# MULTIDISCIPLINARIEDAD (O INTERDISCIPLINARIEDAD) Y TRANSVERSALIDAD BAJO LA PERSPECTIVA DE LA LEY ORGÁNICA 3/2020, DE 29 DE DICIEMBRE, POR LA QUE SE MODIFICA LA LEY ORGÁNICA 2/2006, DE 3 DE MAYO, DE EDUCACIÓN

# MULTIDISCIPLINARITY (OR INTERDISCIPLINARITY) AND TRANSVERSALITY UNDER THE PERSPECTIVE OF ORGANIC LAW 3/2020, OF DECEMBER 29, AMENDING ORGANIC LAW 2/2006, OF MAY 3, ON EDUCATION

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Resumen

La organización del conocimiento escolar en disciplinas cuenta con una larga tradición. Y, aunque el anhelo por el trabajo interdisciplinar tiene también amplios referentes históricos, no es hasta el último tercio del siglo pasado cuando no entra en crisis la tradición de enseñar por separado las disciplinas.

En este artículo, se reflexiona sobre la interdisciplinariedad y la transversalidad curricular bajo el enfoque de la nueva ley de educación, la LOMLOE. Para ello, se analizan y vinculan los conceptos de interdisciplinariedad y transversalidad. Hablar

de interdisciplinariedad supone comparar el término con el de disciplinariedad, pero no negarlo. Y supone también definir los espacios de "no disciplinariedad" que se encuentran en la extensa literatura producida durante los últimos cincuenta años al respecto de este término.

Se adentra en el nuevo currículo a través de los tres ejes que han configurado la estructura curricular derivada de la LOMLOE, relacionando estos con el espectro de significados de interdisciplinariedad y transversalidad. Se evalúa la potencialidad del Perfil de salida como elemento curricular con un marcado carácter transversal y se analizará la presencia e incidencia de las competencias específicas como medio de enlace en pro de la transversalidad entre este Perfil y las áreas y materias; y se abordará una de las vertientes del incremento de autonomía curricular de los centros educativos a través de la posibilidad que se les ofrece de agrupar en ámbitos del conocimiento interdisciplinares las áreas de educación primaria y las materias de los tres primeros cursos de la Educación Secundaria Obligatoria.

Palabras clave: *Interdisciplinariedad, LOMLOE, competencias específicas, multidisciplinariedad, transversalidad, Perfil de salida, disciplinariedad.*

Abstract

The organization of school knowledge into disciplines has a long tradition. Although the desire for interdisciplinary work also has broad historical references, it was not until the last third of the past century that the tradition of teaching disciplines separately entered into crisis.

This article reflects on interdisciplinarity and curricular transversality under the approach of the new education law, LOMLOE. To do so, it analyzes and links the concepts of interdisciplinarity and transversality. Speaking of interdisciplinarity involves comparing the term with disciplinarity but not denying it. It also entails defining the spaces of "non-disciplinarity" found in the extensive literature produced over the last fifty years regarding this term.

The new curriculum is explored through the three axes that have shaped the curricular structure derived from LOMLOE, relating them to the spectrum of meanings of interdisciplinarity and transversality. The potential of the Exit Profile is evaluated as a curricular element with a marked transversal character, and the presence and impact of specific competencies as a means of linking this profile with the areas and subjects are analyzed to promote transversality. Additionally, one aspect of increasing curricular autonomy in educational centers is addressed, which involves the possibility for them to group interdisciplinary knowledge areas in

Primary Education and subjects from the first three years of Compulsory Secondary Education.

Keywords: *Interdisciplinarity, LOMLOE, specific competencies, multidisciplinarity, transversality, Exit Profile, disciplinarity.*

Introduction: clarification of concepts

We believe, like Lenoir (2013), that there is a great deal of confusion in schools about the concept of interdisciplinarity.

First, because the word has different meanings. The research and texts to which we have had access show that the word is polysemic.

Second, on the contrary, several terms come to mean the same thing for most teachers. Yes, indeed, terms such as multidisciplinary or interdisciplinarity, among others, are used with great frequency to refer to the same proposal.

Third, because of the diversity of contexts in which it is used. The expression is not only part of the pedagogical-educational field but is also included in the specific vocabulary of scientific research and even in that of the media. Within the former, it is frequently used both in educational organization and in classroom planning and practice.

Fourth, because other constructs such as integration, transversality, comprehensiveness or globality threaten, for most teachers, to usurp the spectrum covered by the meaning of interdisciplinarity.

And fifth, and perhaps most importantly, because the development of this practice, this methodology, this form of organization or this strategy (depending on one's interpretation of the term) does not always correspond to what it really means. Recurring again to Lenoir (2013, p.52), we again agree that "it is not enough to use the word to implement things!". As Pombo (2013, p.22) points out "the word has been used, abused and trivialized. We could say: the word is worn out".

However, even if we could take for granted the conclusion that the word is empty of content, we believe that its meaning is once again fully current; proof of this are the following pages that the reader is confronted with.

