxis generated by the New School movement, its principles can be grouped into five main categories: the vitalistic school (Luzuriaga, 1980; Palacios, 1988), the active school (Dewey, 1900; Luzuriaga, 1980; Vicente, 2002), the child-centred (or paedocentric) school (Murga, 2001; Carreño, 2008), the revaluation of the teacher's role (Schmid, 1976; Carreño, 2008), and the school as a community (Luzuriaga, 1980; Murga, 2001).

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In Spain, the postulates of this movement began to spread in the late 19th century, coinciding with the *fin de siècle* crisis. Spanish regenerationists focused on education as a mechanism for transforming society and called for the establishment of a "new education" that would lead to a "new Spain" (Del Pozo, 2003, p. 320). However, the political regime was not favourable to educational reform until a significant faction within the Liberal Party embraced changes in this direction, influenced by the *Institución Libre de Enseñanza*, which had developed new teaching methodologies that echoed the principles of the New School since its establishment in 1876 (Luzuriaga, 1980, p. 233). The proximity between liberals and the ILE resulted in the promotion of educational reforms aimed at reducing the role of the Catholic Church in Spanish education, although these changes were not sustained over time. The alliance proved more effective in the creation of institutions and programs that helped to disseminate and implement the new pedagogical ideas, thus increasing the popularity of the New School. In this regard, in addition to the impetus provided by the establishment of the *Residencia de Señoritas* in Madrid (1915) and the *Instituto-Escuela* (1918) (Vázquez, 2001; Puelles, 2009), awareness of the New School movement spread significantly with the creation of the *Junta para la Ampliación de Estudios*, whose main mission was to fund educational stays abroad for the best students (Hernández, 2009; Marichal, 1988; Marín, 1990).

The connection between the JAE and the ILE was evident from the beginning. Proof of this is that the first deputy director of the JAE was José Castillejo, one of the most distinguished students of the ILE. Equally revealing is the fact that many of the scholarship holders came from this institution, such as Manuel Bartolomé Cossío and Lorenzo Luzuriaga, two of the most important pedagogues in Spain during the first third of the 20th century. They were clearly influenced by the New School and their contributions greatly enriched the educational reform program of the Second Republic (Del Pozo, 2003, 2004). Luzuriaga played a prominent role in promoting the New School in Spain through the *Revista de Pedagogía*, which was published from 1922 to 1936. In this journal, he expressed the innovative ideas stemming from this pedagogical movement. Bartolomé Cossío described him as "one of the most illustrious precursors of the two basic ideas of education in our time: internally, the Active School, and externally, the Unified School" (Luzuriaga,

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1948, p. 132). Beyond these major initiatives, the New School movement spread across Spain through private initiatives, many of which were led by teachers in Catalonia (Del Pozo, 2003, p. 322), including Marcelino Domingo himself.

Materials and methods

The research methodology used in this study was qualitative in nature and relied on Content Document Analysis (CDA), defined here as "the cognitive process of recognizing, describing, and representing the document content" (Pinto, 1996, p. 301). The CDA process comprises three phases (Alía, 2008): document reading, influenced by the contexts in which the document is created and read (Flick, 2012; Gibbs, 2012); analysis, consisting of dividing the text into several units (segmentation), identifying relevant units and eliminating the rest (selection), and interpretation; and finally, synthesis, where the gathered information is synthesized by drawing conclusions based on the analysis phase. The analysis categories for the second phase of the CDA process focused on Marcelino Domingo's political ideology, as expressed in his essays and public speeches, and the public education policies implemented during his tenure as Minister of Public Instruction. These categories were treated as the independent and dependent variables, respectively.

The information for analysis was primarily sourced from institutional documents, particularly session records and legislation, as well as journalistic sources, which provide valuable insights into different social realities (Callejo, 2009). The main body of institutional data was obtained from Republican legislation through the digitized collection of the *Gazeta*: *colección histórica*, and from session records of the Constituent Courts found in the historical series of the *Congreso de los Diputados* session records. The hemerographic research was conducted using the *Hemeroteca Digital* of the National Library of Spain, which contains a collection of historical Spanish newspapers. Searches in these databases were limited to the timeframe relevant to this study: from 14 April to 17 December 1931, the months during which Marcelino Domingo served as Minister of Public Instruction.

To complement the CDA, numerous writings by Domingo were consulted, extracting ideas related to the issue of education. Likewise,

speeches that he delivered in the Constituent Courts or had published in the written press were also reviewed, along with the political program of the Radical Socialist Republican Party. To achieve a deeper understanding of the impact of his discourse on society, discourse analysis techniques were employed. This involved studying the construction, functioning, and evolution of his speeches, as well as examining the social, political, and institutional references within them (Lozano, Peña-Marín & Abril, 1993; Howarth, 1997). In the review of his political thought, the analysis was extended to cover the period from the early 20th century to 1936. This broader timeframe allowed for a comprehensive exploration of the main elements of his political vision and, in particular, his educational project for the Second Republic.

Analysis and results

On 14 April 1931, a period filled with democratic hopes began, led by a group of Republicans and Socialists, among them Marcelino Domingo. Given his professional and political background, Domingo seemed to be the best choice for the position of Minister of Public Instruction in the provisional government. In the early 20th century, Domingo was one of those teachers who embraced the principles of the New School and implemented various initiatives in line with this educational approach. At just twenty years old, he secured a teaching position in the municipal schools of Tortosa (Tarragona), while participating in the Catalan Republican movement. As a teacher, he witnessed first-hand the challenging circumstances faced by the most underprivileged families, prompting him to launch a campaign denouncing their social conditions and strongly criticizing the prominent role of the Catholic Church in education. The pressures he faced took a toll on him, and after two years of teaching in the municipal schools, he decided to establish a private school in Roquetas, then a hamlet of Tortosa, in 1905. Capitalizing on the circulation of new pedagogical ideas in Catalonia, the young teacher defined his school as secular, respecting the individual conscience of the students, and implemented coeducation in the classroom as a means to promote equal education. Despite the challenges, the school soon had around 200 students from diverse backgrounds, as families with limited resources could attend at no cost (Garcitoral, 1930, p. 70). This experience provided a

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unique opportunity to put new pedagogical methodologies into practice and assess their effectiveness in a specific context[1].

While pursuing his career as a teacher, Domingo took his first steps in republicanism, specifically in progressive Catalan republicanism. Guided by Rovira i Virgili, he embraced the republican and federalist ideas of Pi i Margall (Moreno Luzón, 2006; Robledo, 2006). Initially serving as a councillor in Tortosa for *Solidaridad Catalana* (1909), and later as a deputy (from 1914 to 1923, with the exception of the 1920 elections), he gained the sympathy of other Catalan and Spanish republicans, with whom he collaborated extensively during the Restoration period. During this time, he developed closer ties with the socialists, which in turn brought him closer to the world of the proletariat. Likely as a result of this transition, in his view the worker acquired the status of the "greatest and best social collaborator in the work of regeneration that, out of necessity, must be done"[2]. Regardless of the challenges inherent in political practice, his thought always remained rooted in the fundamental principles of freedom, democracy, justice, goodness, and homeland. It is true that Domingo's patriotic stance had to be reconciled with his Catalan identity and Catalanism, leading him to propose a solution to the national problem: the establishment of a republic that guaranteed freedom through a pact for the articulation of the nation (Domingo, 1930). The republican's position regarding the articulation of cultural identity found a connection with his educational program in advocating for the use of vernacular languages in the classroom.

Following Primo de Rivera's *coup d'état*, Domingo positioned himself clearly in the opposition and in 1929, he founded the Radical Socialist Republican Party (PRRS) (Avilés, 2006). This new party viewed education "as one of the primary duties and rights of the republican and secular state, inspired by its principles and oriented towards the social goals of the community, excluding any confessional tendencies, and generously funded in the Budget". Education was thus seen as a means to foster community and strengthen the bonds of unity among Spaniards (Cucalón, 2016). In the *Ideario* of the PRRS (1930), public instruction was highlighted as an essential element in the future Republic. Education should be "comprehensive, secular, and free" at all levels, strictly prohibiting the involvement of any

[1]Some of the techniques and methods of the New School implemented by Domingo in this school in Roquetas are referenced in the newspaper article "Y vengan hojas sueltas" ("And Loose Sheets Keep Coming"), *Las Dominicales. Semanario Librepensador*, 01/03/1907, p. 4. Among them, coeducation, secularism, and classroom cleanliness were highlighted.

[2] Session records of the *Congreso de los Diputados*, Legislature 1918-1919, 25/04/1918, n. 27, p. 646.

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religious community in shaping education policies. The creation of public education centres where there was demand should be promoted. Viewing the school as a resource whose purpose transcended mere academic development, the State had to guarantee the support and nourishment of children. Moreover, the party emphasized the importance of secondary and post-school education, drawing inspiration from the experience of the *Instituto-Escuela* in this field. They also focused on providing technical education for professions, tailored to the specific needs of each region. For the teaching profession, they called for the "urgent training of new and numerous cohorts of teachers with equal remuneration and identical proportionality in their staff compared to other civil servants"[3]. This last proposal aligned with the principle of revaluing the role of the teacher, which had been championed by the New School movement.

The concept of education as an instrument for democratic transformation was reflected in the Republican Constitution of December 1931, specifically in Article 48, which was meant to be developed through specific legislation. However, during Domingo's tenure as Minister of Public Instruction, the reforms undertaken were implemented through decrees, while awaiting the approval of a general education law that never materialized. When Domingo took office, the enrolment rate was over sixty percent for boys and fifty-six percent for girls, although less than half of this student body, around forty-three percent, was enrolled in public schools (Núñez, 2005). Despite the brief duration of his term in this department, Domingo's legacy extended beyond legislative measures, as his team continued to hold positions in subsequent governments, even as political parties changed in the executive branch. Prominent figures among these positions were Rodolfo Llopis as Director General of Primary Education and Domingo Barnés as Undersecretary.

Among his collaborators, Domingo also had Lorenzo Luzuriaga, who was one of the main proponents of the new pedagogy in Spain. Domingo appointed him as a member of the Council of Public Instruction, with the intention of having him draft the long-awaited education law based on his "unified school" concept. The establishment of this organization aimed to bring about a "creative renewal that national education requires to quickly incorporate the progress of our time"[4], and placing

[3] "Manifesto of the Radical Socialist Republican Party", December 1929, and "Ideology of the Radical Socialist Republican Party", September 1930, both included in the work by Artola (1991).
[4] "Decree regarding the composition of the Council of Public Education and the organization of work within it" (Gaceta de Madrid, n. 125, 05/05/1931, p. 538).

this distinguished educator at its forefront represented a tangible (and achievable) commitment to the principles of the New School. Although a new education law could not be approved, Luzuriaga's contributions formed the basis for the educational provisions in the Republican Constitution and, consequently, for the legislative developments in the field of education in the subsequent years (Puelles, 2011).

During his tenure, Marcelino Domingo championed several measures inspired by the New School, with a particular focus on coeducation and secularization. One of his key proposals was the adoption of the unified school model, which epitomized the principles of this pedagogical trend. Regarding coeducation in the classrooms, Marcelino Domingo advocated for its implementation in the education system, aligning with the idea of schools as institutions for shaping citizens. The government could not deny education to half of the population, as the Republic would be incomplete (Domingo, 1934). This concept of education was consistent with the principles of the vitalistic school, which aimed to bring the reality of the outside world into the classroom. Given that boys and girls coexisted in society, it was only natural that this coexistence should also be reflected in the classroom. The responsibility of shaping this idea fell to Luzuriaga, who included coeducation in his educational project, ensuring the presence of girls at all levels of education. However, due to strong opposition from certain sectors, coeducation could not be implemented in many schools. This was the case despite the construction of new schools favouring greater access for girls to primary education (Samaniego, 1977; Molero, 1991). Domingo tried to overcome this resistance by promoting various measures, including the approval of a decree urging several secondary schools to admit students of both sexes. At the beginning of the decree, the intended structural scope of this innovation was explicitly and literally acknowledged, stating that if coeducation was to be applied in any official secondary education centre, "it does not seem reasonable to maintain exceptions [...] by creating local female institutes [...]. To the consideration of this principle, we should add the urgent need to open said institutes to numerous students, without distinction of sex"[5].

[5] "Decree stating that the female institutes of Madrid and Barcelona should follow the same regulations as other educational institutions of their level and accept enrolment from students of either sex who request it, and that the current names of the institutes 'Infante Beatriz' and 'Infanta María Cristina' should be replaced with 'Instituto Cervantes' and 'Instituto Maragall'" (Gaceta de Madrid, n. 241, 29/08/1931, pp. 1495-1496).

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Alongside coeducation, secularization faced strong criticism from the more conservative segments of Spanish society. The proposals for secularization also received criticism from more radical Republicans, who considered them too moderate (Puelles, 2009). However, the principle of achieving a neutral school was guaranteed from the beginning of Marcelino Domingo's ministerial activity. In May, he approved a decree eliminating the obligation of religious education[6]. However, far from being completely eradicated, a circular published a few days later ensured that parents could request religious education for their children in writing and that religious symbols could remain in the classrooms. In a text published in 1932 titled "Gospel of the Republic", the adoption of this conciliatory approach was justified based on the concept of a secular school that could not be seen as being "in opposition to religious beliefs. [...] This principle denotes the utmost respect for your conscience as children and the conscience of the teacher" (Terrero, 1932, p. 39). According to Domingo, the purpose was not to foster anti-clericalism but to ensure freedom of conscience. This freedom was considered fundamental to fulfilling the principles of an active school, which required respecting the child's conscience in order for them to develop as individuals.

Undoubtedly, the implementation of the Unified School project was Domingo's closest expression to the ideas of the New School. This model of education, which aimed to eliminate inequalities manifested from birth, embraced the principles of a vitalistic and active school centred around the child (a paedocentric school), where the role of the teacher was essential, and the school was conceived as an instrument for building communities. In Domingo's own words (1932), the purpose of the Republic was for schools to be:

> Not a place of torment, but a home; not a fetid building [...] but a joyful space [...], with beautiful canvases that were gifts and teachings for the eyes; not a prison [...] but a community identified by the unity of work; not a lost island in the town, but a centre of culture that [...] fully fulfilled its social function (p. 12).

Consequently, in line with these principles, Marcelino Domingo advocated for the use of mother tongues in education. For the minister,

[6] "Decree stating that religious instruction will not be mandatory in primary schools or any other institutions under this Ministry" (Gaceta de Madrid, n. 129, 09/05/1931, pp. 619-620).

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respecting the vernacular language meant "respecting the soul of the child. Because in Catalonia, there is a language under these conditions, and not because I am Catalan, but because I am a teacher, I have issued my decree on their use in school"[7]. To achieve this, teachers needed to be proficient in Catalan, and its study was included in the *Escuelas Normales*[8].

In addition to incorporating religious and ideological neutrality, coeducation, and universality into the classroom, the model of a single or unified school aimed to establish an education system that encompassed all levels of education. Once again, it faced opposition from the right, who strongly criticized Domingo's focus on the early stages of education while neglecting higher education[9].

Naturally, educational reform entailed the universality of education. For Domingo, education was a crucial aspect of the democratic system that demanded a comprehensive approach through state intervention. This axiom, prominently manifested through the universalization of education, not only led to an increase in the number of schools but also involved the implementation of various measures concerning teacher training, in line with the principle of revaluing the role of the teacher. Decrees were approved against professional intrusion[10], training courses were established for the selection of teaching staff[11], and the *Escuelas Normales* were reformed. From September 1931, these teacher training centres began operating as mixed-gender institutions, emulating coeducation in primary education. The number of teachers was also increased to fill the positions created by the planned construction of new schools, especially in rural areas, and a salary raise for these professionals was

[7] "The Ministers of War, State, Justice and Education, the Director of Prisons, and the General Captain of Madrid give extensive speeches" (*La Voz*, 15/06/1931, p. 4). The decree referred to in these speeches was the "Decree repealing all provisions against the use of Catalan in primary schools; stating that nursery schools and kindergartens should exclusively teach in the mother tongue, either Spanish or Catalan, and likewise in primary schools, where Catalan students should be taught the knowledge and practice of the Spanish language from the age of eight" (Gaceta de Madrid, n. 120, 30/04/1931, pp. 413-414).

[8] "Decree stating that in each of the Normal Schools for Teachers in Catalonia, a Chair should be established for the knowledge and study of the Catalan language" (Gaceta de Madrid, n. 161, 10/06/1931, p. 1285).

[9] Session records of the *Congreso de los Diputados*, Legislature 1931-1933, Constituent Cortes, 12/08/1931, n. 16.

[10] "Decree declaring that no one can exercise the profession of a teacher in a primary school, regardless of the level, without possessing the title of Teacher" (Gaceta de Madrid, n. 143, 23/05/1931, p. 882).

[11] "Decree stating that admission to the national primary teaching profession will be carried out through a professional selection course, organized as mentioned" (Gaceta de Madrid, n. 185, 04/07/1931, pp. 109-112).

approved[12]. All these initiatives aimed to bring greater dignity to the teaching profession, with the intention of attracting talent to the field (Domingo, 1932).

The construction of new schools was always a central aspect of Minister Domingo's educational project. In late June 1931, the government approved a massive plan for building education centres through a decree, which also entailed the creation of 7,000 teaching positions. Domingo's program focused in particular on establishing these centres in rural areas[13], where illiteracy rates were highest. Furthermore, these rural regions especially needed the impetus of modernity that Domingo sought to achieve during his tenure in the Ministry of Public Instruction, driven by the conviction that building new schools and improving existing ones was key to fulfilling the principles of a vitalistic, active, and community-building school (Domingo, 1932). As stated in the decree of 24th June, the goal of achieving universal education required the establishment of 27,151 new schools, almost doubling the number of existing centres. It was not only about creating new centres but also equipping them with the necessary educational resources. Hence, each centre was intended to have its own library[14]. Moreover, the provision of a canteen was encouraged to ensure that students were well nourished, which was essential for them to be able to focus on their studies rather than having to seek sustenance elsewhere[15].

The universalization of education was complemented by the *misiones pedagógicas* (pedagogical missions) project, an innovative program aimed at bringing culture to all regions of Spain and all social classes. These missions were carried out by the *Patronato de Misiones Pedagógicas*, an institution under the Ministry of Public Instruction and Fine Arts, chaired by Manuel Bartolomé Cossío. Cossío traced the origins of these missions back to Giner de los Ríos' idea of sending the best professionals to the poorest territories. Marcelino Domingo expressed his support for

[12] "Decree stating that, effective from 1st July of the current year, national teachers with annual salaries of 2,500 and 2,000 *pesetas* will be increased to 3,000 *pesetas*" (Gaceta de Madrid, n. 220, 08/08/1931, pp. 1064-1065).

[13] "Decrees approving the projects drafted by the Technical Office for School Construction to build buildings for schools in the stated locations" (Gaceta de Madrid, n. 189, 08/07/1931, pp. 212-214).

[14] "Decree stating that every primary school should have a library, and declaring that where multiple schools exist, they can associate to establish one or more libraries" (Gaceta de Madrid, n. 220, 08/08/1931, p. 1064).

[15] "Decree stating that local committees for primary education should establish school canteens in as many schools as possible, ensuring that a large number of students benefit from them" (Gaceta de Madrid, n. 241, 29/08/1931, pp. 1496-1497).

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this initiative in the preamble of the decree issued on 30th May, emphasizing the need to implement new methods to educate the "people, by reaching out to them and to primary school teachers, not only through printed texts, but also through the spoken word and the spirit that moves it, and inspires a communion of ideas and noble aspirations"[16]. Based on these principles, the pedagogical missions became a celebrated instrument of popular education. They also involved young artists who were committed to the cultural and educational vision of the Republic.

Conclusions

The evidence presented throughout this study supports the hypothesis that Marcelino Domingo served as the link between the Republican movement and the New School. Domingo played a crucial role in transforming the principles of this pedagogical movement, initially confined to private initiatives such as the ILE and small schools in Catalonia and Madrid, into the very basis of the public and official education system during the Second Republic.

Marcelino Domingo's work in the Ministry of Public Instruction aimed to transform the Spanish education system, which was considered a fundamental pillar of the Republic. Within this context, the principles of a vitalistic school became a reality through initiatives such as universalization, which brought children from different social classes together and promoted cohesion. This was reinforced by the introduction of coeducation from an early age, fostering mutual learning between genders. The paedocentric or child-centred vision of education was also implemented in schools, ensuring the use of vernacular languages at all educational levels and promoting nondoctrinaire thinking within a neutral education framework, thus creating a respectful environment for children's development and fulfilling the principles of an active school. The atmosphere of freedom in the classroom, which relied heavily on the role of the teacher, was also fostered through the professional and economic consolidation of educators. Increasing salaries, promoting specialized

[16] "Decree creating a 'Board of Pedagogical Missions' under this Ministry, tasked with spreading general culture, modern educational orientation, and civic education in villages and towns, with special attention to the spiritual interests of rural populations" (Gaceta de Madrid, n. 150, 30/05/1931, pp. 1033-1034).

training, and recognizing their importance in Spanish society all aimed to prevent the precarity experienced in the past from interfering with their educational work and, by extension, the implementation of ambitious reforms advocated by Domingo. Teacher training, primarily conducted in the *Escuelas Normales*, became a fertile ground for the principles of an active school. It also inspired the pedagogical missions, whose activities made culture accessible and enjoyable to segments of the population traditionally excluded from formal education.

In short, from the beginning of his political career, Domingo embraced the idea that education was the most effective instrument for achieving the necessary social cohesion to build a community of all citizens and involve everyone in the project of Spain. However, achieving this goal required schools to not only educate students in scientific subjects but also act as platforms for the dissemination of Republican values. The reforms undertaken by Domingo aimed to institutionalize the principles of the New School, with the significant contribution of pedagogues trained in this paradigm. Although a significant part of his work was not fully accomplished, Domingo left the ministry with a positive assessment of his reformist efforts, stating, "Leaving the Ministry meant letting go of a fruitful, feasible, and effective job in which one could see reality transformed every day" (Domingo, 1934, p. 176).

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Influence of group dynamics on blended higher-education training

El impacto de las dinámicas de grupo y el aprendizaje mixto en la formación de educación superior

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Abstract

This article explores the benefits of combining blended learning and group dynamics approaches in higher education. While blended learning is known to offer greater efficiency in teaching hours than traditional face-to-face education, it can also result in a lack of communication and relatedness among peers, negatively impacting student well-being and performance. To address this, the study conducted an experiment with Master's students from the European Institute of Innovation and Technology within the EIT Digital knowledge and innovation community. One group was instructed with traditional teaching methodology, while the other group was instructed with group dynamics infused blended learning. The study found that the blended learning students internalized the external motivator of group dynamics. The use of group dynamics infused

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blended learning approach not only sustained the well-being and performance of blended students, but also improved the assimilation of technical and soft skills compared to traditional approaches. Thus, the group dynamics serves as a catalyst for effective teaching in blended learning environments and enhances the students' academic performance of group activities. Overall, the findings of this study suggest that blended learning education can be improved through the use of group dynamics. The article concludes that this work could contribute to the implementation of blended learning education in the post-coronavirus era, as it offers an effective approach for sustaining student well-being and performance while achieving teaching efficiency.

Keywords: blended learning, higher education, group dynamics, efficiency, quantitative analysis, intrinsic motivation.

Resumen

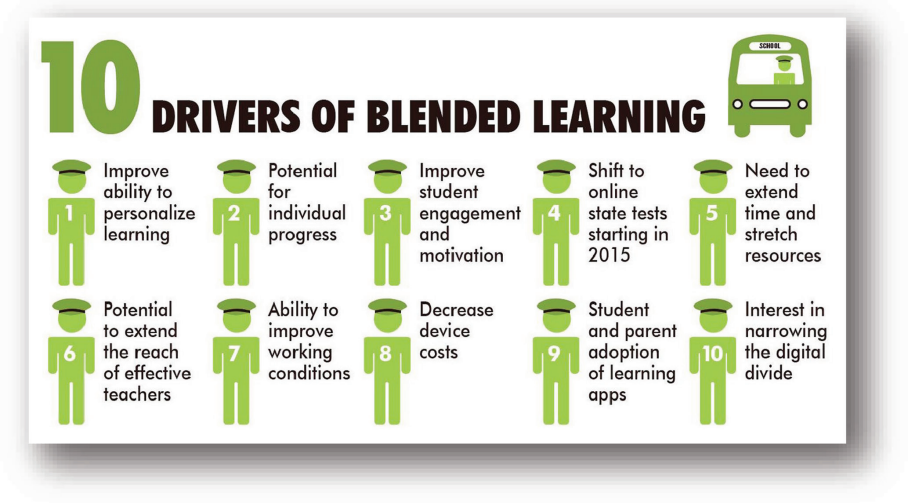
El uso de estudios combinados con el propósito de obtener mejoras significativas en la formación se estudia a gran escala, aunque no tanto su combinación con los enfoques basados en la dinámica de grupo en el sector educativo superior. Este artículo analiza el uso combinado de la formación bimodal y la dinámica de grupo para mejorar la performance en las horas en presencia, algo presumiblemente ayudaría a una mejora en la eficiencia de la formación. Los resultados obtenidos con los estudiantes de Maestría del European Institute of Innovation and Technology dentro del área Digital de EIT, muestran la mejora en su formación, no solo con la mantención de resultados académicos y bienestar, sino también debido a la notable elevación experimentada en la adquisición de habilidades técnicas y sensibles, en comparación con aquellas obtenidas a través de método.

Palabras clave: aprendizaje mixto, educativo superior, dinámica de grupo, eficiencia, análisis cuantitativo, motivación intrínseca.

Introduction

Blended learning is the combination of face-to-face (in the classroom) and online learning (on digital media, such as e-learning platforms) (Buhl-Wiggers et al., 2023; Graham, 2018; Hrastinski, 2019). The concept of blended learning is clearly related to wise combination of on-line and face-to-face concepts in a seamless learning process but also to other relevant concepts in the learning domain as "skills enhancement", "learner centred", "creativity" and "cooperative classroom" to mention some of

FIGURE I. Drivers of blended learning



Source: Bailey et al., 2013.

them, which condition the implementation process and its performance (Banditvilai, 2016; Pisoni, 2019).

There are various educational reasons to support "blended learning" in the educational context. Figure I (Bailey et al., 2013) schematically depicts ten drivers for that phenomenon. Not all of them have the same relevance in a given context, but all of them have challenged well-consolidated learning processes. At the university level, drivers 1, 2, 3, 5, 6, 7, and 8 seem especially relevant, and they should be considered during the implementation process.

Related to the previous aspects shown in Figure I, the improvement of the quality of learning by using blended learning approaches, and more specifically having the ability to measure this quality improvement, is presented as one of the key aspects to take into account today, since there are many and varied implementations made with a promise based on these quality assumptions, but this assessment relies on subjective views of involved actors (Dey & Bandyopadhyay, 2019; Ginns & Ellis, 2007; Han & Ellis, 2019). That is why this document is focused on measuring the improvement of the quality of blended learning approaches by using a systematic process.

Given that the current trend and post-coronavirus era in education are expected to push towards Blended Learning approaches (Glantz & Gamrat, 2020; Sharma & Shree, 2023), with their corresponding benefits in favour of higher quality education, in this paper is described a work carried out for measuring, at quantitative level, the improvements of the potential quality contributed using Blended Learning approaches. In particular, this paper presents a set of indicators that enable the measurement of the impact of Blended Learning activities within regulated training at university level. Furthermore, as will be described below, these indicators are useful to detect improvement points for new implementations.

The work presented in this document was carried out with the purpose of maximizing the percentage of online hours within the Master programs (Dion et al., 2018; León et al., 2018) currently taught at EIT Digital without losing the benefits o face-to-face interaction and networking. This objective addresses a well-defined strategy by EIT Digital (Pisoni et al., 2018, 2019) for the transformation of training towards Blended Learning approaches. In this way, not only are the benefits of these types of approaches obtained, but it is also possible to take advantage of all the benefits offered by a distributed organization such as the EIT Digital, which has both human and material resources of very high-quality spread across different countries of the European Union.

However, maximizing the teaching efficiency has a trade-off which leaves the responsibility of learning to the student's own will to some extent. Face-to-face learning has a clear advantage on student motivation, real time engagement, and performance assessment compared to online or blended learning. Lack of communication between the students and teacher could thwart the building of emotional bound which is necessary for engagement and well-being (Hu & Li, 2017; Zhu et al., 2023). In this paper, we describe how the administration of group dynamics could develop a relatedness among the student's and mitigate the risk of performance and motivation decrease.

Students' motivation

The motivation of the students is a fundamental aspect to take into account to obtain the maximum results in education. Students with good

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motivation tend to achieve superior results and higher levels of interest to achieve their learning objectives, and fulfil their goals (Mo, 2019).

With respect to the concept of student motivation, Self-determination theory (SDT), (R. M. Ryan & Deci, 2000) explains the sources of motivation mediated by the autonomy-control continuum and categorized these sources into two main branches. Respectively, intrinsic, and extrinsic. Intrinsic motivations are the basic psychological needs of humans which are "competence," "autonomy" and "relatedness" when satisfied, they lead towards greater personal growth, well-being, and engagement (Reeve, 2017; R. M. Ryan & Deci, 2000, 2018). In contrast, extrinsic motivations refer to the "performance of an activity in order to attain some separable outcome." The extrinsic motivations are varied into four level according to the autonomy-control continuum. From autonomous to controlled, they are: "integrated regulation," "identified regulation," "introjected regulation," and "external regulation". Among these four, "integrated regulation" and "identified regulation" are internalized sources of external motivations and serve as a tool to reach intrinsic needs.

In the area of education, controlled motivation fosters the external regulations and diminishes the intrinsic motive of learning which can cause issues like anxiety, disengagement or drop-out from the course (R. M. Ryan & Deci, 2018). Hence, the need for "competence," "autonomy", and "relatedness" should be satisfied, and extrinsic regulations should be internalized for positive academic outcomes (Hornstra et al., 2018).

Students attend to educational courses either because the student finds the course interesting and enjoyable (intrinsic), or the course can contribute to a greater personal goal (extrinsic-integrated), or the student should do (extrinsic-introjected) or have to do (extrinsic-external) (R. Ryan & Moller, 2017). Whatever the reason is, facilitating the satisfaction of "competence," "autonomy" and "relatedness" is essential for educational engagement. Especially for the internalization process of extrinsically motivated students (Niemiec & Ryan, 2009).

Group Dynamics to improve the motivation and performance of blended learning students

Collaborative learning is one of the ways of fostering the satisfaction of psychological needs, student engagement, student empowerment

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and active learning (Monteiro & Morrison, 2015). Collaborative classwork activities of small groups (typically 3 to 4) can lead to a situational interest, which becomes a common mission or activity among the group members, constructing a social bond between them (Hakami et al., 2022; Hmelo-Silver et al., 2013; R. M. Ryan & Deci, 2018). If this bond is trustworthy and not abused by others, it satisfies the need for relatedness. Moreover, the students become more autonomous as the controlling factor of the teacher decreases –in case, the students can express themselves freely within the group- and they feel more competent when they share their contributions or knowledge to the rest of the group or to all the classmates.

Intrinsic motivation is essential for an effective learning outcome. However, the efficient productivity should be sustained. Collaborative group activity has both incremental (process gain) and decremental (process loss) consequences on the performance (Forsyth, 2018). In his research, Steiner has defined two mediators for process loss: "suboptimal coordination" and "reduced motivation" (Steiner, 1972). The Coordination loss is defined as the inability of individuals to put optimal potential due to social interaction processes (e.g. "production blocking" or "non-simultaneous individual activity") and the Motivation loss refers to the decreased willingness of the individual to contribute with the optimal potential in the group settings (e.g. "free-riding", "social loafing") (Brodbeck & Greitemeyer, 2000). On the other hand, a group environment can yield increased energy, creativity, new insights, and solutions that can contribute to the process gains (Forsyth, 2018) (e.g., Brainstorming). Therefore, the mathematical equation of this relationship is expressed as follows: actual productivity = potential productivity – process loss + process gain (Forsyth, 2018).

Face-to-face education has a greater advantage in order to eliminate process losses compared to pure on-line education. The group members are in the same physical location during some activities, and they have increased interaction within the group, which contributes to the construction of the group dynamics. However, the online learning environment limits the interaction and mutual understanding due to a lack of sensual information. Hence, positive social relations within the group members are harder to build (Rothwell, 2012). Likewise, significantly lower perceived relatedness among peers has been reported in the blended learning environment compared to traditional face-to-face education (Raes et

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al., 2020). Therefore, blended learning can be a solution to this dilemma by its hybrid learning sessions. The teacher can advocate for extended "group dynamics activities."

Group dynamics have as main objective the connection of the components of a group of people. At the level of behaviour, with this type of activities, we seek to explain the internal changes that occur as a result of the forces and conditions that influence the groups of students as a whole, as well as the reactions produced by their different members. This type of activity is often highly motivating for group members, giving them the opportunity to work together to solve specific objectives and to increase their creativity. The dynamics are highly recommended group in educational contexts, in general and in university students in particular, for the development of their competences (Arashpour et al., 2020; Ishimura & Fitzgibbons, 2023; Washington et al., 2013). These dynamics promote self-knowledge, through the observation of one's own behaviour, but also the behaviour of the other members of the group, within a set of previously defined parameters and norms of behaviour (Forsyth, 2018; Ishimura & Fitzgibbons, 2023).

In the present work, group dynamics were used only in the blended learning students (experiment group). One of the objectives pursued was to maximize the performance of face-to-face hours, first for the opportunity to work more skills meanwhile maximizing the intrinsic motivation of students, but also for the possibility offered by this type of tools to carry out classroom activities in combination with online content (blended approach). In particular, these are the activities carried out during the group dynamics: 1) Introduction to Technology Watch by the teacher, 2). Groups creation and preparation (Identification of experts and read content; Experts meeting to exchange read content; and groups meeting to share knowledge), 3) Groups facing the resolution of different tests (a quiz of Technology Watch and problem solving of a short-written case).

Purpose of the study

The underlying idea of this work is to reduce face-to-face hours as much as possible but maximizing the performance of those remaining

face-to-face hours, with which, as a hypothesis, the quality of learning is expected to improve.

For this purpose, dynamic group activities are used in combination with online contents, as it is described above. From the measurement of perceptions questionnaires, student performance, and teaching hours, we seek to assess whether group dynamics maintain intrinsic motivation, relatedness, competence, autonomy, value, performance, and increase the overall teaching efficiency of blended group compared to face-to-face. Our specified hypotheses to address this are as follows:

- H1: Intrinsic Motivation (Perceived Competence, Perceived Relatedness, Perceived Autonomy) of the experiment group (blended with group dynamics) will result greater than the threshold (4 out of 7) and there will not be significant difference compared to face-to-face group (control group).
- H2: Extrinsic motivator of Group Dynamics will be internalized (Perceived Importance, Perceived Value) by experiment group.
- H3: There will be no significant difference on the performance of the experiment group (blended with group dynamics) and face-to-face group (control group).
- H4: Blended teaching will result in greater teaching efficiency compared to face-to-face when group dynamics applied.

This document is organised as follows: after this introductory section, the materials and methods used to measure the quality of application of blended learning approaches are presented. After that, the results of the application to the case study are presented to demonstrate the effectiveness and validity of the methods. Finally, conclusions are outlined.

Method

Context and participants

Within the EIT Digital knowledge and innovation community of the EIT Digital Academy and specifically in the implementation of the Master, Doctoral and Professional schools, there is a strong commitment to support innovative learning approaches by combining face-to-face and

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on-line techniques in the so-called "blending learning approach." The hope is to bring together the best of both worlds in a cost-effective and productive approach.

Based on the general goals, and as a part of the development of the priority lines of EIT Digital, relevant on-line contents for I&E (Innovation and Entrepreneurship) subjects have been produced and used in regular education in the last five years (Pisoni et al., 2018). The objective is to get these contents regularly used by partner universities (materials are provided by individual universities to be used by all universities in the network), which committed efforts to "going-blended" by merging them with more conventional approaches.

Nevertheless, present implementation hints of blended approaches depend too much on the experience and wishes of individual teachers and/or common practices found in engaged universities to ensure smooth formal grading according to their internal rules. For that reason, a common and homogeneous EIT Digital approach for blended learning was defined (the going blended strategy of EIT Digital) (EIT Digital, 2020), looking for top leap forward digital education in Europe. In this section is showed an activity, which is implemented using online contents, group dynamics and perception tests for improving the quality of classes.

Within the "Technology Watch" seminar of 1 ECTS credit, included in the "Introduction to Innovation & Entrepreneurship Management" course, an experiment was conducted to improve the quality of the classes taught in the I&E subjects of the Master of Digital EIT using blended learning approaches. The students ranged in age from 23 to 25 and came from various European countries. They were enrolled in the "Introduction to Innovation & Entrepreneurship Management" course at the Universidad Politécnica de Madrid, Spain, as part of the EIT Digital Master's program. To conduct this experiment, the contents of the seminar on "Technology Watch" were taught using two different approaches in two different group of students. In particular:

- In the control group, 8 hours of class were taught in a traditional way (face-to-face classes), using a set of slides that were delivered to the students. The first part of the seminar was a theoretical introduction to make students aware of the necessary concepts, later moving on to a part of group work on the contents to develop

a Technology Watch (TW) report and ending with the presentation of the reports made by the groups. During these sessions, the following skills were developed:

- Teamwork
  - Technical competences of Technology Watch (TW)
  - Decision making (when developing the TW group report on a specific case study)
  - Communication (with the presentation of the group report in class)
  - Critical thinking (within the presentation of the reports of other groups)
- On the other hand, 6 hours of classes were taught at the experiment group, applying a blended learning approach by using online materials uploaded to the EIT Digital e-learning platform (Sakai). The first part of the seminar consisted of group dynamics, where students faced as a group different activities and problems presented by the teacher and supported by online contents. Next, the groups of students worked autonomously and completely online in the development of their TW reports. Finally, student groups presented their reports in class (face-to-face). During these sessions, the following skills were developed:
  - Team building (in a group dynamic, sharing knowledge learned individually from the online content for group knowledge improvement).
  - Teamwork (working in different group dynamics and in the development of the group report in a virtual way, using the e-learning platform, WhatsApp, etc.).
  - Digital skills (necessary to access online content and learn, but also to work in groups for the development of the group report).
  - Decision making (when developing the TW group report on a specific case study).
    - Complex problem solving (in a group dynamic to solve a test and a complex problem as a group, using their TW knowledge).
    - Autonomous work (within group dynamics and when students work on the development of the TW report based on the online content).
    - Technical competences of TW.

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- Communication (with the presentation of the group report in class).
- Critical thinking (in the peer evaluation of the test conducted in groups, group dynamics, but also during the presentation of reports from other groups).

At the end of the workshop, participants were asked to complete a perception survey to address hypotheses 1 and 2 regarding intrinsic motivations and perceived value. To avoid bias, the survey was done after all course activities and student assessments were completed, but before the course grades were published. In addition, the grades of the students (both individual and group grades) have been collected in order to answer hypotheses 3 and 4. The survey findings and performance of the control and experiment groups were compared using the Student's t-test for the analysis.

Data sources and instruments

- The data obtained to carry out the activity come from the following instruments:
  - Perception questionnaire. A 13-question questionnaire based on a 7-point Likert scale with questions to learn about students' perceptions on intrinsic motivation (perceived competence, relatedness, pressure, importance, and value).
  - Assessment of the control (N=19) group, in which was used the traditional approach.
  - Assessment of the experiment (N=19) group, in which was used the blended learning approach.
- Students' grades (academic performance).
  - Based on both groups, control, and experiment.
- Indicator of performance.
  - This indicator is based on other two sub-indicators: time performance and results performance.

Perception questionnaire

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The perception questionnaires in blended learning approaches have already been used previously, as well as proven their reliability and validity, as can be extracted from the literature (Akkoyunlu & Yilmaz-Soylu, 2008; Han & Ellis, 2020). In particular, in the present work was used the Intrinsic Motivation Inventory (IMI) (Center for Self-Determination Theory, 2020). It is a multidimensional measurement instrument intended to assess participants' subjective experiences related to target activity in experiments. This instrument assesses several subscales or categories, such as participants' interest/enjoyment, perceived competence, effort, etc. The IMI consists of varied numbers of questions from these categories, all of which have been shown to be factor analytically coherent and stable across a variety of tasks, conditions, and settings. In this activity, 13 items have been rated on a 7-point Likert scale, ranging from 1(not at all true) to 7 (very true), and the midpoint 4 indicating the threshold value (somewhat true). The following categories have been assessed (Deci et al., 1994; Reeve, 2017; R. M. Ryan & Deci, 2000; R. Ryan & Moller, 2017):

- Perceived Importance (3 items, e.g., "I think Technology Watch is an important activity"): Extrinsic motivations do not diminish intrinsic motivation if they are perceived by the person with a value or importance (R. M. Ryan, 1995). Perceived Importance is measured to assess internalization of Group Dynamics.
- Perceived Value/Usefulness (3 items, e.g., "I think doing this seminar could help me to make better decisions about technological projects in future"): Value/Usefulness category measures "integrated regulation" and "identified regulation". These two regulations are important to measure to what extent people internalized the activity.
- Perceived Pressure/Tension (2 items, e.g., "I felt pressured while doing this seminar"): Satisfaction of autonomy need is the experience of one own choice and direction. The behaviour is self-determined if it is volitional and wholeheartedly self-endorsed. Internal (e.g., feeling of shame or guilt, etc.) or external (e.g., rewards and punishments, etc.) control decreases the level of self-determination. "Perceived Pressure/Tension" measures the level of the control feeling; therefore, the less pressure signifies more feeling of autonomy.

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- Perceived Competence (4 items, e.g., "I think I am pretty good at Technology Watch"): Competence is intrinsically rewarding for the human being, and it is related to the experience of mastery or seeking mastery challenges. It plays as a leading role for intrinsic motivation and is crucial for human development. Perceived Competence measures the students' mastery of the related activity.
- Perceived Relatedness (1 item, e.g., "I felt really distant to the rest of members of my group" (*reverse)): Relatedness is the need to settle an emotional bond and attachment with others. It includes bilateral trust and caring for others' wellbeing. Responsiveness and social bond are essential for the satisfaction of the relatedness. In this research, the Perceived Relatedness is measured to assess if Group Dynamics managed to establish a bond among blended students.

Student's grades (academic performance)

The academic results of the students (instructor was the same to avoid biases) of both groups are based on the grades obtained from the different activities carried out in the different groups, according to the following rule:

- *Total Grade*: Technology Watch report development and presentation (75%) ("*Group Grade*") + individual final quiz (25%) *("Individual Quiz Grade")*

Indicator of performance

This indicator evaluates the effectiveness of group dynamics in combination with the use of online contents to improve the quality of the courses (blended learning approach). The indicator is calculated as follows: (Time performance) "Use of class hours" x (Results performance) "improvement of student results". Therefore, the indicator depends on the values of two sub-indicators:

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- (Time performance) "Use of class hours" for group work of the contents of the course:
  - Objective: reduction of hours of contents explanation by the teacher to maximize the time of work of the contents by the students (working in groups).
  - Resources used: group dynamics in-class and use of online contents.
  - How to obtain the quantitative value of this indicator: number of hours dedicated to content work / number of total class hours.
- (Results performance) "Improvement of student results." Of the two groups of students, only group dynamics were applied in the experiment group.
  - Objective: to improve the results of students in the course.
  - Resources used: academic results of the students.
  - How to obtain the quantitative value of this indicator: comparative of the results obtained by the students of the group where the group dynamics were applied (experiment) and the other group where they were not applied (control), to show the performance / improvement. That is, results obtained by students belonging to the group dynamics (experiment group) / results obtained by students of the control group.

Results

Perception questionnaire results

For the perception questionnaire, the perception categories of control and experiment students are compared (Students t-test) one-by-one to measure the motivational differences between face-to-face and blended students. Furthermore, t-test has been applied for the score of the experiment students to assess if they are above the threshold level. Descriptive statistics and Students t-test results are presented in Table I. Three students from the control group were not evaluated because they did not participate in the survey.

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TABLE I. Descriptive Statistics and Students' t-test of perception questionnaire

	Control (N=16)		Experiment (N=19)		Threshold (M=4) vs experiment	Control vs experiment
Perception	min-max	M±SD	min-max	M±SD	p-value (t-test)	p-value (t-test)
Competence[a]	3.5-6.75	5.03±0.80	3.25-6	4.97±0.79	*<0.01	0.41
Relatedness[a]	4-7	6.18±0.98	2-7	5.63±1.46	*<0.01	0.11
Pressure/ Tension[a]	2-6	3.56±1.41	1-6	3.42±1.42	*0.04	0.38
Importance[a]	3.5-6	4.87±0.84	3.5-7	5.60±0.89	*<0.01	*<0.01
Value[a]	4-7	5.89±0.84	3.6-6.6	5.59±0.94	*<0.01	0.16

[a] *Threshold for the variables is M= 4. All representing the confirmation level of the relevant variable within the range of [0-7]. Belove the threshold implies disagreement and above implies the agreement degree. *p<0.05*
Source: Compiled by author.

▪ Testing for H1

Perceived Competence, Perceived Relatedness, and Perceived Pressure have been measured for the inspection of the intrinsic motivation. First remarkable result is that students in the experiment group have significantly higher perceived competence (M=4.97, p<0.01, ES=1.23 indicating large effect size), relatedness (M=5.63, p<0.01, ES=1.12 indicating large effect size), and significantly lesser perceived pressure (M=3.42, p=0.04, ES=0.41 indicating small effect size) compared to threshold. Moreover, there is no significant (p=0.41) difference between the experiment students (M=4.97) and control students (M=5.03) have been observed in the means of perceived competence. Likewise, both groups have indicated a high score on the perceived relatedness. The score of the control group (M=6.18) was higher compared to experiment (M=5.63) but was not significant (p=0.11). For the final component of the intrinsic motivation, perceived pressure has been compared. For this specific case, lower results represent greater autonomy. Thus, the scores should have been lower than threshold. Both experiment (M= 3.42) and control (M= 3.56) groups perceived lesser pressure than the threshold and there were no significant (p=0.38) differences observed within their means. All the results of the three variables of experiment group were significantly (partly for the

Perceived Pressure) above the threshold, and there was no significant difference compared to control group, thus H1 was supported.

▪ Testing for H2

Perceived Value and Importance have been measured for observing the internalization process of the activity. Experiment group (M=5.60) had a high score on the perceived value which is significantly ($p<0.01$) higher than threshold. Like the previous results, there were no significant ($p=0.16$) differences occurred among the groups (Control, M=5.89). Second remarkable result has been observed on perceived importance. experiment group (M=5.60) give significantly ($p<0.01$, ES=0.80 indicating large effect size) more importance on the activity than control ones (M=4.87), and their score is significantly higher than threshold ($p<0.01$) both of which demonstrates the internalization of group dynamics by experiment students.

Results of both variables of experiment group were above the threshold level, and there was no significant difference on the Perceived Value compared to control students, and Perceived Importance of the experiment group were significantly higher compared to control group, thus H2 was supported.

TABLE II. Grades of students

	Control (N=19)		Experiment (N=19)		Control vs experiment
	min-max	M±SD	min-max	M±SD	p-value
GG[a]	5.00-8.60	7.91±0.97	8.10-8.50	8.37±0.17	*0.01
IQG[b]	5.00-10.00	7.36±1.37	5.0.-10.00	7.89±1.64	0.14
TG[c]	5.40-8.80	7.77±0.86	7.32-8.87	8.25±0.46	*0.02

[a] *Group Grades.* [b] *Individual Quiz Grade.* [c] *Total Grade. All variables are within the range of [0-10]. *p<0.05*
Source: Compiled by author.

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Students' grades

A total of eight groups (4 group control, 4 group experiment) with four to six members were assigned for a team project. Each student had also individual quiz at the end of the activity. Descriptive Statistics and the t-test results obtained by evaluating from group assignment, individual quiz, and final grades are summarized in the Table II:

▪ Testing for H3

Remarkably, Group Grades of the experiment students (M=8.37) were significantly (p=0.01, ES=0.66 indicating large effect size) higher than the control ones (M=7.91) which reflects the effect of perceived importance on Group Dynamics in the collaborative assignment. Likewise, experiment (M=8.25) group have received higher grades on the Total Grade than control students (M=7.77) with the p=0.02 significance. Moreover, the Individual Quiz Score of the experiment (M=7.89) was even higher compared to control (M=7.36) yet was not significant (p=0.14, ES=0.70 indicating large effect size).

As a result, there were no performance degradation on the blended-approach teaching. On the opposite, experiment group performed better on the group assignment and total grade, thus H3 is also supported. Sustaining the motivation and performance (additionally, improved performance) of the experiment group enabled us to measure the final hypothesis of teaching efficiency.

Results of the indicators

▪ Testing for H4

For the fourth hypothesis, the "indicator of performance" metric described in the methodology was utilized to compare the teaching efficiency of each group. With this objective in mind, primarily, "Time performance" sub-indicator has been calculated to determine the efficiency of the instructor's class hours.

"Use of class hours" for group work of the contents of the course:

- Use of control group hours "Time performance" (traditional approach) = 4 hours of theory by instructor (face-to-face) + 4 hours of content work among groups (face-to-face) = 4 (hours of work in class) / 8 (total class hours) = 0.5
- Use of experiment group hours "Time performance" (blended approach) = 1 hour of theory by instructor (face-to-face) + 5 hours of content work among groups (face-to-face) + 2 hours content work among groups (online) = 7 (hours of work) / 8 (total class hours) = 0.88

The experimental group spent seven hours on group content work compared to the control group's four hours. This yields a "Time performance" efficiency of 88% (experiment) to 50% (control) for total face-to-face class hours. Second, the "Result Performance" sub-indicator has been measured for the purpose of comparing students' academic performance. The "Total Grade" of the students was used for calculation, and the grades can be seen below;

- "Results Performance" of the experiment group = 8.3
- "Results performance" of the control group = 7.8
- Improvement of student results = Average experiment group grades (blended learning approach) / Average control group grades (traditional approach) = 8.3 (blended learning approach) / 7.8 (traditional approach) = 1.064

The improvement in student performance indicates that the experiment group received 0.064% higher grades than the control group. After having both "Time performance" and "Results performance" sub-indicators, it is finally possible to calculate the "Indicator of Performance" for overall efficacy. The calculation for the "Performance Indicator" is provided below;

"Time Performance"= " Time performance " x "Results Performance":

- Indicator of performance of the control group (traditional approach) = 0.5 (time performance) x 0.78 (results performance) = 0.39 (39%)
- Indicator of performance of experiment group (blended learning approach) = 0.88 (time performance) x 0.81 (results performance) = 0.73 (73%)

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"Time Performance" results signifies that the teaching efficiency obtained using the blended learning approach is higher than the performance obtained with the traditional approach=73% (experiment) > 39% (control), thus this result supports the final hypotheses of H4.

Discussion

In this study, the effect of Group Dynamics on the motivation and performance of students was examined in order to observe the instructional efficiency of the blended learning environment. For this objective, four hypotheses were evaluated.

First, the effect of group dynamics on intrinsic motivation was examined to determine if group dynamics may mitigate the typical problem of the lack of communication in blended learning environment which could diminish well-being, relatedness, and emotional link among the group members (Hu & Li, 2017; Zhu et al., 2023). From the results of the IMI questionnaire, there is no significant difference on the perceived relatedness, competence, and autonomy between experiment and control students. Moreover, experiment group had significantly higher scores compared to the threshold on these three variables (partially for the autonomy). Consequently, the evaluation of the first hypothesis presented that Group Dynamics have managed to sustain the well-being and established a team bond among the experiment group which especially prevented the diminishing effect on the relatedness among the peers due to the lack of communication and feeling loneliness.

Second, we must be sure that the implemented Group Dynamics would be internalized by the experiment students as external regulations may result in disengagement and a decline in intrinsic motivation and academic performance (R. M. Ryan & Deci, 2018). In this regard, Perceived Value and Importance of the experiment students were above the threshold level. It demonstrates the experience of the internalization process. Moreover, experiment students put more importance on the activity compared to the control ones. Both Perceived Importance and Value signify the internalization of the Group Dynamics by the experiment students. This result is promising since the internalized external regulations could lead to positive academic outcomes (Hornstra et al., 2018).

Third, the effect of Group Dynamics on the academic outcomes has been observed. Internalization of the Group Dynamics reflects itself on the grades of the group activities and experiment students performed significantly higher compared to control ones. Remarkably, experiment students also had greater results in Individual Quiz and Total Grades (partly significant). As a result, Group Dynamics not only prevented the performance degradation in individual quiz, but also improved the performance of group activities and total grades. This finding This finding reinforced the notion that group dynamics not only push self-academic outcomes, but also the behaviour of other members of the group (Forsyth, 2018; Ishimura & Fitzgibbons, 2023).

Group Dynamics has been internalized by experiment students, sustained well-being, and improved performance, thus, enabled us to measure the teaching efficiency of the blended education. From the results obtained from the indicator of performance, as can be seen, the performance obtained using the blended learning approach is higher than the performance obtained with the traditional approach = 73% (experiment) > 39% (control). This result demonstrates that with the blended learning approach it is possible to improve the performance within the course, which, consequently, results in greater teaching efficiency.

Conclusion

Blended and online learning clearly have a greater efficiency in the aspect of teaching hours compared to the face-to-face education. More students could have access to the course contents and train themselves within a flexible working hour. However, this autonomy leaves the responsibility on the student's hand which could result in lack of communication among peers, diminish the relatedness, well-being, and eventually performance degradation. In this aspect, teaching efficiency is meaningless without teaching effectiveness. In this paper, we have demonstrated that Group Dynamics could sustain well-being and performance of the blended students.

At a more specific level, in the 6 hours of work conducted in face-to-face classes with blended-approach (experiment) students, 9 types of skills have been developed, both soft and hard; while with the students of traditional-approach (control), 8 hours have been worked and 5 types

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of competencies have been developed. Therefore, even having less face-to-face classes with the blended learning approach, the number of the skills of the students was improved, what result in an important improvement of the classes.

The perception survey results indicated that the experiment group's well-being has been sustained and that the group activity has been internalized. Consequently, group activity could serve as a catalyst for effective teaching in blended learning environment.

The performance of the experiment group is greater than that of the control. The average grade of the experiment group is higher than that of the control group by 0.5 points (8.3 vs 7.8), which has even more impact in the group grades by 0.5 points (8.4 vs 7.9). In the same way, the performance obtained using the new approach with group dynamics and online contents is higher than the performance obtained with the traditional approach (73% > 39%, almost double). This reflects the relevance to use Group Dynamics in blended learning approaches.

This article has demonstrated the possibility of quantitatively measuring the improvement in efficiency and quality offered by blended learning approaches through Group Dynamics. With this fact, well-being, and performance of the blended students have been sustained, and the teaching efficiency of the blended learning has been presented. We believe this work would contribute for the required actions taken for the expected blended learning education in the post-coronavirus era.

Limitation and Future Work

One of the main limitations of this study is the small sample size used for each group, which consisted solely of European students aged 23-25. This may limit the extrapolation of the findings to other populations. Additionally, no pre-test was conducted to assess the participants' baseline perceptions, which could have influenced the results.

Another limitation of the study is the number of items in some categories of the perception questionnaire, which was less than three. This limited the dimension and factor analysis, which could have led to an incomplete understanding of the relationships between variables.

To address these limitations, future studies should aim to increase the sample size and include a more diverse range of participants, including

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international students. Additionally, a pre-test should be conducted to establish baseline perceptions and ensure that the study is measuring changes in perception over time. Finally, including more items in the categories of the questionnaire could help to provide a more comprehensive understanding of the relationships between variables.

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Impact of an intervention based on dialogical gatherings and interactive groups for the development of prosocial behavior in a learning community

Impacto de una intervención basada en tertulias dialógicas y grupos interactivos para el desarrollo de la conducta prosocial en una comunidad de aprendizaje

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Abstract

One of the aims of *Learning Communities* is the continuous search for the development of a better coexistence and solidarity attitudes by means of *Successful Educational Actions*. However, to date little is known about the impact of the interventions carried out in these types of schools for this purpose. That is why the objective of this study has been to find out if the main *Successful Educational Actions*, such as interactive groups and dialogic gatherings, contribute to improving the prosocial behavior of Primary and Secondary Education students. A longitudinal study was carried out in a *Learning Community*, in which 186 Primary and Secondary Education students participated, who filled out the *Spanish Scale to Evaluate Prosocial Behavior* with an intermediate intervention

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of 9 months. The results revealed that after the intervention, both Primary Education students and Secondary Education students did not show significant statistical differences in any of the dimensions of the Prosocial Behavior instrument, except in the dimension of Helping, in which students reduced their values along the time. These findings are relevant for education professionals with the purpose of reflecting on the type of methodologies and dynamics that are being carried out to improve coexistence and prosocial attitudes in their lessons, as well as in their schools.

Keywords: prosocial behavior, successful educational actions, learning community, primary education, secondary education.

Resumen

Uno de los objetivos de las *Comunidades de Aprendizaje* es la búsqueda continua del desarrollo de una mejor convivencia y actitudes solidarias a través de *Actuaciones Educativas de Éxito*. Sin embargo, hasta la fecha se conoce poco sobre el impacto de las intervenciones realizadas en este tipo de centros educativos con este fin. Por ello, el objetivo de este estudio ha sido averiguar si las principales *Actuaciones Educativas de Éxito*, como los grupos interactivos y las tertulias dialógicas, contribuyen a mejorar el comportamiento prosocial de los alumnos de Educación Primaria y Secundaria. Se realizó un estudio longitudinal en una *Comunidad de Aprendizaje*, en el que participaron 186 alumnos de Educación Primaria y Secundaria, que cumplimentaron la *Escala Española de Evaluación de la Conducta Prosocial* con una intervención intermedia de 9 meses. Los resultados revelaron que, tras la intervención, tanto los alumnos de Educación Primaria como los de Educación Secundaria no mostraron diferencias estadísticas significativas en ninguna de las dimensiones del instrumento de Conducta Prosocial, excepto en la dimensión de Ayudar, en la que los alumnos redujeron sus valores a lo largo del tiempo. Estos resultados son relevantes para los profesionales de la educación con el fin de reflexionar sobre el tipo de metodologías y dinámicas que se están llevando a cabo para mejorar la convivencia y las actitudes prosociales en sus clases, así como en sus centros educativos.

Palabras clave: conducta prosocial, actuaciones educativas de éxito, comunidades de aprendizaje, Educación Primaria, Educación Secundaria.

Introduction

Prosocial behavior in Compulsory Education Students

Prosocial behaviors refer to the actions that individuals voluntarily carry out to improve the well-being of others (Gross et al., 2017), hence,

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contributing to developing healthy interpersonal relationships (Fehr & Fischbacker, 2003).

Currently, there are different theoretical models of understanding prosocial behavior, but one of the most commonly used models is the multidimensional model that comprises three large dimensions: Helping, Sharing and Comforting. This model has been supported by a large literature (e.g., Dunfield, 2014; Dunfield et al., 2011; Dunfield & Kuhlmeier, 2013; Padilla-Walker & Carlo, 2014; Paulus, 2014, 2018) and it is based on a variety of negative states children and adolescents should identify and overcome in order to foster their prosociality. A summary of the main dimensions is discussed on the following lines, as well as in Table I.

- Helping: It is understood as other's instrumental need that can be overcome by correcting unintended outcomes. As early as two years old, children "have developed some social cognitive skills required to support the recognition of instrumental need and produce helping behaviors" (Dunfield, 2014, p. 4).
- Sharing: it is understood as one's unmet material desire. This desire can effectively be overcome by recognizing an unequal distribution of resources as well as by overcoming an egocentric desire to monopolize resources (Dunfield, 2014). Despite the fact that children could identify unequal distribution of resources as early as two years of life, the tendency to spontaneously act fairer increases with age (Blake and McAuliffe, 2011).
- Comforting: it is understood as one's emotional distress that can be effectively overcome by alleviating others' negative emotional states. Dunfield (2014) highlights that although infants can identify emotional expressions within the first years of life, the skill to represent and respond adequately to other's emotions takes much longer to develop.

The differences in these behaviors arise very early in the first years of life and have important consequences in the child's social development, during childhood, adolescence and adult life (Eisenberg et al., 2006). Indeed, during childhood and early adolescence, prosocial behavior correlates with a series of benefits that should be commented on. First, with regard to personal variables, some studies highlight that prosocial behavior can be considered a protective factor against behavior problems (Carlo et al., 2014), helping to reduce aggressive behavior (Arbel et al., 2022), severe delinquency (Padilla-Walker et al., 2015), victimization from

TABLE I. Main dimensions of the prosocial behavior construct

	HELPING	SHARING	COMFORTING
Represent the problem	Instrumental need: Recognize goal directed behavior	Unmet material desire: Recognize unequal access to resources	Emotional distress: Recognize negative emotional states
Solution	Correct unintended outcomes	Distribute resources equally	Alleviate negative emotional states
Motivation	Motivation to see negative state alleviated	Motivation to see negative state alleviated	Motivation to see negative state alleviated

Source: Compiled by authors based on Dunfield (2014).

bullying (Wang et al., 2015) and developing high values of self-esteem (Van der Graaff et al., 2018). Second, prosocial behavior is positively associated with social competence, in a way that it contributes to developing children's and adolescents' social skills including peer attachment and acceptance (Dirks et al., 2018). As a consequence, prosocial behavior could be key when flourishing positive interpersonal relationships (Van der Graaff et al., 2018). Finally, other studies have stated the relevance of prosocial behavior for improving academic achievement, in transversal studies (Van der Graaff et al., 2018), as well as in longitudinal studies (Caprara et al., 2000).

Based on these potential benefits the relevance of carrying out interventions based on fostering students' prosocial behavior is crucial. What is more, to date, despite the fact that researchers have striven to foster intervention programs with the aim of developing adolescents' prosocial behavior (e.g., Caprara et al., 2014; 2015; Mesurado et al., 2019), even today there is still a significant lack of prosociality between cultures. This is the case of the high percentage of Korean adolescents who have suffered cyberbullying (The Ministry of Education of Korea, 2018), or the case of the few percentage of Canadian adolescents that claim that they would help a bullying victim (Trach et al., 2010), to name but a few.

Interventions focused on increasing students' prosocial behavior should have a series of features that have been previously discussed in the literature. On this matter, it is noteworthy the study carried out by Shin & Lee (2021) who reveal in a meta-analysis which should be the main factors that affect the effectiveness of prosocial behavior interventions. In this sense, the wide variety of interventions are focused on adding

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positive attitudes as a way of promoting prosociality (e.g., Caprara et al., 2014), whereas others use interventions with the aim of removing one's negative behavior by managing one's anger, resolving disputes and dealing with impulse control (e.g., McMahon & Washburn, 2003; Muratori et al., 2015; Yeager et al., 2013). As some studies point out, interventions focused on increasing social competence tend to be more effective than those focused on preventing problem behavior as they obtain smaller effects compared to those structured to improve positive behaviors (Menting et al., 2013). The durability of the interventions as well as the length of the sessions when fostering prosocial behavior is another topic that has been previously discussed (Granski et al., 2020; Kriemler et al., 2011; Shin & Lee, 2021), pointing out how short duration interventions seem to be more ineffective than large duration interventions for developing social skills (Limbos et al., 2007; Hynynen et al., 2016). With regard to the measuring tools, self-reports, behavioral ratings and observations tend to be the most common instruments, surely by their ease of use (Shin & Lee, 2021). Nevertheless, these authors discuss that future studies could attempt to mix different measuring methods in order to assess whether prosocial behavior values differ by the tool used. Subsequently, another feature to take into account is the usage of standardized scales. In fact, the effectiveness of an intervention could be better measured when using more valid and reliable scales (e.g., Caprara et al., 2005), instead of using ad-hoc instruments with poor validity and reliability (e.g., Bosworth et al., 1998). Indeed, Shin & Lee (2021) observed how studies that used non-standardized instruments for measuring prosociality obtained larger effects than those studies using standardized instruments. In addition, the participant's age is another feature that has been discussed. Shin & Lee (2021) state that, here, inconclusive results are highlighted as some studies point out that prosociality is better developed as early as possible (e.g., Ramey & Ramey, 1998; Webster-Stratton et al., 2004), while others claim that prosociality is gradually improved in the development from childhood to early adulthood (e.g., Crocetti et al., 2016; Luengo-Kanacri et al., 2013). What it is more, some authors consider the early and middle adolescence as a proper period for the development of prosociality (Eisenberg et al., 2016;), as first real intimate circles with friends supporting each others appear (Goldstein et al., 2015) and a series of skills are rapidly developed, as perspective taking (Van der Graaff et al., 2014), moral reasoning (Malti et al., 2014) and the cognitive and affective skills to think and act prosocially (Carlo et al., 2011). Finally, the last feature

of interventions focused on developing prosociality is the nature of the participants, underlining regular children and adolescents, and children and adolescents with behavioral disorders. As observed in the literature, participants with behavioral disorders tend to participate more often in a therapy or treatment carried out by psychologists or therapeutic specialists than in an intervention program carried out, generally by teachers (Kellner et al., 2008; Nitkowski et al., 2009). Consequently, Shin & Lee (2021) state that intervention programs for regular adolescents could be less therapeutic than treatment programs, in which approximately 85% of adolescents with behavioral disorders successfully respond to the training's aim (Reinke et al., 2014).

Contribution of *Successful Educational Actions* for developing Prosocial Behaviors

The *Learning Communities* model refers to the project made up of a series of *Successful Educational Actions* with the aim of socially and educationally transforming schools (Díez-Palomar & Flecha, 2010). These *Successful Educational Actions* arise as a result of the European research project INCLUD-ED, whose ultimate objective was to detect which specific actions helped promote educational success and social inclusion, thus reducing educational inequalities, throughout the different stages mandatory (Valls-Carol et al., 2014). Among the main *Successful Educational Actions* within these centers we find dialogical gatherings, interactive groups, homework clubs outside school hours, learning mentors, or tutored libraries, among others (Valls-Carol et al., 2014). Despite the fact that the impact of *Successful Educational Actions* in developing prosocial behaviors is a relatively novel topic, and hence, the available literature is scarce, there are some findings that should be commented below:

- **Dialogical gatherings.** They are presented as a space in which, after reading a text at home, generally a literary classic, and selecting a significant piece for each one, a series of people meet to interpret it through interactive dialogue, respecting all the contributions without taking into account the sociocultural origin of the members. This is possible thanks to the active role of the moderator of the gathering (Pulido & Zepa, 2010). In this process, the families' role stems from the fact that they help their children when reading the

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literary classic at home. The chosen literary classic will depend on the age of the student, but some of them are, Alice in Wonderland (Lewis Carroll, 1865), Around the World in 80 Days (Jules Verne, 1873), or Oliver Twist (Charles Dickens, 1838).

- In relation to quantitative works, Villardón et al. (2018) carry out an intervention of dialogic gatherings with a control group in students of the last cycle of Primary Education. The results pointed out how the students who participated in the intervention with the dialogical literary gatherings improved certain prosocial behaviors, such as solidarity and friendship, in a statistically significant way, unlike the control group, which remained stable over time.
- In relation to qualitative works, García-Carrión et al. (2020) carry out a series of egalitarian dialogues with Primary Education students, appreciating how participating in dialogic gatherings helped them to get to know the other classmates better and to build relationships of trust. By the same token, Foncillas et al. (2020), study the impact of 10 sessions of Dialogic Literary Gatherings with Primary Education students. Using the written communicative stories and the argued drawings of 48 students as an instrument of analysis, the authors conclude that the intervention favored the students' understanding and capacity for reflection.
- Likewise, García-Carrión et al. (2016), analyze the impact of dialogical literary gatherings on Primary Education students through a series of interviews. The results pointed to how the students improved their academic results and their relationships, sharing words and deep feelings. In addition, Ugalde et al. (2022), present an intervention with dialogic gatherings in order to transform the memories of those victims of violent and intimidating couples. The results obtained helped support the idea that the participants who read the play "Radical Love" and participated in the intervention increased their rejection of violent people and reduced the intensity of emotions associated with memory. It is also noteworthy the study of López de Aguileta et al. (2020), who carry out a 28-session intervention based on dialogic gatherings with students in the last years of Primary Education, in order to analyze patterns of violent behavior in relationships. The results indicated that the

dialogical gatherings enabled the emergence of the language of desire in combination with the language of ethics towards non-violent relationships. Finally, Villarejo-Carballido et al. (2019) carried out a case study in a Primary Education center in which they studied the impact of *Successful Educational Actions,* especially dialogic gatherings, to deal with cyberbullying and violence. The results obtained from a documentary analysis, communicative observations and in-depth interviews, showed how the intervention helped to face cyberbullying, making the students more confident to reject violence and to support the victim.

- **Interactive groups.** They are presented as a form of inclusive grouping in which the students are divided into heterogeneous groups of four or five students for each group. As many adults participate in the classroom as groups have been consolidated, generally, volunteers, family members, retirees, or pre-service teachers. The teacher, prior to the participation of adults, must coordinate and train volunteers to avoid possible misunderstandings and lack of coordination in the classroom. Likewise, the teacher designs as many tasks (related to the same subject or to different subjects) as groups have been consolidated, and each adult is responsible for supporting the students in carrying out the task. Once the task, which lasts approximately 15 minutes, is completed, the students rotate to another type of task (Valls-Carol et al., 2014).
  - In relation to quantitative studies, Villardón et al. (2018) carry out an intervention of interactive groups with a control group in students of the last cycle of Primary Education. The results showed how the interactive groups did not contribute in a statistically significant way to the development of prosocial values such as solidarity or friendship. This pattern also occurred in the case of students belonging to the control group.
  - In relation to qualitative studies, Amaro et al. (2020) analyze the impact of *Successful Educational Actions,* especially interactive groups, in improving coexistence and the school climate. The results obtained from a series of interviews with teachers pointed to how the proper functioning of the interactive groups helped to improve coexistence and the school climate. Likewise, León-Jiménez et al. (2020) analyze the effect

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of *Successful Educational Actions,* specifically interactive groups and dialogic gatherings, in Primary Education students, through a focus group with teachers, and interviews and documentary review of the students. The results pointed to a favorable development of friendship and empathy, reducing violent behavior and promoting inclusive attitudes among students. Finally, Valero et al. (2018) observed how interactive groups helped to foster prosocial behaviors, such as solidarity or mutual help, between immigrant and native students.

- **Tutored libraries.** It is presented as a space, not necessarily a library, in which students carry out activities guided by adults outside school hours in order to contribute to increasing their learning (Flores, 2017).
- **Learning mentors.** It is presented as a program in which the older students guide and get involved in the academic life of the younger students. Through this practice it is achieved that the younger students have positive references that motivate them to get involved with academic tasks, and that the older students get involved in the academic life of the school (Formosa & Ramis-Salas, 2012).
- **Homework club.** Families and students stay outside of school hours with a professional educator to work on different curricular content, do homework or reinforce certain subjects they need (Valls-Carol et al., 2014).

Purpose of the study

After the reviewed literature some relevant gaps were found. Amongst others, the following ideas are highlighted:

- As it has been seen in the theoretical framework, there is an increase in the interest of carrying out interventions that fosters prosocial behavior (Caprara et al., 2015; Mesurado et al., 2019) in order to reduce the negative effects of the lack of prosociality (e.g., The Ministry of Education of Korea, 2018; Trach et al., 2010).
- In general, as it is a novel topic, the quantity of studies focused on analyzing the impact of *Successful Educational Actions* on

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developing prosocial behaviors is scarce. Hence, it is required to shed more light on this topic.

- The vast majority of studies are carried out using a qualitative approach, hence, being scarce the quantity of studies applying a more quantitative approach.
- The vast majority of studies have been performed using small samples. Thus, it is required to delve into the effectiveness of *Successful Educational Actions* with more significant samples.
- The total of studies analyzed to date are mainly focused on Primary Education students, leaving aside other relevant stages of the Compulsory Education, as it could be the Secondary Education. Therefore, it is necessary to take into account this stage too when carrying out the analyses.
- The vast majority of studies that analyze prosocial behaviors when applying *Successful Educational Actions* are not based on a theoretical framework of this construct. Consequently, it is necessary to apply solid research taking into account previous literature about prosocial behavior models.

Based on these limitations and prospective lines, the aim of this study is to analyze the impact of the main *Successful Educational Actions*, as Dialogic Gatherings and Interactive Groups, on the development of Prosocial Behavior amongst Primary and Secondary Education students. On this topic and based on the previous literature, specially based on the qualitative studies, it could be thought that dialogic gatherings and interactive groups could be useful methodologies for improving students prosociality.

Method

Intervention

A quasi-experimental study with a pre-post design is presented. The sampling was done intentionally, contacting the participating center, consolidated as a *Learning Community*. This center agreed to carry out a 9-month intervention based on the use of the main *Successful*

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Educational Actions with the students. The intervention was carried out by a total of 18 teachers (Age = 48.55; SD = 10.83). Although each teacher taught different subjects (Math, Sciences, Language…), the methodologies used jointly were significantly shared, highlighting exposition dynamics (M = 3.94; SD = 1.10), cooperative learning (M = 3.88; SD = 1.27) and debates (M = 3.77; SD = 1.21) that were used in most weekly sessions, and interactive groups (M = 3.22; SD = 1.59), dialogic gatherings (M = 3.44; SD = 1.82) and workshops (M = 3.16; SD = 1.54) that were held with the students every two weeks. These last methodologies were applied at the end of the didactic units following the main procedure explained in the theoretical framework with the aim of strengthening the knowledge worked along the didactic unit, promoting the interaction between heterogeneous groups, and manipulating and experimenting in a playful way. Another series of *Successful Educational Actions* were used to a lesser extent, such as *Learning Mentors* (M = 2.00; SD = 1.49) or *Tutored Libraries* (M = 1.72; SD = 1.22). Finally, the families occasionally actively participated in the classroom dynamics of their sons and daughters (M = 2.5; SD = 1.04), attending the classroom to be part of the interactive groups, as well as to prepare the readings in their respective homes in the case of dialogical gatherings.

Sample

A total of 257 Compulsory Education students initially participated in this study, although the study was completed by 186 students (27.6% mortality). Specifically, of the total 110 were Primary Education students (Age = 8.54, SD = 1.76; 50 Girls and 60 Boys). By academic course, 18 came from the 1st course of Primary Education, 14 from the 2nd, 18 from the 3rd, 22 from the 4th, 16 from the 5th and 22 from the 6th. In addition, 76 students came from Secondary Education (Age = 13.28, SD = .974; 35 Girls and 41 Boys). By academic course, 8 came from the 1st course of Secondary Education, 40 from the 2nd, 24 from the 3rd and 4 from the 4th. By race, as the vast majority of participants was from Spain, 152 were Whites, 15 Latinos, 11 Asians, and 8 Blacks.

The center of all the participants was intentionally selected for its characteristics through which they are consolidated as a *Learning Community*.

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Instruments

In the present study, two different instruments were used. On the one hand, an ad-hoc instrument was used that allowed collecting a series of sociodemographic variables of the participants; specifically, course, age, gender, repeater status and performance in mathematics, science and languages.

On the other hand, the Spanish *Scale to Evaluate Prosocial Behavior* (Balabanian & Lemos, 2018) was used. This scale is a scale formed by 30 items that measures a total of 3 dimensions: Helping (i.e. "I help a person if they stumble or fall"), Sharing (i.e. "I lend something for a while if someone needs something that I have") and Comforting (i.e. "I congratulate others when they have a good idea or do something well").

Procedure

The procedure began by agreeing with the *Learning Community* on the conditions and objectives of the study in September 2021. Seeing the infrastructure of the center, it was agreed that the students from 1st to 4th grade of Primary Education would fill out the questionnaires in paper format, unlike the 5th grade students of Primary Education to 4th year of Secondary Education, who filled out the questionnaires in digital format. Prior to passing the questionnaires, the management team met with the teaching team to send them the data collection guidelines. Days later, the teachers gave the families the informed consent where the participation and ethics conditions of the study were collected, as well as its objective and data processing. In September 2021, the pre-study phase was carried out. Subsequently, and after a 9-month intervention, in May 2022, the post-study phase was carried out. Finally, all the data were transferred to a database and analyzed using SPSS Statistics 24 and SPSS AMOS 24.

Data Analysis

Initially some preliminary adjustments were done by assessing the model fit of pre and post phases. Specifically, the main indices (X^2/df, CFI, RMSEA and AIC), as well as by the usage of factorial loadings and

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Modification Indices were evaluated. Subsequently, a correlation analysis was performed by the usage of Pearson's r, and the internal consistency of the scale was assessed by Cronbach's alpha. Finally, a paired t-test was carried out, first with primary Education students, and then, with Secondary Education students. These last analyses were carried out highlighting the means and standard deviations of each phase, as well as the p-values and Cohen's d values of the t-tests.

Results

First of all, some preliminary adjustments were done. Indeed, the theoretical model's goodness of fit was assessed for pre and post phases. The model fit was adequate for both pre ($X^2/df = 1.93$; CFI = .878; RMSEA = .071; AIC = 536.62) and post phases ($X^2/df = 1.98$; CFI = .872; RMSEA = .073; AIC = 582.32), as well as all the factor loadings for both phases as they were all above $\lambda = .50$ (Galindo-Domínguez, 2020).

Apart from the model fit, as it was expected to use parametric tests, a descriptive normality test was carried out, taking into account the asymmetry and kurtosis values of all dimensions for both phases. Results, shown in Table II, revealed that all dimensions ranged between -2 and +2 ensuring an acceptable normal distribution of the data (George & Mallery, 2010).

TABLE II. Skewness and kurtosis values of the main dimensions

	PRE PHASE		POST PHASE	
	Skewness	**Kurtosis**	**Skewness**	**Kurtosis**
TOTAL	-.981	1.2	-.518	-.426
SHA	-1.28	1.78	-.793	-.131
HEL	-.678	-.118	-.298	-.724
COM	-1.39	1.85	-.946	.804

NOTE. SHA, Sharing; HEL, Helping; COM, Comforting.

Next a correlational analysis was performed in order to check the association between all dimensions for pre and post phases. As it can be seen in Table III, all dimensions correlated positively and significantly

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with values ranging from r = .538; p < .001 to . r = .737; p < .001 in the pre phase, and with values ranging from r = .606; p < .001 to r = .789; p < .001 in the post phase.

TABLE III. Correlations between the main dimensions of the Prosocial Behavior Scale

	PRE PHASE		
	1	**2**	**3**
SHA	(.708)	.661	.538
HEL		(.837)	.737
COM			(.862)
POST PHASE			
SHA	(.702)	.687	.606
HEL		(.799)	.789
COM			(.859)

NOTE. SHA, Sharing; HEL, Helping; COM, Comforting.

With regard to the internal consistency of the scale, Cronbach's alpha values were calculated, pointing out good values ranging from α = .702 to α = .862. These values made the scale useful for doing research.

Next, a paired t-test for all the dimensions of the Prosocial Behavior Scale for Primary Education and Secondary Education students was performed.

With respect to Primary Education students and collected in Table IV, scarce differences were observed before and after the 9-months intervention in dimensions as well as in the total scale. In fact, all differences were statistically not significant, except for the case of Helping (p < .001: d = .84) in which students of primary education worsened over the time, from pre phase (M = 4.64; SD = .902) to post phase (M = 3.95; SD = .729).

Likewise, with respect to Secondary Education students and collected in Table V, scarce differences were observed before and after the 9-months intervention in dimensions as well as in the total scale. In fact, all differences were statistically not significant, except for the case of Helping (p < .001: d = .59) in which students of secondary education worsened over the time, from pre phase (M = 3.96; SD = .839) to post phase (M = 3.50; SD = .704).

Finally, as it can be seen comparing the values from all dimensions from pre and post phases, higher values appear in favour of primary

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TABLE IV. Paired t-test for all the dimensions of the Prosocial Behavior Scale for Primary Education students

	PRE		POST		p	d
	M	SD	M	SD		
Total	4.23	.683	4.20	.607	.418	.04
SHA	4.04	.985	4.14	.782	.216	.11
HEL	4.64	.902	3.95	.729	< .001	.84
COM	4.40	.641	4.41	.561	.952	.01

NOTE. SHA, Sharing; HEL, Helping; COM, Comforting.

TABLE V. Paired t-test for all the dimensions of the Prosocial Behavior Scale for Secondary Education students

	PRE		POST		p	d
	M	SD	M	SD		
Total	**3.81**	**.554**	**3.81**	**.586**	**.977**	**.00**
SHA	4.15	.725	4.15	.706	.950	.00
HEL	3.96	.839	3.50	.704	< .001	.59
COM	3.97	.574	3.95	.578	.850	.03

NOTE. SHA, Sharing; HEL, Helping; COM, Comforting.

education students in contrast to secondary education students. Specifically primary education students scored higher values in the total scale ([M_{pre} = 4.23; SD_{pre} = .683][M_{post} = 4.20; SD_{post} = .607]), as well as in the different dimensions of Helping ([M_{pre} = 4.64; SD_{pre} = .902][M_{post} = 3.95; SD_{post} = .729]) and Comforting ([M_{pre} = 4.40; SD_{pre} = .641][M_{post} = 4.41; SD_{post} = .561]), in contrast to secondary education students for the total scale ([M_{pre} = 3.81; SD_{pre} = .554][M_{post} = 3.81; SD_{post} = .586]), as well as in the different dimensions of Helping ([M_{pre} = 4.64; SD_{pre} = .902][M_{post} = 3.95; SD_{post} = .729]) and Comforting ([M_{pre} = 4.40; SD_{pre} = .641][M_{post} = 4.41; SD_{post} = .561]). The unique dimension in which non significant differences were found was for the dimension of Sharing in which primary education students ([M_{pre} = 4.04; SD_{pre} = .985][M_{post} = 4.14; SD_{post} = .782]) scored similar to secondary education students ([M_{pre} = 4.15; SD_{pre} = .725] [M_{post} = 4.15; SD_{post} = .706]).

Discussion

The aim of this study has been to analyze whether the main *Successful Educational Actions*, as Dialogic Gatherings and Interactive Groups, contributed to developing prosocial behavior amongst Primary and Secondary Education students. Findings reveal that after a 9-month intervention applying *Successful Educational Actions*, like Dialogic Gatherings and Interactive Groups, neither Primary Education students, nor Secondary Education students significantly improved their prosocial behavior.

These results are contrary to those studies that used qualitative approaches in order to measure the effectiveness of their intervention when developing students' prosociality (Amaro et al., 2020; García-Carrión et al., 2016, 2020; Foncillas et al., 2020; León-Jiménez et al., 2020; López de Aguileta et al., 2020; Ugalde et al., 2022; Valero et al., 2018; Villarejo-Carballido et al., 2019), but are partially shared with the findings of the quantitative study of Villardón et al. (2018), who in spite of the fact that concluded that the intervention based on dialogic gatherings contributed to developing prosociality, like solidarity and friendship, more than the control group; in the case of the intervention based on interactive groups, students did not improved their solidarity and friendship values.

These results have relevant implications. First, with regard to teaching practice, these findings are useful for teachers in order to assess whether some types of *Successful Educational Action* could play an important role in developing primary and secondary students' prosociality. Especifically, these results support the idea that dialogic gatherings and interactive groups do not contribute to the development of prosociality, and hence, it could serve for teachers in order to reflect about new paths for developing prosocial behavior, as well as reconsider their teaching programmes whenever these methodologies are used. For improving these kinds of teaching programmes, it can be taken into account the study carried out by Caprara et al. (2014). These authors, based on their intervention called CEPIDEA (*Promoting Prosocial and Emotional Skills to Counteract Externalizing Problems in Adolescence*), did obtain positive effects with the experimental group across time increasing their prosociality and reducing their physical and verbal aggression, concluding how prosociality can flourish counteracting aggressive conducts. Their intervention was based on 4 fundamentals: (1) sensitization to prosocial

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values; (2) development of emotion regulation skills (management of negative emotions, and expression and reinforcement of positive emotions); (3) development of perspective-taking skills; and (4) improvement of interpersonal-communication skills. Therefore, future interventions based on *Successful Educational Actions* should consider the fact of introducing these pillars within their teaching programmes in a transversal and specific way. Second, with regard to institutional performance, these findings could serve as a turning point for *Learning Communities* that commonly use different *Successful Educational Actions.* Based on the obtained results and taking into account the low values of implication of families within students' learning processes, it is hypothesized that fostering the implication of families in dialogic gatherings as well as in interactive groups, could bring positive effects to the development of prosociality in primary and secondary students. This hypothesis is based on the results of Yoo et al. (2013) who revealed how enhancing a balanced connectedness in the parent-child relationship may contribute to promoting empathy and prosociality in adolescents over time. Third, with regard to teacher training, these results are significant in a way that they could serve for deliberating and comparing the effectiveness of different teaching methods. On this matter, carrying out this reflecting process could empower teachers' professional training as the conclusions could justify the teaching methods used in their future professional job. In addition, these reflecting processes could be interesting to be performed with the collaboration of pre-service peers, due to the fact that Van Ryzin et al. (2020) found that cooperative learning contributes positively to evolving prosocial behavior in adolescents, and thus, it should be a central component in teacher training as well as in professional development.

Finally, this study has some limitations that should be considered when interpreting the results. The main limitation of this study has been the lack of a control group. In fact, a control group could have served as a reference for comparing these results. As a result, future studies could attempt to replicate this study's methodology complementing it with a control group. In addition, the second limitation refers to the inability to guarantee a causal relationship between the methodologies used and the development of prosociality. As in the vast majority of research carried out in the social sciences, individuals are involved in an environment influenced by an amalgam of variables that to a greater or lesser extent

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have repercussions, in this case on prosocial behavior, so guaranteeing that the applied methodologies are the main cause of non developing prosociality could result in a simplistic reading of reality. Hence, the results are more focused on the association between methodologies and prosocial behavior, more than the causality between methodologies and prosocial behavior. Finally, the last limitation is linked to the fact that the intervention was carried out by different teachers of Primary and Secondary Education, with different backgrounds. Hence, despite the fact that the common points of *Successful Educational Actions* have been met by all teachers, maybe, the material or spatial resources used by the teachers could have varied, leading to potential differences between classes.

In spite of all these limitations, it is hoped that this work will be the beginning of a series of future quantitative works that contribute to shedding more light on the impact of the main *Successful Educational Actions*, like dialogic gatherings and interactive groups, on students' prosociality.

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Authentic learning in service-learning: Theoretical learning and identity change

El aprendizaje auténtico en el aprendizaje-servicio: Aprendizaje teórico y cambio identitario

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Abstract

We explored the potential of Service-Learning (SL) as a methodology for authentic learning, understood as that which occurs in real situations with real problems, leading to the acquisition of holistic learning that will generate personal transformations. To this end, we conducted research with students involved in similar SL experiences at two universities. The experience consisted of complementing teaching with collaboration for a semester in highly complex schools, with a majority Roma population. In both universities the subjects involved followed similar structures. Four studies were developed with mixed methodology.

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Two quantitative studies compared students who had undergone the SL experience with control groups who had taken the subject with traditional methodologies. The Course Value Inventory translated into Spanish was applied to check whether participation in SL generated differences in the three dimensions of learning: conceptual, procedural and personal. The two qualitative studies explored in depth the differences found in the previous studies by analysing the field notes generated by the students. The first qualitative study focused on analysing the acquisition and appropriation of the classes' theoretical contents and the other on the processes underlying the identity and personal changes taking place. The quantitative studies yielded significant differences in the self-perception of the learning achieved, in both universities. The qualitative studies showed the importance of psychological tools and personal relationships for authentic learning, highlighting the importance of considering the SL experience as a frontier space of learning generated by new participants, new goals and new tools.

Keywords: higher education, service-learning, authentic learning, identity, social participation.