In general, the term discipline is interpreted as a unit of knowledge organization[1], that in the context of our current academic organization refers to the subjects in which the curriculum is organized. Thus, disciplinarity represents the use by the Administration, the school, or the teacher, of disciplines totally independent of each other.

It was in the late 60s and early 70s that the tradition of teaching the disciplines separately came into crisis. "Many saw in it the remedy to overcome the motivation crisis affecting students" (Agazzi 2004, p. 241). Different authors, and among them the renowned Jean Piaget, Edgar Morin, Basarab Nicolescu or Eric Jantsch, include

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[1] A definition of this term often refers to the renowned French philosopher and politician Edgar Morin, who identifies a discipline as an organizing category of scientific knowledge, with its autonomy, delimited boundaries, its own language, techniques, and exclusive theories. (Morin, 2003).

in their research various forms of disciplinary convergence: multidisciplinarity, pluridisciplinarity, interdisciplinarity and, ultimately, transdisciplinarity; although research by Sills, 1986 (cited by Berridy and Fernández Guillermet 2021b) indicates that the concept has been used since the beginning of the 20th century, the origin of the discussions on the conceptualization of this topic is located in the international conference held in September 1970, under the title "Interdisciplinarity: problems of teaching and research in universities".

From the extensive bibliography produced since the 1970 conference, we highlight some authors (Jantsch, 1972; Piaget, 1972; Nicolescu, 1999; Lenoir, 2003; Lenoir, 2013; Pombo, 2013; Elizondo, 2020) who have helped us to assess the four concepts[2]:

Multidisciplinarity (multi-d). Represents the use of two or more disciplines in juxtaposition, but without connection between them.

Pluridisciplinarity (pluri-d). It also expresses, according to the etymology of the prefix, a mere approximation or addition between disciplines. It could be differentiated from multi-d by the fact that in this case the disciplines would necessarily be close to each other in terms of their fields of knowledge (Palmade, 1979). However, given that from an etymological point of view it does not make much sense to differentiate between the prefixes pluri and multi (Pombo, 2013), in our proposal we accept both terms, multi-d and pluri-d, as synonyms.

Interdisciplinarity (inter-d). Use of several disciplines (two or more) that are integrated into each other through interaction, and from the existing links and points of union between them. Both the possibilities of integration and interaction are multiple.

Transdisciplinarity (trans-d). Although different meanings are attributed to this term (Lenoir, 2003), in general it represents a higher stage of integration where there are no limits between disciplines, thus giving rise to a new discipline (macro discipline), in the sense of overcoming the principles, methods or contents of each of the disciplines that integrate it.

As it is logical to think, our intention is not to transfer the problem to the field of semantics. Our interest is focused solely on the possible applications of these concepts by teachers. For this reason, and in order not to confuse the reader even more, on the one hand, as we have already announced, we will differentiate only three terms: "multi-d", "inter-d" and "trans-d"; and, on the other hand, we will not include in this taxonomic analysis other terms that have emerged during the literature review, such as "intra-d", "poly-d", "co-d" or "cross-d".

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[2] We recommend the exhaustive compilation made by Damián Berridy and Armando Fernández Guillermet in their article *Interacción y convergencia de saberes en la tradición "clásica" sobre interdisciplinariedad: Un esquema de sistematización conceptual* (2021b).

The most generalized view is that of a continuum ranging from disciplinarity (at one end) to transdisciplinarity (at the other end). A continuum, as shown in Figure 1, that begins with the separation of knowledge (disciplinarity); that continues with simple coordination or coexistence (multi-d); that progresses with combination and exchange (inter-d); and that ends with fusion or unification (trans-d).
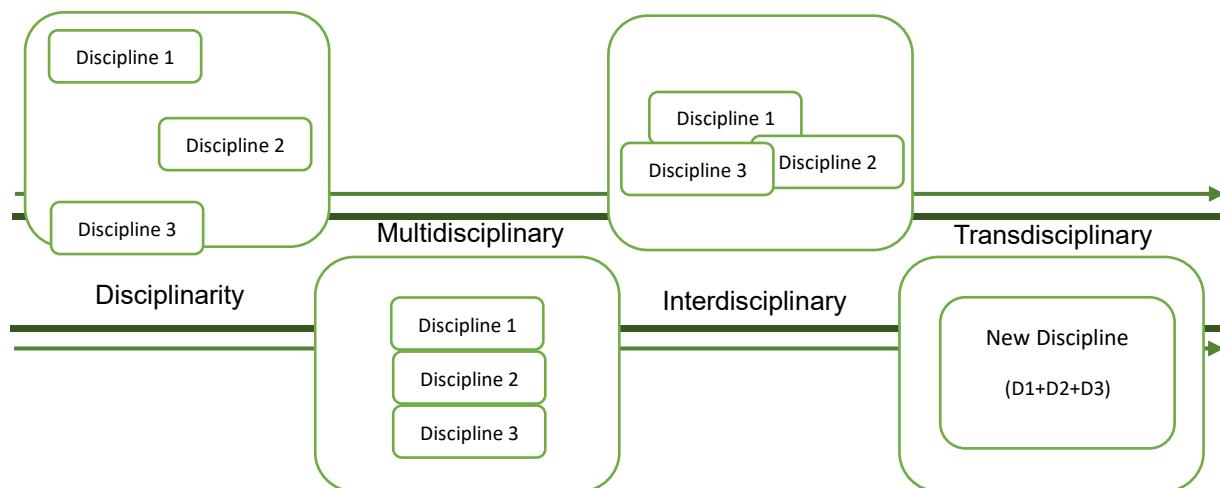


Figure 1. Continuum of levels of disciplinary integration: from the separation to the fusion of disciplines. Own elaboration based on the work of Pombo (2013) and Berridy and Fernández Guillermet, (2021a).).