Resumen

Exploramos el potencial del Aprendizaje-Servicio (ApS) como metodología para el aprendizaje auténtico, entendido como aquel que ocurre en situaciones reales con problemas reales, dando lugar a la adquisición de aprendizajes holísticos que van a generar trasformaciones personales. Para ello realizamos una investigación con estudiantes implicados en experiencias similares de ApS de dos universidades. La experiencia consistía en complementar la docencia con la colaboración durante un semestre en escuelas de alta complejidad, con población mayoritariamente de etnia gitana. En ambas universidades las asignaturas implicadas seguían estructuras similares. Se desarrollaron cuatro estudios con metodología mixta. Dos estudios cuantitativos compararon estudiantes que habían pasado por la experiencia de ApS con grupos control que habían cursado la asignatura con metodologías tradicionales. Se aplicó el *Course Value Inventory* traducido al castellano, con el objeto de comprobar si la participación en ApS generaba diferencias en las tres dimensiones del aprendizaje: conceptual, procedimental y personal. Los dos estudios cualitativos analizaron en profundidad las diferencias encontradas en los estudios anteriores a través del análisis de los diarios de campo generados por el alumnado. El primer estudio cualitativo se centró en analizar los procesos de adquisición y apropiación del contenido teórico de las asignaturas y el otro en los procesos subyacentes a los cambios identitarios y personales que se estaban produciendo. Los estudios cuantitativos arrojaron diferencias significativas en la autopercepción de los aprendizajes realizados, en ambas universidades. Los estudios cualitativos mostraron la importancia de los instrumentos psicológicos y las relaciones personales para el aprendizaje auténtico, destacando la importancia de considerar

la experiencia ApS como espacio fronterizo de aprendizaje generado por nuevos participantes, nuevas metas y nuevas herramientas.

Palabras clave: educación superior, aprendizaje-servicio, aprendizaje auténtico, identidad, participación social.

Introduction

One line of debate on the mission and meaning of learning at university level is located at the tension between focusing on the efficiency of students' professional training and endowing the learning experience with meaning and significance for each learner and for social change (García-Romero et al., 2018; Manzano-Arrondo, 2012). Thus, throughout history there have been numerous teaching methodologies proposed committed to transformative logics, both for the learner and for society. This is the case of Dewey's experiential learning (1936), Freire's critical theory (2000), Vygotsky's historical-cultural perspective (1978) or the more recent *Social Design Experiments (*Gutiérrez & Vossoughi, 2010) and service-learning (Taylor, 2017). These proposals, which focus on developing processes that are meaningful to the learner and coherent with the world in which they live, show a concern for understanding how learning is meaningful throughout life, in an attempt to bring classrooms into reality, and reality into the classroom.

The purpose of this paper is to reflect on the learning process that takes place through the service-learning (SL) methodology, defined as a training tool that integrates academic study with participation in community practice, in order to give meaning to academic content and at the same time generate processes of transformation and social change (McMillan et al., 2016). For the past two decades, this methodology has been experiencing increasingly rapid growth, as shown by systematic reviews conducted internationally (Sotelino et al., 2021) and nationally within Spain (Redondo-Corcobado & Fuentes, 2020). Specifically, on the subject of the impact of service-learning on the student body, we find studies aimed at analysing the impact of SL on cross-cutting competences such as group work, empathy and critical thinking (Blanco-Cano & García-Martín, 2021; Santos-Rego et al., 2022), as well as on identity-related aspects such as commitment or social justice (Asenjo et al., 2021; Jiménez-Jiménez et al., 2021).

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One concept that allows us to address the different dimensions of student learning is that of *authentic learning*, a concept already used in some studies on SL (Marco-Macarro et al., 2016; Santos-Rego et al., 2022). This concept overcomes the existing duality between formal knowledge and contextual knowledge, understanding it as that which occurs within the development of an *authentic task*, directly connected with current human needs (Duman & Karakas-Ozur, 2020). This leads us, again following Dewey (1936), to a conception of learning as another dimension of life and not just a preparation for the future. Similarly, cultural-historical psychology argues that one key to learning is that a person's development must be in response to real needs and, therefore, be based on genuine problems and questions embedded in cultural practices (González, 2009). Thus, authentic learning is learning that is situated and developed in a goal-directed collective activity (Vygotski, 1978), provides learners with a context (Duman & Karakas-Ozur, 2020) and has a purpose that is socially relevant (Velázquez-Rivera et al., 2020).

Consequently, the authentic learning process transcends the teacher-learner dyad and involves a wider community, a real audience where the motives for learning do not respond only to individual purposes but are framed in the social sphere (Guerrero-Rodríguez et al., 2014; Velázquez-Rivera et al, 2020). And this is where critical theories converge, which argue that it is through the awareness of social meaning that the learner establishes a relationship of commitment to the learning objectives and to learning itself (Freire, 2000), as they become able to make personal and immediate contributions valuable for a group of people. The progressive participation of the learner in a cultural practice will generate the development of commitment to it and to the people included in it, resulting in a change in their relationship with the world and in the way they perceive themselves as a person (Macías-Gómez-Estern et al., 2014; Wenger, 2001). The holistic process that includes these dimensions necessarily involves a reflective activity (Duman & Karakas-Ozur, 2020) in which the learner moves between the consideration of new conflicts and uncertainties, their problematisation and their resolution, where reconfigurations and changes are articulated. Thus, both the learner's agency and the human relationships established are the pivots for the whole learning process.

To summarise, the concept of authentic learning can account for the processes that occur in SL educational practices as an experience that puts the learners at the centre of a real, complex and intercontextual

learning process, while placing them in a hybrid activity setting between academic activity and community practice (McMillan et al., 2016). This setting provides real motives and goals that give meaning to learning, while generating personal commitments and positioning. All of this will anchor the acquisition of competences that, as the afore mentioned studies have shown, coincide with the three main dimensions of learning: conceptual, procedural and attitudinal.

The results of two quantitative and two qualitative studies carried out in the framework of the project "*Analysis of the process of learning and identity change through service-learning in communities of practice in contexts of exclusion"* are presented below, which aim to illustrate the authentic learning process that takes place within the framework of SL.

Method

The research is based on a mixed methodological approach, already used in other studies on SL (Capella-Peris et al., 2020). It sets out to answer the following questions: a) Does participation in SL projects generate differences in learning between students who have undergone SL experiences and those who have not? And b) If such a difference exists, how does this participation operate in conceptual learning processes, and how are personal changes related to this type of learning?

To answer the first question, a quantitative study was developed comparing students who had undergone SL experiences with another group working through traditional methodologies. A qualitative approach, on the other hand, was only used with students participating in SL.

The participants were students from the Faculty of Social Sciences at *Universidad Pablo de Olavide,* studying the subject *Fundamentals of Human Psychological Functioning*, and from the Faculty of Psychology at *Universitat Autònoma de Barcelona,* studying *Developmental Psychology*. The teachers of these subjects were part of the research team of this project. In both cases, the SL project involved collaborating with highly complex schools located in socially vulnerable environments, with a majority Roma population. The university students attended two hours a week for a semester to carry out joint tasks with primary school students. In addition to the collaboration with the schools, the students kept a field journal of each of the sessions, reflection sessions were held

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with the teacher-researcher, and a final evaluation report was drawn up. The students who did not participate in the SL experience followed traditional methodologies, carrying out their practices through classroom seminars, analysing case studies and reading documents, and producing a final report.

The common antecedent for the SL projects at both universities were the *Fith Dimension (*Cole & The Distributed Literacy Consortium, 2006; Lalueza et al., 2020) and *La Clase Mágica (*Vásquez, 2003) models. These projects emerged in the USA and have been constituted as teaching, research and community service environments where reciprocal relationships are established between participants, enabling mutual learning while generating processes of social change and transformation (Underwood et al., 2021).

Quantitative approach

We used the *Course Value Inventory* (Nehari & Bender, 1978) translated into Spanish to test whether participation in SL generated differences in learning. This instrument, whose learning dimensions coincide with those found in existing research (Macías-Gómez-Estern et al., 2014), had previously been used in other studies that analysed SL experiences (Conway et al., 2009; Shek et al., 2020). The questionnaire consists of 36 items grouped into 4 scales, which assess students' perceptions of their learning experience in: 1) the course in general, related to overall satisfaction; 2) conceptual learning, referring to the understanding of course content; 3) behavioural learning, referring to procedural and professional learning generated; 4) personal learning, related to the students' identity constructions. Each subscale consists of 9 items that correspond to sentences that students must evaluate on a 4-point scale indicating whether it is: 4. positively true, 3. probably true, 2. probably false or 1. positively false. No neutral option was given. The item scores, as well as the scores for each subscale - with polarity adjustment - were used to compare the results between the two groups. In Table I, a sample item describes each subscale of the CVI.

Each university carried out a study, comparing two groups from the same subject and with the same teaching staff. One group was taught through SL methodology (SL-group) and the other through traditional

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TABLE I. Sample items of the subscales of the Course Valuing Inventory (CVI)

Course evaluation	I consider this learning experience as time and effort well spent.
Conceptual learning	This course has helped me to acquire important information.
Personal learning	In a way, I feel good about myself because of this course.
Behavioural learning	This course has been useful for me in developing new ways of learning.

Source: Compiled by authors.

classroom methodology (non-SL-group). The selection of the samples was thus intentional and non-probabilistic.

The total sample of *Universidad Pablo de Olavide* taking the subject in the first semester of 2015-2016 was made up of 179 students, 74 following the SL methodology (41.3%) and 105 following a traditional methodology (58.7%). In *Universitat Autònoma de Barcelona* data were collected from 174 students, 68 SL (39.1%), from three groups that had undergone SL experiences in three different periods (SL Group 14-15A in the first semester of the academic year 2014-2015; SL Group 15-16A in the first semester of the academic year 2015-2016; SL Group 15-16B in the second semester of the academic year 2015-2016), and 106 that followed the traditional methodology (60.9%), from a single group in the first semester of the academic year 2014-2015. The age of the students in both samples ranged from 18 to 25.

The CVI was administered as an anonymous survey after the end of the first semester classes. The two studies were conducted and analysed separately.

Quantitative data were processed using SPSS software, MANOVA-one-way, ANOVA and Chi-Square analyses.

Qualitative approach

For the qualitative study, the field notes prepared by each student throughout the semester were analysed (Lalueza & Macías-Gómez-Estern, 2020). Each student wrote between 9 and 10 field notes according to a script provided by the teaching staff. It included: general data on the visit (author, date, class group, participants, space), general observation

(descriptive overview of the social climate and physical environment of the session), focused observation (detailed description of the behaviours and interactions, with the explicit instruction not to make subjective interpretations or assessments) and theoretical and personal reflection (where they related the contents of the subject with the experience of the activity, together with emotions, sensations or personal interpretations of their own learning processes and the dynamics observed). Students received feedback with their first marks from the teaching staff.

The field notes of the students who had completed them, a total of 66 students (32 from *Universidad Pablo de Olavide* and 34 from *Universitat Autònoma de Barcelona*), were followed up. After a first overall reading, the journals of 28 students (14 from each university) were selected for an in-depth analysis with the support of Atlas.ti 7 software, as they offered the most complete information, developing the theoretical and personal reflection parts more extensively.

For the analysis, we began by partitioning each text into units of meaning, through cycles of coding, until properties emerged that allowed us to construct our own categories, ensuring that they conformed to the definitions of validity (Martínez & Moreno, 2014). We proceeded as follows: a) Familiarisation: two people from each university reviewed all the field notes to formulate basic ideas and questions to be answered in relation to the research; b) Coding and categorisation: classification of the data into categories; c) Piloting of the category system and sharing: a random sample of journals was distributed so that each was read by two people; the categories that emerged within each pair were compared until agreement on definitions was reached; this was followed by team-wide sharing until a single set of categories and their definitions were reached; d) Using a different sample of field notes, it was confirmed that each coding pair had an agreement rate above the 90% criterion; e) Coding and categorisation: all texts were re-distributed for coding according to the developed category system; f) Integration: the results were analysed on the basis of the guiding research questions.

We obtained 25 different categories that were grouped into the three macro-categories detected in previous studies (Macías-Gómez-Estern et al. 2014): conceptual learning, procedural learning and attitudinal learning or processes of identity change (see Table II).

In a second phase, the results of the conceptual and identity learning categories were analysed in depth and separately. For the conceptual

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TABLE II. Schematic summary of the developed category system

CONCEPTUAL LEARNING	1.1. Theoretical learning		
	1.2. Theoretical and practical learning		
	1.3. Application of theoretical knowledge to practice		
	1.4. Inappropriate content		
2. PROCEDURAL LEARNING/ PROFESSIONAL	2.1. Communication and information strategies		
	2.2. Conflict management		
	2.3. Analytical observation		
	2.4. Intervention in thinking and learning processes		
	2.5. Register of procedures		
	2.6. Teamwork		
3. PROCESSES OF IDENTITY CHANGE	3.1. Taking the initiative		
	3.2. Self-awareness	3.2.1. Emotional states	
		3.2.2. Self-awareness	
		3.2.3. Awareness of the learning/identity process	
	3.3. Knowledge of the other/alterity	3.3.1. Reality check	
		3.3.2. Awareness of the cultural other	
		3.3.3. Knowledge of the interpersonal other	
		3.3.4. Prejudices/ stereotypes	3.3.4.1. Emission of prejudice
			3.3.4.2. Challenging prejudice
	3.4. Proximity and identification with the other professional		
	3.5. Commitment		

Source: Compiled by author.

analysis, the 28 selected field notes were examined in an attempt to analyse the role of curricular learning as artefacts mediating participation in practical experience. For the analysis of personal learning, the changes experienced by the students in relation to otherness and their own identity were investigated, for which an intensive narrative study was carried out of the field notes of 2 students, one from each university, with the aim of gaining in-depth knowledge of the personal transformations generated by the experience. These cases were selected for the density of their narratives, as well as for the way in which each illustrated two different types of identity trajectories found in our student body as a whole.

Results

Quantitative analysis

Quantitative analysis showed significant differences in the self-perceptions of SL and non-SL students about their learning in their subjects.

In the study of the *Universidad Pablo de Olavide* (Macías-Gómez-Estern et al, 2019) a one-way MANOVA analysis was used to analyse the overall differences between groups. Subsequently, an ANOVA was used to compare the scores obtained in each of the four subscales (table III). Significant results were found for both the overall score and the four subscales, with the SL group showing a better evaluation of the course in all the categories considered. Using Chi-square, a third analysis was carried out, which informed us about which items made the differences.

The results showed significant differences in 6 items in the subscale of overall assessment of the course, 2 in the subscale of conceptual learning, 2 in the subscale of professional learning and 7 in the subscale of personal learning. The items that marked differences in subscale 1 were related to the relevance of the experience; the assessment of the course as constructive and enriching; the assessment of the time and effort spent; and the statement that they would recommend the course to their peers. In the subscale of their assessment of conceptual learning, the students in the SL group highlighted that the course had helped them to understand the contents better and to consider them in a different and more clarifying way. In the subscale of personal learning, the students in the SL-group highlighted the positive impact of the course on their values, feelings and emotional reactions; the help the course gave them in terms of clarifying their personal views and increasing their sensitivity, tolerance and empathy towards others; and, finally, the greater impact of the course on their personal growth. Finally, the behavioural learning subscale showed significant differences in the items highlighting the usefulness of the course in their learning and in their lives in general. No significant differences were found between genders or between students with and without previous volunteering experience.

The analyses the results of *Universitat de Barcelona* (García-Romero et al., 2018), a comparison of means and an ANOVA were carried out, which showed significant differences both in the questionnaire as a whole and in almost all the subscales (table IV). In the subscale on general

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TABLE III. Scores of the ANOVA of the *Universidad Pablo de Olavide* study

	Group	N	M	S.D.	P	Stage2
Full scale CVI	SL	74	29.69	3.34	< .001	0.26
	Non-SL	105	23.17	9.91		
	Total	179	25.87	8.50		
Course evaluation	SL	74	31.95	4.16	< .001	0.27
	Non-SL	105	24.89	10.84		
	Total	179	27.81	9.37		
Conceptual learning	SL	74	30.34	3.86	< .001	0.25
	Non-SL	105	24.15	10.39		
	Total	179	26.71	8.87		
Personal learning	SL	74	27.76	3.52	< .001	
	Non-SL	105	21.38	9.41		
	Total	179	24.02	8.17		
Procedural learning	SL	74	28.73	3.64	< .001	
	Non-SL	105	22.26	9.69		
	Total	179	24.93	8.39		

Source: Compiled by authors.

assessment of the course, SL students showed a greater positive affective involvement with the course. The subscale analysing personal learning showed the greatest differences, with perceptions indicating that the SL experiences had brought about relevant personal changes, related to self-knowledge, commitment and attitudinal changes. The results of the behavioural learning subscale showed that SL students perceived a greater and better acquisition of professional competences and skills than the non-SL group. Finally, the conceptual learning subscale was where the fewest differences were found between the four groups, although calculating the joint average of the three SL groups showed scores that exceeded those of the traditional methodologies group.

In short, in both studies the results confirmed our initial hypothesis about the differences that students perceive in their learning depending on the methodologies used in the subject, with the SL groups showing the highest levels of satisfaction.

TABLE IV. Mean scores of the *Universitast de Barcelona* sample

Groups	Full scale CVI	Course evaluation	Conceptual learning	Personal learning	Procedural learning
SL 14-15A	2.262	2.656	2.115	2.000	2.336
SL 15-16A	2.180	2.495	1.913	2.165	2.136
SL 15-16B	2.226	2.534	2.119	2.091	2.211
Non-SL 1415A	1.757	1.972	1.923	1.433	1.715

Source: Compiled by authors.

Once these data were obtained, the aim of the research was to analyse the learning processes that took place through the P2P experiences. The following sections show the results obtained by analysing, on the one hand, the conceptual learning processes that take place through SL and the role they play in participation in the practical activity (García-Romero & Martínez-Lozano, 2022) and, on the other hand, the impact that participation in these SL experiences has on the identity processes of students (Lalueza & Macías-Gómez-Estern, 2020).

Appropriation of theoretical content in social participation

If we look at authentic learning as holistic change, we must understand the role of disciplinary knowledge promoted in the subjects students study, and this is the focus of our third study (García-Romero & Martínez-Lozano, 2022).

From a historical-cultural perspective, we start from the dialectical relationship between theory and practice (Taylor, 2014). A dialectical process in which reflection, understood as the mental activity dedicated to understanding uncertain situations or resolving incoherence (Clarà & Mauri, 2010), plays a fundamental role. Through reflection, new significant learning emerges. Service-learning contexts involve a boundary activity where two activity systems with parallel historical developments converge, often involving inconsistencies in their norms, roles and even worldviews (McMillan et al., 2016). These uncertain situations need to be confronted by students, leading to reflective processes of negotiating meanings that smooth out contradictions (Kiely, 2005).

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This study analyses the students' field notes in which we find the account of this reflective activity, where the personal processes of negotiation and learning that lead to understanding the curricular concepts taught in class are recorded, so that they can be applied in practice. The results (García-Romero & Martínez-Lozano, 2022) showed that the role played by the contents as mediators of the practice is in itself very diverse, in accordance with the plurality of motives that guide each person and the different degree of participation they develop in the experience (figure I).

At a first level, students wrote down the definition of the concept in their notes, with the main purpose of passing an assessment, in line with the requirements of a traditional model of learning by transmission. Therefore, the concepts were used here only as objects of their own reflection, constituting the ultimate purpose of the latter. Below is an example from one of the field notes analysed:

> "Lalueza et al. (2001): their socialising practices are based on children's participation in the social world and on guided learning techniques. (Ana[1], note2, 4th year, Psychology)

On a different level, although the concepts occupied the same role as the object of conceptual reflection, a relationship was established with experienced practice, giving examples, contextualising them and providing them with concreteness in order to deepen and resignify the concept, informing us of a genuine interest in the theory itself, but with an interest in appropriating it, an equally relevant aspect in the academic community. Below is an example taken from a focus group participation:

> "It's very difficult to decipher . . . the concept of 'socialisation'. I didn't understand it, so I started to do some research, and then I related it to the school, to how these children have a different socialisation to ours because they were born where they were." (Maricarmen, Note7, 1rst year, Social Education)

On the other hand, curricular concepts also appear as psychological artefacts that mediated understanding of the complex, new and uncertain reality in which one is participating. Here, the purpose of concept use is not about assessment, but about a need to understand and orient

[1] Fictitious names have been used to ensure the anonymity of the participants.

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oneself when participating in a meaningful social practice (Primavera, 2021). Concepts stand as frameworks for understanding both their own participation and experience and the new context in which they find themselves, as well as the relationships with the actors involved (Schön, 1987). This use of concepts is particularly relevant, as this need to understand what is happening has an important implication for students' learning and competence as new participants in the community who want to contribute to collective goals and be legitimised by their peers. In short, it shows us the role of curricular concepts as promoters of agency processes. Below is one example where this is made very explicit:

> "Having made a prior diagnosis of the class helped me to get to know them even better and to set the goals I wanted to achieve. In other words, I was able to detect abilities and needs that I was unaware of before; I became aware of the priorities of each student and so I was able to set the objectives I considered appropriate. (Esther, Note 4, 4th year, Psychology)

We thus see how, in a situation where initiative and action are required, the conceptual tools that serve to understand practice also enable decisions to be made about which procedures and actions to implement. Thus, we find narratives in which students legitimise their actions based on these curricular concepts, which allows them to participate more centrally and fully in practice (Wenger, 2001). This transition in their participation implies a commitment to the collective objectives, as well as to the different people involved in the activity, a commitment that involves enabling new identity positions on the part of the participating students, often confronting their own implicit theories and re-signifying them to adjust them to the new knowledge and experience. In this process, the new concepts they learn related to the lived context remain imbued with ethical and political values, assuming an important role in the awareness-raising process, a fundamental aspect in a genuine education process (Matusov et al., 2016). We can see it here:

> What makes us afraid to express what we feel is the consequences. As we can see in the book Summerhill, if children are aware that a teacher is "superior", simply because she is a teacher and older, they will not reveal themselves as they really are and will be afraid of the repercussions of saying what they think, for fear of punishment, failure

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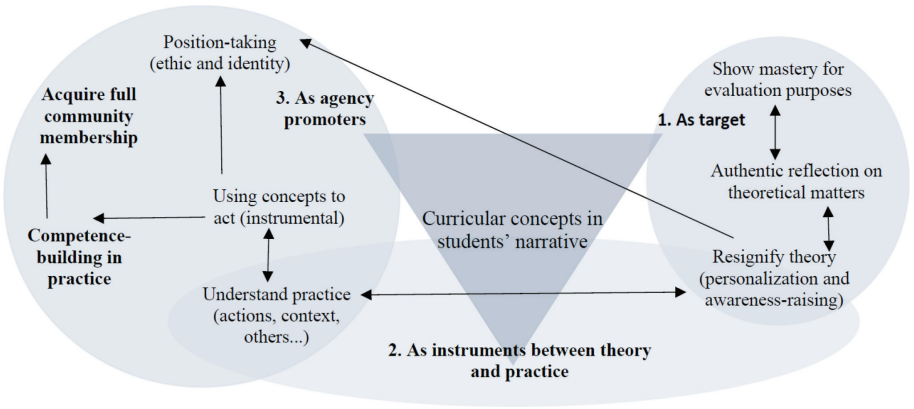
and countless other things. That is why we must fight so that children do not see us as their superiors; we are all people with equal rights and equal duties, free to express what we feel, and we should not be inhibited by the consequences of our thoughts. FREE EDUCATION is the basis of our future to be formed as real people. (Raquel, Nota8, social education)

FIGURE I. Functions of curricular concepts in SL narratives



Source: Compiled by authors.

Identity change in the service-learning experience

A second qualitative study was carried out on the impacts experienced by students participating in SL projects on their personal learning processes, focusing on the trajectories of two students whom we tracked through an identity "border crossing" elicited by the educational experience of SL itself.

The idea of "border crossing" (Kiely, 2005; Naudé, 2015) is a metaphorical way of looking at a change in the subjective world of the learner. This change occurs as a result of the incursion into a context that is different from one's own, with different assumptions, norms, values and routines. It is an opportunity for transformation as the learner 'denaturalises' their own position by re-situating it in a more complex cultural

and interactional universe. The result is not only an entry into a different world 'on the other side of the border', but also, and above all, the opportunity for introspection and self-knowledge.

In a very similar way to this trajectory identified by Kiely (2005) and Naudé (2015), our students go through different processes from the first moment of contact with practice, when they arrive at a school with children belonging to a cultural community that is alien to them, and with which they must collaborate to achieve predetermined goals. Thus, in their field notes, they report moments dominated by dissonance, in which they show surprise, discomfort and disagreement with certain practices of the students, their families or the school itself:

> Soledad told me to go down to the secretary's office to call the mother back so that she could come and visit the school and talk to her daughter. However, the answer she gave to the secretary on the phone was: 'I'm not coming because I'm making lunch'. (Maria, note1, social education)

In both students, these dissonances spark processing or reflection, i.e., conscious attempts to make sense of practices that seem strange to them.

> This is perhaps to me, having been brought up under the premise that school is a fundamental element for the physical, social and psychological evolution and development of the person, the fact that an 11-year-old pupil has been absent from school for three weeks in a row is anomalous and alarming. So, at this point I try and try not to be carried away by my beliefs, but to keep in mind that Roma culture as Lalueza et al. (2001) explains 'their socialising practices are based on the participation of children in the social world and on guided learning techniques..." (Paula, note 7, psychology).

This processing takes place on two parallel planes, an intellectual plane of distancing from the object, and another plane catalysed by a process of personalisation, in which the people with whom they carry out the tasks (mainly boys and girls, but also teachers and fellow trainees) "take shape" through the relationship. Explicitly in the field notes, the weaving of affections is reported, as well as approximations that allow us to understand the motives and justifications for their behaviour. This affective connection between the students and the 'subjects' of the

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intervention, 'the others', appears in both cases as the prelude to the development of agency and commitment to the activity.

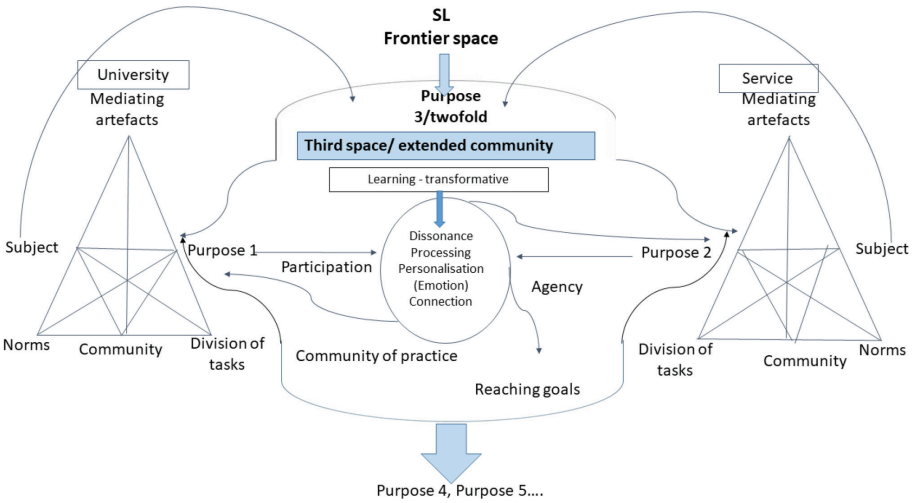
> "I have been very moved by the change that we have all undergone during these months, the transformation of some students who did not know what their future would be like and are now fighting to become policemen, firemen, teachers... Without forgetting their essence as children and looking to the future with perspective (María, note 10, social education)".

Our analysis (Macías-Gómez-Estern & Lalueza, 2024) thus illustrates the complex interweaving and synchrony between individual, social, affective and interactive processes involved in achieving boundary crossing in SL projects. These two cases were chosen because they offer two distinct and paradigmatic crystallisations of the processes we have found in our student body as a whole. Each of them shows a different trajectory, as their starting conditions (age, academic experience, narrative style, etc.) and the characteristics of the activity scenario in which they participated (differences in the organisation of the projects, in the role expected of them, in the models of action present) are different. However, in both cases there are iterations of the same process of identity change and "border crossing", forging transformations both in themselves and in the scenarios in which they participate. In the narratives of both we find some elements that give content to the processes involved in identity change, such as the processes of dissonance, processing, personalisation and connection. Firstly, in both cases, the emergence of intense emotions (frustration, commitment, etc.) constitutes the first element of dissonance, which elicits transformative learning. However, this is not enough for "border crossing" to take place. It is necessary for the tools of the hybrid system of activity in which they are inserted to come into play so that it can be processed and personalised (through, among others, reflective writing as part of the didactic methods of SL), progressively giving rise to greater agency in this hybrid scenario. The SL scenario analysed then takes on the characteristics of what other authors have called a "third space" (Gutiérrez & Vossoughi, 2010), where norms, values and ways of doing, coming from different cultural traditions and practices, connect, converge, are legitimised and put into interaction, forming a new place as a result of the participation of all the subjects involved.

In summary, the internal processes of identity transformation in the two students analysed involve a dialectical view of what happens in the SL scenario, in which the change in subjectivities occurs as a result of motivated participation in a goal-directed activity in coordination with people who may be guided by different cultural and social referents, and with whom intersubjective agreements need to be established (McMillan et al., 2016).

Figure II, developed in Lalueza & Macías-Gómez-Estern (2020) and inspired by the third generation of Activity Theory (Engeström, 2001), accounts for the dialectical and continuously transforming character of identity change processes in a hybrid activity context that we have observed in our SL programmes.

FIGURE II. Conceptual map of the dialectical process of identity change



Source: Compiled by authors, inspired by Engestrôm, 2001.

Discussion and conclusions

Through an action-research project conducted at two universities, we have analysed the learning processes of university students enrolled in SL projects, questioning their character as authentic learning. Thus, we

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have been able to identify the details of a process that, as previous studies have shown (Santos Rego et al., 2022; Asenjo et al., 2021), combines the development of competences with the redefinition of reality in contact with a community group.

Quantitative studies have allowed us to access the perceptions of the learning process of the students who participated in the SL programmes, revealing results consistent with quantitative research conducted to date (Blanco-Cano & García-Martín, 2021). Firstly, we found that SL helped students to understand contents better, with a significant differential with respect to the non-SL group. Secondly, there were also significant differences in self-perceptions about the procedural competences acquired, as well as their usefulness in a potential professional field and in their life in general. Finally, and consistent with the literature (Asenjo et al., 2021), students who participated in the SL projects developed their self-concept and recognised personal changes related to their personal views, sensitivity, tolerance and empathy towards others.

For their part, qualitative studies have allowed us, through the pupils' field notes, to interpret the processes that favour this learning. Although both studies are oriented towards different goals, both identify as triggers the immersion of students in an uncertain context, which they have to face, and the reflective processes that they generate. We therefore highlight, in line with Kiely's studies (2005), the relevance of considering our SL experience as a "border crossing" that forces students to move towards a context of activity that is different from their everyday world, oriented towards goals other than those of the university institution, governed by other rules and mediated by different artefacts. This is intensified if it also involves an encounter with people with very different cultural references.

The first qualitative study shows how students develop a new interpretation of reality using the tools they learn on the course, which they use to intervene in it. Conceptual knowledge is not content to be "hoarded" but an instrument for understanding and acting in the world. Nevertheless, what is decisive for us to be able to speak of authentic learning is how this new knowledge acquired in practice leads to initiative and commitment to the activity. The need to understand - in order to act - goes hand in hand with making commitments to people and to the goals of the activity. The concepts are appropriated by the students as psychological tools that enable them to understand the practice, to make decisions and thus to become intervening agents in the context of the practice.

The second qualitative study allowed us to trace the dynamics of otherness that the students had with members of the Roma community, and how they went through some emotional experiences that were generators of internal changes. The "crossing of borders" acts as a triggering factor in this process, where "the other" becomes especially important, both culturally or paradigmatically (the Roma) and in a personalised way (each of the children with whom one enters into a relationship). As Saavedra et al. (2022) show in their study, the students express and analyse their own emotions, personal interactions and awareness of their own role, allowing us to unravel the chain of dissonance, reflection and bonding that leads them to acquire agency through commitment, also showing us the very important role of affective bonds in this process.

The identity changes shown in the field notes, described in terms of personal pathways and learning, can only be understood within the framework of the practical activity taken as the basic unit of analysis. Agency emerges through involvement in the activity, in a scenario that transforms through the intervention of the different participants and generates its own goals. From a cultural-historical perspective (Vygotski, 1978), we interpret the SL projects analysed as activity systems in which otherness plays a special role as a driver of learning and change (Taylor, 2014). In this perspective, the focus shifts from isolated individual learning to the analysis of SL activity as a boundary field in which subjects, motives, cultures, and goals converge from the two preceding systems, the university, and the school, creating a hybrid system with a dual community referent and an equally dual object. Students thus participate simultaneously in a university academic activity scenario and a community professional scenario, each with its own goals, instruments, motives and rules of action. In this sense, our work gives empirical support to McMillan et al. (2016), when they state that this type of hybrid system in which students do not participate to respond exclusively to academic requirements, but also to respond to the demands of the community, will transform them as they become active agents.

The two quantitative studies described here are highly reliable due to the sample sizes, the concordance of the results between them and the coherence with previous studies focusing on the same object. However, the qualitative studies, although they have allowed us to investigate processes that undoubtedly have potential to generate authentic learning processes, are nonetheless case studies and therefore their results cannot

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legitimately be generalised. The context, made up of the particular type of SL programme shared by both universities, among other elements, cannot be separated from the contents analysed, which allow us to speak of *border crossing* and *authentic learning*. This is why we believe that more qualitative studies are needed to examine the relevance of these concepts in different types of SL programmes.

The institutionalisation processes currently underway in Spanish universities require, firstly, a definition of what is meant by university SL, and secondly, mechanisms for evaluating the impact on students (learning and personal change) and on the service (impact on the community). In this framework, we consider that the conceptualisation of SL as authentic learning provided by our work is not just an academic exercise, as it can operate as one of the tools for evaluating the impact of SL required by these institutionalisation processes, a task that we have already begun to advance in García-Romero et al. (2021), but which still has a long trajectory ahead.

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Recreation in the playground of a school in the Community of Madrid: teacher and student analysis of an intervention with a gender perspective

El ocio en el patio de un colegio de la Comunidad de Madrid: análisis del profesorado y alumnado de una intervención con una perspectiva de género

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Abstract

The school playground represents an educational area that is full of significance, where recreation between boys and girls is conditioned by the multiple interactions, sometimes unequal, that are established continuously in the coexistence between pupils. The school playground is an educational space full of significance, where leisure time between boys and girls is conditioned by the

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multiple interactions, sometimes unequal, that are established continuously in the coexistence between pupils. To explore the study objectives, teacher interviews and post-intervention student surveys were conducted and drawings and a graphical-numerical scale were collected from students before and after the intervention. In accordance with this mixed methodology, the data were treated qualitatively and quantitatively according to their nature in a process of triangulation of techniques and sources. The results found differences in the type of recreational activities (active and passive) between female and male pupils, both before and after the intervention. The intervention was successful in promoting active recreational activities and providing passive leisure areas and reducing gender inequalities in the intervention context, contributing to the emergence of homogeneous groups more frequently. Areas and games shared between girls and boys were identified, such as a tyre balancing area or the board games area, and others that continued to generate the separation of boys and girls, such as the majority of sports or traditional game We found a significant increase in pupils' satisfaction with the new reality of the playground after the intervention with no differences according to the gender of the pupils.

Keywords: primary education, equal opportunities, sport, social interaction, leisure education.

Resumen

El patio escolar representa un espacio educativo cargado de significatividad, donde el ocio entre chicos y chicas se ve condicionado por las múltiples interacciones, en ocasiones desiguales, que se establecen de forma continuada en la convivencia entre el alumnado. El objetivo de esta investigación fue analizar las actividades e interacciones en el ocio y la satisfacción del alumnado con un patio de recreo de Educación Primaria desde una perspectiva de género, después de intervenir en él con la intención de impulsar el ocio activo. Para explorar los objetivos de estudio, se realizaron entrevistas al profesorado y encuestas al alumnado después de la intervención y se recogieron dibujos y una escala gráfico-numérica del alumnado antes y después de la intervención. De acuerdo con esta metodología mixta, los datos recibieron un tratamiento cualitativo y cuantitativo en función de su naturaleza en un proceso de triangulación de técnicas y fuentes. Los resultados encontraron diferencias en el tipo de ocio (activo y pasivo) entre las alumnas y los alumnos, tanto antes como después de la intervención. La intervención consiguió impulsar el ocio activo, proporcionar zonas de ocio pasivo y reducir las desigualdades de género en el contexto de intervención, contribuyendo a la aparición de grupos homogéneos con más frecuencia. Se identificaron zonas y juegos compartidos entre las chicas y los chicos, como una zona de equilibrio con neumáticos o la zona de juegos de mesa, y otras que continuaron generando la separación de alumnas y alumnos, como la mayoría de las modalidades deportivas o los juegos tradicionales. Se halló un incremento significativo

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de la satisfacción del alumnado con la nueva realidad del patio después de la intervención sin diferencias en función del género del alumnado.

Palabras clave: enseñanza primaria, igualdad de oportunidades, deporte, interacción social, educación para el ocio.

Introduction

During breaktime, students must autonomously manage a series of interactions with themselves, with others and with the physical environment, regulating their behaviours in a less structured environment and with less adult supervision (Ridgers et al., 2011). Through these interactions, students shape and transmit their beliefs about what it is to be a boy or a girl, which is biased by the prevailing gender stereotypes in a given culture (Boyle et al., 2003; Pawlowski et al., 2014). Therefore, through the constant interactions that transpire and are charged with significance during breaktime at school (Luis et al., 2020), teachers and students are active stakeholders in the *construction of gender*.

At the Primary School stage, one of the elements that contributes to favouring these interactions at break time is play, which is influenced by the beliefs that teachers and pupils attribute to gender, and promotes the ideological construction of gender (Boyle et al., 2003). Luis et al. (2020) showed that the game conditioned the spontaneous creation of groups of pupils, showing a segregating tendency and the more frequent existence of homogeneous groups at break time. Along the same lines, Boyle et al. (2003) and Pawlowski et al. (2014) observed a greater presence of same-gender groups during breaktime and Gil-Madrona et al. (2014) showed that play was only sometimes shared between male and female pupils. It is agreed that playtime preferences of girls and boys denote the social ideology about gender and determine the use they make of space and equipment, resulting in more active or passive games (Amholt et al., 2022; Graham et al., 2021). In this regard, the evidence on the development of more active games in boys is extensive, compared to the activities of girls, who tend to show more sedentary or less active behaviours in the playground (Baquet et al., 2018; Graham et al., 2021; Méndez-Giménez, 2020; Ridgers et al., 2011; Suga et al., 2021). The research of Boyle et al. (2003), Massey et al. (2018), Pawlowski et al. (2014) or Ridgers et al. (2011) in Primary Education found that boys were more inclined

towards sports games, mostly team and ball games; while girls showed preference for activities such as walking and talking, symbolic, relational and active games with less physical contact.

In this context it is necessary to highlight that one of the consequences of the (androcentric) gender ideology that prevails in the playground, as a result of the play and interactions it hosts, is the aggressive, mostly male domination of the space, which can reduce play opportunities for girls and some minority boys (Spears, 2020) and host discriminatory situations (Bobby and Yoyok, 2023). Previous work (Luis et al., 2020; Pawlowski et al., 2014; Ridgers et al, 2011; Salas and Vidal-Conti, 2020) agreed that the traditional construction of the playground and the gender stereotypes assumed by the pupils give rise to the following picture: playgrounds dominated by ball game sports that are mainly played by pupils, which drive the majority of pupils (generally girls) to the periphery, who accept this situation, adapt their leisure time to their opportunities and display more passive behaviour.

In short, the playground represents a mixture of elements that are gender-transmitting and that describe an unequal and complex situation. Recent studies continue to highlight the need to deepen the understanding of breaktime as a meaningful and self-managed environment for learners (Graham et al., 2021). Previous literature provides important data on the status of playground leisure, the interactions that are generated or the difficulties encountered by pupils in playing and interacting. However, fewer studies have analysed the consequences of interventions in these spaces, most of them focusing on the amount and opportunities for physical-sport activities produced after the intervention (e.g., Graham et al., 2021; Massey et al., 2018; Méndez-Giménez and Pasallá-Manteca, 2018). This research aims to contribute to this thematic line of action, with the following general objective: to explore recreation (games and areas used) and student satisfaction after intervening in the playground of a primary school from a gender perspective. In particular, the following specific objectives are pursued:

1. To analyse the changes in leisure activities and interactions during breaktime following an intervention in a school playground from a gender perspective.
2. Enquire about the satisfaction with the offer and recreational organisation of breaktime after the intervention and the possible differences depending on the gender of the pupils.

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Methodology

In order to achieve the objectives of the study, a mixed methodology was used, with data being processed qualitatively and quantitatively according to their nature in a process of triangulation of techniques and sources.

Context and intervention

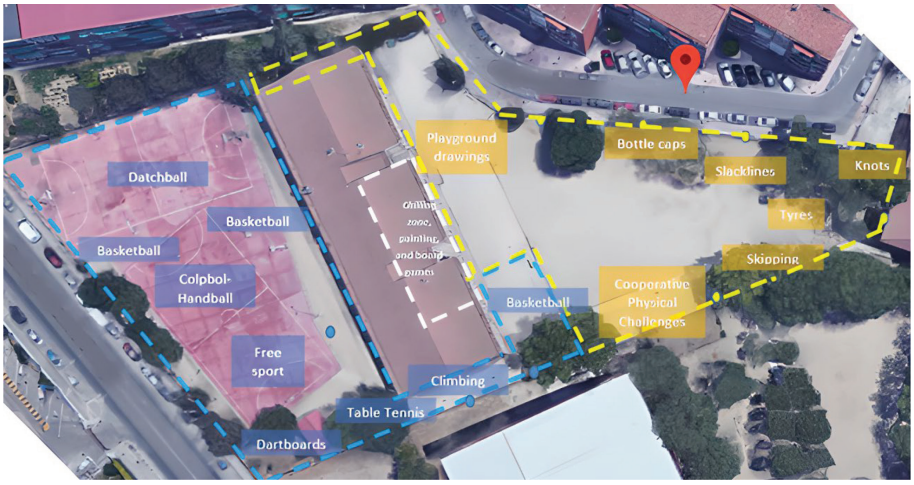
The study was implemented in a municipality in the south of the Community of Madrid (Spain) in a public primary school with 658 pupils enrolled there (358 boys and 271 girls). In this educational centre, there was a playground programme in which balls were provided to students for free play, and the use of the multi-sports grounds was regulated in turns according to educational levels (Figure I).

FIGURE I. Organisation and distribution of the playground before the intervention

In accordance with this background, various actions were planned and carried out with the participation of university students, primary school pupils, school teaching staff and the research team. The approach, based on a socio-ecological conception of the playground (Graham et al., 2021), did not seek to intervene through adult-directed play, but rather to generate a semi-structured environment (through rules, provision of

materials and delimitation of areas), which would allow pupils to develop independent play behaviour. The playground was divided into three zones: the white or rest area, the yellow or alternative recreational area and the blue or sports area. The three areas were made visible by marking the physical elements (lampposts, fences, ground...) of the school with these colours. The students, in coordination with the school's Social Integration Technician[1] established rules for the use of each area (e.g., the ban on playing with balls outside the sports area), The regulation was displayed and visible in the playground. In addition, in each of these spaces, corners were marked out where a variety of games, both passive and active, were offered and managed without teacher direction (Figure II and Table I). A space free of corners was set aside where pupils could enjoy less focused recreational activities and the appearance of the playground was altered with a few murals and other decorations. Turns for playing games were regulated for the different educational levels in some of the corners and teachers were trained and made aware of the gender inequalities that occur at breaktime.

FIGURE II. Organisation and distribution of the playground areas and their corners after the intervention



[1] Professional responsible for the development of social skills and the independence of pupils at risk in the educational centre, intervening with the children, their families, the teaching staff and other possible social stakeholders involved.

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TABLE I. Description of playground areas and corners

Area	Corners	Description
White or rest	*Chilling zone*	Area covered with benches, cushions, plants and other decorative elements.
	Painting Corner	Space covered with hanging whiteboards and tables to draw on.
	Board Game Corner	Covered space with tables and chairs and a trolley with board games that was brought out during break time.
	Sports mural	Wall covered with posters of top athletes in sports traditionally typified for the opposite gender.
Yellow or alternative recreation	Drawings on the ground	Concrete area with drawings of stripes, mazes, circuits, footprints… painted on the ground.
	Badge or caps corner	Sand pit area in which caps were available.
	Slacklines & spider web corner	Sand and tree area with rubber bands between trees and other free rubber bands provided during breaktime.
	Knots Corner	A space with a book of knots graded by difficulty levels and cut nylon rope for practising knots.
	Skipping Corner	Space where ropes were provided during breaktime in the playground.
	Balance and wheels corner	Area with tyres fixed perpendicular to the ground and others not fixed.
	Cooperative physical challenge	A space where every two weeks a laminated poster and the material necessary to overcome the challenge was brought out (Velázquez-Callado, 2016).
	Free	The inner area of the yellow zone was left open with the intention of hosting unstructured recreational games such as chase games.
Blue or sporty	Datchball	A multi-sport track with two fields drawn horizontally.
	Free sport	Half multi-sports court with two horizontally movable goalposts for playing non-fixed sports.
	Colpbol or handball	Half a multi-sports court with two horizontally movable goals for playing these sports.
	Basketball	Baskets located at various points of the sports area.
	Table Tennis	Tables on which mobile nets were placed and bats were provided.
	Dartboards	Wall with targets drawn with different scores.
	Climbing wall/climbing	Wall on one side of the building with about 10 meters of climbing wall and padded floor.

Source: Compiled by the authors.

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Participants

Teachers and pupils were involved in the gathering of information ten semi-structured interviews were conducted with teachers. In the selection of teachers for convenience and accessibility, criteria were applied to achieve a certain heterogeneity in the discussion. Therefore, eight women and two men between the ages of 30 and 56, with different years of professional experience and longevity in the school (from one academic year to more than ten), who had different areas of specialisation (Physical Education, Management Team, Tutors, Social Integration Technician and Psychopedagogical Guidance Team) and who taught at different educational levels (from 1st to 6th year of Primary Education) took part. Pupils completed different research instruments in a random selection process with the intention of involving pupils from all levels of education... On the one hand, 66 people from 1st to 6th grade completed the graphical-numerical scale from 1 to 3 (31 boys and 35 girls, M=9.06 years, DT=2.05). On the other hand, 15 girls and 10 boys from 1st to 6th grade of Primary Education drew a picture of their playground before (girls, M=8.5 years, DT=1.99; boys, M=7.9 years, DT=1.45) and after the intervention (girls, M=9.13 years, DT=2.17; boys, M=8.2 years, DT=1.48). The survey involved 98 subjects from 3rd to 6th grade of Primary Education (47 girls and 51 boys, M=10.01 years, DT=1.2). The selection and access to the participating teachers and pupils after the intervention was conditioned by the situation of confinement experienced from March 2020 onwards, resulting in a loss of participants in the collection of drawings and graphical-numerical scales before and after the intervention.

Instruments

Interviews were conducted following recommendations of experts (e.g., Kvale and Brinkmann, 2009). A prior script designed by the research team was prepared with the intention of collecting the information that would allow the research objectives to be explored

(Table II). To ensure rigour in the interviews, a pilot interview was conducted to fine-tune the script and familiarise the interviewer. The ten interviews ranged in length from 17 to 36 minutes and were audio-recorded.

TABLE II. Design of the script in relation to the study objectives: example of questions

Research Objective	**Scripted Questions**
1. To analyse the changes in recreational activities and interactions during break time following an intervention in a school playground from a gender perspective.	Could you describe what a playground was like before the new changes were introduced: the games, activities, interactions...? Do you currently notice any differences between the most usual games or activities in boys and girls? If yes, which?
2. To investigate satisfaction with the recreational provision and organisation of recreational activities after the intervention and possible differences according to the gender of the pupils	How do pupils currently value the playground?

Source: Compiled by the authors..

The drawings, the purpose of which was for pupils to freely represent their breaktime, are useful tools that were used in previous research on this problem (Alonso-Sanz, 2017). This instrument was designed by the research team, leaving a white space for the drawing itself and collecting data on gender, age, educational level and an acronym to identify the pupils. The numerical scale 1 to 3 was included in this instrument and was accompanied by a graphic representation with faces, with level 3 being the highest level of the scale and identified by a smiling face and 1 the lowest level symbolised by a sad face. With the application of the drawings and the scale, the aim was to investigate the beliefs of pupils in the 1st and 2nd years of Primary Education. The survey was designed *ad hoc* to assess the intervention itself. It was applied to students from 3rd to 6th grade of Primary Education. Among other matters, questions related to gender, age, educational level, as well as one single-choice question and four multiple-choice questions related to recreation in the playground were included (Table III).

TABLE III. Examples of questions asked in the survey

Question type	Questions
Simple choice	My favourite area of the playground is... • Yellow or alternative recreation • Blue or sporty • White or rest
Multiple choice	On the playground... (you can tick two options) • Walking and chatting • Rest • Playing without materials (games like *zombie*, hide-and-seek…) • Playing with materials (skipping ropes, board games, caps…) • Play sports (basketball, handball, prison ball, datchball…) • Other

Source: Compiled by the authors.

Procedure

At the beginning of the 2019/2020 academic year, the project was presented to the management team and the school's faculty, who expressed their interest and agreed to participate in the project. Following this, informed consent was given and collected from all families, ensuring anonymous and confidential processing and the voluntary participation of the students in the research. During the months of November and December 2019, the instruments were designed and applied to collect the drawings and scales of the pupils, which were handed out by the tutors in their classrooms (with prior explanation and training of the tutors). The intervention took place at the end of December 2019 and the beginning of January 2020. The post-intervention data gathering was carried out in April 2020, during the period of confinement, applying all the instruments (survey, scales, drawings and teacher interviews) with telematic tools. The surveys, scales and drawings were collected using *Google Forms* through emails sent to the pupils' families. The teacher interviews were conducted through video calls, using the *Zoom* application (Figure III).

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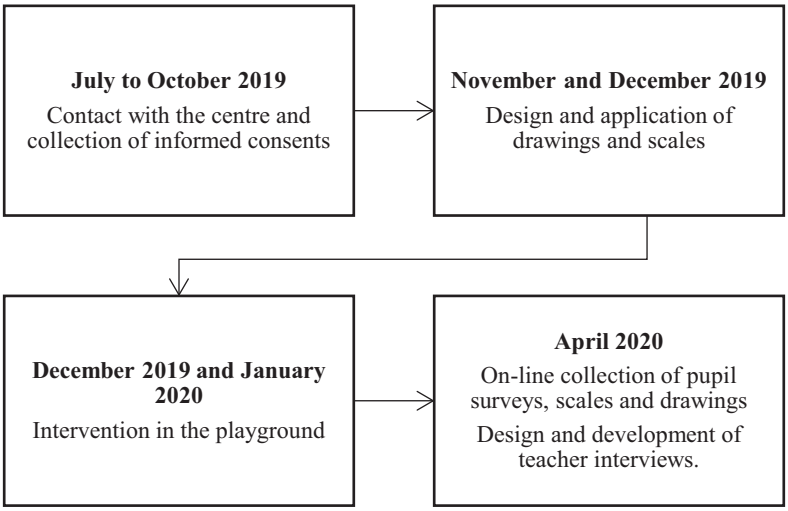
FIGURE III. Chronology of the research procedure



Source: Compiled by the authors..

Data analysis

The data collected from teachers and pupils were analysed in a process of triangulation of sources. The information from the teacher interviews was processed with Atlas.ti, version 8. We proceeded with a deep and simultaneous inductive analysis (Saldaña, 2015), with three coding cycles: open, axial and selective (Strauss and Corbin, 2016). The open coding was inductive and led to the identification of categories about playground games and the changes that emerged around them after the intervention. Axial coding established relationships between categories and facilitated their arrangement into groups of categories. For this purpose, a numerical key (2., 2.1., 2.1.1...) was used to rank the relationships between categories. Finally, selective coding refined the categories and inductively deepened some of them, resulting in the appearance of new categories, which were identified with the acronym X in the previous numerical key (e.g. 2.X. or 2.4.X) to maintain the rank and relational

order of the analysis. The categories and their relationships are presented in the results (Figures IV, V and VI). The coding of the pupils' drawings was inductive and the categories are shown in the results (Table IV). In addition, in all qualitative coding processes, Atlas.ti tools were used to generate networks and explore code-code and code-document co-occurrence. Data from the scales and the pupil's survey were processed with SPSS version 28. Descriptive analyses of frequencies, percentages and means were carried out. Pearson's X^2 tests were applied to analyse the differences between the pupils' preferred area and gender and the pupils't-test to analyse the differences in the graphical-numerical scale before and after the intervention, calculating the size of the effect with Cohen's formula.

Results

Analysis of changes in recreational activities and interactions after the intervention from a gender perspective

The interviews with teachers showed differences in the type of recreational activities chosen by girls and boys, with physical and sporting activities being less common among girls. However, despite this difference, teachers reported that female recreation after the intervention was more active, linking this to participation in games in the alternative recreational area and some sports, as illustrated below (Figures IV and V):

> "Before the change ... the girls, in general, what they used to do was to stand on the stairs talking, eating breakfast and at most walking around ...". (Therapeutic Pedagogy teacher).
>
> "I have observed a greater activity and participation in other types of activity that girls did not used to have and which neither existed previously, as the only thing they did was either to walk around or sit down" (Therapeutic Pedagogy teacher).
>
> "With the launch of the playground programme I have seen that all of this has become much more equal and it is fantastic to see how both boys and girls are playing team sports in what used to be an exclusively male preserve" (6th grade teacher).

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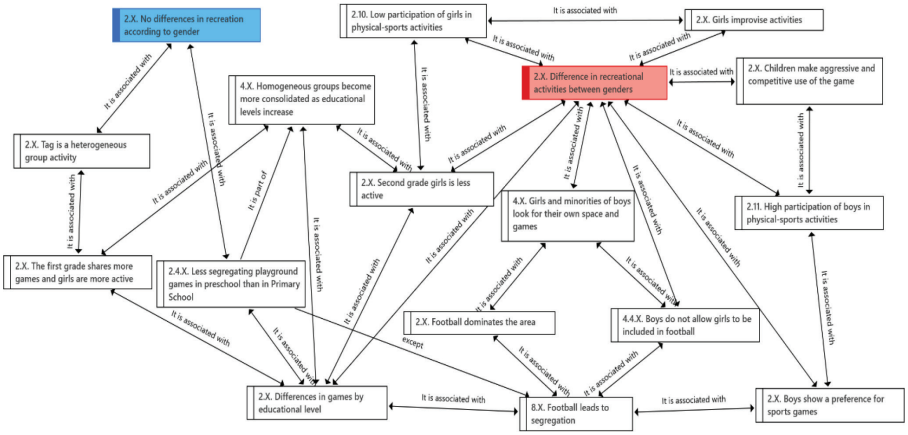
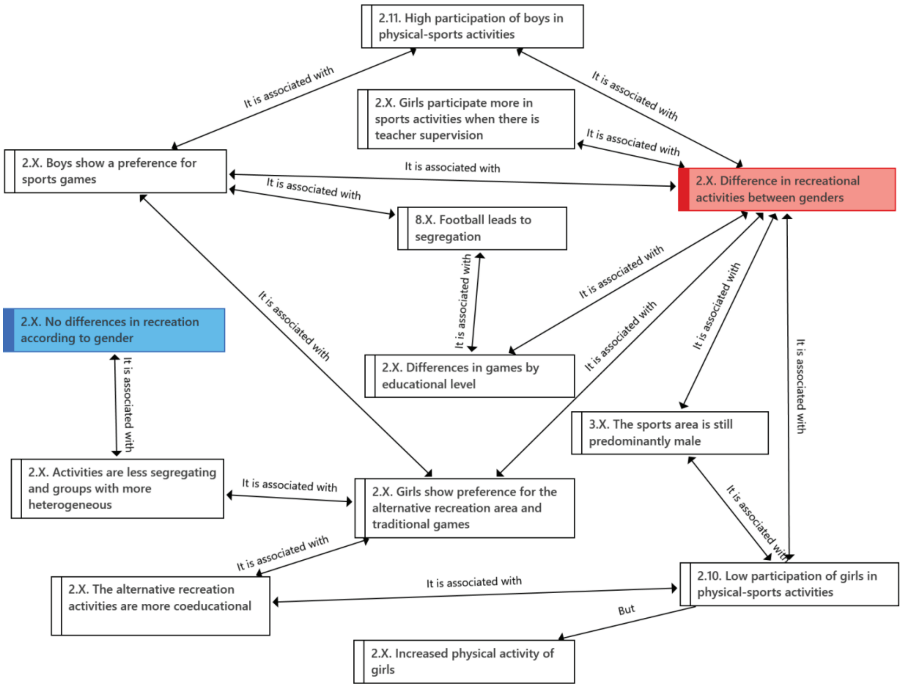
FIGURE IV. Recreation before the intervention in the playground from a gender perspective



Source: Compiled by the authors.

FIGURE V. Recreation after the intervention in the playground from a gender perspective



Source: Compiled by the authors.

However, sports activities were identified as the most segregating, even after the transformation. The yellow or alternative recreational area encouraged the formation of heterogeneous groups and mixed participation, although girls showed a greater preference for this area. This is how the teacher expresses it:

> Before the change - "Boys more sports and girls more other types of games, but there wasn't much difference either" (3rd grade teacher).
>
> Before the change - "Spaces that were left for football, always boys, and that really caught my attention because in other schools where I have been there is more balance, but here thç truth is that I haven't seen any.... (1st grade teacher).
>
> After the change - "The other area where there is the rope, the slackline, the tyres, where the traditional games are… well, I have seen that there is more balance between the participation of boys and girls now" (1st grade teacher).

Digging deeper into the alternative recreational area, there was some disagreement about the skipping rope games, which were perceived as a segregating activity predominantly carried out by girls:

> "Skipping rope games are usually more for the girls" (Therapeutic Pedagogy teacher).

Likewise, there was a concerning issue for the teaching staff before and after the intervention: the segregation of students generated by football However, the teaching staff acknowledged that this concern was greater before the intervention. In fact, after the transformation of the playground, the day designated for playing football in the open sports area lost significance for the students. The following extracts justify these results:

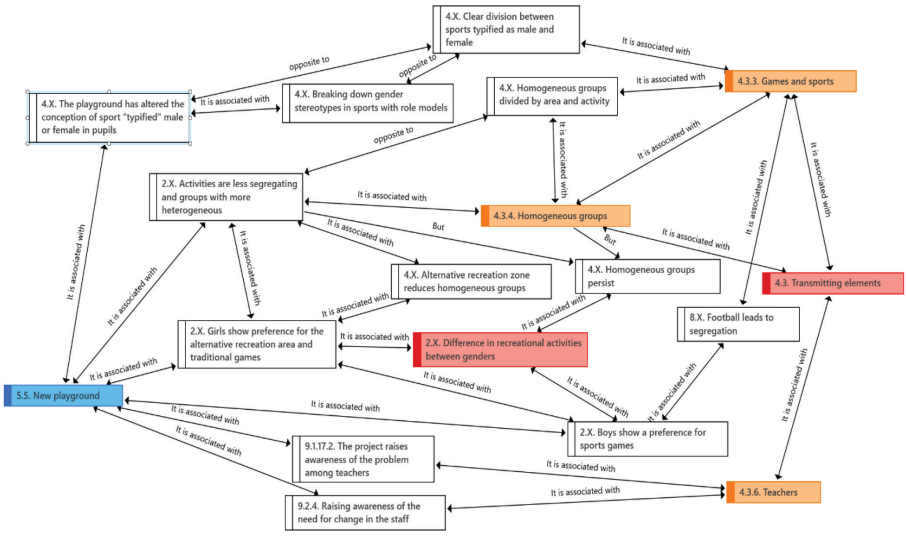
> "Football continues to be considered and played more by boys, but perhaps it is somewhat inevitable, but obviously children have more possibilities to engage in other types of games, and the girls as well - after changing the playground." (Management Team).
>
> "Footballs for all classes, those balls were only assigned to the boys, who were the ones who wanted to play football, some girls, but very few, were admitted into those groups, but not the majority of them. If a girl wanted to play, she was not well received because they said she didn't

play well enough or that they played better, and the rest of the spaces, where football was not played, were used by the rest of the students, (...) and they would walk around in areas like asking for permission to be there without disturbing the football activity." (4th grade teacher).

"Furthermore, they had a specific day when they could use a space, which I believe was initially used more for football, but later they didn't give that particular day so much importance, but rather they preferred to play datchball another day... it's not something so concerning for them now." (4th grade teacher).

Analysing the gender stereotypes manifested at break time, the interviews with teachers showed that the intervention had an impact on these (Figure VI), affecting three elements: the games and sports themselves (with greater female participation in active games); the grouping of pupils (with heterogeneous groups appearing more frequently); and the teachers themselves (more aware of the problem and more involved in break time). Despite the differences between pupils' and students' play preferences, the types of games and activities offered ensured the formation of more homogeneous groups, which was highlighted by the teachers.

FIGURE VI. Influence of intervention on elements that transmit gender stereotypes



Source: Compiled by the authors.

> "In the rest area (...) there are still a larger number of girls who come down to draw, colour... but it is true that in the other area where there were benches and cushions, it is true that there are now many boys (...) games such as the skipping rope have attracted many boys from my class, the wheel area has led to many mixed groups being there to talk quietly or play..." (5th grade teacher).

Likewise, the display of female or male athletes in stereotyped sports, located in the rest area, was positively valued by the teaching staff, as expressed by the following teacher:

> "What surprised me the most was the posters at the entrance, the posters of sportswomen, ... I thought it was great that this subject, which is a bit theoretical, has been put into practice and I have realised that sport can help a lot to break down these barriers" (2nd grade teacher).

In addition, the playground intervention also had an impact on teachers and their belief systems, raising awareness of the problem and engaging them in the need for change, which supported the development of equal opportunities for pupils in the playground. This is justified in the following quotations:

> "It made me think and reflect on how we influence gender stereotypes in an unintentional way and at times when we think it is not happening" (4th grade teacher).

> "In the end it is true that you are used to very similar playgrounds (...) and you give it the normality that you see, (...) so you don't think in depth because it is true that there they are, always in that corner, or they are always playing football in the centre and they sort of make themselves the owners" (3rd grade teacher).

The teachers' perspective on the types of play at breaktime was consistent with the results of the surveys and the students' drawings (Table IV). Particularly in relation to the drawings, it could be appreciated how static poses were more frequently represented by the girls (six drawings), although their representation was reduced in the drawings after the transformation of the playground (one drawing). Furthermore, two male pupils also showed a preference for passive activities, depicting the rest area in their drawings or depicting themselves having breakfast at breaktime. Alternative play activities, such as tyres (seven representations), running games (especially before the change, nine representations), jumping activities (before and after the

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change, with two and three representations, respectively), drawings on the ground (six drawings) or tyres between trees (four drawings), among other activities, were most frequently drawn by female pupils. In contrast, the boys showed a greater preference for sporting activities, depicting a wide variety of sports in their drawings, such as football (four drawings), handball, prison ball or free sport (one drawing of each). This and other sports, such as basketball or tennis, were depicted by male and female pupils, while boys also depicted alternative activities, such as tyres (3 drawings), drawings on the ground (two depictions) or climbing (3 drawings).

TABLE IV. Recreation represented by students before and after the intervention from a gender perspective

Activities	**Number of citations**			
	Prior to the intervention,		**Post intervention.**	
	Girls	**Boys**	**Girls**	**Boys**
Tyres	0	0	7	3
Climbing	0	0	5	3
Drawing on the ground	0	0	6	2
Slacklines between trees	0	0	4	1
Jumping activity	2	0	3	0
Rest area	0	0	1	2
Corporal expression	0	0	2	1
Basketball	1	0	1	1
Football	2	3	2	0
Table tennis	0	0	1	1
Prisonball	0	0	0	1
Handball	0	0	0	1
Swings	0	0	1	0
Datchball	0	0	0	1
Free sport	0	0	0	1
Locomotor activities: tag, running...	9	1	1	0
Presence (static characters)	6	0	1	0
Skipping rope zone	0	0	1	0
Having breakfast.	0	1	0	0

Source: Compiled by the authors.

According to these results, the surveys showed that the favourite activity of the girls was passive, specifically, walking and talking (42.5%, Table V). In the case of boys, the favourite activities were sports (32.3%).

Within the framework of physical-sports activities, it seems relevant that non-sports games, with or without materials, showed more balanced proportions of female students (12.6% and 29.9%, respectively) and male students (14% and 25.8%, respectively).

TABLE V. The most common playground activities, answers to the multiple-choice question: "On the playground … (you can tick two options)"

Activities	Gender			
	Girl		Boy	
	n	%	n	%
Walking and chatting	37	42.5	24	25.8
Rest	2	2.3	2	2.2
Playing without materials (*zombie*, hide and seek...)	26	29.9	24	25.8
Playing with materials (skipping ropes, board games, …)	11	12.6	13	14
Playing sports (basketball, handball, prisonball, datchball…)	8	9.2	30	32.3
Other	3	3.4	0	0
Totals	87	100	93	100

Note: n=number; %=percentage.
Source: Compiled by the authors.

According to the findings from the interviews with the teaching staff, the surveys revealed that gender influenced the choice of the preferred area in the playground, $\chi^2(2)=13.75$, p=<.001. The preferred areas for girls were the alternative recreation area (n=22) and the rest area (n=12), whereas boys more frequently chose the sports area as their favourite (n=33, Figure VII).

The analysis of the areas by type of activity and gender was consistent with the evidence of the drawings and interviews. The boys preferred the bottle caps corner (n=9), cooperative physical challenges (n=15, Table VI) and almost all the games in the sports area (Table VII). Female pupils were more attracted to the rest of the corners in the rest area than the male pupils (Table VIII), except for the *chilling zone* (21 girls and 19 boys), as well as other games such as skipping ropes (n=16), floor drawings (n=10), and climbing (n=24). The games that showed the greatest similarity between the number of girls and boys who frequented them were: (a) the *chilling zone* corner of the blue zone; (b) the knots, the wheels and balance, the elastic rubbers and spider web of the yellow zone; (c) the datchball and the dart boards in the sports area.

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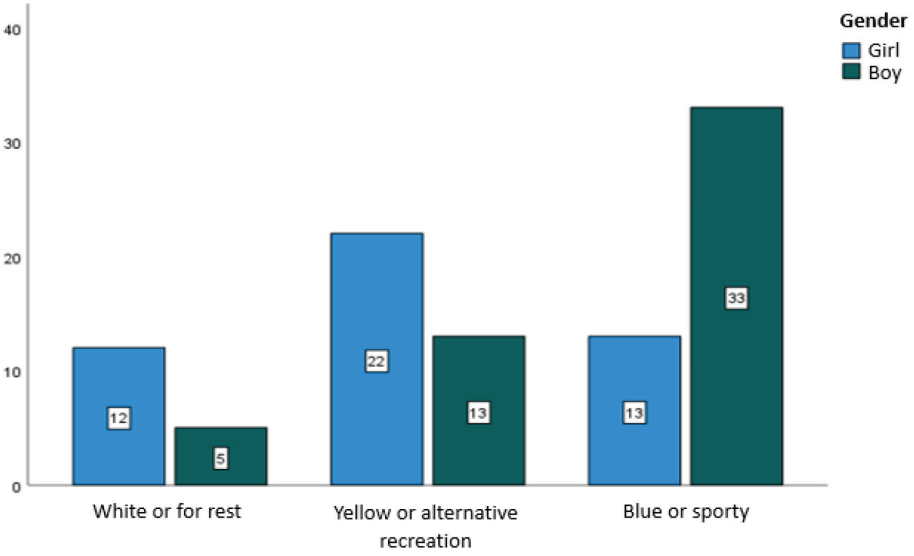
FIGURE VII. Preferred playground areas based on the gender of pupils, responses to the simple choice question: "My favourite area in the playground is..."



Source: Compiled by the authors.

TABLE VI. The favourite corners and games in the alternative recreation area depending on the gender of pupils. Answers to the question: "In the yellow area or alternative leisure area, the games and activities in the playground that I like the most are... (you can tick two)"

Corner/Game	Gender			
	Girl		Boy	
	n	%	n	%
Drawings on the playpground floor	10	13.3	5	6.3
Bottle caps corner	0	0	9	11.3
Slackline & spider web corner	5	6.7	5	6.3
Knots Corner	2	2.7	3	3.8
Skipping Corner	16	21.3	5	6.3
Balance and wheels corner	36	48.0	37	46.3
Cooperative physical challenge	3	4	15	18.8
None	3	4	1	1.3
Totals	75	100	80	100

Note: n=number; %=percentage; 28 female students and 29 male students marked two corners as favourites.
Source: Compiled by the authors.

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TABLE VII. The favourite corners and games in the sports area, based on pupils' gender. Answers to the question: "In the blue area or sports area, the games and activities in the playground that I like the most are... (you can tick two)"

Corner/Game	Gender			
	Girl		Boy	
	n	%	n	%
Datchball	23	31.1	21	23.1
Free sport	14	18.9	28	30.8
Colpbol or handball	4	5.4	9	9.9
Basketball	4	5.4	8	8.8
Table Tennis	1	1.4	9	9.9
Climbing wall or climbing	24	32.4	15	16.5
Dartboards	1	1.4	1	1.1
None	3	4.1	0	0
Totals	74	100	91	100

Note: n=number; %=percentage; 27 female students and 40 male students marked two corners as favourites.

TABLE VIII. The favourite corners and games in the white area based on pupils' gender, responses to the question: "In the white area or rest area, the games and activities in the playground that I like the most are... (you can tick two)"

Corner/Game	Gender			
	Girl		Boy	
	n	%	n	%
Chilling zone	21	36.2	19	30.6
Painting Corner	13	22.4	8	12.9
Board Game Corner	22	37.9	19	30.6
None	2	3.4	16	25.8
Totals	58	100	62	100

Note: n=number; %=percentage; 11 female students and 11 male students marked two corners as favourites.

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Satisfaction with the offer of recreation and organisation of breaktime after the intervention according to the gender of the pupils

The changes significantly influenced the satisfaction with the playground, which was higher after the intervention (M=2.65, DT=0.59) compared to before (M=2.8, DT=0.40), as confirmed by the t test, t(65)=-2.09, p=.04. Applying Cohen's formula, the effect size was moderate, d=.58. The t-test did not report significant differences in increased satisfaction based on student gender. Likewise, the findings of the interviews confirmed these results and the teachers declared to perceive their students happy and interested enjoying the new dynamics of the playground (14 citations):

> "Well, they rate it from 1 to 10, and it's a 10. I know this personally because they have told me that they are extremely happy and they are looking forward to finishing some activities so they can participate in all of them" (1st grade teacher).

Discussion

The first objective of this work was to analyse the changes in the activities and interactions that arose in recreation during breaktime after the intervention from a gender perspective. Regardless of the source of information (teachers or students) and the instrument (drawings or surveys), the results demonstrated how the girls showed a greater preference for the rest area and more passive recreational activities, such as walking and talking; while the boys presented a greater inclination towards more active games, especially those included in the sports games area and some of the alternative recreational areas, such as bottle caps or cooperative physical challenges. This dual perception of recreation was found before and after the change in the playground. These results contribute to reinforce the trend found in multiple studies reflecting that during breaktime girls show lower levels of physical activity (Méndez-Giménez, 2020; Ridgers et al., 2011; Suga et al., 2021), even after intervention in the playground (Baquet et al., 2018). Along the same lines, the findings are consistent with those obtained in other studies (Massey et al., 2018; Graham et al., 2021), showing how the type of play acts as a dividing element, which

divides groups of pupils, with girls being more likely to develop more sedentary behaviours and preferring areas that are more social and boys being more likely to prefer active games and more sporty areas.

However, the results found that the active recreation of female pupils and some passive recreational habits of male pupils were altered after the intervention. According to the pupils' drawings and the teachers' statements, the bipolarity of a breaktime in which the boys mostly played team sports and ball game sports and the girls often engaged in more passive types of activities or locomotor games of jumping or running, was less pronounced after the intervention in the playground. Despite the girls' preference for more passive games, which was justified in the interviews, drawings and surveys, the results showed that the intervention succeeded in increasing the participation of female pupils in active games, in addition, the number of games in which both boys and girls participated was found to be greater. These findings contrast with those obtained by Castillo-Rodríguez et al. (2018), whose intervention, related to the redistribution of space and the provision of activities in those spaces, led to an expansion and diversification of active recreation chosen by girls. However, it resulted in a reduction in the number of games chosen by boys, with football being the most practiced activity (around 60% of boys). In contrast, the results are consistent with the study by Graham et al. (2021), where a social-ecologically oriented intervention, which addressed both active and passive recreation, diversified the number of activities played by pupils. Regarding this topic, the pupils' drawings and surveys, as well as interviews with teachers, found that the introduction of certain sports games, such as datchball or climbing, and some games included in the alternative recreation area, such as playground drawings, skipping rope games, or balance games on tyres, were responsible for the increase in active recreation among girls. In addition, the surveys showed how the *chilling zone* or board games contributed to the boys' finding spaces for passive recreation in the dynamics of the playground. The increase in the participation of girls in more active playful dynamics was reflected in other interventions such as those of Castillo-Rodríguez et al. (2018), Graham et al. (2021) or Massey et al. (2018). In line with the work of Graham et al. (2021), the findings of this research reinforced that the climbing areas, such as climbing walls or areas with ropes or tyres, contributed to increased levels of physical activity in girls, and may minimise the consequences of hegemonic masculinity in a space

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dominated by mostly male sports grounds (Amholt et al., 2022; Salas and Vidal-Conti, 2020; Spears, 2020).

In accordance with this reorganisation and shared offer of playground games, the results found that certain sports activities, such as datchball, and several of the alternative recreational games hosted a more balanced number of girls and boys, most notably the tyre balancing area and the knots corner. Likewise, board games and the *chilling zone* generated spaces for shared play between pupils in the rest area. Although the results of the surveys and the drawings reflected that both female and male pupils used these spaces, it is not possible to assert that these games were played with mixed groups. However, the results of the teacher interviews complemented this information, identifying a greater number of games played with heterogeneous groups after the change in the playground. The findings are in line with that obtained by Gil-Madrona et al. (2014), who showed that at recess girls and boys only sometimes shared play, as well as linking to previously discussed arguments, such as the gender separation that can be caused by the games themselves (e.g., Massey et al., 2018; Graham et al., 2021; Luis et al., 2020). This fact reinforces the idea that the types of groupings and games generated, and both elements put in relation to one another, can contribute to the transmission of gender stereotypes at breaktime (Boyle et al., 2003), at the same time they may favour non-egalitarian relationships (Bobby and Yoyok, 2023; Gil-Madrona et al., 2014). Therefore, considering that the playground and playing games are social spaces in which pupils freely express their identity and values, thereby building gender through their relationships (Spears, 2020), there is a growing interest in promoting positive interactions and a shared play at breaktime, in order to teach and learn to live together with equal gender opportunities (Salas and Vidal-Conti, 2020).

In the opposite perspective, the findings suggest that there are certain segregating games that may favour the reproduction of hegemonic models, such as playground drawings, the painting corner or, as already analysed, sports ball games. In particular, the traditional games in the alternative recreation area deserve special attention, which, according to the results of this study, may act in a segregating manner. Surveys and drawings of the students showed that bottle caps were played only by boys and the skipping ropes were a predominantly female activity. Despite the coeducational advances in the dynamics of traditional games,

the sexist cultural heritage and gender-typed practice was maintained during breaktime in the context of the study, which gives rise to the debate on the possible use of these games in the playground as positive discrimination strategies for the promotion of recreation between girls or boys (Trigueros, 2009).

Likewise, the fact that some of these games still reflect gender-related beliefs even after the intervention emphasises the need to act on the recreational activities of both girls and boys in the school playground from systemic perspectives, considering intrapersonal, interpersonal, environmental, and political-organisational factors, with multilevel interventions that alter pupils' behaviour in the long term (Graham et al., 2022; Salas, 2022). Future developments of this or other interventions in Primary Education must place emphasis on an architecture of space and a provision of more coeducational resources based, among other components, on existing government supports and programmes, such as those reflected by Saldaña (2020) in Barcelona, Bilbao or Madrid that have driven multiple transformations; but they must also attend to the gender ideology of the educational community (families, teachers and students), whose transformation can be another support for the achievement of more lasting changes during playtime, which have an impact on the physical, psychological and social health of students (Méndez-Giménez, 2020; Salas, 2022), providing opportunities for joint and healthier play to girls and boys (Bobby and Yoyok, 2023). In this line, the formative and sensitising inclusion of pupils in the design of school playgrounds, for the application of learning about playground situations and the development of social and citizenship skills, is a recommended co-educational strategy (Salas and Vidal-Conti, 2020) that can contribute to minimising gender stereotypes in the recreational activities (active and passive) that take place in playgrounds. In fact, some previous interventions that have included pupils obtained positive results on coexistence and the promotion of physical activity in other contexts (Castillo-Rodríguez et al., 2018; Méndez-Giménez and Pasallá-Manteca, 2018; Saldaña, 2020).

In relation to the second study objective, to investigate satisfaction with the recreational provision and organisation of the playground after the intervention according to pupils' gender, it was found that the transformation of the playground significantly increased pupil satisfaction, as recorded in the graphic-numerical scales and endorsed by the teachers. Furthermore, the fact that no significant differences were found

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according to gender shows that the changes contributed to the overall well-being of pupils and that the attention and regulation of recreation (both active and passive) could be a positive response to the tastes and interests of all pupils. These results were consistent with what was found in studies such as that of Méndez-Giménez and Pasallá-Manteca (2018) or Castillo-Rodríguez et al. (2018), that showed a positive assessment of interventions in the playground, without differences depending on gender.

This study had the limitation of the confinement situation as of March 2020, which made it difficult to carry out a longitudinal follow-up of the changes implemented in the playground, as well as making it impossible to collect the information in person, resulting in a loss of participants in the study. These limitations outline future lines of research, such as long-term monitoring of recreational activities in this context in order to find out the evolution of the pupils' recreational practices during school breaks. Furthermore, according to a systemic perspective, it would be of interest to understand the perceptions of other stakeholders, considering the training and awareness of families towards a gender perspective as a determining factor within a macrosystem with direct implications on the behaviours of primary school pupils during playtime (Salas, 2022).

Conclusions

Regarding the first study objective, to analyse the changes that emerged in recreational activities during playtime after an intervention on a school playground from a gender perspective, it was found that the intervention on the playground altered the recreational habits of the pupils. According to teacher interviews, gender differences were reduced, increasing the opportunities for recreation of girls and minority groups of boys. However, all the sources and techniques found differences in the recreational activities of girls and boys, both before and after intervening in the playground, showing boys to be more active and more inclined to use the sports areas and the girls more passive and more inclined to use rest or alternative recreational areas. The surveys and drawings reported games that reproduce the traditional segregationist model as: (a) most of the sports games, played more by boys, with the exception of climbing

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with a higher presence of girls; (b) most of the games in the rest and alternative zone, played more by girls, with the exception of cooperative physical challenges and bottle caps which had a higher presence of boys. However, this study provided valuable data for teaching teams and educational administrations in the future design of more coeducational playground spaces. It identified certain shared active recreational activities, such as datchball or balance zones with tyres, and passive activities, such as the *chilling zone* or board games.

In relation to the second objective of the study, to investigate satisfaction with the playground intervention and possible differences according to pupils' gender, the results of the interviews and the graphic-numerical scales showed that there was a significant increase in appreciation of the playground regardless of pupils' gender. Accordingly, it can be argued that, in spite of altering the dynamics of the students' use of the playground, the development of this intervention, in addition to generating greater recreational opportunities for everyone, was perceived in a positive sense by the participants in this work. In line with these findings, the results support the development of future interventions in this context and encourage attention to breaktime to promote pupils' well-being in other contexts.

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Bibliometric study on Quality Education

Estudio bibliométrico sobre la Educación de Calidad

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Abstract

Meeting the 17 sustainable development goals (SDG) declared in the 2030 Agenda is vital for our survival. Its fulfillment is incomplete without achieving an education for sustainable development. Previous bibliometric studies partially analyze the scientific production related to Quality Education, which does not allow full knowledge of its bibliometric behavior. For this reason, the objectives of this study are to analyze the scientific production related to SDG 04 during the 2017-2021 period and verify its level of integration with the other SDG. The Clarivate Analytics Incite tool was used to obtain the information and, to search for the documents and their metrics, the Web of Science Core Collection. 189,364 documents were identified from them, 141,372 were analyzed, distributed as follows: articles (135,476) and reviews (5,896). For the analysis and representation of the data, the VOSviewer tool was used, as well as Tornado and Sankey type diagrams. The results show that the terms with the highest co-occurrence were: COVID-19 (7,366), Mental health (5,903), Higher Education (5,659), Education (5,547), Gender (5,152), Sustainability (4,689), Food insecurity (4,394),

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Depression (3,444), and Health (3,338). The most influential sustainable development goals with Quality Education were 03 (Good Health and Well-being), 05 (Gender Equality) and 10 (Reduced Inequality). In relation to the countries with more than 1,000 published documents, the following stand out: the United States (46,937), the United Kingdom (14,611), Australia (11,659) and the People's Republic of China (10,307). The analysis of the scientific production justifies those efforts toward curricular sustainability and the integration of the sustainable development goals are still insufficient.

Keywords: bibliometrics, education, quality education, sustainability, statistical studies.

Resumen

El cumplimiento de los 17 objetivos de desarrollo sostenible (ODS) declarados en la Agenda 2030 es de vital importancia para nuestra supervivencia. Su cumplimiento es incompleto sin lograr una educación para el desarrollo sostenible. Estudios bibliométricos previos analizan parcialmente la producción científica relacionado con la *Educación de Calidad* lo cual no permite conocer totalmente su comportamiento bibliométrico. Por tal motivo, los objetivos de este estudio son analizar la producción científica relacionada con el ODS 04 durante el periodo 2017-2021 y comprobar su nivel de integración con los restantes ODS. Se utilizó la herramienta Incite de Clarivate Analytics para la obtención de la información y, para la búsqueda de los documentos y sus métricas, la *Web of Science Core Collection*. Se identificaron 189.364 documentos. De ellos, se analizaron 141.372 distribuidos de la siguiente manera: artículos (135.476) y revisiones (5.896). Para el análisis y representación de los datos se utilizó la herramienta VOSviewer así como diagramas de tipo Tornado y de Sankey. Los resultados muestran que los términos de mayor co-ocurrencia fueron: COVID-19 (7.366), Mental health (5.903), Higher Education (5.659), Education (5.547), Gender (5.152), Sustainability (4.689), Food insecurity (4.394), Depression (3444), y Health (3.338). Los objetivos de desarrollo sostenible de mayor influencia son los objetivos 03 (Salud y Bienestar), 05 (Igualdad de Géneros) y 10 (Reducción de las Desigualdades). En relación a los países con más de 1.000 documentos publicados, se destacan: Estados Unidos (46.937), Reino Unido (14.611), Australia (11.659) y República Popular China (10.307). El análisis de la producción científica justifica que aún son insuficientes los esfuerzos hacia la sostenibilidad curricular y la integración explícita de los objetivos de desarrollo sostenible.

Palabras clave: bibliometría, educación, educación de calidad, sostenibilidad, estudios estadísticos.

Introduction

The Sustainable Development Goals (SDG) are a current and future perspective of the construction of a sustainable world, with broad collaboration between economic, social, environmental, developmental, and sustainability factors (Sinakou et al., 2017). For this, the conception of a type of thinking that is systemic, complex, and global, about ecological and economic factors, or from a perspective of «planet», society, and «prosperity» is fundamental (McKenzie & Abdulkadri, 2018), through citizen action, participation, and empowerment.

To achieve the above, 17 SDG were defined (Figure I), as well as 169 inter-related goals, at least theoretically, to which all countries must contribute according to their policies and laws in accordance with the requirements from the Agenda 2030 (Armitage et al., 2020).

It has been reiterated in the scientific community that political strategies are marked by their isolated and particular characters, so that the achievement of the SDG is very challenging (García et al., 2020). One

FIGURE I. Objectives of sustainable development

Source: United Nations (2018a).

of these objectives is 04 (Quality Education), which was conceived with a close relationship with the other SDG, by promoting the training and development of competences, attitudes, skills, values, and ways to understand and act in coherence with sustainable development.

In the official reports from the United Nations, it was declared that more than 250 million children are illiterate or do not have a way to access an educational institution (United Nations, 2019), underlining the need to eradicate or decrease the existing social, economic, and developmental divides in all countries.

Education is one of the main pillars of humanity, because, as a social and cultural process, it brings human beings closer to understanding, reflection, knowledge, and sustainable transformation for permanent learning, in coherence with society and nature (Estrada-Molina et al., 2022). The partial achievement of this objective is sometimes viewed from a general and quantitative perspective in the European Commission report "*Education and Training 2020*", and the annual report from the *"Organisation for Economic Co-operation and Development"* (OECD), which can be consulted (reports from the previous year) in the European Commission (2021) and the Organisation for Economic Co-Operation and Development (2021), respectively.

Quality education (SDG 04) is often studied from micro (family, friends, social relations –face-to-face or virtual), meso (society, social groups, school, education institutions, organizations, etc.), and macro (country level and its policies) perspectives. Thus the need for the social coherence and cohesion between the different socialization agents and the sustainable responsibility, aside from citizen awareness, political responsibility, access and the opportunities of quality education (Boeren, 2019; Estrada-Molina & Fuentes-Cancell, 2022). Even though many European Union (Pleśniarska, 2019), American (Corbett & Guilherme, 2021), Asian (Jermsittiparsert & Sriyakul, 2020), and African (Nafukho & Muyia, 2021) countries have made great advances on the implementation of SDG 04, it is still insufficient for meeting the indicators and goals established in this objective.

The studies conducted have demonstrated the interest of the scientific community to contribute, through social and scientific actions, towards the achievement of the SDG 04 objectives. However, how has academic production on SDG 04 behaved in the last five years? Have the publications on SDG 04 achieved integration with the other SDG? These questions, among other initial ones, motivated the performance of this bibliometric study.

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Bibliometric studies and systematic reviews about SDG 04

In the search performed (2017-2021) in the *Web of Science* (WoS) and Scopus, not many bibliometric studies and systematic reviews were found related with SDG 04. Of these (Table I), five were bibliometric studies, six were systematic reviews, and one a meta-analysis.

Most of them (Ferrer-Estévez & Chalmeta, 2021; Meschede, 2020; Prieto-Jiménez et al., 2021; Yeh et al., 2022) were characterized for conducting a bibliometric analysis of all the SDG, which in some sense, does not allow delving into a specific objective, although it establishes some approximations of quality with respect to their relationships. Other similar studies (Diksha & Chakravarty, 2022; Sweileh, 2020) have analyzed these objectives, but from the perspective of SDG 03, framing the strong relationships between this objective and Quality Education.

Only five studies (Crawford & Cifuentes-Faura, 2022; Palomino et al, 2022; Acosta-Castellanos et al, 2021; Avelar et al., 2019; García et al., 2020) have focused on SDG 04. The authors García et al (2020) performed a meta-analysis of 240 documents present in Scopus and WoS, through an initial extrapolation of academic production, without a co-analysis of keywords or a co-authorship analysis. Meanwhile, Avelar et al. (2019) performed a systematic review of 193 articles, and underlined, from the information collected from them, co-authorship networks, periodical publications, higher education institutions (HEI), and the most influential countries. However, as only a small sample was selected, their results did not provide a comprehensive perspective of SDG 04.