In this regard, we would like to make two clarifications:

- A priori, in this continuum we do not intend to establish a progressive path that advances from the worst (disciplinarity) to the best (trans-d).
- We reject the conception that multi-d, inter-d or trans-d are in opposition to disciplinary knowledge. "There is no true inter-d without disciplines" (Agazzi 2004, p. 242) or as Miguel Ángel Tirado ironizes in his book Escuelas que enseñan. El conocimiento sí importa, "if subjects did not exist, they would have to be invented" (Tirado, 2021, p. 126).

There is another term that must also be clarified and, moreover, put in relation to those discussed so far. This is the term transversality, which, as could not be otherwise, is equally complex.

The literature consulted (Monclus and Sabán, 1999; Velásques, 2009; Torres and Fernández, 2015; Jauregui, 2018; Montes et al., 2019; Cole and Bradley, 2018; Correa et al., 2021) analyzes the concept from an epistemological, philosophical, social, and educational point of view, and within this, particularly at the curricular level.

Due to its operational nature, we will start from the interesting interpretation offered by Velásques (2009) or Torres and Fernández (2015), both based on the work of Monclus and Sabán (1999), in relation to the double meaning of the concept of transversality from an etymological point of view.

The word, on the one hand, is related to the word "cross", that is, transversality is that which extends from one side to the other, crossing it. On the other hand, it is linked to the terms "to link", "to thread" or "to filter", thus interpreting transversality as a backbone element of learning that binds (threads) around different subjects, linking curricular contents of all of them.

The first meaning, more classic and without risk of didactic complexity, refers exclusively to the (famous) transversal "themes", "axes", "teachings" or "elements". These are contents of a fundamentally attitudinal nature or generators of daily habits, which are linked to the problems that beset society and have a particular impact on the behavior of students. We refer to peace education, road safety education, etc., of the LOGSE (1990); to reading comprehension, oral and written expression, etc., of the LOE (2006); to entrepreneurship, civic and constitutional education, etc., of the LOMCE (2013); or to gender equality, emotional and values education, etc., of the LOMLOE (2020). As is already known, they do not refer to any specific subject and, as they permeate (or cross) all of them, they are worked on by all teachers whatever their field of knowledge. In this regard, we highly recommend the article by Valdivieso, Rodríguez and Rey (2021), in which they offer a critical and argumentative comparative analysis of the conceptual and practical treatment of transversality by these organic laws of the educational system[3].

Now we can say that this reductionist interpretation of transversality leads us to link it solely with disciplinarity or, if anything, with multi-d. We mean that working on cross-cutting themes in the classroom can be done (in fact, we dare say that it is generally done) without teachers connecting the different disciplines of the curriculum. Rather, the math teacher, the language teacher, the physical education teacher... work on certain cross-cutting contents completely independently from the work of their colleagues.

In the second interpretation of the term transversality is where we associate it with the concept of "inter-d" and, especially, with "trans-d". Around a topic or subject of any nature that presents a certain globalizing character, the curricula of different disciplines will be integrated. It is this globalizing character of the topic that allows the curriculum contents to be interconnected or woven together. In this case, we refer to issues such as water, food, election campaigns, public transportation, the Middle Ages, the World Cup, and many others. All of these can be transformed into an inter-d or trans-d project.

By now, you may have noticed, logically, that the topic or subject could also be any of the cross-cutting contents (such as education for peace, road safety education, etc.) referred to in the aforementioned regulations. However, that is not the concern

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[3] La Transversality in the Spanish educational system: perspectives, trends, and implications. In *Supervisión 21*, April 2021, no. 60.

of this discussion; our interest is focused on showing the dual interpretation that teachers make of the concept of transversality, as well as its connections with disciplinarity and "multi-d" in the first meaning, and with "inter-d" and "trans-d" in the second one.

Interdisciplinarity and transversality in the new curriculum through the Exit Profile and essential learning

Coll and Martín (2021b) consider that the new Organic Law on Education[4] "provides a propitious framework for undertaking the necessary and unpostponable process of curricular modernization required by our educational system, especially — although not exclusively— as regards basic education" (p. 3).