Palomino et al. (2022), in their qualitative systematic review (18 documents), analyzed the attitudes and competences of the educators for achieving education for sustainable development, although they did not analyze the indicators of academic production. Acosta-Castellanos et al. (2021) performed a systematic review with publications published between 1987 and 2021 related with education for sustainable development, associating it with SDG 04, but without identifying the indicators of academic production. Lastly, Crawford & Cifuentes-Faura (2022) initially analyzed the impact of COVID-19 on SDG 04, but did not provide an analysis of academic production.

The studies referenced show the interest of the academic community on SDG 04, its impact, trends, lines of research, and academic production. The studies published are not able to fully characterize the scientific production on this SDG.

TABLE I. Bibliometric studies and systematic review on SDG 04

Studies	Type of study	Sustainable development objectives	Source of data	Period
Yeh et al (2022)	Systematic review	All the SDG	WoS	2013-2022
Crawford & Cifuentes-Faura (2022)	Systematic review	ODS 04	PsycInfo, ERIC and Academic Search Ultimate	2020-2021
Diksha & Chakravarty (2022)	Bibliometric study	All the SDG centered on SDG 03	Scopus	2015-2019
Palomino et al (2022)	Systematic review	ODS 04	Scopus and WoS	
Ferrer-Estévez & Chalmeta (2021)	Systematic review	All the SDG	Scopus and WoS	2015-2020
Prieto-Jiménez et al (2021)	Bibliometric study	All the SDG	WoS	2015-2020
Acosta-Castellanos et al (2021)	Systematic review	SDG 04 and education for sustainable development	Science Direct, Scopus and ERIC	1987-2021
Sweileh (2020)	Bibliometric study	All the SDG centered on SDG 03	Scopus	2015-2019
Meschede (2020)	Bibliometric study	All the SDG	Scopus and Web of Science (WoS) Core Collection	2015-2019
García et al (2020)	Meta-analysis	ODS 04	Scopus and WoS	2015-2020
Avelar et al (2019)	Systematic review	ODS 04	WoS (Social Sciences Citation Index (SSCI) and the Emerging Sources Citation Index (ESCI))	2015-2018
Körfgen et al (2018)	Bibliometric study	All the SDG centered on scientific production in Austria	Publications in official university repositories	2013-2017

Source: Compiled by authors.

For this reason, this bibliometric study seeks to (1) identify the main sources of publications on SDG 04; (2) show and analyze the main sources of scientific collaboration from the perspective of a co-authorship network and a co-authorship map according to country; (3) identify the most-utilized terms; (4) determine the existing flow between SDG 04 and the other SDG; (5) determine the most frequent keywords, and (6) show,

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from the scientific production related with SDG 04, the universities with the greatest scientific production.

Method

The objectives of the present study were to analyze the scientific production related with SDG 04 during the 2017-2021 period, and to verify its level of integration with the remaining SDG. To achieve this objective, a bibliometric study was performed, as this type of study offers strategies, tools, methods, and techniques, to inquire and analyze the scientific production from different perspectives and aims (Mukherjee et al., 2022; Narin et al., 2016).

To achieve these objectives, the following research questions were posed:

- Question 1. What are the main sources of publications related with Quality Education?
- Question 2. What are the main sources of scientific collaboration?
- Question 3. What are the most utilized terms in publications related with SDG 04?
- Question 4. How does the proportion of the amount of flow observed between the SDG behave?
- Question 5. From the perspective of SDG 04, what are the top 20 universities with the greatest scientific production? With what other SDG is the Education research at these universities related with?

Sources of information and search strategy

To select the publications related with SDG 04, the filters provided by *Clarivate Analytics* in the platform InCites were utilized. This platform was selected, as it can determine if a publication indexed in the *Web of Science* (WoS) is related with one or many SDG (García, 2022).

The study was limited to publications related with SDG 04 present in the *Web of Science Core Collection* published between 2017 and

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2021. The system offered a result of 189,364 publications, twenty times that indicated in similar studies by Momete and Momete (2021); Prieto-Jiménez et al. (2021) and Salvia et al. (2019).

The document obtained was filtered to select the UT (*Accession Number*) of the publications, to afterwards download, from the *Web of Science Core Collection* the information on *author, title, source, abstract, keywords, reference cited and use, affiliations,* and*, document type*. From all of these documents (189,364), 141,372 were chosen, classified as: articles (135,476) and reviews (5,896).

When searching for the 141,372 documents in the *Web of Science Core Collection, v*arious cycles were utilized with a maximum of 36,000 manuscripts, utilizing the tags UT and OR for this. The research was conducted between the months of June and July, 2022.

Selection and representation of the information

The functionalities of VOSviewer were used to (1) analyze the scientific collaboration through a co-authorship analysis, and (2) to determine the most-utilized terms according to the author's keywords; for this, the co-occurrence of keywords were analyzed, as well as the networks created (Question 2). This *Software* was utilized, as it allows for the construction and visualization of academic networks for their posterior analysis and interpretation of the information provided (Orduña-Malea & Costas, 2021) and it also utilizes grouping techniques that are verified and useful for bibliometrics professionals (van Eck & Waltman, 2017).

To identify the authors with the greatest scientific production, those with more than 30 publications were selected. With respect to the collaboration between countries, those with more 1000 documents were selected. Lastly, in relation to the determination of the main keywords, those with more than 100 occurrences were selected (Question 3). In general, for the construction of bibliometric networks, analysis and measurement units were utilized, and for the identification of clusters, the visualization of similarities and grouping techniques from VOSviewer were utilized.

The Power-user add-in in Microsoft Excel was utilized to create a «tornado» diagram to represent 141,372 publications according to the main indexation categories of WoS (Question 4). This type of graphic was utilized, as it is a visualization alternative for representing similarities and differences associated to scientific production (Mitteer et al., 2018),

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making it possible to associate them with indexation categories, thus allowing for the comparison of the series of data obtained.

A «Sankey» flow diagram was utilized to represent the proportion of flow observed between the different SDG, from the perspective of SDG 04. For this, a 1x15 matrix was created according to the SDG (except for SDG 04 and 17, as no documents were found associated to this last objective). This diagram was utilized, as it allows representing and analyzing the relationships (flows) between the different starting and ending nodes (Lupton & Allwood, 2017). It has become one of the most utilized visualization resources for exploring association relationships (Chen et al., 2019).

To determine the scientific production of the top 20 universities (Question 5), the UTs of each publication associated to the SDG were filtered, and afterwards, the *Web of Science Core Collection* was explored to be able to consult the metrics it offers.

Lastly, to determine which 20 keywords were the most frequently used, from the perspective of SDG 04 and its value for each SDG, (1) the UTs from each publication associated to the SDG were filtered, and (2) the *Web of Science Core Collection* was explored, and (3) the necessary and sufficient information was exported for their analysis with VOSviewer.

It is important to highlight that the visualization of the information in different diagrams and networks, as well as the keywords, WoS categories, and university and country names, are shown in English, in accordance with the unified information provided by *Clarivate Analytics*.

Quality verification and strategy

To filter the UT for each SDG, the CONTAR.SI function from Microsoft Excel was utilized, which allowed for the identification and counting of these studies. The process was verified on three separate occasions by the authors.

Results

In the Incites (*WoS*) search, 189,364 publications were found in the 2017-2021 period. The main types of documents found were: *Article* (135,476), *Proceedings Paper* (28,915), *Editorial Material* (10,150), *Review* (5,896),

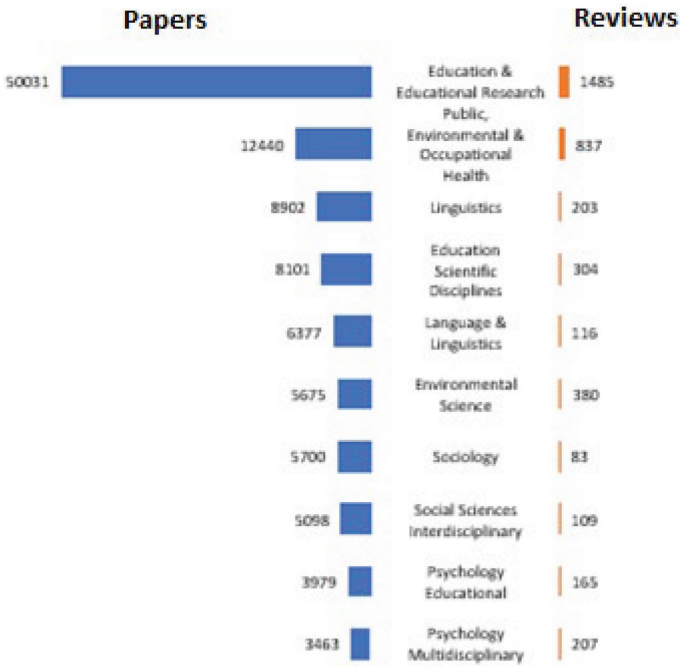
Letter (2,467), *Book Review* (2,315), and *Book Chapter* (1,446). In the analysis (Figure II), which only included articles and reviews (141,372), ten thematic categories of the WoS were underlined, with the following distribution: 2017 (23,581), 2018 (22,853), 2019 (26,768), 2020 (26,321), and 2021 (41,849).

The main categories were: *Education & Educational Research, Education, Scientific Disciplines, Public, Environmental & Occupational Health,* and *Linguistics*.

Question 1. What are the main sources of publications related with Quality Education?

In the analysis of the data, 16 journals stood out that grouped 500 articles (Table II). Of these, only seven were indexed in the category *Education & Educational Research* or *Education*.

FIGURE II. Distribution of the scientific production according to the top 10 indexation categories of the WoS



Source: Author created through the use of the Power-User add-in in Microsoft Excel.

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TABLE II. Main sources with the largest number of publications

Journals	**Documents**
Sustainability	2,302
International Journal of Environmental Research and Public Health	1,743
PLOS One	1,400
Frontiers in Psychology	1,219
Journal of Chemical Education	1,086
Teaching and Teacher Education	922
Computers & Education	686
BMC Public Health	680
Ciencia & Saude Coletiva	677
Education and Information Technologies	661
BMJ Open	608
International Journal of Science Education	602
Interactive Learning Environments	541
International Journal of Inclusive Education	535
Social Science & Medicine	503
Studies in Higher Education	503

Source: Compiled by authors.

Question 2. What are the main sources of scientific collaboration?

The authors with the greatest scientific production (more than 70 documents) were: Gwo-Jen Hwang (103) from the *National Taiwan University of Science and Technology*; Shervin Assari (93) from the Charles R. *Drew University of Medicine and Science*, Los Angeles; Karrie A. Shogren (80) from the *University of Kansas*; Chin-Chung Tsai (77) from the *National Taiwan Normal University*, and Tahmeed Ahmed (74) from the *University of Whashigton*.

During the identification of collaboration networks, from co-authorship clusters, 279,155 were identified. Of these, 106 with more than 30 documents, and only 26 establishing inter-relations, with two author clusters underlined : (1) Wilfried Admiraal, Richard Mayer, Fred Paas, Katharina Scheiter, Tamara Van gog and Jeroen Van Merrienboer, and (2) Ching Sing Chai, Ronnel King, Yan Li, Jing Wang, Shanyong Wang, and Hongbiao Yin.

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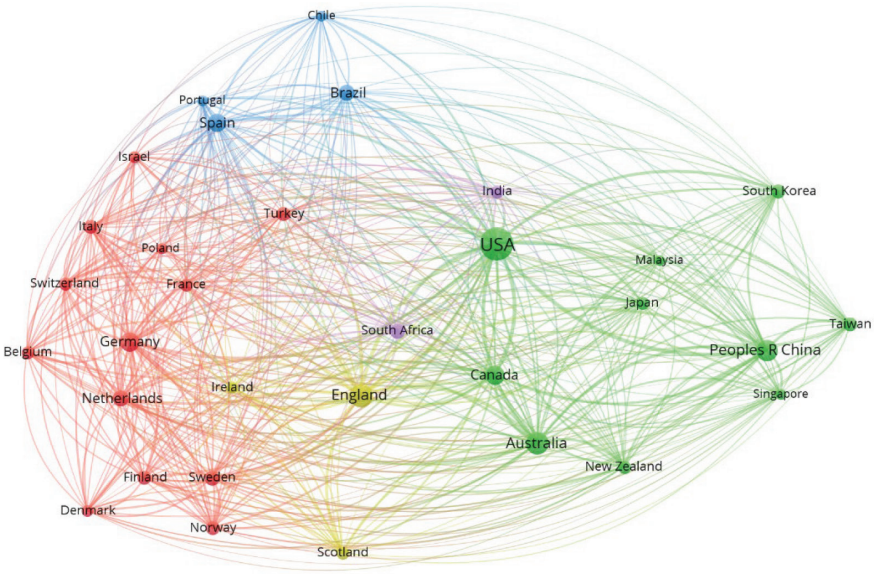
In the 141,372 documents analyzed, 199 countries were identified. With respect to the collaborations between the author's countries of origin (Figure III), 32 countries stood out with more than 1,000 published documents, principally: United States (46,937), United Kingdom (14,611), Australia (11,659), and the People's Republic of China (10,307), meanwhile, given the total number of strong links, these countries also stood out, with the addition of Germany and Canada. This measurement of 1,000 documents was utilized given that it was the smallest measurement suggested by VOSviewer associated to the relationship between clusters.

Question 3. What are the most utilized terms in publications related with SDG 04?

A total of 149,381 keywords were identified, of which 671 appeared in at least 100 publications (Figure IV). The terms with the highest co-occurrence (X≥1000) were: *Higher Education* (3,283), *Education* (2,569),

FIGURE III. Co-authorship map according to country



Source: Compiled by authors.

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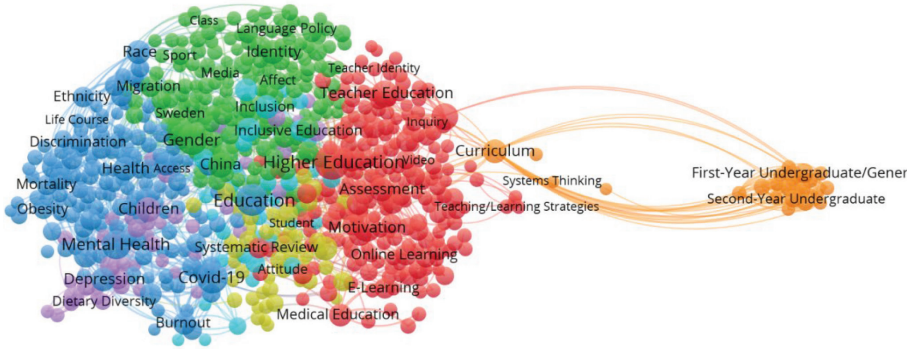
FIGURE IV. Network of keywords from the authors



Source: Compiled by authors.

COVID-19 (2,257), *Gender* (2,025), *Mental Health* (1,692), *Motivation* (1,445), *Teacher Education* (1,373), *Professional Development* (1,336), and *Disability* (1,244). This measurement (X≥1000) was selected, as strong relationships between nodes were observed, according to the metadata obtained from the WoS.

In the analysis of keywords from the authors, seven sub-networks were identified. In the first (Figure V), the relationship/links between the terms *Higher Education* (2,208), *Motivation* (1,609), *Professional Development* (1,247) and *Teacher Education* (1,149) were underlined, that is, this the network in which the education phenomenon was studied from its structural education dimension, while in the second sub-network, the terms were *Gender* (1,076), *Identity* (888), and *Sport* (462), specific elements of cross-sectional education, related to education policies.

In the third sub-network (Figure VI), the following were underlined: *Mental Health* (2,124), *COVID-19* (2,036), *Depression* (1,536), *Education* (1,442), *Race* (1,152), and *Stress* (1,084), a health and psychological approach to the education phenomenon, while in the fourth, we found: *Sustainability* (323) and *Attitudes* (188), related to the works on education values.

In the fifth sub-network (Figure VII), we found the keywords: *Stunting* (769), *Children* (477), *Malnutrition* (453), and *Nutrition* (459) which shows the importance of pediatrics and nutrition, through the dedication

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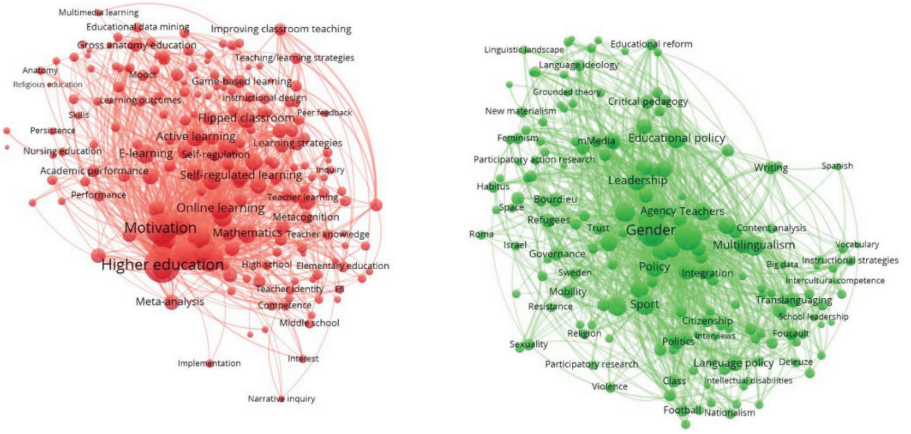
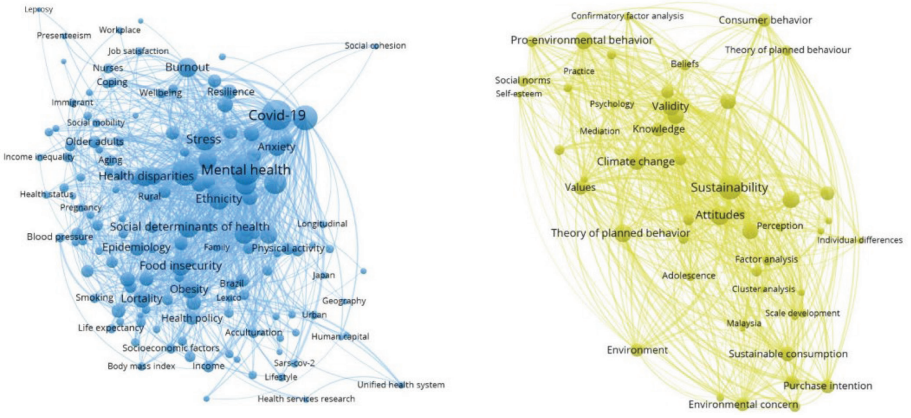
FIGURE V. First and second sub-network (left to right)



Source: Compiled by authors.

FIGURE VI. Third and Fourth sub-network (left to right)



Source: Created by authors.

of an education dimension, while in the sixth sub-network, we found: *Inclusion* (586), *Diversity* (461), *Disability* (441) and *Inclusive Education* (339), where the Special Education articles would be found.

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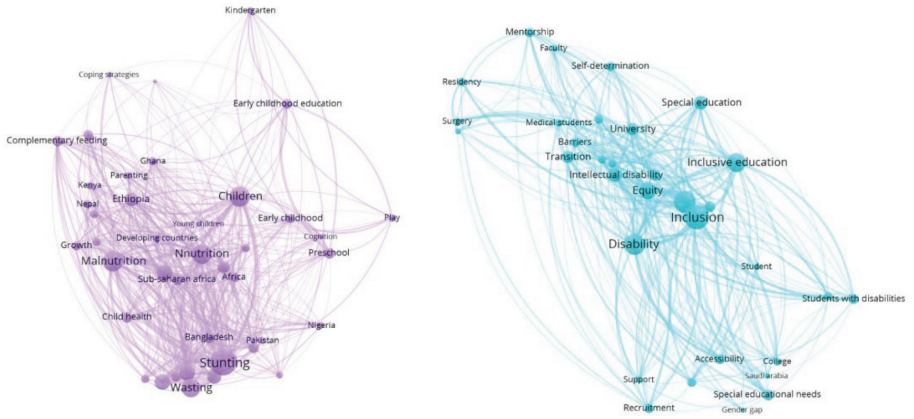
FIGURE VII. Fifth and Sixth sub-network (left to right)



Source: Compiled by authors.

Lastly, in the seventh sub-network (Figure VIII), the following keywords were found: *First-year Undergraduate-general* (1,375), *Second-year Undergraduates* (1,060), and *Laboratory Education* (887), that is, strongly applied works.

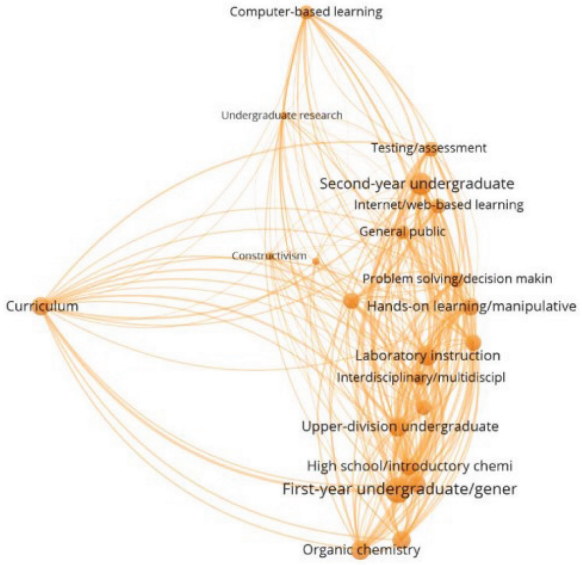
When analyzing the co-occurrence of keywords from the authors for each SDG (Table III), it was re-confirmed that SDG 03 and 05 had the greatest relationship with Quality Education. It is interesting (Table III) to underline that the keywords that coincided in the 16 SDG were: *COVID-19*, *Motivation, Children, Assessment, Sustainability y, Food insecurity*, while the ones with the strongest presence were: COVID-19 (7,366), *Mental Health* (5,903), *Higher Education* (5,659), *Education* (5,547), *Gender* (5,152), *Sustainability* (4,689), and *Food insecurity (*4,394).

Question 4. How does the proportion of the amount of flow observed between the SDG behave?

The analysis of the data allowed us to identify that none of the publications was associated with SDG 17 (Figure IX). The publications related with SDG 03 (Good Health and Well-being), 05 (Gender Equality), and 10 (Reduced Inequalities) had the strongest relationship with SDG 04.

Question 5. From the perspective of SDG 04, what are the top 20 universities with the greatest scientific production? With what other SDG is the Education research at these universities related with?

FIGURE VIII. Seventh sub-network



Source: Compiled by authors.

The main universities (Table IV) were located in the United States and the United Kingdom. Four universities were underlined among the 20 universities (*University of California System, University of London, University of Michigan, and Harvard University*) with respect to the scientific production on all of the SDG.

Discussion and Conclusions

The search provided a total of 189,364 publications from the 2017-2021 period, with 141,372 publications related with articles and reviews analyzed. The results confirm that the regions with the highest number of publications and highest impact (according to the citations of the documents) were the United States of America and European countries, in agreement with the results from Salvia et al (2019). And in general with the production at the global scale of the *Web of Science* database.

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TABLE III. Top 20 keywords by authors according to SDG 04

Keywords	ODS 01	ODS 02	ODS 03	ODS 04	ODS 05	ODS 06	ODS 07	ODS 08	ODS 09	ODS 10	ODS 11	ODS 12	ODS 13	ODS 14	ODS 15	ODS 16
COVID-19	219	255	1.387	2.257	1369	31	31	94	153	596	221	218	175	175	184	1
Higher Education	10	53	332	3.283	403	0	0	18	118	687	116	153	153	153	153	27
Education	41	91	767	2.569	742	7	7	20	70	687	92	104	106	106	107	31
Gender	95	128	824	2.025	1073	9	0	57	38	534	63	72	59	59	59	57
Mental health	92	85	1.535	1.690	1540	0	2	33	48	787	91	0	0	0	0	0
Motivation	7	202	152	1.445	186	20	20	4	20	24	13	71	55	55	55	4
Teacher education	0	51	0	1.373	254	0	0	1	13	72	12	28	29	29	29	2
Professional development	0	5	126	1.336	91	0	0	0	9	42	1	13	13	13	13	2
Disability	39	31	194	1.244	191	0	0	1	10	116	17	2	3	3	7	15
Children	316	347	740	996	553	5	5	11	3	96	30	42	43	43	45	14
Assessment	11	21	73	948	79	1	1	1	26	43	20	31	31	31	31	9
Depression	79	62	896	945	921	0	3	8	5	461	27	3	4	4	1	22
Race	18	17	424	924	583	0	0	2	8	495	33	12	12	12	12	28
Curriculum	2	14	119	921	162	0	0	1	24	69	29	34	35	35	35	3
Sustainability	50	504	125	895	102	20	20	31	184	60	163	622	622	632	632	27
Food insecurity	864	864	870	868	898	1	1	1	2	18	2	1	1	1	1	1
Diversity	5	12	403	965	462	0	4	5	12	168	13	16	17	16	17	9
Health	94	122	680	851	743	19	19	0	34	479	44	56	58	58	58	23
Inclusion	11	6	151	828	184	0	0	7	14	69	14	3	7	7	7	15
Social Capital	10	24	304	822	320	0	0	6	3	670	6	17	18	18	18	6

FIGURE IX. Distribution of the scientific production between the SDG

Source: Compiled by authors.

The scientific production obtained higher values in the years 2021, 2019, and 2020, which partially coincides with the bibliometric study by García et al (2020), which analyzed 98 documents from the WoS and 142 from Scopus, with the years of 2018 and 2019 having the highest production, according to their study. However, there was an agreement with respect to the sources of collaboration, the general distribution of the publications (Chin & Jacobsson, 2016), and that most of the publications belonged to the indexation categories *Education & Educational Research*, and *Education*.

The production of documents published, according to the SDG, showed that the strongest relationships with SDG 04 were found with SDG 03, 05, 10, and 02, partially coinciding with the general study on the SDG by Fonseca et al. (2020). These researchers performed a global

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TABLE IV. Top 20 universities with the highest number of publications on SDG 04

Universities	ODS 01	ODS 02	ODS 03	ODS 04	ODS 05	ODS 06	ODS 07	ODS 08	ODS 09	ODS 10	ODS 11	ODS 12	ODS 13	ODS 14	ODS 15	ODS 16
University of California System (10 campuses)	382	421	1.981	3.781	1.979	28	29	148	85	1311	218	113	130	131	133	159
University of London	452	481	1.580	3.468	1.431	19	20	138	150	999	254	103	124	125	137	231
University of Michigan	194	226	1.637	2.843	1.593	16	18	50	58	1064	112	90	98	100	104	54
Harvard University	368	368	1.576	2.175	1.534	12	12	46	63	694	117	34	40	40	43	77
University of North Carolina	144	185	778	2.098	792	13	13	35	45	523	73	71	75	75	75	45
State University System of Florida	85	147	609	2.086	629	9	10	28	65	408	84	110	118	119	118	49
Pennsylvania Commonwealth System of Higher Education PCSHE	98	128	562	1.864	605	0	0	20	32	363	70	55	60	60	60	34
University of Texas System	96	98	769	1.693	791	8	9	39	42	472	100	36	38	39	39	63
University College London	152	170	609	1.614	551	10	10	25	54	463	71	41	45	45	48	53
University System of Georgia	57	94	329	1.525	341	11	12	20	45	285	48	72	76	77	76	20
University of Toronto	181	181	826	1.495	812	0	0	30	60	397	90	0	23	23	23	83
Monash university	55	86	420	1.348	440	10	10	26	47	204	67	56	60	60	60	50
University of Melbourne	40	73	562	1.248	505	7	10	20	48	292	66	53	57	60	61	45
California State University System	34	80	271	1.241	322	0	0	22	26	257	40	69	73	73	73	29
University of Sydney	87	102	600	1.159	565	0	5	9	43	178	56	28	29	31	29	42
Johns Hopkins University	319	319	911	1.087	889	25	25	36	40	348	56	34	39	39	40	24
Michigan State University	28	48	157	1.035	158	0	0	0	0	126	0	30	32	32	32	0
University of Oxford	122	136	407	1.020	0	8	8	54	45	196	83	41	49	77	51	72
University of Illinois System	78	98	331	992	350	7	7	21	23	193	35	36	40	40	40	25
University of California Los Angeles	44	51	529	857	534	4	0	46	0	403	61	22	22	24	27	49

analysis of the SDG described in the *Index and Dashboards Report* 2018, while the present study analyzed the documents generated by the Incites tool of the WoS with respect to SDG 04. Nevertheless, this is due to the origin of the information to be analyzed, and it is important to consider that in both studies, SDG 03 and 02 were strongly related with SDG 04. Along this line, the results coincide in that the relationships between the SDG are associated with themes such as Higher Education, Gender, Quality and Education, Mental Health, and Professional Development, coinciding with bibliometric studies that analyzed the specific relationship between Sustainability and Education in diverse regional contexts (Momete & Momete, 2021; Prieto-Jiménez et al., 2021).

The analysis of the keywords reaffirms the relationship between the quality of education and COVID-19 (Agarwal et al., 2022). Other aspects that coincided with studies and official reports that analyzed specific subjects of SDG 04 showed a strong relationship of this sustainable development objective with the subjects of gender (Unterhalter, 2019), education for sustainable development (Ferguson & Roofe, 2020), professional development and economic growth (Cervelló-Royo et al., 2020), poverty, migration, and education (United Nations, 2018b), inequality, rural and urban areas (United Nations, 2017), legal education and sustainable development (Tejani, 2021), schooling and economic development (Hanushek, 2020), social cohesion and social economy of the sustainable market (Camilleri & Camilleri, 2020), mental health, burnout, mental disorders and education (Lund et al., 2018), and lastly, education and changes in pro-environmental behavior (Kanowski et al., 2019). A relevant aspect is that in the five main five keywords from the authors, with respect to their co-occurrence, the presence of terms such as *sustainability* or *sustainable development* was not underlined, which ratifies the continuous methodological and systematic integration errors of the SDG found in some studies (Alonso-Sainz, 2021).

The main sources of publication showed that articles and reviews fundamentally originated from journals in the area of medicine (emphasis on psychology and psychiatry), computational sciences, and in third place, education sciences. This is mainly due to the number of journals indexed in the WoS associated to these sciences, and to the frequent *annual* conferences on Medical Sciences and Technical Sciences. Thus, when analyzing these sources from the perspective of high-impact journals, and the sources with the highest number of documents published on SDG 04,

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most were not indexed in the categories of *Education or Education & Educational Research*. In this sense, an aspect that must be highlighted is the presence of multi-disciplinary journals such as those with the highest index of publication: (1) *Sustainability*, (2) *International Journal of Environmental Research and Public Health*, and (3) PLOS One.

Although co-authorship does not necessarily imply scientific collaboration (Ponomariov & Boardman, 2016), it was observed that countries such as the United States, the United Kingdom, the People's Republic of China, and Australia, had the highest number of published documents, and a high level of collaboration (strength of the relationships). In this sense, when analyzing countries with more than 1000 published documents, five clusters were clearly documented:

- Cluster 1: *Belgium, Denmark, Finland, France, Germany, Israel, Italy, Netherlands, Norway, Poland, Sweden, Switzerland,* and *Turkey*.
- Cluster 2: USA, *Australia, Canada, Japan, Malaysia, New Zealand, China, Singapore, South Korea*, and *Taiwan*.
- Cluster 3: *Brazil,* Chile, Portugal, and Spain.
- Cluster 4: *England*, *Ireland*, and *Scotland*.
- Cluster 5: India and *South Africa*.

When analyzing the top 20 keywords of SDG 04, their clear relationship with the other SDG was clear, with the following relationships underlined:

- SDG 01,02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, and 15 (COVID-19 and Education)
- SDG 10, 11, 12, 13, 14, and 15 (COVID-19*, Higher Education,* and *Education*)
- SDG 12, 13, 14, and 15 (COVID-19*, Higher Education, Education,* and *Sustainability*).
- SDG 03, 04, 05, and 10 (COVID-19*, Education,* and *Mental Health*)
- SDG 03, 05, and 04 (COVID-19, *Gender, Depression,* and *Mental Health*)
- SDG 06, 07, and 08 (COVID-19 and *Sustainability*)

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- SDG 01 02, and 05 (*Food insecurity*)
- SDG 06 and 07 (COVID-19, *Motivation, Sustainability,* and *Health*).
- SDG 01 and 02 (COVID-19*, Children,* and *Food Insecurity*)

It is indisputable that the COVID-19 phenomenon had a strong influence on scientific production associated to Education. The analysis of the keywords from the authors showed that this term was strongly associated with the words: *Higher Education, Education, Gender, Mental Health, Teacher Education, Children, Sustainability, Medical Education, Medical Students, Social Determinants of Health, Depression, Burnout,* and *Food Insecurity.* It permeated different disciplines such as: psychology, sociology, economy, education technology, and politics. We are in agreement with Crawford & Cifuentes-Faura (2022) in that there is a scarcity of studies that analyze the impact of COVID-19 on Education and its relation with the other SDG, and with Faura-Martínez et al (2021) on the need to analyze the influence of COVID-19 on Education, from the perspective of the digital divide (Estrada-Molina & Fuentes-Cancell, 2021).

Lastly, with respect to the universities and their scientific production associated to the SDG from the perspective of SDG 04, the following results are underlined:

- The universities: *University of California System* (10 campuses) and *University of London* are underlined due to their scientific production on all of the SDG, while the *University of Michigan* on the first 15 SDG.
- The universities: *Harvard University* and*, Johns Hopkins University* are highlighted for their scientific production on SDG 01, 02, 03 and 05.
- As for the SDG 12, 13 and 14, the following universities are highlighted: *University of California System, University of London, University of Michigan, State University System of Florida,* and *University System of Georgia*.

In all the cases of the universities with the highest number of publications, the presence of the Unites States and the United Kingdom was re-affirmed as the countries with the greatest productivity and influence on SDG 04.

In conclusion, the present study provides the following ramifications and future lines of research in Education: (1) the identification of

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the keywords with the highest occurrence shows a reiterated academic production related with the levels of education, the training of educators, and their professional development in light of the consequences of COVID-19 associated to mental health, motivation, disability, and inclusive education; (2) a growing interest in the scientific community is observed for influencing SDG 04 with their research studies (directly or indirectly). However, the analysis of the keywords shows that the efforts made that achieved curricular sustainability and the explicit integration of the SDG are still insufficient (Torres, 2021), and (3) in the data from *Clarivate Analytics*, it is observed that there is a need to systematize empirical studies that show the education and pedagogic repercussion of COVID-19 on education institutions, educators, and students.

The study conducted has two fundamental purposes: to analyze the scientific production related with SDG 04 during the 2017-2021 period, and verify its level of integration with the remaining SDG. For this, the main sources, authors, institutions, countries, and most-utilized keywords were identified. Given the lack of bibliometric studies related with SDG 04, the present study offers an exploratory overview of the academic production in light of the publications indexed in the *Web of Science Core Collection*, with emphasis on articles and reviews.

A limitation of the present study is that as it only focused on information published in the WoS, other publications from diverse databases such as Scopus and ERIC were ignored. Thus, an opportunity is available to broaden the search strategy through the inclusion of other databases, to afterwards make comparisons and generalizations.

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Are student evaluations of university teaching biased?

¿Están sesgadas las evaluaciones de la docencia universitaria realizadas por los estudiantes?

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Abstract

Questionnaires that use students as a source of information to evaluate university teaching are a common tool in university evaluation systems. The lecturers often question their value by alluding to the possibility that students may make biased judgments, linked to teaching traits or events not related to a fair assessment of the teaching activity. The main objective of this work is to examine the relationships between the characteristics of students and lecturers and the scores on the teaching evaluation questionnaire applied to students at the Complutense University of Madrid, in order to detect possible biased patterns in the evaluation they offer of their teachers. A hierarchical linear cross-classification model was used, with two levels, taking students as the first level and the lecturers as the second. The sample of this work is composed of 143,377 surveys, completed by 33,071 students, which involved the evaluation of 7,885 teaching activities and 3,922 university teachers in the academic year of 2016-17.The results show that

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the students' evaluations of their lecturers are mainly influenced by their interest in the subject, the age of the students and their lecturers and, to a lesser extent, attendance, hours of study and research quality. It should be noted that the type of undergraduate or master's degree studies, student's academic performance, and the lecturer's job category are not related to the teaching evaluations. After this analysis of the results, we cannot deduce the existence of invalidating biases derived from the evaluation of university teaching by questionnaires answered by the students.

Keywords: teacher evaluation, higher education, student evaluation of teaching, quality of teaching, questionnaires, hierarchical linear modeling, bias.

Resumen

Los cuestionarios que utilizan a los estudiantes como fuente de información para valorar la docencia universitaria son una herramienta habitual en los sistemas de evaluación de las universidades. Los docentes universitarios suelen cuestionarlas aludiendo a la posibilidad de que los estudiantes emitan valoraciones sesgadas, vinculadas a rasgos o acontecimientos docentes que no están relacionados con la valoración, ecuánime, de la actividad docente. El objetivo principal de este trabajo es examinar las relaciones entre las características de los estudiantes y de los profesores y las puntuaciones en el cuestionario de evaluación de la docencia aplicado a los estudiantes de la Universidad Complutense de Madrid, para detectar posibles patrones sesgados con relación a la valoración que éstos ofrecen de sus profesores. Se ha realizado un modelo jerárquico lineal de clasificación cruzada, con dos niveles, siendo el primer nivel los estudiantes y el segundo los profesores. La muestra de este trabajo está compuesta 143.377 encuestas, respondidas por 33.071 estudiantes que supuso la evaluación de 7.885 actividades docentes y 3922 profesores en el curso 2016-17. Los resultados indican que las valoraciones que los estudiantes emiten sobre los profesores están influidas sobre todo por el interés que manifiestan por la asignatura, la edad de estudiantes y docentes y, en menor medida, la asistencia, horas de estudio y calidad investigadora. Hay que destacar que no tiene relación alguna con las valoraciones sobre la docencia el tipo de estudios de grado o máster que cursan, el rendimiento académico del estudiante, ni la categoría laboral del profesor.

Tras este análisis de los resultados, no se puede afirmar la existencia de sesgos invalidantes derivados del uso de los cuestionarios para la evaluación de la docencia universitaria respondidos por los estudiantes.

Palabras clave: evaluación del profesorado, educación superior, evaluación de la docencia por los estudiantes, calidad de la docencia, cuestionarios, modelos jerárquicos lineales, sesgos.

Introduction

The suitability and pertinence of student evaluations of university teaching to assess part of their lecturers' teaching activity has been the focus of a long-standing and continuous debate. In every national and international university, the lecturers, understandingly, have voiced their concern over using students' perceptions to evaluate university teaching (Cox et al, 2021).

Questionnaires that use students as an information source to evaluate university teaching, called Student Evaluation of Teaching (herein referred to as SET), are a common and widespread tool in systems employed to assess universities and their accountability. These teaching evaluations formally began in the 1920's, at the University of Washington (Guthrie, 1954; Kulik, 2001) and the first report on SET was published in 1927 by Remmers and Brandenburg. However, the application of these questionnaires has evolved in line with the changing needs of universities. Today, SET participate in both formative and summative evaluations (Johnson, 2000; Spooren et al., 2013).

In Spain, the inclusion of teaching evaluations in the recruitment, promotion and stability of university teachers (ANECA 2017) has greatly increased the application and demand of student evaluation of teaching, which in some cases have become the central component of the evaluation of teachers.

Empirical studies developed in our country have mainly focused on the design and psychometric analysis of more or less standard evaluation tools (see Castro et al. 2020; Casero, 2008; Mayorga et al. 2016, López-Cámara et al. 2016; Molero and Ruíz, 2005, Muñoz et al. 2002), and on the descriptive analysis of the results of student questionnaires in given contexts (e.g. De Juanas and Beltrán, 2014; Ordoñez and Rodríguez, 2015).

Important objections frequently raised refer to the possibly that students may make biased judgments, linked to teaching traits or events not related to a fair assessment of the teaching activity. Bias can be defined as a situation in which a characteristic associated with a specific student, teacher or course can either positively or negatively affect students' evaluations, but is not directly related to any criterion of good teaching, such as improving students' learning (Centra and Gaubatz, 2000, p. 17). In English-speaking countries, consolidated findings have been reported about possible bias in students evaluations of university teaching (Esarey

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and Valdés, 2020; Marsh, 1987; Spencer and Schmelkin, 2002; Spooren, 2010; Sulis et al., 2019; Wachtel, 1998). In a Spanish setting, the works of García et al. (2011) and Gómez et al. (2013) are important; and also the review by Casero (2010).

Published studies are in accordance in that students' evaluations are positively correlated (correlations above 0.4) with those from other sources such as those of supervisors, colleagues and external observers (Beran & Violato, 2005; Marsh, 1987). We can deduce, therefore, that the scores given by students are similar to those offered by other evaluators.

Moreover, SET are also demonstrated to be solid tools in technical terms, proving to be reliable, stable and consistent (Marsh, 1984; Clayson, 2018). The construct is recognized to have a multidimensional structure (Spooren et al 2013; Spooren et al. 2014 and Lizasoain-Hernández, et al., 2017), although some authors refer to a single general factor in all questionnaires analyzed (Castro e al. 2020). Spooren et al. (2017) describe five factors that influence student evaluations: quality of the teaching, rigor of the course, students' level of interest, course taught, and the teacher's ability to help the student. Therefore, the literature finds these studies to be relatively valid with regards to indicators of effective teaching and not highly sensitive to bias.

Other research findings related to SET indicate some characteristics of teachers, students and subjects that tend to be associated with possible biased evaluations. A wide range of factors related to the students are assessed, including students' academic performance, their interest for the subjects, the kind or branch of studies, and characteristics such as their age or gender. For the teachers, factors such as their teaching or research experience and also their age or gender are studied. For the academic subjects, factors such as year taught and branch of learning are taken in account, although these can also be associated with the teachers.

Students' academic performance is one of the characteristics most studied in the literature on SET, as an indicator of the results of effective teaching (Penny, 2003) and also as a means of studying convergent validity (Spooren et al., 2013). However, the findings of the studies consulted in this area do not agree. Cohen's meta-analysis (1980, 1981) shows a moderate-to-large positive correlation between students' performance and the evaluations they give the teachers using these tools; Clayson (2009) also reports this same relationship. However, in the meta-analysis of Uttl et al. (2017) clearly this correlation does not exist. Other studies

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that refute this link include those of Mohanty et al. (2005), that of Stark-Woblewski et al. (2007) or Braga et al. (2014) and, more recently, the one published by Berezvai et al. (2021). It is also important to point out that the SET score is not clearly associated with teaching efficacy in the strict sense of the term, in other words when efficacy is measured in terms of students' performance. Consequently, authors such as Hornstein (2017) and Carpenter et al. (2020) do not recommend it be used to evaluate teacher aptitude, especially not to make decisions about recruiting or promoting teachers.

The use of academic qualifications to prove the validity of students' perceptions of teaching has been a focus of debate since the 1970's (Marsh, 1987; Griffin, 2004; Gump, 2007; Marsh and Roche, 2000). As Spooren summarized (2010), the first interpretation is that qualifications can reflect good teaching and that the SET scores acknowledge this quality and, consequently, the students with higher marks tend to give their teachers better evaluations. A second interpretation is that teachers give higher marks in order to receive better evaluations in the SET; this would correspond to a clear case of bias. Regarding the data collected in our study, students' evaluations of teachers were carried out before they knew their qualifications, in order to avoid this source of bias. A third trend points to a link between the students' attitude or perception of their learning (such as their interest in the subject or motivational aspects) and the evaluation they give of the teacher. In this same line, Greimel-Fuhrmann and Geyer (2003) show that the teacher's behavior largely determines how interested or not the students are in their subject. Paswan and Young (2002) also found that the interaction between teachers and students affects students' level of interest. More recently, Carpenter et al. (2020) argue that the students' perception of their own ability to learn, and also of what the teaching process should be like, can determine their evaluation of the teaching. The same authors also consider the possibility that this view may be false, which would mean that their opinion about the efficacy of the teacher would also be inaccurate.

Fjortoft (2005) associates higher levels of attendance in class with a greater interest and motivation for learning. However, the results of research that includes attendance as a factor linked to SET scores are not homogeneous, given that some studies demonstrate the importance of this association between students' attendance and their evaluation of

the teacher (Beran and Violato, 2005; Davidovitch and Soen, 2006), while other authors reported attendance to be irrelevant (Guinn and Vincent, 2006).

The fact that academic performance and variables that reflect students' motivation towards the learning process affect the SET can be explained because, in part, these are both determined by the quality of the teaching. Spooren et al. (2013) point out that the effort made by students and the amount they study indicate their level of interest and motivation and are partially dependent on the organization of the teaching of that subject.

If we focus our attention on students' traits not related to the quality of the learning process, such as gender and age, the results of the research are not conclusive either. For example, the study of Centra and Gaubatz (2000), and that of Spooren (2010), conclude that students' gender is not a determining factor in the SET. Other research, however, has pointed to a possible effect of the interaction between students' gender and that of the teachers in relation to the SET, with female teachers tending to receive lower scores (Basow et al., 2006; Boring, 2017; Boring et al., 2016; Mitchell & Martin, 2018 and Rivera & Tilcsik, 2019).

The work of Sprinkle (2008) studied this interaction in addition to other teacher characteristics (age, gender and teaching style) and concluded that age, gender and the interaction between student and teacher gender all affected student evaluations. The results showed that female students tended to give higher scores to female teachers and male students to male teachers. With regards to the age, Spooren (2010) also found that age had a significant effect, with older students tending to give teachers higher scores, although the effect size is small for both gender and age. Wachtel (1998) remarked that the higher scores given by the older students could be caused by the students' greater maturity or by the fact that older students study more specialized subjects, in which they tend to be more interested.

On examining the literature on this matter, there is a correlation, albeit a weak one, in the work Griffin (2004), between teacher gender and students' evaluations, with female teachers scoring higher than their male colleagues. Other studies found no correlations between the teachers' age and gender and the SET scores (Ting, 2000). Spooren (2010) did not observe a significant effect for these variables either,

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although in the study by McPherson et al. (2009) the results showed that younger teachers received higher scores. In the review by Wachtel (1998), an inverse relationship was observed between teacher age and students' evaluations, with older teachers receiving less favorable evaluations. And, as Spooren et al (2013) mention in their study, age, scientific productivity and the job category of the teacher are all indirect indicators of the lecturers' teaching skills and mastery of the subject. For example, teaching experience is a factor associated with higher SET scores (McPherson and Jewell, 2007 and McPherson et al., 2009), by contrast, the number of scientific publications has no significant effect on evaluations (Ting, 2000).

Finally, when considering the branch of study taught by the teacher, Theall and Franklin (2001) found that teachers of science subjects received lower SET scores than teacher of subjects belonging to humanities, and these results were similar to those of Basow and Montgomery (2005). Likewise, Kember and Leung (2011), by means of a multigroup structural equations model, concluded that, although the explanatory structure of the SET scores is equivalent in the different areas (invariant configuration), teachers of humanities received higher scores than teachers of pure sciences or of business studies (metric invariance).

In synthesis, the research into possible student bias in the evaluation of teacher quality is inconclusive. The results show that student characteristics linked to the learning process, such as academic performance, their interest in the subject, study time or attendance, can affect these evaluations. The effect of age on the evaluations may also be associated with the greater maturity of the older students or their greater interest in the subject, especially in more specialized courses, such as those studied in master's degrees. A significant effect of these factors would, therefore, not reflect bias on the part of the students. This factor would only be considered as susceptible to bias if students knew their marks before evaluating their teachers. By contrast, the results of these studies show a crossed effect between the gender of the student giving the evaluation and that of the teacher receiving it. Despite the low effect size, there can be some degree of bias. Similarly, teacher characteristics that reflect their mastery of the subject, such as teaching experience or scientific production could also affect the SET scores, without this constituting a bias.

The main aim of this work is to examine the relationship between students' and teachers' traits and scores in the teacher evaluation questionnaire applied in the Universidad Complutense de Madrid (UCM) to detect possible bias in students' evaluations of their teachers. For this purpose, the following objectives are proposed:

- To study the impact of students' traits linked to the teaching and learning process (marks, level of interest, difficulty, attendance and hours of study).
- To study the effect of students' demographic characteristics (gender and age).
- To study the impact of teachers' traits linked to the teaching and learning process (job category, scientific production, teaching experience).
- To study the effect of the teachers' demographic characteristics (sex and age).
- To study the crossover effect of student and teacher gender.

Method

This research is a secondary analysis of the survey applied to students of the UCM as part of the Docentia program implemented in this university. The study design is non-experimental and it has both correlational and exploratory objectives. Although the effects of student and teacher traits on the SET scores have been tested empirically, owing to a lack of consensus in the literature consulted, it is difficult to test more confirmatory models.

Sample

The sample studied here is composed of the students that evaluate the teaching activity of their lecturers in the teaching activities in which they are matriculated. Hence, 33,071 students (65.1 % women with a mean

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age of 22 years (S.E=5.281)) completed a total of 143,377 questionnaires that evaluated 7,885 teaching activities involving a total of 3922 teachers (48 % women with a mean age of 49 years (S.E.=7.739)) and a total of 7885 subjects taught in a degree or master's degree in the academic year 2016-17. It is important to take into account that within the framework of the Docentia program of ANECA universities must evaluate teachers over the range of their teaching activities. On average therefore, each teacher was evaluated by 31 students.

The teachers in the sample had received previous evaluations in the past (at least two evaluations of their teaching in two successive academic years) with good results (positive evaluations). Regarding the distribution of teachers over different areas of study, 25% taught in subjects related to health, 21.9% in the experimental sciences, 35.1% in the social sciences, and 18% in the arts and humanities.

Instruments and variables

The students' questionnaires are made up of 17 questions that are given a score on a scale of 0 to 10, to which the possibility of not answering is added. The forms for the student evaluations were distributed *on line* during the two evaluation periods (December and May) of that academic year 2016-2017[1].

The response variable is the mean of the evaluations that students gave to the 17 questions, expressed on a global scale of 0 to 10 (mean= 7.95; S.E. = 2.188) and reliability estimated by Chronbach's α coefficient is 0.98 (Castro et al. 2020). The unidimensionality was tested again in this research by a confirmatory factorial analysis and produced acceptable values (CFI=0.93; TLI:0,915; RMSEA=0.066 and SRMR=0.038).

The following variables, linked to biased evaluations reported in the literature (see Table I), were studied.

[1] The questionnaire can be consulted at https://www.ucm.es/data/cont/docs/3-2017-11-15-3-2016-11-16-Convocatoria%20DOCENTIA%202016convocatoria_2017%20(17-11)48.pdf

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TABLE I. Relationship between student and teacher variables

Student variables	**Measuring scale**
Student gender	0 = Male 1= Female
Student age	Continuous variable. Centered around the group mean
Alleged attendance	4 =Less than 20% 3 =20%-39% 2 =40%-59% 1 =60%-79% 0=80% or more
Hours of study per week	4=Less than 1h 3 =From 1 to 4 2=From 5 to 7 1=From 8 to 10 0= More than 10
Level of interest in the subject	Scale from 0 to 10.
Perceived difficulty of the student	Scale from 0 to 10
Average performance of the university student over the entire university degree	Scale from 0 to 10
Type of studies (Degree or Master's)	0= Degrees 1= Official Master's Degree
Teacher variables	
Teacher gender	0 = Male 1= Female
Teacher age	Continuous variable. Centered around the group mean
N° of six-year periods teaching	0 to 6
Years of teaching experience (n° of five-year teaching periods)	0 to 8
Job category	PDI Civil Servant PDI Tenure/contract
Branch of studies taught	0 = Health sciences 1 = Experimental sciences 2 = Social sciences 3 = Arts and Humanities
Variables between levels	
Gender	0=Student (Female) - Teacher (female) 1= Student (Male) - Teacher (Male) 2= Student (Female) - Teacher (Male) 3= Student (Male) - Teacher (female)

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Data analysis

The SET are the results of students' perceptions of their teaching activity, but these can be influenced by both the students' and teachers' traits, clearly distinguishing two levels of variability, which also share the same context.

In this evaluation, given that students completed several surveys each corresponding to a different teacher, the data do not have a completely nested structure. Hence, for data to be fully nested each teacher would be evaluated by a different teacher. In this study, given that one student can evaluate several teachers then the scores are not completely independent. For this reason, we estimated the results by employing un cross-classified multilevel regression model (Rasbasch and Goldstein, 1994). This implies that the identification of the student is associated with the teacher evaluated. Another scenario to consider is that students can evaluate the same teacher in different subjects. Moreover, a teacher can also receive evaluations in one or more subjects. In this regression model, the first level includes the variability among students (crossed with the teacher and the subject). The second level represents the variability between the combination of teacher and subject. The models estimate the impact of the students' and teachers' traits on the total scores of the Docentia questionnaires (fixed effects) and the residual variances associated with two levels of data clustering (random effects).

To respond to the different objectives proposed, a total of 9 models (see Table II) were estimated. The first does not include predictors and is used to test whether there is sufficient residual variance among teachers to be able to continue with the analytical plan (Model 0). Moreover, it also serves as a reference with which to compare the remaining models that do include predictors. The other models incorporate different groups of predictors with the aim of collecting empirical evidence of their impact on the evaluations of teacher quality. The following table displays the students' and teachers' traits included in each model.

Model 1 incorporated the effect of predictors related to the students' learning (marks, level of interest, difficulty and attendance, and type of degree) in the fixed part of the model. Additionally, another model was estimated to determine the effect of performance separately (Model 1b). Model 2 added the variables gender and age. The effect of these

TABLE II. Models estimated and predictors included in each one

Model	Predictors
0	Null. No predictors.
1	Students: Learning (marks, interest, difficulty, attendance, hours of study, and type of degree)
1b	Students: Academic performance (marks)
2	Students: Learning (interest, difficulty, attendance, hours of study) + demographic factors (gender and age)
2b	Students: demographic factors (gender and age)
3	Students: Learning (interest, difficulty, attendance, hours of study) + demographic factors (gender and age); + Random variance of predictors at level 2
4	Students: Learning (interest, difficulty, attendance, hours of study) + demographic factors (gender and age); + Random variance of predictors at level 2 + teachers' demographic factors (gender and age)
4b	Students: Learning (interest, difficulty, attendance, hours of study) + demographic factors (gender and age); + Random variance of predictors at level 2 + teachers' demographic factors: age + gender (crossed between levels)
5	Students: Learning (interest, difficulty, attendance, hours of study) + demographic factors (gender and age); + Random variance of predictors at level 2 + Teachers: demographic factors (gender and age) + academic factors (job category, nº of six-year terns, nº of five-year terms.
5b	Teachers: demographic factors (gender and age) + academic factors (job category, nº of six-year terns, nº of five-year terms)

Source: Compiled by the authors.

predictors was also tested separately in Model 2b. Model 3 includes the effects of these predictors in the second level, including parameters of random variance. Model 4 begins with the introduction of teachers' traits, by first including the teachers' gender and then age. In a complementary model to the previous one, 4b, the variable student gender and teacher gender is replaced by the crossed effect. Finally, in model 5 (Final) teacher's job category, scientific production and teaching experience were incorporated. A model was also estimated only with teacher traits (Model 5b), incorporating random coefficients of these predictors at the teacher level.

To compare the models, the global fitting statistics restricted maximum likelihood estimation (-2 log-likelihood) was used, and AIC and BIC information criteria, with a smaller value of these indices reflecting a better fit of the model. Moreover, to test whether the variance

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explained by the models with predictors was significant, the differences between the likelihood indices were calculated (with Chi-^{2} distribution with the same number of degrees of freedom as the number of parameters of the models compared). Significant values indicate that inclusion of the predictors significantly explains part of the variability in teachers' scores.

To estimate the importance of the predictors, the recommendations of Lorah (2018) were followed. R^2 values were estimated (Snijders and Bosker, 2012) to verify the reduction in variance at the first level.

$$R^2 = 1 - \frac{\sigma^2_{level\,1\,Final} + \sigma^2_{level\,2\,Final}}{\sigma^2_{level\,1\,Initial} + \sigma^2_{level\,2\,Initial}} \quad (1)$$

σ^2 is the variance between the data nesting levels. The results of two models were compared. The numerator shows the results of the complete or the final model and the denominator the model without predictors. Also, f^2 was calculated (Cohen, 1992) to estimate the complete effect size, taking into account level 1 and level 2.

$$f^2 = \frac{R^2}{1 - R^2} \quad (2)$$

From here on, the values of 0.02 (from mean values of 0.15) are considered to be effects of little importance, and values higher than 0.35 as highly important. We also added the Intraclass Correlation Coefficient (ICC) to estimate the proportion of variability of the results in the second level of the model, in other words, the effect of teachers.

All analyses were carried out with the statistical program IBM-SPSS 27, using the MIXED module (Mixed Linear Models).

Results

Table III shows the results of the different models estimated. It includes the coefficients of the fixed part, the random variances of the two levels and, in parentheses, the associated standard errors. To facilitate interpretation, the main models are given in the table and additional models are explained in the description of these results. Table IV displays the global

fit indices, an estimation of the proportion of variance explained by the models that includes predictors and the intraclass correlation. Analysis of the fit takes into account all nine models presented in the Methodology section.

As can be observed, a study of the random effects of this null model indicates a residual variance in the level of students, taking into account that this effect includes an association between students, teachers and courses evaluated (3.21, S.D. =0.013, $p<0.005$) and randomized at level 2, which includes the variance between teachers (1.58, S.D.= 0.040, $p<0.005$). The variance between the two levels is, therefore, verified. The cut off in this model (the mean score expected for the SET of teachers by all the students in all the courses) is 7.916 (S.D. = 0.028, $p<0.005$), out of 10 points.

As shown in Table III, in the final model (Model 5), the cut off is 4.501 (S.D. = 0.041, $p<0.005$). This mean value represents the score for teaching quality when the predictors in the model equal zero. It is also noteworthy that, to facilitate interpretation, the age variables are centered around a mean, so the value 0 is 22 years for students and 49 years for teachers.

The model explains 36% ($R^2=0.363$) of the variability in students' responses. The global effect of predictors has a large effect size ($f^2=0.571$). This model clearly fits the data better than the initial null model, with a pronounced variation in the number of parameters considered in the estimation (3 vs 23 parameters) and a considerable fall in the global fit indices (-2 log-likelihood, AIC and BIC). The teacher variables (research experience, teaching experience, age and gender), explain 3.5% of the variability (difference between effect sizes of models 5 and 3), considered to be a small effect size. Moreover, as can be observed with the ICC values, approximately 21.5% of the variance in the results is maintained in the 2nd nesting level.

It is also noteworthy that of all the factors studied, the students' interest in the subject is the trait with the greatest explanatory power. At the other extreme, teacher or student gender, and variables linked to teaching and research experience contribute the least. The scores given by the students improve by 0.437 (0.002; $p<0.005$) for each point increase in level of interest.

The SET scores given by students older than the mean age are also higher (0.14 points for each year). Hence, students near the end of their

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TABLE III. Models of estimated crossed effects

Effects	Model 0	Model 1	Model2	Model 3	Model 4	Model 5
Intercept	7.916 (0.022)***	4.635 (0.034)***	4.574 (0.038)***	4.57 (0.035)***	6.061 (0.081)***	4.501 (0.041)***
Student gender (Female)			0.052 (0.009)***	0.049 (0.010)***	0.051 (0.010)***	0.053 (0.010)***
Student age			0.14 (0.01)***	0.014 (0.001)***	0.14 (0.001)***	0.14 (0.001)***
Note						
[Attendance=Less than 20%]		-0.54 (0.028)***	-0.558 (0.028)***	-0.57 (0.031)***	-0.57 (0.031)***	-0.566 (0.031)***
[Attendance=20%-39%]		-0.452 (0.026)***	-0.465 (0.026)***	-0.459 (0.028)***	-0.457 (0.028)***	-0.456 (0.028)***
[Attendance=40%-59%]		-0.301 (0.019)***	-0.303 (0.018)***	-0.312 (0.021)***	-0.312 (0.021)***	-0.313 (0.021)***
[Attendance=60%-79%]		-0.194 (0.013)***	-0.195 (0.013)***	-0.198 (0.016)***	-0.1987(0.015)***	-0.197 (0.015)***
[Attendance=80% or more]		-	-	-	-	-
[Hours of study= Less than 1h]		0.122 (0.026)***	0.144 (0.026)***	0.138 (0.027)***	0.138 (0.027)***	0.139 (0.027)***
[Hours of study=from 1 to 4]		0.217 (0.024)***	0.227 (0.026)***	0.226 (0.024)***	0.225 (0.024)***	0.225 (0.024)***
[Hours of study=from 5 to 7]		0.159 (0.024)***	0.170 (0.024)***	0.169 (0.024)***	0.169 (0.024)***	0.17 (0.024)***
[Hours of study=from 8 to 10]		0.1 (0.026)***	0.106 (0.026)***	0.106 (0.027)***	0.106 (0.027)***	0.105 (0.027)***
[Hours of study=from toe 10]		-	-	-	-	-
Interest		0.44 (0.002)***	0.434 (0.002)***	0.437 (0.002)***	0.437 (0.002)***	0.437 (0.002)***
Difficulty		-0.015 (0.002)***	-0.015 (0.002)***	-0.016 (0.002)***	-0.016 (0.002)***	-0.017 (0.002)***
Degree (Master's)						
Teacher gender (Female)					-0.07 (0.025)**	-0.066 (0.024)**
Teacher age					-0.028 (0.001)***	-0.04 (0.002)***
N° six-year terms						0.025 (0.1)*
N° five-year terms						0.027 (0.1)*

(*Continued*)

TABLE III. Models of estimated crossed effects (*Continued*)

Random variance						
σ2e (Level 1)	3.21 (0.013)***	2.248 (0.009)***	2.243 (0.008)***	2.097 (0.010)***	2.01 (0.010)***	2.01 (0.010)***
σ2 (Level 2)	1.58 (0.040)***	0.932 (0.025)***	0.931 (0.024)***	0.721 (0.046)***	0.663 (0.021)***	0.663 (0.021)***
σ2 (student gender)				0.094 (0.01)***	0.093 (0.01)***	0.091 (0.01)***
σ2 (attendance)				0.168(0.1)***	0.166 (0.1)***	0.166 (0.1)***
σ2 (hours of study)				0.034 (0.006)***	0.034 (0.006)***	0.034 (0.006)***
σ2 (interest)				0.002 (0.000)***	0.002 (0.000)***	0.002 (0.000)***
σ2 (difficulty)				0.003 (0.000)***	0.004 (0.000)***	0.0043(0.000)***

*p<0.05; **p<0.01;***p<0.005
Source: Compiled by the authors.

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TABLE IV. Models of estimated crossed effects

	M0	M1	M1b	M2	M2b	M3	M4	M4b	M5	M5b
-2 log. *likelihood*	553034.556	505163.436	552533.12	504916.456	552231.034	504019.01	503635.197	503634.437	503615.197	552630.194
AIC	553038.556	505167.436	552537.12	504920.456	552235.034	504033.01	503649.197	503648.437	503629.197	552634.194
BIC	553058.171	505187.051	552556.736	504940.071	552254.65	504101.662	503717.849	503717.09	503697.849	552653.809
N° of parameters	3	13	4	15	5	20	22	23	24	6
R^2 (level)		0.337	0.013	0.338	0.007	0.349	0.362	0.362	0.363	0.028
f^2 (Total)		0.507	0.013	0.510	0.007	0.536	0.567	0.567	0.571	0.029
ICC	0.330	0.293	0.329	0.293	0.330	0.231	0.217	0.217	0.215	0.316

Source: Compiled by the authors.

degree or taking a master's degree will give their teachers higher scores. By contrast, students' evaluations decline as teachers surpass the mean age of around 49 years, (-0.04 points per year).

With regards to gender, on average female students tend to give all their teachers scores that are 0.053 points higher than the male students, and on average, female teachers were given scores 0.04 points lower than male teachers. Model 4b tested the crossed effect of gender between teachers and students and observed a differential effect when male students evaluated female teachers, with scores 0.079 points lower than those given by female students.

In any case, although the impact of these variables is significant, as can be observed by the effect sizes of the models that only include students' demographic characteristics (Model 2b), or only the teachers' traits (Model 5b), they have an almost negligible importance.

Students' alleged attendance to class is an ordinal variable with 5 categories that express this percentage of attendance. Contrast coding was performed, placing the maximum level of attendance (more than 80%) at the cut off. The correlation between the score received by the teacher and student attendance is linear and positive. Students who claim to attend almost all their classes give higher scores to their teachers than those who almost never go to class (less than 20% of students), with a difference of -0.56 between the two groups.

The study hours and weekly work the students claim to do is also an ordinal variable with 5 categories. Contrast coding was performed, placing the maximum at over 10 hours of work a week per subject at the cut-off point. The correlation between the scores given to teachers and attendance is not linear, with evaluations of teachers reaching maximum values when students dedicate between 1 and 4 hours weekly to studying. These students give their teachers scores 0.225 points higher than the group that studies for more than 10 hours.

The students' perceived difficulty of a subject is evaluated on a scale of 0 to 10. It was also found to be a significant characteristic with a negative impact on the evaluation of the teaching activity (-0.017).

Certified research experience evaluated by six-year terms had a significant and positive effect on the score received by the teacher (0.031, S.D.= 0.012, $p<0.05$), and teaching experience reflected by the number of five-year terms taught also had a positive correlation on scores (0.027, S.D.= 0.01, $p<0.05$).

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The model that only includes teachers' traits (Model 5b) had a greater explanatory power than the one that only incorporates the students' demographic characteristics (Model 2b); and has an effect size of 0.029 (low) versus 0.007 for the latter (negligible).

If we compare the explanatory capacity of student variables linked to learning (Model1) with the effect of their demographic characteristics (Model 2b), we observe a marked difference in effect sizes. While the effect sizes for the former are large (0.507), the effect size of the latter is too small to be even considered as having a low effect (0.007).

Finally, it is interesting to observe students' and teachers' traits with no statistically significant impact on students' evaluation of teachers. No differences were observed in relation to the specialization of the studies (degrees or master's). However, it's important to take into account that this variable is linked to the students' age. We, therefore, cautiously deduce that the students evaluating behavior is independent of the type of studies they are undertaking.

The average mark obtained over their university studies (understood as an overall qualification of the student's time at university) is not statistically significant, suggesting that students with higher qualifications do not systematically award their teachers higher evaluations. This is not significant either in the case that students' traits are also taken into account (Model 2). By contrast, when analyzed separately (Model 1b), the effect size is 0.013; more important than that of demographic characteristics (Model 2b). Similarly, the branch of studies and lecturer's job category do not appear to have significant effects either.

Discussion and conclusions

The results of this research work, conducted on an extensive sample of students, teachers and teaching activities, provide empirical evidence for the effect of a range of factors, described in the literature as indicators of possible bias in students' evaluations of the quality of their teachers. Our findings also establish a link with other characteristics that can be related to the teaching processes.

Taking into consideration the results of the final model, students' evaluations of teachers are especially influenced by the following factors, enumerating first the ones with the highest impact. These correspond to:

the interest shown by the students for the subjects taught, the ages of students and their teachers, students alleged class attendance, perceived difficulty of the subject, hours of study, and the research experience of the teacher (measured in six-year terms dedicated to research).

On analyzing the characteristics linked to the students' learning process, which reflect the students' commitment to studying (interest, attendance and hours of study), students more interested in the subject and with a higher level of attendance tend to give better evaluations. In fact, the effect of students' interest was one of the five factors that Spooren et al (2017) identified as linked to teaching quality. The works of Greimel-Fuhrmann and Geyer (2003), and Paswan and Young (2002) also found that the teachers' behavior and how they interact with the student determine the students' level of interest and, therefore, cannot be considered as a bias factor.

Attendance is another factor that affects the results, with students' attendance and teachers' scores being positivily correlated. Hence, students who attend less than 40% of classes, and also those who attend less than 20%, give teacher evaluations of approximately half a point lower. These results are in accordance with those reported by Beran and Violato (2005) and Davidovitch and Soen (2006), who stressed the importance of these, contradicting therefore the findings of Guinn and Vincent (2006). Fjortoft (2005) links regular attendance to classes with more interest in the subject and a greater motivation for learning. The question worth considering here is whether students that attend less than 50% of classes give unbiased evaluations. This may depend upon if the student's absence is due to the type of teaching imparted, or alternatively, to their lack of interest.

Another factor that affects the evaluations, albeit to a lesser extent, corresponds to the number of hours spent studying. In this case, the correlation is linear but reaches a peak, at a reasonable number of hours. Beyond this, an increase in the number of hours dedicated to studying can reflect other kinds of difficulties (related to the student, course or teacher etc.) outside the normal situation of a student's autonomous study and work. Hence, Spooren et al. (2013) suggest that study and effort are indicators of the students' interest and motivation and also, partly depend upon the quality of the teaching. The last student learning factor to consider is their perceived difficulty of the subject, which tends to inhibit evaluations. However, this effect is very low (-0.016 for each

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increased rise in level of this perception) and despite being of statistically significance, makes only a minimal contribution to the variability explained by the model.

If we now turn to contemplating aspects of the teacher that can affect teaching quality, we find a positive effect for research experience (number of six-yearly terms) and teaching experience (number of five-yearly terms), with the former showing a higher impact. This result reflects a specific recognition for the university teacher, who combines teaching experience with research. Similar findings were also reported by Spooren et al. (2013), who associated these variables with the teaching skills of the lecturer and their mastery of the subject. The results are also in accordance with McPherson and Jewell (2007), and McPherson et al. (2009), who demonstrated that teaching experience is linked to higher SET scores (McPherson and Jewell, 2007, and McPherson et al., 2009), and also with Ting (2000), who reported the quality of the scientific production to have an effect, although this was measured by the number of references cited in the bibliography of teachers' publications. Although these factors are significant, they still have an almost negligible effect size.

With regards to students and teachers' demographic characteristics (gender and age), these also have a significant effect. Age is the factor with the highest explanatory power, showing a greater influence than hours of study, perceived difficulty of the subject and lecturer's research and teaching experience. For the teachers' characteristics, age is the factor that most explains the variability among the results. In the case of the students, those aged 23 years, one year older than the mean student age, give teacher evaluations 0.14 points higher on average. Hence, students near the end of their training tend to give their teachers higher scores. This coincides with the findings of Sprinkle (2008) and Spooren (2010), who also found that the older students tended to give their teachers higher evaluations. This cannot be considered a bias factor either, because, as Wachtel (1998) points out, these higher scores can reflect a higher level of maturity among students, or a greater specialization of the subjects, aspects that would be linked to higher levels of students' interest.

Teachers' age was also a significant factor. Our findings are similar to those reported by McPherson et al. (2009), where the best scores are given to younger teachers. This, therefore, supports the evidence

summarized in the review by Wachtel (1998), that described an inverse correlation between teachers' age and student evaluations, although the effect size is low.

Gender was another significant factor, with female students evaluating their teachers more generously than male students, but giving significantly lower evaluations to female teachers. This latter observation, largely coincides with research studies (Basow et al., 2006; Boring, 2017; Boring et al., 2016; Mitchell & Martin, 2018 and Rivera & Tilcsik, 2019). The crossed effect of this variable between students and teachers was also tested. This was found to be significant and male students were also found to give their female teachers worse scores than their male teachers, as in the work by Sprinkle (2008). However, in this study female students gave similar evaluations to both their female and male teachers, although the effect sizes of these variables are too low to even be considered as having a minor importance. Moreover, the model that includes crossed gender (Model 4b) did not contribute any significant difference when compared with the model that included these separately (Model 4). Hence, this factor cannot be considered to bias students' evaluations, and as Centra and Gaubatz (2000), and Spooren (2010) remark, cannot be considered a determining factor. The relationship of this variable with SET scores is, therefore, extremely weak, as reported in the review of Griffin (2004).

From comparisons between the main models and additional models, it can be concluded that students' traits are the most important when explaining SET scores, with a large effect size. Teachers' variables, when considered together, have a low effect size, with teacher's age making the greatest contribution.

The gender of both teachers and students made only a negligible contribution to explaining the results. And the same was found for crossed gender. Although values reached statistical significance, given the small effect sizes, the effects cannot be considered to be important.

It is noteworthy that the type of degrees or master's studied was not in any way correlated with the teaching evaluations. However, age could possibly already incorporate this effect, given that master's students tend to be above the mean age. The lecturers' job category in the university (tenure versus contract) had no effect either. We could not confirm that lecturers with permanent posts received higher evaluations than non-tenure teachers. Nor were effects significant for areas of study, in contrast to

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the works of Theall and Franklin (2001), Basow and Montgomery (2005), and Kember and Leung (2011).

Especially noteworthy was the lack of any effect of academic performance during the university degree, as students with poorer academic records gave similar teacher evaluations to those of students with good academic results. Our results, are in contrast with the findings of Cohen's meta-analysis (1980, 1981), which reveals a medium to large positive correlation for this factor, and also with the results reported by Clayson (2009). However, this cannot be considered as a bias factor, given that students did not know their qualifications before carrying out the evaluation process. Nor can it be associated as an award for good teaching, as Spooren pointed out (2010).

According to our data (in accordance with the findings of other authors such as Mohanty, et al., 2005; Stark-Woblewski et al., 2007; Braga et al., 2014; Uttl et al., 2017; Berezvai et al., 2021), the impact of variables such as students' qualifications is insignificant, and make no contribution at all to explaining the variation in students' evaluations of teachers. Moreover, as Hornstein (2017) and Carpenter et al. (2020) explain, it is not recommendable to use these scores to evaluate teachers' aptitude.

From our analysis of the results, we did not observe any invalidating bias derived from the use of SET to evaluate the teaching activity. Judgements made by university students are based on their university experience, their interest in the subjects, and their needs when studying and learning in a university setting. In the light of the descriptive results obtained, on average teachers' evaluations are equivalent to the level of merit. However, students in university classrooms are diverse, ranging from those showing high levels of interest to those with only minimal interest, and from very good to almost no attendance. Moreover, student profiles make the greatest contribution to explaining the variability of students evaluations of teachers. Bearing this in mind, it could therefore be recommendable to incorporate in these evaluations some system for weighting variables, especially for those with the greatest impact on SET scores. However, in general university students do not appear to be prejudiced in their evaluation of teachers, nor do they seem to be influenced by a lack of knowledge of what constitutes university teaching of quality.

Obviously, we cannot conclude that students' perception of the teaching they receive are completely unbiased. But, within the framework of this study, conducted on a large sample of students and teachers, on average there is more empirical evidence to support a lack of bias

in these evaluations than the opposite scenario. Our findings therefore that students' perceptions of the quality of the teaching they receive are essentially unbiased.

In future research, therefore, taking into account the important impact that the students' interest in their studies has on the SET scores they give, we should delve further into the factors that can generate and/or condition this. Students' age, attendance, hours of study and perceived difficulty of the subject could all possibly be related to the students' interest in a course. It is necessary, therefore, to define an explanatory model of these characteristics and to test it empirically by causal analysis.

An important limitation of this study is related to the selection of the individuals surveyed. The evaluation questionnaires were handed out to all students during the academic year (before they received their qualifications) without any further control of the subjects, who responded voluntarily. Despite this, it would be reasonable to deduce that the sample is sufficiently broad to endorse the results obtained, or at least not to question the existence of bias in the sample. The teachers in the sample were selected on the basis of having received previous evaluations over a time period, with positive results.

The results of this study support the technical quality of the questionnaires used by students to evaluate the quality of the teaching. Although students' evaluations should not be the only method applied to evaluate university teaching, provided they can be carried out in an essentially unbiased setting, they are advantageous in that they can cover diverse aspects of the teaching activity by incorporating a range of scores. This is not possible using other instruments or procedures.

From the authors' perspective, it is critical that those responsible for programs of student evaluation of university teaching can effectively convey to teachers the indicators of high performance of these tools, in order to increase the teachers' trust in these systems and to dispel their concerns of systematically biased student evaluations.

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Specific indicators for detection of dyslexia simulation

Indicadores específicos para la detección de simulación de la dislexia

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Abstract

Disability pretence increases when compensatory aids are provided by the education and health systems. Although tests are available to assess dyslexia, direct observation is not sufficient to detect deceptive behaviour. In order to protect people with this learning disability, it is necessary to use specific strategies to detect deception when in doubt. This research looks for reliable indicators to ensure that the person has dyslexia or is faking it. 30 people with dyslexia, 30 simulators and 30 controls participated. A set of paired experimental tasks was applied: in one of them, people with dyslexia had difficulties and in the other they did not. Simulators tended to generalise a pattern of exaggeration across all tests, whereas people with dyslexia responded differentially to tasks that related to the neuropsychological characteristics of their disorder and other tasks free of that influence. A set of five indicators - text reading, pseudoword copying, and the effects of frequency, articulatory suppression and phonemic cueing - allow the detection of fraud with sensitivity and specificity rates above 90%.

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Keywords: dyslexia, higher education, symptom simulation, deception detection, cut-off points.

Resumen

El fingimiento de la discapacidad aumenta cuando los sistemas educativos y sanitarios proporcionan ayudas compensatorias. Aunque contamos con pruebas para evaluar la dislexia, la observación directa no es suficiente para detectar conductas de engaño. Para proteger a las personas que padecen esta dificultad de aprendizaje es necesario usar estrategias específicas de detección de la simulación en caso de duda. Esta investigación busca indicadores fiables que permitan asegurar que la persona tiene dislexia o la finge. METODOLOGÍA: Participaron 30 personas con dislexia, 30 simuladores y 30 controles. Se aplicó un conjunto de tareas experimentales emparejadas: en una de ellas, las personas con dislexia tenían dificultades y en la otra no. RESULTADOS: Los simuladores tienden a generalizar un patrón de exageración en todas las pruebas, mientras que las personas con dislexia responden de forma diferencial ante tareas que se relacionan con las características neuropsicológicas de su trastorno y otras tareas libres de esa influencia. DISCUSIÓN Y CONCLUSIONES: un conjunto de cinco indicadores -lectura de textos, copia de pseudopalabras, y los efectos de la frecuencia, la supresión articulatoria y el indicador fonémico- permiten la detección del fraude con índices de sensibilidad y especificidad superiores al 90%.

Palabras clave: dislexia, educación superior, simulación de síntomas, detección de engaño, puntos de corte.

Introduction

There is historical evidence that the simulation of disability symptoms is enhanced when health and education systems provide protection and compensatory measures (Harrison et al., 2010; Hurtubise et al., 2017; Loser, 2013). Many education systems grant privileges to people with dyslexia for access to and progression in university studies. We have evidence that the number of these students reaching higher education is increasing and the heterogeneity among them is very large (Rice & Brooks, 2004), and that teachers who are instructed to provide the stipulated supports do not always know how to do so and sometimes have doubts about whether they are fair, proportionate and effective (Ryder & Norwich, 2019). The diagnosis of dyslexia is mainly made on the basis of

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performance on standardised reading and writing tests because, although it is true that some markers have been found that are related to its neurobiological origin (Doust et al., 2022; Formoso et al., 2021; Gertsovski & Ahissar, 2022), these have not yet been incorporated into the clinical diagnosis which is still made on the basis of the criteria established in the DSM-5 (American Psychiatric Association, 2013). These conditions are fertile ground for fraud to occur, although few studies have estimated it (Harrison et al., 2008; Morgan & Sweet, 2009; Sullivan et al., 2007; Van den Boer et al., 2018). Its detection is not automatic with standard assessment procedures (González Ordi et al., 2012) and direct observation is not sufficient to reveal simulators (Sweet, 1999).

In general, in order to discover feigning behaviour, it is necessary to converge clinical, psychological, neuropsychological and specific tests to detect fraud. The application of self-report-based simulation detection tests, such as the Victoria Symptom Validity Test or the Validity Symptom Test, have demonstrated sensitivity and specificity in adults with specific learning difficulties (Frazier et al., 2008; Giménez et al., 2015), but have several drawbacks: they may be too obvious, are easily available on the internet and do not include the specific symptoms of people who actually suffer from these difficulties. Another alternative is to use specific and sensitive indicators of pretend dyslexia in reading and writing tests, which reveal the pretending without the person being aware of it. These have been less studied, but have several advantages: people who seek information to simulate symptoms often do not understand how they work and have been shown to be resistant to training (Lindstrom et al., 2011). The study by Lindstrom et al. (2011) was based on an analysis of the performance of one group of participants with dyslexia and another group of people trying to simulate the symptoms in ordinary tests of written language proficiency. It was concluded that the simulators were able to cheat on most measures of reading and writing performance, but not on measures of neuro-linguistic processing, speed and number of errors in reading texts. Harrison et al. (2008) developed two instruments called the Dyslexia Assessment of Simulation or Honesty (DASH) and the Feingning Index (FI) based on the ability of people with dyslexia to correctly read words with altered letter order. These instruments have high sensitivity and specificity (Harrison et al., 2010).

In general, we know that the simulator tends to exaggerate symptoms, even those of other abilities unrelated to their disorder (González Ordi

et al., 2012). In one of the few studies to detect fake participants with dyslexia, it was observed that they faked poor performance in all reading and writing tasks, as well as in tasks measuring intelligence (Harrison et al., 2008).

The main feature in adults with dyslexia is slow reading (Bønnerup et al., 2019; Nergård-Nilssen & Hulme, 2014; Rouweler et al., 2020), which persists along with a higher number of spelling errors (Afonso et al., 2015), even in those who apparently manage to compensate for their difficulties (Hatcher et al., 2002). They also show difficulty in reading long pseudowords and infrequent words, which is interpreted as a lack of automation of grapheme-phoneme conversion rules and poor lexical pathway efficiency, respectively (Bruck, 1990; Nergård-Nilssen & Hulme, 2014; Suárez-Coalla & Cuetos, 2015). On the other hand, they do not seem to benefit from context, because they are also slow at reading texts (Szenkovitz & Ramus, 2005; Tops et al., 2012) and are more sensitive to word frequency (Yael et al., 2015). The level of transparency of languages can have an important influence on reading fluency. In the most transparent languages, people with dyslexia achieve good levels of accuracy, although slowness always persists, even in university students (Suárez-Coalla & Cuetos, 2015). An Italian study, another language with a high degree of orthographic transparency, confirms the discriminatory power of reading speed as a marker of dyslexia in adults, even if the level of comprehension is normal (Re et al., 2011).

As in more opaque orthographies, Spanish adults with dyslexia continue to have difficulties in tasks involving the management of their phonological skills. Some studies in transparent orthographies suggest that phonological skills are related to reading, but that their effect diminishes after the first or second year of primary school (de Jong & van der Leij, 2003; Holopainen et al., 2000; Landerl & Wimmer, 2000).

This paper focuses on the search for differences between simulators and people with dyslexia when performing reading and writing tasks. We look for tasks that reveal simulation, in order to provide specific strategies that complement general clinical assessment methods (Rogers & Correa, 2008). The hypothesis underlying this work is that defaulters will tend to generalise their pattern of behaviour across all tests administered to them, whereas people with dyslexia will respond differently to tasks that are related to the neuropsychological characteristics of their disorder and tasks that are free of that influence or, at least, that adults

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with dyslexia manage to pass. For this purpose, we have designed a set of tests paired two by two. Apparently both tests are very similar, so we expect the simulators to behave in the same way, while people with dyslexia will show differential performance.

Method

Participants

A total of 90 Spanish-speaking adults (73 females and 17 males) participated in three groups of 30 each: simulator, dyslexic and control. The three groups were sex-matched χ^2 (2, 90)=3.62, p=0.16. The dyslexia group was recruited among relatives and acquaintances of children receiving specific treatment. All reported having a clear diagnosis or history of specific reading and writing difficulties and having received compensatory care. Their mean age was 32.5 ± 9.33 years (range 20 to 47). The intelligence of the dyslexia group was controlled using the TONI-2 test (Brown et al., 2000), (IQ, M=109, SD =11.4). The simulator and control groups were recruited among volunteer students of psychology, speech therapy and occupational therapy from two universities in the city of Valencia (Spain). All of them reported having no neurological history, language disorders or learning difficulties; they were studying in Spanish and were randomly assigned to the control or sham group. The mean age was 23.13 ± 5.89 years (range 18 to 42), that of the sham group 23.07 ± 4.20 years (range 17 to 34). To establish a criterion for inclusion in the simulator and control groups, a Global Index of Reading Efficiency in Words (IGELp) was defined, weighting the time spent and the errors made in the reading test of 30 isolated infrequent words, using the expression IGELp= (30-nº. errors)/seconds*100), which followed a normal distribution (K= .572, p= .90). Five participants from the control and simulator groups with IGELp ≤ 93, which corresponds to the first decile and whose reading efficiency was very low, were excluded from the sample. The CSC-S RF questionnaire (Barkley & Murphy, 2006) was administered in order to detect possible participants with ADHD. Six people were excluded for this reason, so we can be sure that the sample is free of dyslexia/ADHD comorbidity.

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The study was approved by the Ethics Committee of the Catholic University of Valencia San Vicente Martir (Declaration of Helsinki in the European Council Agreement, 1964-2013), complied with data protection law and participants gave their written consent.

Instruments

Given the scarcity of standardised tests in Spanish, we decided to use specially created experimental tasks.

■ Reading tests

To assess participants' reading we used three classic tasks that measure lexical access (Suárez-Coalla & Cuetos, 2015): text reading and high and low frequency word reading.

Text Reading: speed (wpm) and accuracy (hits) were assessed with the Punctuation Signs subtest of the PROLEC-SE test (Ramos & Cuetos, 2005), whose scope of application extends up to the 4th year of Compulsory Secondary Education, as we consider that in this last educational year, levels of accuracy and speed similar to those of adults are reached.

Isolated Word Reading: includes two lists, the first of 30 frequent words (frequency range 50-100) and the second of 30 non-frequent words (frequency 1), according to the Diccionario de Frecuencias de las Unidades Lingüísticas del Castellano (Alameda & Cuetos, 1995), matched in length and syllabic complexity. Time and errors were assessed. In order to compare the effect of frequency, the composite variable Frequency Effect on Speed Reading Single Words (IWRSFE) was created, subtracting the score obtained when reading infrequent words from frequent words (IWRSFE = wpm high frequency - wpm low frequency).

■ Writing tests

Dictation of words with and without articulatory suppression: participants dictated 20 words with low frequency of use, frequency range 11-19 (Alameda & Cuetos, 1995). Half of the words were written under the condition of articulatory suppression, which consists of writing while pronouncing the syllable «la» uninterruptedly (Re et al., 2011). Dictation

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was performed using a digital recording with comfortable listening through headphones. To compare the effect of articulatory suppression, the variable ASEDW (Effect of Articulatory Suppression on Dictation Writing) was calculated, following the same procedure of subtracting the measurements without and with articulatory suppression (ASEDW = hits without suppression - hits with suppression).

Time-limited pseudoword copying: delayed copying of pseudowords after a 4-second on-screen exposure. Ten pronounceable pseudowords (following Spanish phonotactic rules) of eleven characters each were presented, with a predominance of syllables of moderate-high complexity.

- Verbal fluency tasks

Semantic and phonemic verbal fluency: participants were given a task similar to that of the Verbal Fluency subtest of the NEPSY-II (Korkman et al., 2014), in which they were asked to evoke as many words as possible in one minute with the characteristics specified, first with a semantic and then a phonemic inducer. Semantic verbal fluency was determined by asking the participant to evoke any animal and phonemic fluency with words containing the consonant cluster [pr] in any position.

The effect of the semantic versus phonemic inducer was assessed by means of the composite variable SPFIE (Semantic Phonemic Fluency Induction Effect), calculated as Semantic Fluency hits minus Phonemic Fluency hits.