Moya and Luengo (2021, p. 52) refer to this need for curricular modernization when they demand that the educational system be adapted to the changes that are taking place in the 21st century in social systems and in society. Given the capital role played by the curriculum in the functioning and development of any educational system, according to these authors:

> In such situations, an enormous lacuna can arise that profoundly affects the school curriculum (both in the selection of necessary learning and in the selection of relevant culture). Consequently, students do not find in the educational system the opportunity to learn everything that allows them to develop the way of life they consider best, nor to participate actively in the development of the society they consider most just. Well, we believe that this is precisely the situation we are experiencing in our country and in many other countries of the European Union.

Then, the question we ask ourselves is how have social and cultural changes affected the construction of current educational models and mainly our new curriculum?

A possible answer is offered by Olibie (2013) in her interesting article on emerging curricular trends and their implications for teachers. In the first part of the document, the author highlights the trends and characteristics that have had the greatest influence on the latest curricular reforms worldwide[5].

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[4] Organic Law 3/2020, of December 29, amending Organic Law 2/2006, of May 3, 2006, on Education.

[5] Among the most influential trends and characteristics, Olibie highlights: the concept of global citizenship; international assessments and rankings; recognition that education and curriculum must prepare for the labor market; emphasis on skills relevant to lifelong learning, employment and social participation; motivation for interdisciplinary learning; concern for demographics, population, health, nutrition and the environment; advances in technology; and the need for teachers to use a differentiated curriculum.

More recently, Marope (2017), in the first of the documents edited by the UNESCO International Bureau of Education, aimed at guiding the future of the curriculum at the global level, in addition to conducting a detailed historical analysis of its concept and a proposal for its redefinition and repositioning, determines which are the key aspects that should drive educational reforms in the 21st century[6].

In summary, we could point to globalization and the technological revolution as the two major drivers that have influenced and driven curriculum reforms at the international level. These two processes, which are being driven by human beings themselves, are profoundly changing the conditions of habitability of our planet (Moya and Luengo, 2021); and they are causing a change of perspective in educational systems.

Beyond causes, Marope (2017) concludes that the curriculum of the future must help develop the competencies that allow students to thrive and fulfill themselves in the 21st century; a curriculum conceived according to a dynamic, complex and multidimensional conceptualization, and characterized for being the tool that ensures the sustained and significant development of education and education systems, for driving innovation, for being a tool for equity and social justice, democratic stability and peace, for being an integrating element of education systems, for enabling lifelong learning and for determining the quality of education and learning.

Within this framework, Organic Law 3/2020 of December 29 was published. In the words of Coll and Martín (2021a), as members of the expert group[7] commissioned by the Ministry of Education and Vocational Training to make a proposal for the structure and curricular components for the elaboration of the minimum teachings of the LOMLOE curriculum, it would have been a mistake to have limited 2the process of curricular modernization to a revision and updating of school contents" (p. 34). Without denying this, work was done mainly on:

> (...) rethink and revise the principles and criteria used to select these contents and to formulate and organize them in terms of a clear curricular structure and precise and well-defined curricular components that offer a clear and concrete reference of the aims, purposes, and objectives of basic education to teachers, students, the educational community, and society.

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[6] The main key aspects that Marope highlights are: economics (and specifically microeconomics), the recognition of knowledge and technology as drivers of growth, internationally agreed goals (in particular the SDGs and specifically goal no. 4), the information and technology revolution (bringing new skills into the curriculum), new demands of jobs, new ways of working and new tools for working (especially technological ones), climate change, political instability and social fracture, the disconnection of youth from education, the rise in recognition of teachers and students as curriculum designers, advances in relation to understanding learning, and the onset of Industry 4.0 as an accelerator for change in the 21st century.

[7] Antonio Bolívar, César Coll, Francisco Luna, Elena Martín, José Moya, Miguel Soler, and Javier M. Valle.

The three axes around which the will of the aforementioned modernization process has been articulated in our country are: a decidedly competency-based approach to the curriculum with the inclusion of the Exit Profile at the end of basic education; the identification, in each of the subjects, of learning that could be described as essential; and, finally, the curricular autonomy of the educational centers.

We will see below how the mere presence of the first two axes in the new curricular structure, although clearly linked to the object of study of this article, does not guarantee interdisciplinarity and transversality.

According to article 11.2 of Royal Decree 217/2022, of March 29, 2002[8], the Exit Profile of students at the end of basic education (hereinafter, Exit Profile) sets the key competencies that students should have acquired and developed by the end of basic education. For Coll and Martín, (2021b, p.8) the Exit Profile has a markedly competency-based character, but, in addition:

> (...) on the one hand, it articulates these competencies with the great challenges of the 21st Century to which, according to the Sustainable Development Goals of the 2030 Agenda, students will be confronted; and on the other hand, it places them in the moment of vital development of the students proper to basic education.

This Profile is determined from a total of thirty-four operational descriptors, which concretize and contextualize the acquisition of the eight key competencies. Given that the acquisition of each key competency has a sequential and progressive character, to make explicit the fluency and uniformity throughout basic education and high school, the following have also been determined in the Royal Decrees of minimum teachings of Primary Education and High School[9], the operational descriptors at the end of both stages, which also specify and contextualize the acquisition of each of the key competencies.

This is really one of the great novelties of the new curricular structure with respect to previous regulations, the determination of competency performance levels for each of the three stages, Primary Education, Compulsory Secondary Education[10] and High School, starting, of course, from the level set at the end of basic education.

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[8] Royal Decree 217/2022, of March 29, establishing the organization and minimum education requirements for Compulsory Secondary Education.

[9] Article 9.3 of Royal Decree 157/2022, of March 1, which establishes the organization and minimum teaching requirements for Primary Education (which refers us to its Annex I) and Article 16.2 of Royal Decree 243/2022, of April 5, which establishes the organization and minimum teaching requirements for the High School (which also refers us to its Annex).

[10] *Enseñanza Secundaria Obligatoria* (ESO).

Without being little progress with respect to the LOE regulation on competencies[11], in the LOMCE[12] the legislator conceptualized the seven key competencies and indicated their purpose, as well as their distinctive aspects, highlighting in each of them the different components and dimensions for their development. However, it did not establish any degree of competency development by students.

The LOMLOE has now identified three "milestones" of competency acquisition, sequenced from less to more difficult, and stated through those operational descriptors that allow the identification of the achievements to which the teaching processes should be directed in each of the three stages, as shown in Figure

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[11] Annex I of the Royal Decrees of minimum teaching requirements for Primary Education and Compulsory Secondary Education of the LOE regulation includes the competencies that a young person must have developed by the end of compulsory education to achieve personal fulfillment, exercise active citizenship, enter adult life in a satisfactory manner and be able to develop lifelong learning throughout life.

[12] When talking about specific LOMCE regulation on competencies, we refer to Order ECD/65/2015, of January 21, which describes the relationships between competencies, contents and evaluation criteria for Primary Education, Compulsory Secondary Education and High School.
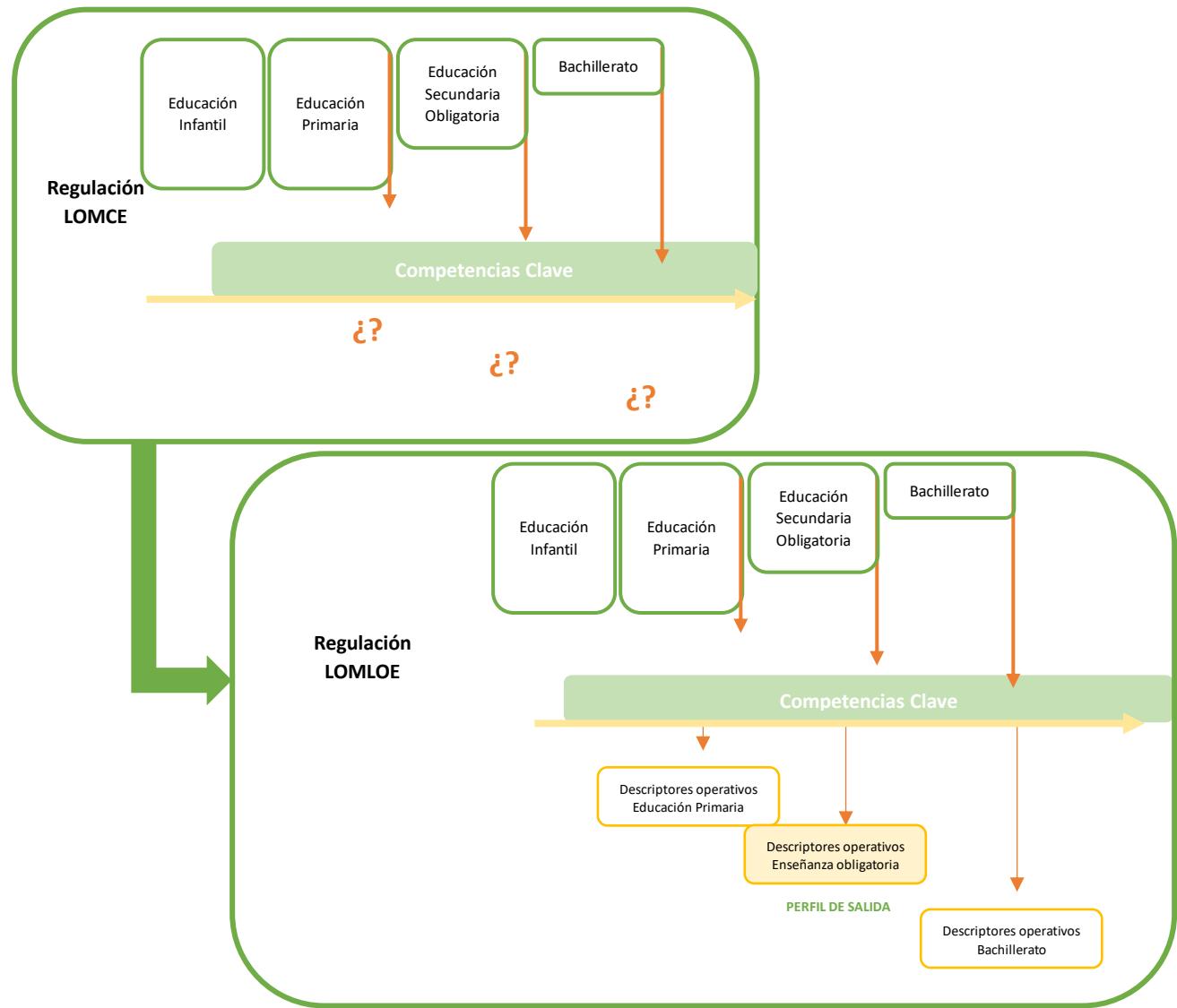
Figure 2. Representation of the three levels of competency development identified in the LOMLOE regulation compared to the LOMCE regulation. Own elaboration.