Procedure

The group of simulators received the following verbal instructions three days before the tests: «Your goal is to demonstrate that dyslexia can be simulated. Take it as a challenge. We want you to imagine that you are a student who needs to obtain the privileges granted to people with dyslexia at the university. To get them, you will be tested to determine if you have dyslexia. Your aim is to fool the examiner». These conditions made it possible for people to seek any kind of information in a similar way to a fraudster. Both the control group and the group of people with dyslexia

were instructed to perform the tests in the best possible way, making as few mistakes as possible and completing them in the shortest possible time. All participants individually performed the same reading, writing and phonological processing tasks. The approximate time to complete the total number of tests was 1 hour and 30 minutes.

A one-factor ANOVA and the corresponding HSD Tukey post hoc tests were performed for each of the tasks applied, after checking for homoscedasticity and normality conditions. T-test was used to analyse the within-group effects of the composite variables reflecting the effects of word use frequency, articulatory suppression and semantic versus phonological fluency. In order to provide strategies and indicators for the detection of simulation, COR curve analyses were conducted to determine a cut-off point of the tests as an indicator of simulation.

Results

The simulator group obtained the worst results in all tasks, showing a general tendency to exaggeration. The differences between the three groups were always significant and with high effect sizes, higher for speed and lower for accuracy. Table I shows the scores obtained by the three groups in all the tests administered and in the composite variables, as well as the corresponding statistical comparisons using the one-way ANOVA.

TABLE I. Means, standard deviations and ANOVA in the reading, writing and fluency verbal test and compound variables

Measure	Groups					
	Simulation	Dyslexia	Control			
	M (SD)	M (SD)	M (SD)	F (2, 89)	p	ηp^2
Text reading (wpm)	73.43(38.64)	130.70 (29.99)	192.63 (22.40)	110.52	<.001***	0.71
Text reading (hits)	268.57(25.51)	289.17 (4.06)	291.97 (1.92)	21.90	<.001***	0.33

(Continued)

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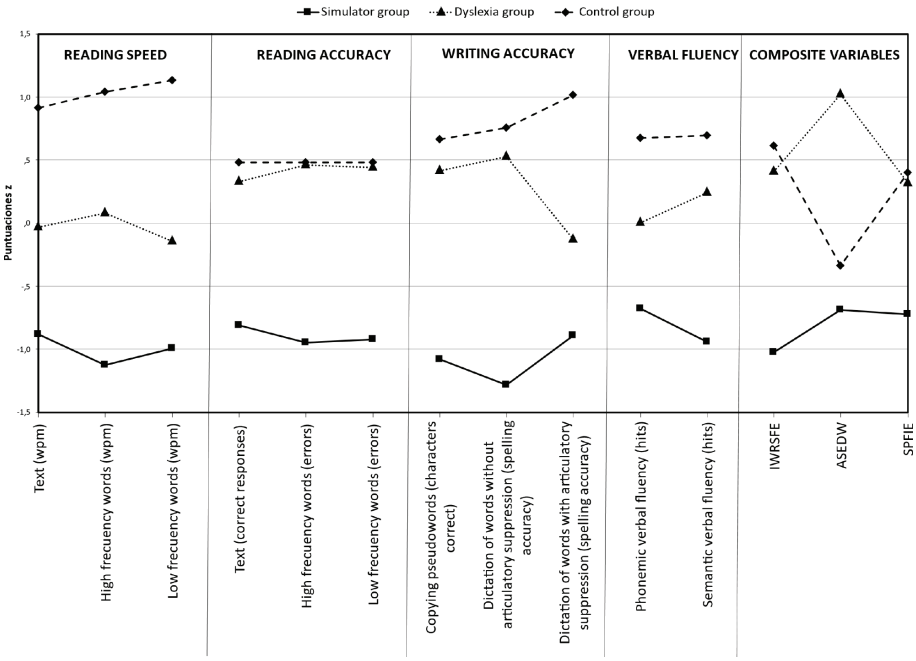
TABLE I. Means, standard deviations and ANOVA in the reading, writing and fluency verbal test and compound variables (*continued*)

Measure	Groups					
	Simulation	Dyslexia	Control			
	M (SD)	M (SD)	M (SD)	F (2, 89)	p	ηp^2
HF word reading (wpm)	22.04 (13.70)	73.44 (18.03)	114.65 (25.37)	167.54	<.001***	0.60
LF word reading (wpm)	22.09 (13.09)	46.99 (12.46)	84.51 (16.66)	147.10	<.001***	0.60
Reading PA words (hits)	23.53 (5.34)	29.57 (1.01)	29.67 (1.21)	35.88	<.001***	0.52
BF word reading (hits)	19.67 (7.88)	28.43 (1.68)	28.70 (2.89)	32.46	<.001***	0.54
Word dictation without AS (hits)	3.67 (3.38)	13.57 (1.70)	14.80 (0.48)	70.82	<.001***	0.62
Word dictation with AS (hits)	3.57 (3.33)	7.53 (4.15)	13.47 (1.81)	31.13	<.001***	0.42
Copy pseudo-words time limitation (cc)	72.20(16.98)	96.03 (4.50)	99.97 (1.52)	65.39	<.001***	0.60
Semantic verbal fluency (hits)	13.30 (5.94)	23.47 (5.69)	27.33 (7.01)	28.58	<.001***	0.40
Verbal phonemic fluency (hits)	7.13(4.06)	10.50 (4.46)	13.83 (4)	14.43	<.001***	0.25
IWRSFE	-0.05(4.26)	26.45 (12.73)	30.14 (17.40)	29.70	<.001***	0.41
ASEDW	0.10(1.86)	5.89 (3.47)	1.33 (1.49)	52.35	<.001***	0.55
SPFIE	6.17(4.59)	12.97 (4.71)	13.50 (7.29)	29.70	<.001***	0.41

Note. M: Mean; SD: Standard Deviation; F: ANOVA; ηp^2: Partial Eta squared, effect size value: 0.01 small; 0.06 medium; 0.18 large; *** = p-value < .001; AF: High frequency; LF: Low frequency; cc: correct characters; AS: Articulatory Suppression; IWRSFE: Effect Frequency Velocity Reading Speed Isolated Words; ASEDW: Articulatory Suppression Effect on Dictation Writing; SPFIE: Semantic Phonological Fluency Induction Effect.
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

Figure I compares the scores obtained by the three groups on the reading, writing, verbal fluency and the composite variables measuring the effects of frequency, articulatory suppression and semantic or phonemic inducer. Typical z-scores were used to compensate for the different measurement scales.

FIGURE I. Comparison of simulator, dyslexia and control groups on measures of reading, writing, verbal fluency and composite variables



Note: Typified scores (z)
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

Reading tests

The results show something to be expected: the control group is faster than the dyslexia group and the dyslexia group is faster than the simulator. However, the dyslexia group reads as accurately as the control group, with no significant differences between them in the post hoc tests - due to the ceiling effect of transparent languages - while the simulator group makes many more errors because they are not aware of this effect, and their scores are much lower.

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TABLE II. Reading tests (text and single words) and frequency effect. Multiple comparisons between groups using Tukey's HSD

Groups	**Text**		**High frequency words**		**Low frequency words**		**IWRSFE**	
	Speed (wpm)		**Speed (wpm)**		**Speed (wpm)**			
	DM	p	DM	p	DM	p	DM	p
Simulator vs Dyslexia	-57.27	<.001***	-51.40	<.001***	-24.90	<.001***	-26.50	<.001***
Groups	**Text**		**High frequency words**		**Low frequency words**		**IWRSFE**	
	Speed (wpm)		**Speed (wpm)**		**Speed (wpm)**			
	DM	p	DM	p	DM	p	DM	p
Simulator vs Control	-119.20	<.001***	-92. 61	<.001***	-62.43	<.001***	-30.20	<.001***
Dyslexia vs Control	-61.93	<.001***	-41.21	<.001***	-37.51	<.001***	-3.69	0.5
	Accuracy (hits)		**Accuracy (hits)**		**Accuracy (hits)**			
	DM	p	DM	p	DM	p		
Simulator vs Dyslexia	-20.60	<.001***	-6.03	<.001***	-8.77	<.001***		
Simulator vs Control	-23.40	<.001***	-6.13	<.001***	-9.03	<.001***		
Dyslexia vs Control	-2.80	0.75	-0.10	0.992	-0.26	0.976		

Note: IWRSFE: Isolated Word Reading Speed Frequency Effect**;**
wpm = words per minute; MD = mean difference;*** = p-value <0.001
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández, own elaboration.

Comparing the intra-group differences for reading the high and low frequency words in the T-test, it appears that control and dyslexia read the frequent words faster and more accurately, with a large effect size; while the simulator read the high and low frequency words at about the same speed and, unexpectedly, was slightly more accurate in reading the low frequency words (see Table I and Table III).

TABLE III. Intra-group comparisons by T-test for word reading, verbal fluency and dictation word writing tests

Groups	Word reading speed (wpm)				
	High frequency	**Low frequency**			
	M (SD)	M (SD)	T-test	p	d Cohen
Simulator	22 (13.7)	22.09 (13.1)	-0.066	0.95	--
Dyslexia	73.44 (18)	46.99 (12.5)	11.38	<.001***	2.08 (L)
Control	114.65 (25.4)	84.51 (16.7)	9.48	<.001***	1.47 (L)
	Word reading accuracy (hits)				
	High frequency	**Low frequency**			
	M (SD)	M (SD)	T-test	p	d Cohen
Simulator	23.53 (5.3)	19.67 (7.9)	4.86	<.001***	0.99 (L)
Dyslexia	29.57 (1)	28.43 (1.7)	4.20	<.001***	0.77 (L)
Control	29.67 (1.2)	28.7 (2.9)	2.99	.006**	0.66 (L)
	Verbal fluency (hits)				
	Semantic inducer	**Phonemic inducer**			
	M (SD)	M (SD)	T-test	p	d Cohen
Simulator	13.30 (6)	7.13 (4.1)	7.30	<.001	1.33 (L)
Dyslexia	23.47 (5.7)	10.50 (4.5)	15.10	<.001	2.7 (L)
Control	27.30 (7)	13.83 (4)	9.70	<001	1.76 (L)
	Accuracy of handwriting dictation (hits)				
	No Suppression	**With Suppression**			
	M (SD)	M (SD)	T-test	p	d Cohen
Simulator	3.67 (3.4)	3.57 (3.3)	0.29	0.77	--
	Accuracy of handwriting dictation (hits)				
	No Suppression	**With Suppression**			
	M (SD)	M (SD)	T-test	p	d Cohen
Dyslexia	13.57 (1.7)	7.53 (4.2)	9.90	<0.001***	-1.81 (L)
Control	14.80 (0.5)	13.47 (1.8)	4.50	<0.001***	-0.79 (L)

Note: wpm = words per minute; M: Mean; SD: Standard Deviation;
*** = p-value <0.001;** = p-value <0.01;
Effect size (d Cohen) - null, small (S) <0.2, medium (M) <0.5, large (L) >0.8
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

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The effect of frequency was quantified by means of the composite variable Isolated Word Reading Speed Frequency Effect (IWRSFE) (Table I). The control and dyslexia groups show a strong positive effect of frequency. Both groups read infrequent words at a slower speed and no significant differences were found between them in the post hoc tests (Table II). However, the simulator group does not suffer from the frequency effect, as it reads less frequent words faster and therefore has a negative effect, behaving differently when compared to the control and dyslexia groups (Figure I). Therefore, we can assume that the frequency effect distinguishes non-fakers - whether they suffer from dyslexia or not - from fakers.

To assess the ability to detect the simulation of the variable Text Reading Speed between the simulator and dyslexia groups, a COR curve analysis was performed (see Figure II), which resulted in an area under the curve value of 0.87, which should be considered good, and a cut-off point of 83 wpm (sensitivity=90% and specificity=73%), so that this variable could be a moderately relevant indicator to discriminate the simulation.

In the same way, the composite variable Isolated Word Reading Speed Frequency Effect (IWRSFE) was assessed, with an area under curve value of 0.99 which should be considered excellent (see Figure III) and a cut-off point of 4.8 (sensitivity=100% and specificity=90%), so that this variable, which expresses the difference in speed when reading frequent and infrequent words, could be a relevant indicator to discriminate the simulation.

FIGURE II. COR Speed curve Text Reading (wpm)

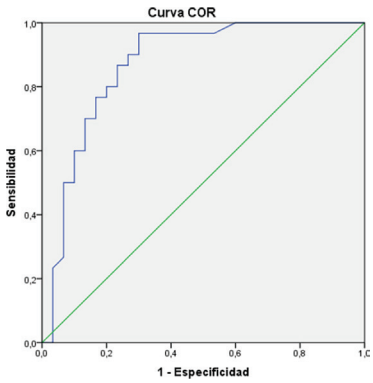


FIGURE III. COR Curve IWRSFE

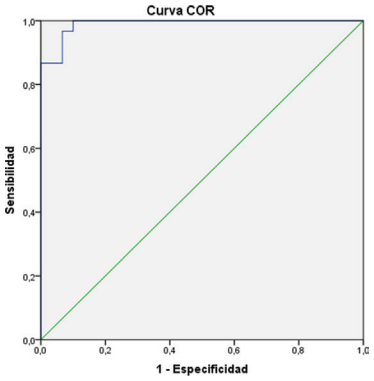


FIGURE IV. Pseudo-word copy COR curve

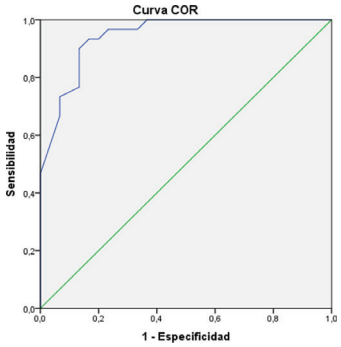


FIGURE V. COR ASEDW curve

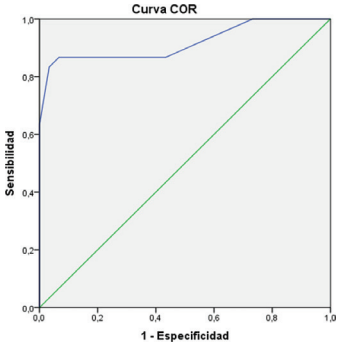
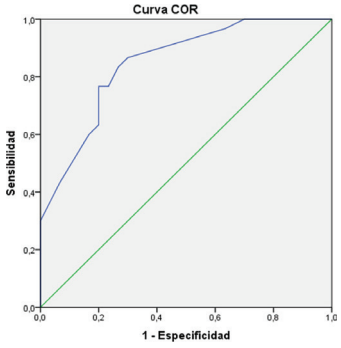


FIGURE VI. SPFIE COR curve



Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

Writing tests

In the writing tasks, the general trend is maintained: the control group performs better than the dyslexia group and the dyslexia group performs better than the simulator (see Table I and Figure I).

Time-Limited Pseudo-Word Copying

Copying accuracy was assessed by assigning one point for each letter copied correctly in the correct order. ANOVA ensures significant differences when comparing the three groups (Table I) and Tuckey's HSD post hoc test shows that the control and dyslexia groups perform the task similarly, while the simulator, which makes significantly more errors, differs significantly from both (Table IV).

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TABLE IV. Writing tests with the effect of articulatory suppression, and Verbal Fluency with the effect of inducer change. Multiple comparisons using Tukey's HSD

Groups	Copy Pseudowords		Word dictation				ESADP		Verbal fluency (number of words)				SPFIE	
			No deletion		With deletion				Semantic indicator		Phonemic indicator			
	DM	p	DM	p	DM	p	DM	p	DM	p	DM	p	DM	p
Simulator vs Dyslexia	-23.83	<.001***	-9.9	*.001***	-4	<.001***	-4,43	<.001***	-10.17	<.001***	-3.37	.007**	-6.80	<.001***
Simulator vs Control	-27.79	<.001***	-11.13	<.001***	-10	<.001***	-1.23	.271	-14.03	<.001***	-6.70	<.001***	-7.33	<.001***
Dyslexia vs Control	-3.93	0.3	-1.23	0.08	-6	<.001***	3.20	<.001***	-3.87	.048*	-3.33	.008**	-0.53	-0.92

Note: MD = Mean Difference; ASEDW = Articulatory Suppression Effect on Dictation Writting;
SPFIE = Semantic Phonological Fluency Induction Effect; *** = p-value <0.001;** = p-value <0.01;* = p-value <0.5
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

The COR curve analysis gives an area under the curve value of 0.94 (very good). This indicator could be considered clinically important in the detection of simulation. The cut-off point of 90 correctly copied characters shows sensitivity 90% and specificity 86.7% (see Figure IV).

■ **Dictation of articulatory and non-articulatory suppressed words**

The number of correctly spelled words was counted under the conditions without and with articulatory suppression. The differences between the three groups were clearly significant, both in the condition with and without articulatory suppression. A large effect size is reached in both conditions (Table I). Figure I shows how the scores of the dyslexia group are close to those of the control group in the non-articulatory suppression condition, although their differences do not reach statistical significance (see Table IV). However, the articulatory suppression condition makes the accuracy of the dyslexia group much worse and the scores are closer to those of the simulator, although they also maintain significant differences with this group.

When we compare the intra-group differences using the T-test (Table III), we see that articulatory suppression affects the dyslexia group with a very large effect size (d = -1.81) and the control group to a lesser extent (d = -0.79). However, it does not significantly affect the simulator group, as they make almost the same number of errors under both conditions.

The composite variable ASEDW, which assesses the effect of articulatory suppression,

The differences between the groups (Table I) and the post hoc contrasts allow us to affirm that suppression affects the dyslexia group to a greater extent, which differs significantly from the control and simulator groups, while it does not seem to have any significant differential effect between the latter groups (see Table IV). The ASEDW variable reaches an area under the curve value of 0.91 (very good) which could be used as a clear indicator of simulation with a cut-off point of 3.5 with a sensitivity of 83.3% and a specificity of 96.7% (Figure V).

■ **Verbal Fluency Task**

In the two paired verbal fluency tests (semantic and phonemic verbal fluency) the control group performed best, followed by the dyslexia and the simulator, which clearly maintains exaggeration behaviour. Intergroup differences were significant for both the semantic and phonemic inducer

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(Table I), with no clustering in the post hoc test (see Table IV), as the dyslexia group always maintained significant differences with both groups. Intragroup differences were statistically significant and the effect size was large in all three groups (Table III), although much higher for the dyslexia group (d=2.7). To assess the effect of the semantic/phonemic inducer condition, the SPFIE variable was used following the procedure of subtraction between scores (table I). The post-hoc tests show that the control and dyslexia groups behave in the same way, and the simulator always differs from both, which shows that the effect of the change of condition has no effect on the simulator group while it has an effect on the other two (see Figure I and Table IV). The SPFIE variable reaches an area under curve value of 0.85 (very good) which could be considered a simulation indicator with a cut-off point of 7.5 with a sensitivity of 83.3% and a specificity of 73.3% (Figure VI).

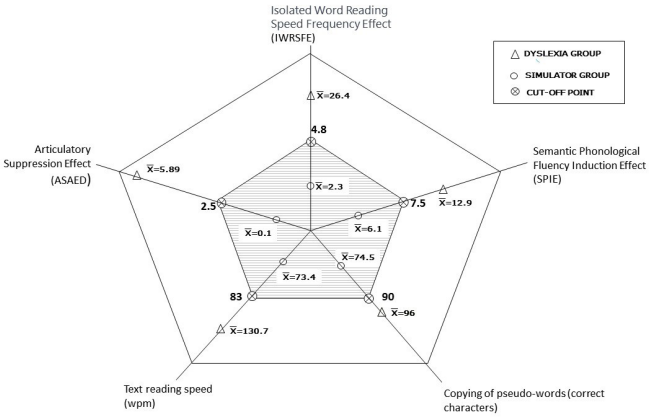
The five indicators have perfect detection power for deception behaviour if the mean scores of the simulator and dyslexia groups are assessed. In the light of the results, the proposal is made concrete in five indicators of simulating dyslexia with their corresponding cut-off points and sensitivity and specificity values as detailed in Table V. Figure VII shows the cut-off points for each of the five indicators in multidimensional form.

TABLE V. Sensitivity, specificity and cut-off points for detecting simulation in dyslexia

Measure	U	Cut-off point	Sensitivity %	Specificity %
Text reading speed (wpm)	0.87*	83	90	73
Copying of pseudo-words (correct characters)	0.94**	90	90	86.7
IWRSFE	0.99***	4.8	100	90
ASEDW	0.92**	2.5	86.7	93.3
SPFIE	0.85*	7.5	83.3	73.3

U = value of the area under the curve; * Values of the area under the curve good (0.75-0.90); ** Values of the area under the curve
very good (0.91-0.97); *** Excellent Area Under Curve Values (0.97-1); IWRSFE: Isolated Word Reading Speed Frequency Effect; ASEDW: Articulatory Suppression Effect on Dictation Writing; SPFIE: Semantic Phonological Fluency Induction Effect.
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández. Compiled by the authors.

FIGURE VII. Multidimensional representation of the average values for the five indicators in the simulator and dyslexia groups



Note: The shaded area detects cheating behaviour below the set cut-off points.
Source: Cervera-Mérida, Pellicer-Magraner and Ygual-Fernández, own elaboration.

The inner pentagon represents the values below the detection thresholds, where the average scores of the simulator group are located. The outer zone indicates the absence of cheating behaviour and contains the scores of the dyslexia group. To determine whether the proposed set of five indicators and cut-off points has the power to detect pretence in each of the participants in the study, we consider that cheating behaviour is detected when the person scores below the threshold in at least two of the five indicators. Applying this criterion, we can see that the sensitivity is 100% (all people in the pretender group are detected as liars), and the specificity reaches 94%, since two people with dyslexia would be considered as pretenders in the basic tasks of reading text or writing to dictation that could be mistaken for pretence.

Discussion and conclusions

The results show the general trend of exaggeration in simulation behaviours. The pretender group is always slower and makes more errors, both

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in reading and writing tests and in verbal fluency tests. Previous work had come to the same conclusion using questionnaires designed to test feigning behaviour (Lindstrom et al., 2011) or using reading and writing tests (Harrison et al., 2008). The work of Harrison et al. (2008 and 2010) is based on the fact that people with dyslexia perform quite well on the task of reading sentences, where some words have altered letter order and pretenders exaggerate the symptoms. The present proposal to detect simulation has been carried out by measuring with paired tests the effect of three factors to which people with dyslexia are sensitive, while simulators are not: word frequency, articulatory suppression and the type of inducer for verbal fluency - semantic or phonemic. In one of these tests, people with dyslexia perform the task significantly better than in the other. We believe that this procedure may be resistant to sophisticated attempts at fraud. It is very unlikely that fraudsters would be able to detect which of the two tests they need to fail more or perform more slowly and do so at an appropriate rate. In addition, read and write speed tests have been included, where exaggeration behaviour is easily detected.

The results provide resources for educators and counsellors to detect simulation when the honesty of those seeking support for the inclusion of students with learning difficulties is questionable. Such doubts may arise, for example, in university access or when compensatory measures are proposed, situations where some educators may be sceptical.

The group of simulators was recruited from among students from two universities and two degrees that provide information about dyslexia and had time for research before taking the tests. In our opinion, these conditions may have given them an advantage over other types of people who would have exaggerated even more.

The frequency of use when reading single words produced the expected effect in the dyslexia and control groups: they read the less frequent words more slowly and less accurately. However, the simulator was not sensitive to this effect and read both types of words in the same way.

Articulatory suppression significantly affects the writing ability of people with dyslexia. Although all participants wrote more slowly and made more errors under this condition, people with dyslexia suffer from this effect two to four times more. The effect is so strong that they come to resemble imitators, scoring very low when they are forced to write and speak at the same time.

In the Verbal Fluency test, the exaggeration behaviour of the simulator group and the tendency of the dyslexia group to resemble the control group are maintained. People with dyslexia suffer from a strong phonemic versus semantic inducer effect, i.e. they are able to evoke many more words from a given semantic field than words containing a particular letter or sequence of letters. Simulators, unaware of this effect, evoked very few words with both inducers.

In the text reading test and the pseudoword copying test, people with dyslexia achieve similar accuracy to controls - as we know to be the case in transparent spelling languages - while simulators exaggerate and make many more errors. However, adults with dyslexia never read or write as fast as controls, although they consistently outperform simulators.

The general behaviour of symptom exaggeration is seen in text reading and pseudoword copying. Similarly, feigning behaviour can be revealed by paired tests in which people with dyslexia can perform quite well on one task and with great difficulty on the other, while pretenders perform equally well on both. Adults with dyslexia clearly suffer from the effects of frequency of use when reading single words, of articulatory suppression when writing in dictation, and of phonological versus semantic cueing in the verbal fluency task, whereas pretenders do not suffer from these effects and perform equally well in the paired tests.

The limitations we have observed have been discussed above: 100% sensitivity and 94% specificity are achieved when applying the criterion of scoring below on two or more indicators of simulation detection, which makes it possible that some people with dyslexia who obtain extraordinarily low scores on text reading and pseudoword copying tasks could be mistaken for simulators. In these few cases of doubt, other tests and indicators of educational history should be added to the assessment. One of the influencing factors may be low schooling and limited exposure to reading in individuals with school failure.

This work is a proposal for the development of strategies and indicators for the detection of faking dyslexia signs in a real context. Future work could standardise an instrument that incorporates these indicators for detecting faking in post-compulsory education students who are eligible for compensatory measures.

It is to be expected that clinicians and counsellors will apply any assessment instrument with caution and supplement it with history data and other indicators. For this reason, we believe that the limitations of the proposal are unlikely to be detrimental to the people with dyslexia

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whom this research is intended to protect. In fact, the indicators we propose could also be used as a complement to the diagnoses, reinforcing the results obtained in their assessment, as they are considered to be free of simulation.

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Specific socio-educational dimensions of university students with an administrative protection measure

Dimensiones socioeducativas específicas del alumnado universitario con medida administrativa de protección

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Abstract

Youth living in protection system centers have specific social difficulties that negatively affect their process of school inclusion. The adolescents under the protection system present worse academic indicators than their peers. Prior research indicates that few of these young people attend university courses. The present study aimed to analyze which socio-educational dimensions affect the university trajectory of students from residential protection centers when they start their degrees. A qualitative investigation was organized in two phases according to the grounded theory. In phase one, 154 interviews were performed during four 36-month follow-ups. In phase two, 18 interviews were conducted to prepare six

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life stories. Ten students participated in the research, seven females and three males. The participants studied at campuses that belong to Santiago de Compostela, A Coruña, and Vigo universities. The results indicate that the vulnerability of youth in care increases when they start the university. The coverage of the protection system disappears when the youngsters leave the residential protection centers. The absence of social and institutional support hinders the youths' integration process. Socio-educational deficits, related to the dimensions that favored achieving school goals, increase during university time. It is concluded that universities and the protection system must implement support mechanisms that favor these youths' academic trajectories. University corporate responsibility has yet to address the needs of vulnerable students due to social factors.

Keywords: universities, social exclusion, social inequality, educational strategies, inclusion, university students, foster care.

Resumen

La juventud que reside en centros del sistema de protección tiene dificultades sociales específicas que indicen negativamente en el proceso de inclusión escolar. La adolescencia tutelada presenta peores indicadores académicos que sus coetáneos. Las investigaciones previas indican que son excepcionales los casos en los que llegan a cursar estudios universitarios. El presente estudio se propuso analizar que dimensiones socioeducativas afectan al itinerario universitario del alumnado que, en el momento de inicio de los grados, proviene de centros residenciales de protección. Se diseñó una investigación cualitativa según el enfoque de la teoría fundamentada. En la fase uno, se realizaron 154 entrevistas durante cuatro seguimientos longitudinales de 36 meses de duración cada uno. En la fase dos, se realizaron 18 entrevistas para la elaboración de seis relatos de vida. Participaron 10 estudiantes, siete alumnas y tres alumnos. Las participantes estudiaron en campus pertenecientes a las universidades de Santiago de Compostela, A Coruña y Vigo. Los resultados indican que la situación de vulnerabilidad de la juventud tutelada se incrementa en el momento en el que acceden a la universidad. La cobertura del sistema de protección desaparece cuando abandonan los recursos residenciales. La ausencia de colchón social y de apoyo institucional condicionan el proceso de integración del colectivo. Durante la etapa universitaria se incrementan los déficits socioeducativos en las dimensiones que favorecieron la superación de las metas escolares. Se concluye que Universidades y sistema de protección deben implantar mecanismos de apoyo que favorezcan los itinerarios académicos de este colectivo. La responsabilidad corporativa universitaria tiene pendiente afrontar las necesidades del alumnado vulnerable por factor social.

Palabras clave: universidad, exclusión social, desigualdad social, estrategias educativas, igualdad de oportunidades, estudiante universitario, sistema de protección.

Introduction

The training students' trajectory conditions their possibilities of overcoming a situation of social exclusion during the transition to adulthood. Training adolescents in protection should be a priority in protective action. Students with an administrative guardianship record are practically invisible at school. In Spain, there are no official state statistics on the evolution of students living in residential centers (Montserrat & Casas, 2010), but the scientific literature indicates that they have specific social difficulties, which translate into a concerning situation of academic exclusion (Jariot et al., 2015; Martín et al., 2020; Melendro et al., 2020; Montserrat & Casas, 2010). In the context of a lack of official information on this group's training trajectories, the statistics offered by the third sector entities accompanying this group are very valuable. In Galicia, the support program for the transition to adult life (Mentor) attends to young people who, having a protection file, need socio-educational support for their emancipation. The annual average number of active participants in the Mentor program between 2015 and 2020 was 539 (Table I). There was an average of 81.01% of young people without compulsory basic training (IGAXES, 2021) in the population attended to during this five-year period. This situation is genuinely concerning, considering that the program was accessed when the compulsory school age had already been exceeded (16 years).

Students who undergo a trajectory of formative exclusion suffer negative impacts that primarily affect groups in a situation of greater social vulnerability (Tabarini et al., 2018), whose consequences are prolonged

TABLE I. Participants in the Mentor program without compulsory basic studies

Year	Participants	Percentage without compulsory basic education
2015	513	81.48%
2016	534	81.7%
2017	519	80.40%
2018	545	80.47%
2019	560	82.37%
2020	566	79.64%

Source: IGAXES3 (2021). Compiled by the authors.

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throughout the life pathway in dimensions such as subjective well-being (Montserrat et al., 2019). Knowledge of the conditions of students in protection is relevant to adapting the actions of the education system to the group's needs. Previous research shows how specific pedagogical actions of the school can affect the school integration of adolescents in protection. For example, the results indicate that the relationship between students and teachers has a particular impact when students come from a vulnerable social context (Wanders et al., 2020). Relational dynamics are a determining dimension in the school inclusion of adolescents in protection (Garcia-Molsosa et al., 2021). Adolescents in protection perceive the academic environment according to the behavioral repertoire they observe in the teaching staff. Along these lines, the students' perception of the social involvement of the teaching staff affects the improvement of their own social competence (Sincer et al., 2022). The above highlights the importance of pedagogical practices in school inclusion processes.

The vulnerable situation of students in protection during the school trajectory makes it difficult for them to pursue higher education. Various studies indicate that adolescents living in residential protection centers have fewer options to carry out post-compulsory training trajectories than their peers (Day et al., 2013; García-Molosa et al., 2021). The group's situation of academic exclusion is especially notable in their access to university (Jackson & Cameron, 2012), with exceptional cases in which they manage to pursue a university education (Miguelena et al., 2018), although they present worse academic evolution when they manage to access the university (Day et al., 2013). Students in protection suffer from the typical difficulties of social exclusion, which condition the expectations with which they plan their formation in their life trajectory. These are deficits of institutional support and the experiences undergone during the school trajectory, which affect their possibilities of access to higher education. Students in protection aspire to pursue post-compulsory studies just like their peers (Geiger et al., 2018), but the dimensions presented limit their possibilities of achieving it. Young people with protective measures know that obtaining a university degree is an exceptional opportunity to overcome social exclusion (Gairal-Casadó et al., 2021; Kirk et al., 2013).

The literature on the subject focuses on the school trajectories of childhood and adolescence in protection. The conditions under which

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the few cases that successfully access the university should be studied. Information on the transition processes to university life is of great value for designing professional practices to support institutional policies. According to Johnson (2019), delving into the intervention processes with students who are studying at university and have a protection file is still pending. The present research studied the transition to university of young people from residential centers of the protection system. We set the following goal: to analyze which socio-educational dimensions impact the academic integration of students in protection when they begin university activity.

Method

Design

A qualitative investigation was designed following the grounded theory approach. The experience at university was analyzed as part of a holistic approach to life in a situation of social exclusion during the transition to adult life. We examined the significance of the experience undergone (Martínez, 1996) through the essential reflection of acts and practices. The investigation of the processes of school inclusion of young people in residential care requires analyses focused on subjective experience (García-Molosa et al., 2021). During the interviews, the participants identified the dimensions they perceived in their university experiences in a situation of social vulnerability. Phase one began in September 2012 with the first longitudinal follow-up. The follow-ups continued until September 2021. It should be noted that it was difficult to access the sample due to the small number of young people who started university studies with a previously opened protection file. Each follow-up lasted 36 months. A monthly interview was established, which was carried out both during the academic year and in the non-teaching periods between courses. The research team considered it appropriate to maintain the investigation active during the months without academic activity. The aim was to analyze the experiences as integral phenomena that are not paralyzed during non-school days. An initial and a final interview were conducted with all participants. A total of 170 interviews were conducted, 152 in phase one and 18 in phase two. The interviews of the second phase were

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oriented to the configuration of life stories with which we intended to analyze the participating youths' consideration of their inclusion process in the university and their previous academic trajectory. In the stories, data were obtained on the aspects that affected their trajectory and those they observed during their stay in the protection system concerning the peers with whom they lived.

Participants

Convenience sampling was used according to our access to young people in protection who were starting university studies. The duration of the data collection process was conditioned by the sample's availability. All participating youths were 18 years of age or older and had had an open protection file for a minimum of 12 months. The sample in phase one had spent an average of 81.5 months as minors with protective measures, and in phase two, 59.8 months. The mean age of the participants in the longitudinal follow-ups was 18.5 years, and 20 years in the life histories.

Data analysis

The audio recordings were transcribed verbatim. Constant comparative analyses of the transcripts were performed by repeating the readings to generate patterns and codes (Strauss & Corbin, 1994). In the first phase, the categories were eventually identified considering the results of the previous literature on the subject. Monserrat et al. (2011) presented a study, framed in the European project "Young people from a public care background: Pathways to education in Europe" (YIPPEE), in which the academic evolution of young people in care in Catalonia was analyzed. The results indicated that the following dimensions facilitate the educational trajectory: the prioritization of school during foster care, participation in decision-making about their training trajectory, stability in both residential and educational centers, the presence of adult role models involved in the school issue, and the possibility of participating in leisure activities that take place outside the protection resources with peers who are not in residential care. The identification of key coding

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categories allowed the analysis of the data to be carried out within the framework of the research objectives. The categories are not limited to what has been presented in the previous literature but are open enough to accommodate emerging data not contemplated in prior research. The process promoted the consideration of all the units of meaning of the data through constant comparison and theoretical sampling, concluding the analysis with evidence of theoretical saturation (San Martín, 2014). The final analytical codes for this phase were validated by two experts foreign to the research team and with the approval of the participants in the longitudinal follow-ups. A final interview was conducted in which the young women validated the categories. The results of this phase were the basis on which the scripts for the Phase 2 interviews were constructed. The new data allowed us to take up the substantive coding again, showing that no new dimensions were obtained and confirming the theoretical saturation (Monge, 2015).

Results

The results indicate that the academic trajectory was a priority during the protective action. "The educators kept an eye on how I was doing in high school and helped me whenever I had a problem" (RV3), says one participant. "In my case, they always encouraged me and insisted that the first thing was to get through high school; the educators insisted that I could not quit. It was very difficult to pass second grade" (RV5), argued one young man. The academic environment shares prominence with other necessities of life with social difficulties when leaving the protection center to access the university. Getting a job during non-school periods becomes a priority to have the financial resources to continue studying. "I have to get a job in the summer. I need the money to make sure I can continue with my career" (SL2), says one participant. "Those of us who don't have anyone to help must fend for ourselves. We can't afford to get distracted and run out of income. We have to work no matter what, and reconcile work and studies" (RV2), argues a young man.

During the protection trajectory, they have stable professional referents. "Carmen was always there ever since I arrived at the family home, and she was the one who supported me in everything" (RV3), argues one participant, referring to an educator. "At the center, they were always very attentive

to me, but when you leave, things change, and you must face life alone" (SL3), says a young woman. The reduced presence of professional figures as the students progress through the university stage was generalized in the trajectories we analyzed. "When I entered the faculty, I realized that I was all alone" (RV2), says one participant. Another university student says that "I often felt like I had no one I could call, and that is very hard" (RV6). "The educators do their job well and support you in any way they can... They cared a lot about me, but I'm not with them anymore. They have to take care of the kids they're with…. I talk with them on the phone once in a while, but I know that their work with me is over" (SL4), argues one participant.

Residential stability is another frequent factor in the sample (see Table II). "I've always been in the same center" (RV5), says a young man. "Since they took me away from home, I've only been in two centers, although the first one was only for a few weeks. I can say that I was actually in one center until I left to come to the university (RV3), explains one participant. The university stage unfolds with housing uncertainty. Public university residences are designed for students with family support who go home during non-teaching periods. Young people without family referents need to improvise solutions for these weeks in which they are not allowed to stay in the residences. "I have come to the residence because it is free, but the problem is at Christmas, Easter, and August.

TABLE II. Sampling and timing

Phase	Code	Age	Gender	Campus	Timing			
					Beginning		Ending	
					Month	Year	Month	Year
1	SL1	19	Female	Ourense	09	2012	09	2015
	SL2	18	Female	Pontevedra	07	2013	07	2016
	SL3	18	Female	A Coruña	06	2015	06	2018
	SL4	19	Female	Ourense	09	2018	09	2021
2	RV1	21	Male	Santiago	10	2021	01	2022
	RV2	19	Female	Lugo	11	2021	12	2022
	RV3	20	Female	Ourense	12	2021	01	2022
	RV4	22	Female	Ourense	01	2022	02	2022
	RV5	19	Male	Ourense	01	2022	02	2022
	RV6	19	Male	Santiago	01	2022	02	2022

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In those weeks when it closes, I have to make a living" (SL1), says a young woman. Another participant, who lives in a shared flat, says that "there are months when you feel very bad about paying the expenses" (RV4). Leaving the protection center is conditioned by the uncertainty of not having economic resources for daily life. "When you leave, you have to take care of all the expenses, and you don't know if you will have the money" (SL4), says a young man. "One of the differences you notice when you leave is the need to pay all the expenses. When you're in the center, you don't worry about that. You start to get overwhelmed when you leave" (RV5), says one participant. "I have to figure out how I'm going to make ends meet. These things don't bother my university classmates" (SL3), argues one participant, highlighting the difference in the situation of students who have social support.

Referenciado pro académico "It helped me a lot to meet girls who played soccer with me. I spent many hours with them, and that motivated me to study... I saw that they were studying, and I wanted to be like them, but none of them were from the center" (SL2), argues a young woman. Participation in community activities is valued as positive for engagement in school dynamics. The results indicate that the participants

TABLE III. Comparison of dimensions with an impact on the training trajectory between the residential stage in protection and the university stage

Academic trajectory in residential care	**Frequencies**	**Academic trajectory at the university**	**Frequencies**
Presence of stable professional referents	8	Leading professional figures significantly reduce their presence	6
Prioritizing the academic in daily activity	8	Compatibility of academic activity with work	7
Permanence in the same residential resource	9	Housing uncertainty conditioned by economic difficulties	8
Coverage of daily living expenses by protection resources	10	Lack of financial support to cover the expenses of daily living	9
Friendships without a record in the protection system who act as reinforcers of schooling	9	Deficits in social support with a lack of referents to turn to in case of personal problems	7
Participation in activities with peers in community contexts	6	Does not participate in community activities organized by the university	7

Source: Compiled by the authors.

in the research do not attend community activities organized by the university. Arguments were collected indicating that the conditions of a vulnerable social life force them to prioritize issues such as work. "Between studying and working, you have little time left to get involved in other activities. The little free time you have left you want to dedicate simply to partying and disconnecting" (RV6), says a young man. "I think some of the activities they do on campus are good, but I don't have the time and I don't feel comfortable. I once went to one that was free. I don't even consider the paid ones... I have a lot of expenses, and the little I have left for leisure I want to spend on other things" (SL3), says one participant. The social support network is not reinforced during the university stage. "I have a good relationship with my classmates, but it's not very intense. We get along well, but I don't consider them close friends. We have different life problems" (SL4), says a young woman. "People our age don't have as many problems as we girls who come from centers..., I have other things to worry about" (SL1), argues one participant. The participants highlight the difference between the protection stage and the university stage in terms of having a safe space from which to deal with personal problems. "You could talk to the educators when you needed to. At university, you interact with your classmates, but it's superficial, and you really feel lonely" (RV3), says a young woman.

Discussion and conclusions

Students who access the university from a residential protection center tackle the transition process with personal uncertainty and a lack of support. The beginning of the academic year is a leap into the void in which they combine academic challenges with those of a life with social difficulties. The protection system does not facilitate a process of gradual adaptability. In the cases analyzed, the break with the support of residential resources is abrupt. Young people in protection do not control all the dimensions that affect the transition process, so they do not have the autonomy to manage their time (De- Juanas et al., 2020b). Their limited control over the time dimension negatively impacts the academic trajectory (Hollingworth & Jackson, 2016). The bureaucratic organization of residential resources does not contemplate mechanisms to provide support by educational teams to be regulated according to students' adaptability to university life. Students in protection have deficits in their

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knowledge of academic dynamics and their abilities to perform autonomously at university (Gairal-Casadó et al., 2021). The results indicated that the beginning of the school year was experienced with high stress, not only due to the changes derived from the new formative stage, but primarily due to the difficulties inherent in the situation of social exclusion, which have a negative impact on their inclusion in post-compulsory studies (Randolph & Thompson, 2017).

The sample participating in the research experienced the beginning of the university stage with skepticism. Their previous life experiences are marked by suspicion of some administrative actions and distrust of their relationships from their personal context (De-Juanas et al., 2020a). The data indicated that they observed the unfamiliar academic dynamics with some trepidation in their first contact with their classroom group. They did not establish a referral relationship with the teaching staff of the first year. In specific cases, their attendance at tutorials was recorded, where they received individualized attention, an aspect that stood out positively in the face of classroom heterogeneity (Martínez et al., 2019). The contents of the tutorials are limited to curricular issues, and the topics discussed do not include issues related to the social and personal dimensions. Students from residential centers are accustomed to having professional figures who compensate for the referential deficits of their natural context. The university tutorial action did not cover this dimension.

University students who have left the protection system need professional socio-educational support (Geiger et al., 2018; Watt et al., 2019), especially during the first months of life outside residential resources (Ruff & Harrison, 2020). The results indicated that the sample intended to maintain the relationship with an educational figure who had accompanied them during their previous trajectory (Gairal-Casadó et al., 2021). In all cases, the support of the social educators of the protection centers was punctual. The students excuse the educators' lack of availability, acknowledging that they have to take care of the new residents. The search for this support is due to the absence of reference figures in this new stage. The transition process takes place without the necessary resources for emancipation (Fernández-Simo et al., 2021). The results indicated that access to university was planned considering the circumstances of precarious support. Therefore, it is not that the difficulties experienced during the process resulted from professional malpractice but that the absence of support mechanisms forced the transitions to be made in a context of social vulnerability.