The operational descriptors become elements that identify expectations of competency acquisition (of knowledge, skills, and attitudes), from an unequivocally cross-cutting perspective.

And it is at this point where the second of the axes around which the process of curricular modernization has been articulated comes into action: the identification in each of the subjects of some essential learning, which have been defined through a new term, specific competencies.

For the four stages (Early Childhood Education, Primary Education, ESO and High School), in article 2 of the respective royal decrees on minimum teaching, specific competencies have been defined as the performances that students must be able to display in activities or situations whose approach requires the basic knowledge of each area, subject or field.

Beyond the fact that they provide a new way of understanding school learning (Coll and Martín, 2021b), the specific competencies represent the translation, for each area and each subject, of those global and cross-cutting expectations identified in the operational descriptors. In short, the specific competencies of each subject area are derived from the operational descriptors.

To our knowledge, this is the second great difference of the new curricular organization with respect to previous approaches, the integration of key competencies together with the rest of the elements of the curriculum through the incorporation of this new curricular element. Figure 3 shows the evolution of this integration throughout the last three organic education laws.
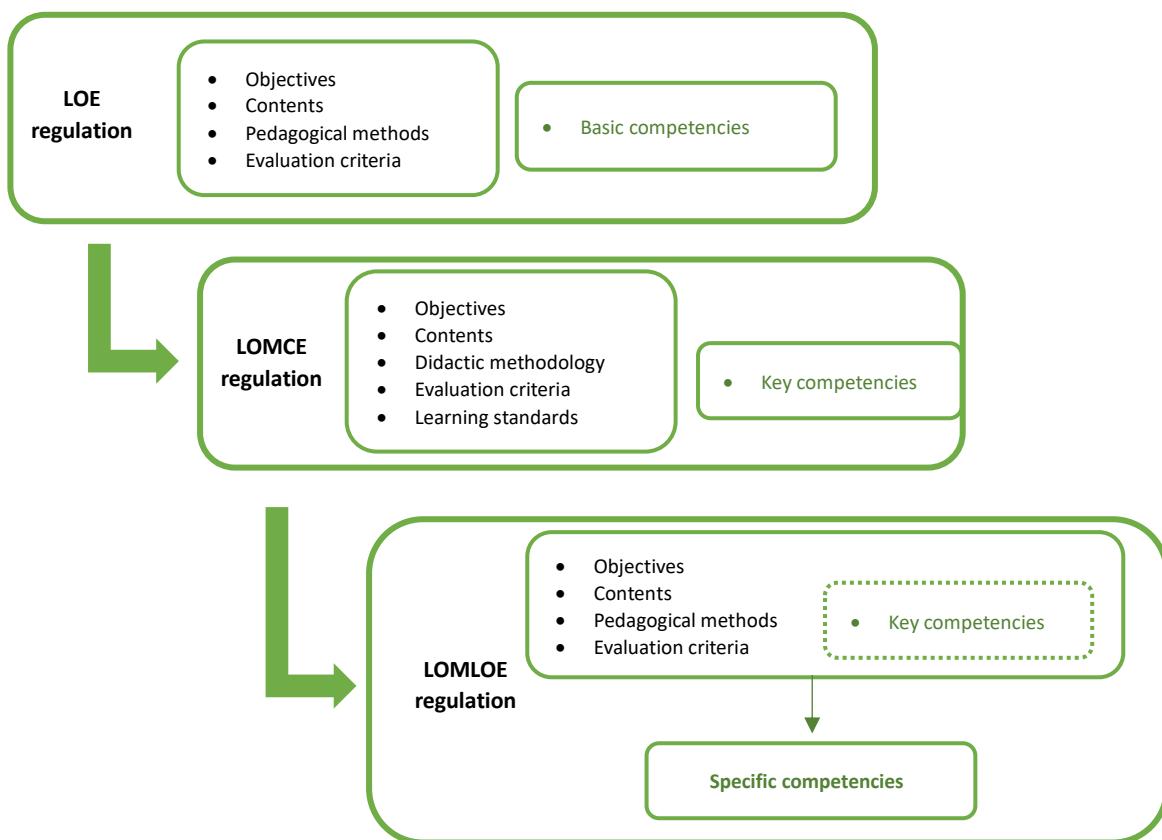


Figure 3. Representation of the successive integration of key competencies throughout the last three organic education laws. Own elaboration.

The presence in the new curricular structure of operational descriptors and specific competencies offers, as already indicated, a vision of a transversal and globalized curriculum. Or rather, we could say of a potentially transversal curriculum, depending on how this curricular model is interpreted by teachers. Depending on how it is translated into daily classroom practice, we will be resorting to the first or the second of the interpretations given in the previous section to the term transversality.

On the one hand, the operational descriptors can represent only those themes or elements that are linked to the problems that beset society and that have a particular impact on student behavior, according to the first of the meanings. We cannot forget that, although these operational descriptors have been designed on the basis of the key competencies for lifelong learning set out in the Recommendation of the Council of the European Union of 22 May 2018, aspects of an attitudinal nature and education in values have been taken into account for their drafting, such as the challenges of the 21st century that students will face in the coming years, in accordance with the SDGs.

By way of example, Figure 4 shows how the operational descriptor STEM1 acts as a transversal axis, crossing all the disciplines to which it is linked in the specific competencies of the Primary Education areas, as established in Annex II of Royal Decree 157/2022, of March 1[13].
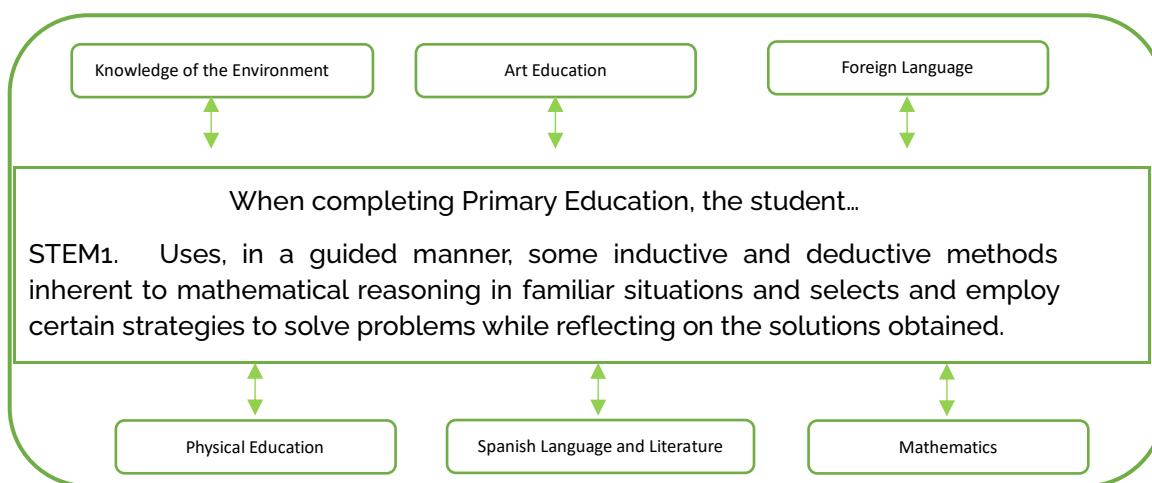


Figure 4. Representation of the use of an operational descriptor as a transversal axis. Own elaboration.

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[13] According to Annex II of the Royal Decree, the operational descriptor STEM1 is linked to the specific competence 5 of the area Knowledge of the Natural, Social and Cultural Environment; to the specific competence 1 of the area Artistic Education; to the specific competence 2 of the area Physical Education; to the specific competencies 2, 3, 4, 5 and 9 of the Spanish Language and Literature area; with specific competencies 1, 2, 3, 4 and 5 of the Foreign Language area; and with specific competencies 1, 2, 3, 4 and 5 of the Mathematics area.

According to this option, the disciplines act independently and without connection between the learning pursued from each one of them. Teachers teach the contents of their own area so that students achieve the performance set in the respective specific competencies, without considering what the rest of the teachers plan and put into practice in the other areas of knowledge.

On the contrary, according to the second interpretation of the transversality construct, the statements of the operational descriptors would act as topics or issues of a globalizing nature that make possible the integration of the curricula of different disciplines, as shown in Figures 5.1 and 5.2.
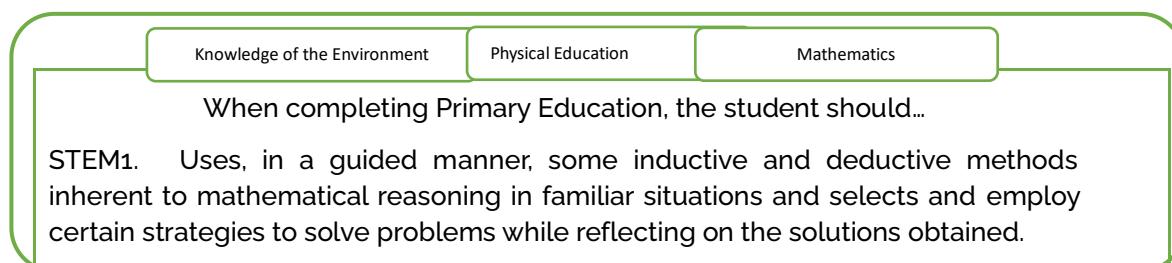
| Knowledge of the Environment | Physical Education | Mathematics |
| --- | --- | --- |

When completing Primary Education, the student should...