Participants in the study had some opportunities—albeit limited—for community relationships during their stay in residential care. The educational teams had considered the community dimension as an educational resource (Trull-Oliva et al., 2022). In this group, the relational network is usually comprised of peers who are familiar with the protection system and have difficulties establishing new networks (Díaz-Esterri et al., 2021). This is not the case for our sample, which related to contemporaries outside the residential resources, a dimension that favors engagement in school activity (Häggman-Laitila et al., 2018). During the process of transition to university, the relational network was weakened, and difficulties were observed in establishing new links with other university students. Good relational dynamics were observed with the classroom group, but no deep relationships were established. Professional support should be established to configure security scenarios on which to rely to create new relational dynamics. Socio-educational action can improve the possibilities of adolescents in protection to develop support networks and links with personal referents (De-Juanas et al., 2022), which are not only decisive during the academic trajectory but also in the success of the post-university life trajectory (Salazar & Schelbe, 2021).

Students in protection do not have the financial support to cover daily living expenses during their post-compulsory studies (Gairal-Casadó et al., 2021; Jackson & Cameron, 2012; Rosenberg & Kim, 2018). This situation forces them to reconcile academic activity with work. We detected some cases in which they not only had to meet their own expenses but also had to help their biological family, immersed in a situation of social vulnerability (Rodríguez et al., 2016). Difficulties in accessing and maintaining a stable housing option were observed during the studies (Salazar et al., 2016). University residences do not have options adapted to the needs of students without family support. They appreciate that the residences are free but they are not allowed to stay in them during the non-teaching periods.

The results indicate a deficit of specific support for university students from residential protection centers. The precariousness of the resources available during the previous formative stages (García-Molosa et al., 2021) increases in the University, when the accompaniment of the child and adolescent care system is abolished. The entire Spanish university system programs should be generalized with a social perspective that promotes socio-educational accompaniment for the inclusion

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of students in protection, such as the program for University Academic Success Arrakasta or Ikaslagun, carried out between the University of the Basque Country and the Basque Provincial Councils (Miguelena et al., 2020), which attempts to create the necessary conditions for this group to successfully complete their university studies. It would be essential for the program targeting university students in protection to have the resources and economic means to compensate for the shortcomings presented (Geiger et al., 2018). University corporate responsibility has yet to address the needs of students who are vulnerable due to social factors. The protection system and universities have yet to establish collaboration mechanisms that favor the performance of academic trajectories. Training is the main factor that will enable students in protection to break the chain of social exclusion.

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Same performance, different paths. Social status, school performance and choices after compulsory

Mismos rendimientos, diferentes trayectorias. Estatus social, desempeño escolar y decisiones tras la educación obligatoria education

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Abstract

The sociological literature has made great efforts to clarify the effect of social origin on educational trajectories. This influence has been analyzed directly, based on the impact of social origin on school decisions, and indirectly, considering school performance (Boudon, 1974). However, to date, the study of primary and secondary effects in Spain has been carried out considering a dual scenario (Baccalaureate versus vocational training). Consequently, those who, having completed compulsory education, do not attain any post-compulsory education qualification have yet to be considered. The non-analysis of students who drop out of school can lead to a statistical bias in the educational performance analysis.

To account for the role of social origin, this paper examines students' educational performance in a multiple-choice context, considering options such as dropout, Vocational Training, or Baccalaureate.

Our purpose is to find out to what extent social origin affects school decisions when we measure individuals with the same performance, measured through the scores in Language in the last year. Employing a mediation model (non-linear probability nested, KHB model) with the longitudinal survey of the

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Andalusian Panel on Education and Labor Market Transitions (IECA, 2010 and 2018, n=1,502), our results indicate that the direct effect of socioeconomic status explains up to two-thirds in the variability of educational decisions after post-compulsory education. On the other hand, the indirect effect of social background, i.e., its direct influence on academic performance, manages to explain up to one-third of the variability in educational decisions. Far from disappearing, socioeconomic status continues to influence educational choices, even when controlling for achievement.

Keywords: educational inequalities, social origin, school performance, educational decisions, social status, social classes, school dropout, primary and secondary effects.

Resumen

La literatura sociológica ha desplegado grandes esfuerzos para esclarecer el efecto que tiene origen social en las trayectorias educativas. Esta influencia se ha analizado tanto de forma directa, a partir del impacto que tiene el origen social en las decisiones escolares, como indirecta, tomando en consideración el rendimiento escolar (Boudon, 1974). No obstante, hasta la fecha en España, el estudio de efectos primarios y secundarios se ha realizado tomando en consideración un escenario dual (bachillerato versus formación profesional). En consecuencia, no han sido considerados aquellos que, habiendo terminado la educación obligatoria, no alcanzan ningún título de educación postobligatoria. Esto supone dejar de analizar una parte importante de la población estudiantil pudiéndose generar un sesgo estadístico.

El presente trabajo trata de dar cuenta del papel del origen social considerando el rendimiento educativo del alumnado en un contexto de elección múltiple (Abandono, Formación Profesional o Bachillerato). Nuestro propósito radica en saber en qué medida el origen social actúa sobre las decisiones escolares cuando medimos a individuos que tienen el mismo rendimiento, medido a través de las puntuaciones en Lengua del último curso. Empleando un modelo de mediación (de probabilidad no lineal anidado, modelo KHB) con la encuesta longitudinal del *Panel de Educación y Transiciones al Mercado Laboral de Andalucía* (IECA, 2010 y 2018, n=1.502), nuestros resultados indican que el efecto directo del estatus socioeconómico explica hasta dos tercios en la variabilidad de las decisiones educativas tras la educación postobligatoria. Por otro lado, el efecto indirecto del origen social, es decir, su influencia en el rendimiento académico logra explicar hasta un tercio de la variabilidad de las decisiones educativas. Lejos de desaparecer, el estatus socioeconómico sigue condicionando las decisiones educativas incluso cuando se controla por rendimiento. Por último, estos resultados corroboran la existencia de un *efecto de compensación* en los estudiantes de alto estatus socioeconómico y bajo rendimiento.

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Palabras clave: desigualdades educativas, origen social, desempeño escolar, decisiones educativas, estatus social, clases sociales, abandono escolar, efectos primarios y secundarios.

Introduction

Some decades ago, several social scientists pointed out that social origin, understood as the highest position attained by one of the parents in terms of both income and education, took two different paths when it exerted its influence on educational decisions (Boalt, 1947; Boudon, 1974; Girard & Bastide, 1963). These decisions were about whether or not to continue studying after completing a given stage of schooling.

The first of these channels - referred to as *primary effects* - focused on the impact that social origins have on schooling decisions. It is known that students who come from lower classes obtain worse results than those who come from middle and upper classes (OECD, 2016). They also have worse school attaiment. This evidence is found in most countries analyzed to date, although there are deep gaps as one moves from one set of countries to another. To examine this relationship, the *Program for International Student Assessment* (PISA) assessments created the *Socio-economic and Cultural Status,* a measure that summarized the economic, social, and cultural resources of households (Willms, 2006). The persistence of this type of educational inequalities is the basis on which one of the most popular sociological currents of the second half of the 20th century was devised: *the theory of social reproduction* (Baudelot & Establet, 1992).

The second way in which social origins influence educational decisions arises when controlling for student performance. When we block its impact and compare the school decisions of those students who have the same school performance but different social origins. When the latter factor is considered, far from eliminating the influence of social origin, it continues to have an impact on educational decisions. In other words, students with similar school results make different educational choices that vary according to their social origin. Raymond Boudon (1974) called this type of consequences as *secondary effects*. There is no doubt that when he theorized about them, the French sociologist had an idea in mind. First, he was trying to explain educational inequality on the basis

of material constraints beyond cultural influences. Second, on the level of social justice, his analysis was to show that the role of the school in the task of distributing the most desirable social positions is limited by the economic potential of families.

In this article, we will analyze the role of secondary effects in post-compulsory education in Andalusia. We analyze them under a multinomial design that considers the three choices that students make when they finish compulsory education (choosing baccalaureate, vocational training or dropping out). At least in Spain, the studies devoted to this topic are restricted to the study of two options (Bernardi & Cebolla, 2014; Valdés, 2020). We think that restricting the population that finishes secondary school to only two options may lead to an underestimation of the impact that social origin has on school decisions since those young people who drop out of the educational path and join, or not, the labor market, are those who come from the lowest socioeconomic statuses. This attrition of the sample can lead to biases when we wish to know whether there is a social compensation effect whereby more advantaged families take academic paths with greater probability than families that are less advantaged, even though their students obtain lower or even mediocre average grades.

Our purpose is to find out to what extent social background plays a role when we compare individuals with the same performance. The results showed that social origins play a role in educational decisions even when we consider the role of academic performance. More specifically, they indicated that as the social status of families increases the probability of students pursuing baccalaureate rather than professional studies or dropping out of school increases even when controlling for performance. In fact, in each of the options we have considered, socioeconomic status accounts for between 60 and 70% of the variability in the decision. We also find a clear compensation effect when calculating the probabilities of opting for baccalaureate versus dropping out.

In terms of social mechanisms, we take up Gambetta's idea (2019) of *overadaptation*. According to this idea, the decisions made by students are strongly conditioned by the contexts in which they are generated. We make use of this idea, but update it in a contemporary scenario of greater educational expansion. Finally, we indicate how this research could be used in terms of public policy.

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Theory and Bibliographic Review

Primary and Secondary Effects

We owe the conceptualization of primary and secondary effects to the French sociologist Raymond Boudon (1974) although it had been previously sketched by other authors. This theoretical distinction was made in the 1970s, in an epistemological context dominated by culturalist explanations. In their famous work *La Reproduction* [1972], Pierre Bourdieu and Jean-Claude Passeron (2001) argued that the bulk of the explanation for school inequalities lay in cultural differences. Students from different social classes entered school with a very unequal initial cultural background. However, the school, instead of behaving as a neutral institution -valuing all cultural manifestations in the same way- positively appreciated the culture of those students who came from the middle and upper classes and undervalued those other cultural expressions that came from the popular classes. Or, to put it another way, using Bourdieu and Passeron's terminology (1972): the school rewarded those *habitus* that had been forged in contact with high culture -or *haute culture*- be it literary, musical or/and artistic, and branded as ordinary, vulgar and/or common those others that were a consequence of contact with popular culture. Thus, what teachers understood to be a sign of the student's brilliance was nothing more than the result of an early exposure to certain intellectual and artistic stimuli by his or her peers. It was, then, under this institutional logic that the symbolic expressions of the middle classes became an asset or, more specifically, a matter of what came to be called *cultural capital*. Thus, the school made social differences legitimate by transforming them into personal differences resulting from individual talent.

In contrast to Bourdieu and Passeron, Boudon (1974) considers the decisions made by students and their families as rational acts subject to constraints known, to a large extent, to the actors. His work referenced the previous work of Keller and Zavalloni (1964) on social class and ambition. In that paper, it was postulated that the relative distance to a good, generates differences in the probability of ambition. Or, in other words, as we are able to satisfy a good, its desire also increases. Boudon thus attempted to explain the mechanics of school inequalities

by focusing on the decisions made at the *micro level by* individuals and their families, disregarding any functional logic attributed to the latent functioning of social institutions. What mattered most were the differential economic resources of students from different social classes and not the culture they brought to class.

The impact of social class on schooling decisions was thus felt in two different ways. On the one hand, the *primary effects* refer to the indirect impact that the social class of origin has on the educational performance of their offspring. That is, how the resources, teachings, skills and stimuli carved out in the family environment can have an impact on the improvement of cognitive skills and on the specific skills required for good school performance. And this, in turn, will result in opting for one of the most desired educational choices, those for which greater ambition is required: the baccalaureate. Three main mechanisms, according to Jackson (2013)-beyond the strictly congenital ones[1] - explain the indirect impact of the family environment on inequalities in educational opportunities:

First, there is the family environment and the economic, cultural and social resources that families provide to their offspring. A great deal of research has shown how greater availability of economic resources helps to improve learning. These can take the form of enrolling in a language school, hiring a private teacher or purchasing teaching materials. Second, there is cultural capital that can have a direct and indirect positive effect on educational attainment and achievement. Finally, other studies shed light on how social capital can have an effect on both educational and class achievement.

Boudon posited his model as a diachronic model of decision processes in which students and their families made an estimate of which options would bring them the greatest future benefits given specific direct and indirect costs (Barone et al., 2018). More specifically, the aim was to explain why, while working class students dropped out as soon as failure knocked on their doors, their peers from the middle classes persisted time and again in continuing their studies, despite their poor performance. This procedure was conceptualized in *secondary effects*.

[1] Numerous studies have been addressing the complex research on the combined effect of inherited genetic and purely environmental aspects. After the famous Bell's study that initiated these approaches, sociology abandoned this avenue of research as non-sociological without taking into account that environmental factors can also affect genetic factors. For more details on the models of "*genetics endowments*" or the study of "*polygenic scores*" and their relationship with educational inequalities, see Barth, Papageorge & Thom (2020).

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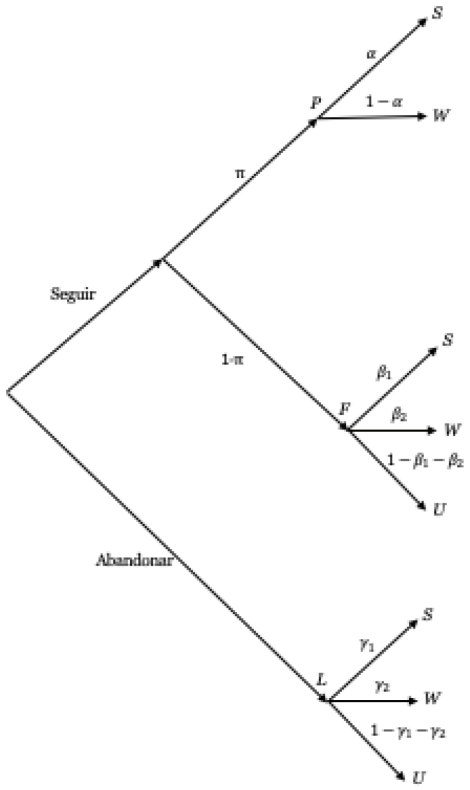
Boudon (1974) developed these arguments based on simulated, not real, data. It was the American sociologist Robert Mare (1980, 1981) who analyzed educational transitions as a successive and discrete set of events in the same way as Boudon but with real data. As one progresses through each of these years, the proportion of students with medium and high social status increases as those with lower status drop out. Thus, students with fewer resources are less likely to make the decision to continue to the more advanced stages. In order to pursue this idea, Mare used a set of binomial logistic regressions. Subsequently, these models were reworked to consider the lack of representativeness of the samples as students of socioeconomic status were no longer included in the higher school stages. This is what is known as *sample attrition bias* (Winship & Mare, 1992).

In this regard we should not forget to mention the work initiated by Gambetta who in 1983 will publish a work in tune with those previously mentioned (Gambetta, 2019). In his search for the mechanisms involved in successive educational decisions, the Italian sociologist found, rather than an adaptation to the circumstances of the lived environment, an *over-adaptation* to it. Low-status students tended to underestimate their chances of success regardless of their performance. Conversely, students from more privileged backgrounds tended to overestimate their chances of success by taking even the riskiest decisions even with poor school performance.

Later on, the scheme proposed by Mare will acquire its microeconomic embodiment in the mathematical modeling work undertaken by Richard Breen and John H. Goldthorpe (1997). They proposed a probability ordering model in which spillover effects were derived from the amount of relative risk aversion exhibited by students and their families. Figure I shows the construction of the decision tree created by both authors. They assumed that all families prevented their children from falling further below their social position by always avoiding downward mobility (Goldthorpe & Breen, 2010). Their theory was based on a utility function in which costs, benefits and subjective probabilities of success were computed. According to these authors, all students and their families aspire to go as far as possible in the educational system as this increases the probability of avoiding downward mobility and, consequently, they do not differ in their attitudes towards school. However, they did differ in their resources and performance, hence their educational choices were different. Students with scarce resources considered the university route riskier, thus showing greater relative risk aversion than the more privileged classes.

FIGURE I. Simple decision tree



Source: Adapted from Goldthorpe and Breen (2010, p. 210).

The assumptions of this model were later relaxed by various authors through replacing risk aversion with loss aversion. According to Breen and Yaish (2006) as the *prospect theory* (Kahneman & Tversky, 1979) losses outweigh gains. Transferring to the field of education, this means that students and their families find greater utility in avoiding downward mobility than in achieving upward mobility. In other words, the less advantaged classes will take up vocational studies with greater propensity than the academic pathway since it guarantees class maintenance and minimizes the costs and risks that the other pathway -the baccalaureate- entails.

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Previous Investigation in Spain

One of the first studies in Spain that set out to unravel the influence of primary and secondary class effects on educational decisions was the one carried out by Bernardi and Cebolla (2014). This work is of special interest given that it evaluates the so-called *compensation effect*. According to it, secondary effects would not have an additive but an interactive form since scores and social class do not increase at the same rate. When grades are low, parents of higher social status push their children towards high school to a greater extent than parents of lower social status. However, two subsequent papers conducted by Troiano, Torrents and Daza (2019) and Merino-Pareja, Martínez-García and Valls (2020) found no evidence pointing, at least at the secondary stage, to a presence of the compensation effect.

Bernardi and Cebolla (2014) estimated that indirect effects accounted for three quarters of total educational inequality. Valdés (2020), on the other hand, considered that these effects are not so high. This may be because the variable chosen to account for performance, grade recall, shows hardly any variability. A continuous performance indicator should bring out more marked differences between social classes that would allow for a greater relative importance of the primary effects (Valdés, 2020). In his research, based on choice expectations with the PISA study in its 2003 wave, Valdés points to a smaller effect of secondary effects on total inequality.

Contrary to each of the investigations that have been previously carried out in our country, we are going to analyze each of the options that young people can take after completing compulsory secondary education, namely, baccalaureate, vocational training or dropping out of school. Concentrating the analysis of secondary effects on two paths (baccalaureate, vocational training) implies omitting from the analysis the population subject to the highest dropout rates[2]. Perhaps for this reason the compensation effect is not observed in the studies sketched above. In fact, subjects coming from lower socioeconomic strata are excluded from a choice that, although they have not made, since they have dropped out, they have been able to make at least eventually (since they have completed compulsory education but have decided not to continue studying).

[2] The same is not true for school failure rates, since the affected population is much smaller in number.

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Moreover, given the large effect of dropping out, in the worst case, this exclusion can lead to a selection bias since the selected sample becomes less representative as the educational stages (*attrition panel*). In theoretical terms, our research differs from previous studies in that we analyze the educational transition that students make when they finish secondary school *per se*, taking as the object of analysis the entire sample (except for those who do not have compulsory education). The rest of the studies take the same educational transition always with a view to more advanced studies. What is known as the at-risk population is not, in our case, composed of those who can go on to university studies or higher vocational training but, exclusively, of those who have had the opportunity to finish high school or intermediate vocational training.

Method

Sample

The data in this article comes from *The Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018, n=1,502). This longitudinal survey examines the educational trajectories of the same representative sample of individuals residing in Andalusia when they were 16 and 24 years old. It was conducted by the *Andalusian Institute of Statistics and Cartography* (IECA).

Variables

The variables that were selected are the following: the highest socioeconomic status of the household (either the father's or the mother's), the levels of performance obtained in language just before the student finished ESO (it was not possible to collect another type of subject due to the high rate of non-response), and gender. Our dependent variable is the choice after compulsory education: baccalaureate, vocational training or dropping out of the educational pathway.

Socioeconomic status was coded according to the *International Socio-Economic Index* (ISEI) scheme created by Ganzeboom et al. (1992). It expresses a score by occupation that is a function of a weighted average

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of income and years of education. This synthetic index coded social position better than education alone. By incorporating income (but together with education) we obtain a measure that allows us to analyze the constraints resulting from the scarcity of resources, both material and economic as well as cultural. The grades obtained in language were collected with scores from 1 to 10 and re-scaled into 4 quartiles (only for the analysis of compensation) (Table I).

TABLE I. Descriptive statistics of the sample

	FREQUENCY	MEDIA	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
Socioeconomic Status (ISEI)	1.501	41,17	12,92	20	70
Language Qualification last year	1.502	6,52	2,12	0	10
Language Grade Quartile	1.502	2,21	1,04	1	4
	FREQUENCY	**PERCENTAGE**			
Genre					
Men	720	47,94%			
Women	782	52,06%			
EDUCATIONAL DECISIONS					
Abandonment	298	21,55%			
Vocational Training	464	33,55%			
Baccalaureate	621	44,90%			

Source: *Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018).

Procedure

Sociology has used different methodological approaches to investigate the importance of the primary and secondary effects of social origin on educational decisions. All of them start from the following model: it must be taken into account that social origin (O) can affect educational decisions (E) both indirectly, through the primary effects that have an

impact in one way or another on students' academic performance (A), and directly, through their influence on educational decisions (secondary effects).

In the present study, we employed the mediation model called KHB (Karlson et al., 2012). This is a technique similar to the product of coefficients in structural equations but has the virtue of separating the changes in the coefficients due to rescaling from those other true changes that result from adding more values. For its execution, two latent linear models are made, whose only difference is that the first one contains a mediator (yield in our case) and the second one does not. This model is called Full o Complete and the other Reduced.

$$Y^* = \beta_0 + \beta_{1\,X} + \beta_{2\,.Z} + \varepsilon \text{ (Complete Model)} \quad (1)$$

$$Y^* = \gamma_0 + \gamma_{1\,X} + v \text{ (Reduced Model)} \quad (2)$$

Y^* corresponds to an unobserved continuous variable, x is the social origin and z the mediating variable. ε is the error independent of x and z that, on the other hand, is assumed to be only dependent on x. v is only dependent on x. In order to compare the coefficients of the two models, the dependent variable representing the propensity to move to the transition under studying is transformed into its binary expression.

The Full model (βx) is then subtracted from the Reduced ($\beta x \mid z$) to capture the true value of the confounder.

This model uses the residuals (R) of performance and/or motivation on academic performance (x).

$$R = z - (a + bx) \quad (3)$$

We use R instead of z in the reduced model.

$$Y* = \widetilde{\alpha} + \widetilde{\beta} X + \widetilde{\delta}_R\, C + \varepsilon \quad (4)$$

Since what distinguishes the residuals (does not explain performance on social origin) from the mediator (performance) is only the component related to social origin, the full model is more predictive than the reduced model. Or, put another way, the residuals are constituted by that which does not explain the performance on the social origin. Moreover,

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the residuals have the same standard deviation ($=\sigma_R\sigma_F$). These two scaling parameters depend in turn on the residual variable of the linear regressions of the Reduced and Full model. Each model is scaled according to the residual variance of the underlying model (Valdes, 2020).

Furthermore, since $\widetilde{\beta}=_R\beta_R$, the difference obtained from the estimated regression between (β_R) and (β_F) is written:

$$\frac{\widetilde{\beta}_R}{\beta_F}=\frac{\frac{\beta_R}{\sigma_R}}{\frac{\beta_F}{\sigma_F}}=\frac{\beta_R}{\beta_F} \tag{5}$$

Likewise, to test whether there is a compensation effect, what we do is simply model a log-additive and log-multiplicative regression. The first of these regressions is composed of the intercept, socioeconomic status (β_1X_1), academic qualifications (β_2X_2), gender (β_3X_3) and error (ε).The second adds the interaction of socioeconomic status with qualifications ($\beta_4X_1X_2$):

$$Y_i = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon \tag{6}$$

$$Y_i = \beta_0+\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_1X_2 + \varepsilon \tag{7}$$

As contrast statistic, we use the χ^2 and the *Bayesian Information Criterion* (BIC), but giving a greater preponderance to the former since the model we are trying to estimate is a parsimonious model with few parameters. We also present, as is often the case, the *Akaike Information Criterion* (AIC).

Hypothesis

Our hypotheses extend previous studies (Bernardi & Cebolla, 2014; Merino-Pareja et al., 2020; Troiano et al., 2019; Valdés, 2020) to include three options. In the first of our hypotheses, we test the extent of spillover effects by asking what influence socioeconomic status has on each of the educational decisions that can be made at the end of compulsory education, regardless of performance.

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- **H1**. *Performance-controlled social status has a strong impact on the whole set of educational decisions (including the choice of vocational training versus school dropout).*

Our second hypothesis postulates that there is a compensation effect. (Bernardi & Cebolla, 2014) which is also felt in each of the contrasted options. When the ratings are high or medium-high, the difference between statuses narrows and when they are low or medium-low, the same difference widens.

- **H2**. *The influence of status on educational choices varies interactively* with *performance*.

Results

In this section, we present the results of the models we have used to analyze the primary and secondary effects. However, before going deeper, to illustrate the enormous strength of the secondary effects, we have grouped social status into two categories: high and low. We have set aside educational achievement in its mean values (central tertile corresponding to values 7 and 8 of the language grades). The results are shown in Table II.

TABLE II. Social status and decision after compulsory education (core values)

	Baccalaureate	Abandonment	F. Professional
High Status	61,5%	9,9%	28,4%
Status Low	45,8%	16,6%	37,5%

Source: *Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018).

As can be seen, with average performance, 61.5% of students from high status backgrounds complete their baccalaureate studies, while only 45.8% of those from low status backgrounds do so. The figures are reversed when we look at dropout rates: only 9.9% of high-status students drop out, compared to 16.6% of low status students. As for vocational training, students from low status backgrounds are more likely to opt for this path (37.5% versus 28.4%).

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By a simple contingency table, we can see how, for the same result, the decisions made according to the status from which one comes are very different, even when the students demonstrate a similar level of school performance. The choices of those students who come from lower status backgrounds are much more conservative. In fact, as we have seen, more than 50% of students choose (opt) for the sum of Vocational Training and dropout, while, with the same qualification, this figure drops to less than 40% for those from higher status.

Let us look at the results of the KHB decomposition models integrating the whole sample. As we have seen above, this model analyzes the effect of social status on the decision to continue studies after compulsory education controlled for gender and mediated by performance. Table III shows the results. The first of the models, the total model, retains the impact of socioeconomic status together with performance. It is found that for each increase in the social status scale, the log-odds of doing baccalaureate instead of dropping out increase by 0.055. For example, the daughter of a primary school teacher (69) is 20% more likely to go to high school than the daughter of a car mechanic (31) and a waitress (30). Likewise, status increases the probability of doing vocational training instead of dropping out by half (0.022). It should be remembered that this choice (dropout vs. vocational training) has hardly been analyzed in previous research. When we consider the Baccalaureate vs. Vocational Training option, social status now increases the log-odds of the first of these options by 0.033. These results of the total model reflect evidence that is well known to the educational and scientific literature community: social status and attainment are good predictors of completion and the type of studies chosen after secondary education.

TABLE III. The primary and secondary effects of father's education in compulsory transition

	Baccalaureate vs Dropout	**Vocational Training vs.**	**Baccalaureate vs Vocational Training**
Total	0,055*** (0,006)	0,022*** (0,006)	0,033*** (0,005)
Direct	0,043*** (0,006)	0,017*** (0,006)	0,025*** (0,005)

(*Continued*)

TABLE III. The primary and secondary effects of father's education in compulsory transition (*continued*)

Indirect	0,012*** (0,002)	0,04*** (0,001)	0,07*** (0,001)
Performance	36,80%	21,94%	22,39%
R-Square	0,13	0,13	0,13
Cases	1383	1383	1383

Control: Gender *<0.05 **<0.01 <***0.001 (statistical significance level)
Source: *Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018).

When controlling for performance (direct model), these same log-odds drop to 0.043, 0.017 and 0.025 (but all reach maximum statistical significance). Explained with the previous example: Having the same grades in Language, the daughter of the primary school teacher has 16.7% more likelihood than the daughter of the mechanic, but she would be only 6.5% more likely to choose vocational training as opposed to abandoning all formal training. When comparing male and female students with the same performance, socioeconomic status has a smaller effect. However, it is unclear how much performance alone affects the decision to take the baccalaureate, pursue vocational training or drop out of secondary school.

As reflected by the indirect model, it explains 36.8% of all the variability. It drops to 22% in the second comparison (Vocational Training vs. Dropout) and to almost the same amount in the third (Baccalaureate vs. Vocational Training). As expected, it has a smaller effect when the most academic option is contrasted with the one with the least.

Once the decomposition using the KHB model has been carried out, we could ask ourselves whether there is a compensation effect already sketched in the previous literature. Two models are tested here: a log-additive model and a log-multiplicative model. The latter contains the socioeconomic status-performance interaction ($\beta_4 X_1 X_2$). A better fit of the former would justify the rejection of the compensation effect while a worse fit would imply the need to include this interaction.

Table IV shows the results obtained for each of the models. The first of these is the additive model in which social status and qualifications are allowed to vary jointly in a monotonic way. The second one allows

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these two dimensions to vary freely in their impact on educational decisions. The difference between the two models is shown in the final column.

TABLE IV. Contrasts of the additive and interactive models for each of the educational decisions made after compulsory education

EDUCATIONAL DECISIONS	ADDITIVE	INTERACTIVE	DIFFERENCE
Baccalaureate vs Dropout			
BIC	890,8	1018,12	127,31
AIC	871,5	872,13	0,62
Chi-Square	863,5	810,13	53,37 (0,00)*
Degrees of freedom	4	32	28
Baccalaureate vs Vocational Training			
BIC	1361,86	1563,12	201,26
AIC	1237	1279	0,04
Chi-Square	1333,9	1311,61	22,29 (0,89)*
Degrees of freedom	4	32	28
Dropout vs. Vocational Training			
BIC	970,07	987,08	17
AIC	1273	1334	0,06
Chi-Square	962,07	923,08	38,99 (0,008)*
Degrees of freedom	4	32	28

Source: *Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018).
* (statistical significance level).

The results obtained allow us to empirically observe the existence of the compensation effect. This is clear when we analyze the decision to take a baccalaureate vs. dropout. When the grades are high or medium-high, the difference between statuses narrows and when they are low or medium-low, the same difference widens. It is likely that this effect also occurs between the Vocational Training vs. Dropout disjunctive. However, it does not occur when the decision made by students and their families is in the decision to choose between Baccalaureate vs. Vocational Training, as happens to Troiano, Torrents, and Daza (2019) and Merino-Pareja, Martínez-García and Valls (2020). In short, when students who drop out -those who tend to have a lower social background- are

considered in each of the options, there does seem to be a compensatory effect. However, when they are excluded from any choice (they are not an at-risk population in statistical terms) we find that the effect of socioeconomic status and grades vary together in the same way. By at-risk population we mean the population that drops out and is excluded when analyzing the effect of social origin on students in Baccalaureate vs Vocational Training.

Conclusions

The evidence collected in this study supports the conclusions obtained in previous studies: secondary effects reinforce the impact of primary effects (Jackson, 2013). Or, in other words, socioeconomic status is felt in educational decision-making through the two channels established in previous literature: directly and indirectly by mediating through academic ability.

We have used *The Panel on Education and Transitions to the Labor Market in Andalusia* (2010 and 2018). This longitudinal survey collects the trajectories of the same representative sample of individuals residing in Andalusia when they were 16 and 24 years old. We collected language scores as a *proxy* for academic ability.

Our results show that as social status increases, the probability of doing baccalaureate rather than dropping out of post-compulsory studies increases even when controlling for performance (H1). In each of the options we have considered, socioeconomic status accounts for one-third of the total. The role of performance is smaller and reaches 36.8% of all variability in the first of the options. It drops to 22% in the second and to almost the same amount in the third. As expected, performance has a smaller effect when the most academic option is contrasted with the one with the least. The strength of the secondary effects increases as we move from the more academic to the less academic options, i.e., it is stronger in the choices Baccalaureate vs. Dropout and Baccalaureate vs. Vocational Training than in Vocational Training vs. Dropout.

From the same model, as contemplated in H2, it follows that *the influence exerted by status on educational choices varies interactively* according to *performance*.

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It should be noted that previous studies have not used dropouts. To our knowledge, this is the first study to include them in Spain. Not including them in their samples as an at-risk population - all those subjects who may eventually opt for some post-compulsory pathway given that they have a high school diploma - has the consequence of underestimating the effects, especially the compensation effect.

Public Discussion

When Italian sociologist Diego Gambetta wrote his *Were They Pushed or Did They Jump: Individual Decision Mechanisms in* Education*?* (2019) [1987], the magnitude and scope of educational expansion was much smaller than it is today. Since this work was published, the average years of education of the Italian population have increased by four years. According to estimates by Barro and Lee (2013) they went from six to ten years. A very similar figure was the one covered by the Spanish population.

If we were to compare the type of decisions students made at the time of the publication of Gambetta's book, forty years ago, with those made today, we would discover a fundamental change. Today, low and lower-middle status students who achieve high grades do not seem to exhibit any kind of overadaptation. The higher their grades go, the less they differ from those students who have a higher status. Or, to put it another way, once they do well in school, students of low socioeconomic status do not underestimate their chances, thus making the riskier and more costly decision. This is because they are confident that their chances of success outweigh their chances of failure, π, outweigh their chances of failure, $1- \pi$ given their good performance so far (Figure I). If we draw from previous literature of such a change we find two fundamental causes: educational reforms that were more inclusive in nature and economic improvements, which considerably reduced families' opportunity costs. Nor should we forget the growing thrust of technological change. Education has become a positional good (Hirsch, 2005; Salem et al., 2009). Everything seems to indicate that at the level of social mechanisms, this change of circumstances led to less risk aversion as gains outweighed losses (Breen & Yaish, 2006).

In contrast, their counterparts with poor grades drop out when poor grades emerge. On the other hand, it does appear that families with middle and high statuses try to promote their offspring through the most desirable routes in the educational system. This compensation effect emerges empirically as long as the representative samples of the surveys analyzed are not reduced.

In any case, one must agree with Michelle Jackson when she points out that the fact that secondary effects are stronger than primary effects is not bad news (2013). Indeed, it is much easier to influence and try to generate some change on secondary effects than on primary effects. It is less complicated to try to show parents through school counseling that the best decision their child can make is to pursue a baccalaureate than to try to inculcate cultural practices that are foreign to them. It is even more difficult to transform the quality, stability, and provision of their jobs.

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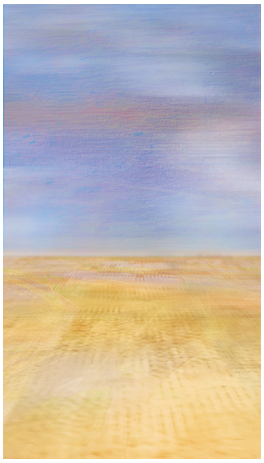

Reviews

Medina Rivilla, A. and De la Herrán, A. (Coords.) (2023). *Futuro de la Didáctica General. Barcelona*. Octaedro. 224 pp. ISBN: 9788419506511

Updating the concept of General Didactics in accordance with the changes brought about by the development of our society, and questioning the consequences and effects caused by the model on which it is based, is necessary and essential if we want to maintain a General Didactics that is useful and adapted to our times. The book Future of General Didactics explores these issues and questions the traditional foundations on which it is based. Society changes, schools change, and the ways of thinking about General Didactics must also change and adjust their models according to the needs and evidence that are discovered. New alternatives that broaden the outlook for conceiving General Didactics must emerge in order to overcome the immobility in which it finds itself, and to glimpse a more promising future.

The book Futuro de la Didáctica (Future of Didactics), by Antonio Medina's research group and Agustín de la Herrán's research group, offers two different visions for overcoming the challenges facing General Didactics today, and even for restarting General Didactics, as Herrán's research group puts it, from its roots.

Firstly, from Antonio Medina's research group, one can find a scientific-artistic vision and understanding of General Didactics. From this approach, it is assumed that the complexity involved in the transformation of the scientific basis of didactic knowledge must be overcome, bearing in mind the view that General Didactics has a direct connection with the "art of teaching". From this perspective, General Didactics is understood as science and as art to explain the teaching-learning process. It values the depth of the didactic act, which is sustained through a dialogue and an interaction between those involved in the teaching-learning process (teachers, students, families, learning community, and new digital scenarios).

Agustín de la Herrán's group, from a radical and inclusive approach to understanding General Didactics, starts from the premise that the foundations that support General Didactics are radically incomplete, denaturalised, egocentric, myopic, or foreshortened. It considers that General Didactics remains on the surface of educational reality, making its analysis and comprehension impossible. From a superficial approach it is

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difficult to achieve its final purpose, which is the education and integral formation of human beings. In order to overcome the bad practices associated with General Didactics, it is proposed to work on conscience as an antidote and a path towards a better future. A General Didactics based on consciousness moves from doing to giving oneself, opening oneself, liberating oneself, expanding oneself, inquiring and internalising oneself. The accumulative ego of the student, which is formed on the basis of a traditional teaching model, is replaced by an ego that is self-critical, rectifies, yields and gives itself. The General Didactics of mediocrity and complacency is destroyed by being understood from the radical and inclusive paradigm.

The reading of these two positions for approaching, understanding and reflecting on General Didactics leads us to think of new alternatives for conceiving it. It leads us to conclude that we cannot continue to maintain traditional, obsolete models for the foundations of General Didactics, which remain on the surface and do not allow us to advance in a conscience-based education. There are other ways to progress towards an integral education of students. Specifically, there are other ways of conceiving General Didactics, such as those proposed in the Future of General Didactics, which open up new possibilities for broadening the horizon of General Didactics towards a more human, more artistic, more profound and more conscious future.

Reading the book The Future of Didactics is, therefore, an essential requirement for those who are interested in knowing and understanding new alternatives for approaching the foundations of General Didactics. For this reason, it is a book especially recommended for all those who are disillusioned with the current models and are looking for a radical change that will give foundation and meaning to their work in General Didactics.

Cristina Moral Santaella

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Bautista García-Vera, A. (2021). *Audiovisuales, desigualdades socioculturales y educación*. Educatio Siglo XXI, 41(1), 149-154. Ediciones de la Universidad de Murcia. ISBN: 978-84-18936-27-2

"Audio-visuals, sociocultural inequalities and education" is an essay based on an interpretative paradigm research that shows how audio-visual technologies and the digital divide influence the increase in sociocultural inequalities in the educational system. Antonio Bautista García-Vera, Professor of Didactics and School Organization, expresses between the lines his sensitivity and concern for the improvement of school education through the possibilities of audio-visual technologies. The book follows a discourse and structure typical of a research paper, distributing the content into eight chapters, annexes and a bibliography.

The author takes us into the research with the first-person narration of the initial contact with the educational centres. In the first chapter, the reader is immersed in the daily life of the two primary education centres of the Community of Madrid, protagonists of what was to become a new scenario for the generation of shared knowledge. There is collaboration between the educational community -teachers, mothers, fathers and students- and the research team.

The second and third chapters of the book are intended to guide the reader in understanding the specific purposes of the research. The background points out, firstly, the importance of differentiating those more technical and functional uses that a digital tool presents, from the role or function it acquires in society and in education or its meaning. The interrelated conceptual frameworks guide to understand how the meaning we give to technologies is linked to sociocultural and educational inequalities. Recognized authors and emerging research are cited in reference to the digital divide, technological literacy, art in aesthetic awareness and digital competence.

From this state of the art, the origin of the study arises under three curiosities to solve about technological and audio-visual tools in formal education: understanding the meaning they acquire in educational centres; to know how the personal, social and academic development of students is favoured; and identify the implications for professional development and teaching staff. To respond to them, the fourth chapter is intended to describe the principles of data collection, discourse analysis and the phases of the study. The research methods are specified in a

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meticulous and detailed way, considering ethical aspects, coherence and validity. Data collection through interviews took place during and after the implementation of digital literacy processes for teachers and students. The study denotes rigor and methodological relevance in the way in which the sensations, perceptions, analysis and reflections of students and teachers are interpreted and described.

The three curiosities are resolved in chapters 5, 6 and 7, respectively. The results show how the functions assigned to the media had expanded during the study: from meanings about the transmission of information and entertainment activities, towards meanings related to expression, creativity and problem solving. This is a great finding of the project, since it shows how to promote the achievement of Digital Competences in multicultural educational contexts for social inclusion. Another significant finding is the impact that audio-visual literacy has generated on academic performance, personal and social development, and the professional projection of students. Audio-visual productions have caused an improvement in the sensitivity for beauty and art in connection with daily experiences and own interests. The results also reflect the role of the media in the personal development and professional development of teachers. These acquire prominence when teachers try to connect with the interests and motivations of the students. For readers of Bautista's book, it is of special interest to stop and review in detail the quotes from the interviews of the participants.

The essence of the results are presented in the eighth and last chapter in the form of conclusions. Bautista reflects in depth on the contributions of the study to reduce the digital divide and improve social ties through technological development in educational communities. The transparency in the description of the research, the sensitivity for the audio-visual world and the concern for the improvement of education guide the reasons for delving into this book.

Laura Fernández-Rodrigo

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Motos, T y Méndez E. (2023). *Teatro en educación sin memorizar textos.* Barcelona: Octaedro. 308 pp. ISBN:978-84-19132-33-4

This book for formal and non-formal education teachers intends to be a manual of theater and drama in education. As stated in the subtitle, "Theater in education without memorizing texts. 77-1 drama & theater techniques" offers seventy-eight ways to do theater in the classroom without the need for the students to memorize texts, in an attempt to break down the notion that memorizing texts is the only way to practice theater in the classroom.

This book is aimed at education professionals that want to teach differently but do not have any or enough training in theatrical education. More often than not, teachers are only interested in getting to know the practical process that involves representing a play, being unaware of the possibility of "doing theater" without the students memorizing other people's texts.

This book is divided into two parts. The first one includes the following sections:

- To begging with, drama/theater principles in education are explained, taking into account both the activity that implies sporadic and improvised work (drama) and performing on a stage (theater).
- Afterwards, the goals of this theatrical methodology are laid out, which are built on top of the principles of the so-called *virtuous circle* of theater/drama in education: expression, presence, socialization, and critical assessment.
- Following, methodological directions are presented. These directions are used to carry out drama and theater activities, based on: the mixing technique, N+1 hypothesis, clauses, the concept of "as if…", the 5 "C" of expression, playful pedagogy, teamwork and the rules of improv.
- Lastly, there is a section about evaluating theater and drama activities.

The second part dives more into what drama and theater techniques are. Drama techniques are those that take place in a classroom, while theater techniques are those that start in the classroom and finish in a public showcase. Therefore, in drama the students are the actual

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recipient of the teachings, while in theater is the audience. However, the goal of both strategies, according to the authors of this book, is to be pedagogic; this facet cannot be traded for some other goal, such as a merely artistic one. Following this reasoning, the educational strategies are compiled into two blocks, completed by a third one: assessment techniques.

a. Drama techniques are compiled into four sections: 1. Reflection actions, which include: expert group, iceberg, the consciousness alley, hot spot, etc. 2. Communication skills: dramaturgy of non-theatrical texts, choirs, grapho-phonetics, matrix (using luck), voicing texts, constrictions, etc. 3. Psychodrama production: antagonistic pairs, doubles, role changing, soliloquy, etc. 4. Improvisation: frozen image, imagination techniques, clown, flashmob, etc. 5. Movement: Lip-dubbing, iconographies, etc.
b. Secondly, theater techniques are introduced: image theater, documental theater, playback theater, reader's theater, sociodrama, forum theater, etc.
c. Finally, assessment techniques: dialogic table, photovoice, sociogram in action, IAN methodology, etc.

The book includes more than four hundred creative proposals adapted to the curricular subjects from all different educational stages. Moreover, it also includes 234 audiovisual references in the form of QR codes, which supports the learning of each technique, thus ensuring the effectiveness of this manual as an educational tool.

Based on this idea, the authors put forward the pedagogical value of this way of approaching theater in education by considering that the repetition of a beforehand written text forces students to face a lifeless text. This way of approaching theater in the classroom has been conducted by literature and dramatized readings. In turn, the authors of this book intend to offer tools to give voice to the students: their topics, their language, their concerns, etc.

As Sajarov, nuclear physicist and Nobel Peace Prize, used to say: "Those who have never seen an orange, will not order an orange. Our task is to promote the orange and ignite the desire." That is precisely what the authors intend to do, ignite the desire to use educational tools inspired by drama/theater in education. Those of you who approach this methodology will confirm that, once this book falls into your hands,

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there is no turning back: the adventure for your students to know, create and find their own voice will be already in motion.

Book review by *Antoni Navarro Amorós*
Translation into English by *Rocío Barquilla González*

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