STEM1. Uses, in a guided manner, some inductive and deductive methods inherent to mathematical reasoning in familiar situations and selects and employ certain strategies to solve problems while reflecting on the solutions obtained.

Figure 5.1. Representation of the use of an operational descriptor as a globalizing topic for interdisciplinary teaching. Own elaboration.

Macro discipline (Science and Social Studies, Physical Education, and Mathematics)

When completing Primary Education, the student should...

STEM1. Uses, in a guided manner, some inductive and deductive methods inherent to mathematical reasoning in familiar situations and selects and employ certain strategies to solve problems while reflecting on the solutions obtained.
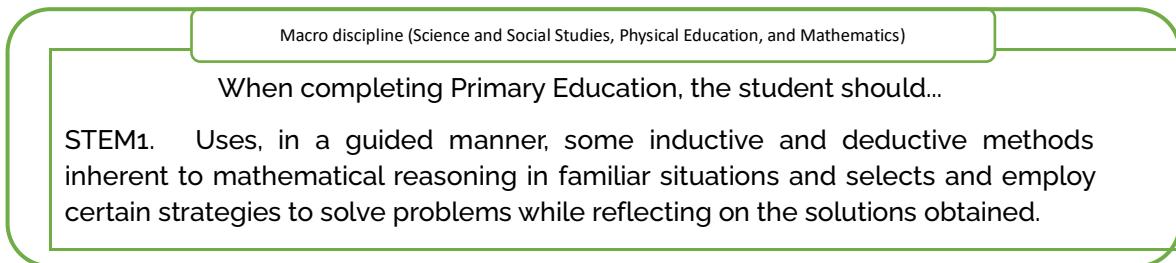
Figure 5.2. Representation of the use of an operational descriptor as a globalizing topic for transdisciplinary teaching. Own elaboration.

In this case, the areas of Environmental Knowledge, Physical Education and Mathematics would act in an inter-d or trans-d way, around the topic represented by the STEM1 statement. The respective teachers would work together in the planning of the teachings, coordinate their teaching intervention and act keeping each other in mind, and could even approach a joint participation under a co-teaching approach. It is under this interpretation that the operational descriptor will provide a particularly useful reference for the design of learning situations, as well as for the planning and development of relevant and meaningful activities and tasks.

Interdisciplinarity and transversality in the new academic organization through the grouping of areas and subjects into fields of knowledge

Another of the great novelties of the recently released LOMLOE is linked to the third of the axes around which the process of curricular modernization has been articulated, the increase in the autonomy of schools. We will now refer to the possibility open to schools of grouping areas of Primary Education and subjects of the first three years of compulsory secondary education into areas of knowledge.

Indeed, this is determined by articles 8.6 of Royal Decree 157/2022, of March 1[14], in the case of Primary Education, and of Royal Decree 217/2022, of March 29[15], in the case of Compulsory Secondary Education.

Beyond this possibility, the LOGSE and LOE legislation already included the organization of the curriculum into areas in the Curricular Diversification Programs (CDP). Likewise, the LOMCE regulations organized the curriculum in the areas of the Learning and Performance Improvement Programs (LPIP) and of the modules associated with the common blocks in Vocational Education and Training (VET) and, in addition, left open the possibility for the centers to organize the subjects of the first year of ESO in areas. Now the LOMLOE integrates different subjects into areas in the PDC and in the Basic Vocational Training Module (BVTM).

With certain differences between the Primary Education and the Compulsory Secondary Education stages, organizing the curriculum of the areas and subjects by areas of knowledge enables a competent, globalized, and holistic learning; on this, we have no doubt.

However, once again, the possibility offered to the centers to establish groupings of areas and subjects in areas or the elaboration by the educational administrations of the curriculum of the specific areas of the Diversification Program may be exercised with a lesser or greater degree of curricular integration, which will imply that the resulting proposal will be more linked to one or the other of the concepts of multi-d, inter-d or trans-d. In other, more direct terms, grouping areas and subjects into areas of knowledge does not imply that the resulting curriculum will necessarily be inter-d, much less trans-d; perhaps we will be left with a multi-d offer. We will analyze this in the following lines.

The elements of the curriculum that correspond structurally to the area or subject level are specific competencies, assessment criteria, and content (basic knowledge). Each one has certain functions in the new curricular framework. We will

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[14] "The centers may establish groupings of areas in fields within the framework of what is established in this regard by their respective educational administrations" (article 8.6 of Royal Decree 157/2022, of March 1).

[15] "The centers may establish groupings in areas of all subjects of the first three years of the stage within the framework established in this regard by their respective educational administrations" (article 8.6 of Royal Decree 217/2022, of March 29, 2002).

not dwell on them now[16], we simply reflect the connection between these three elements through Figure 6.
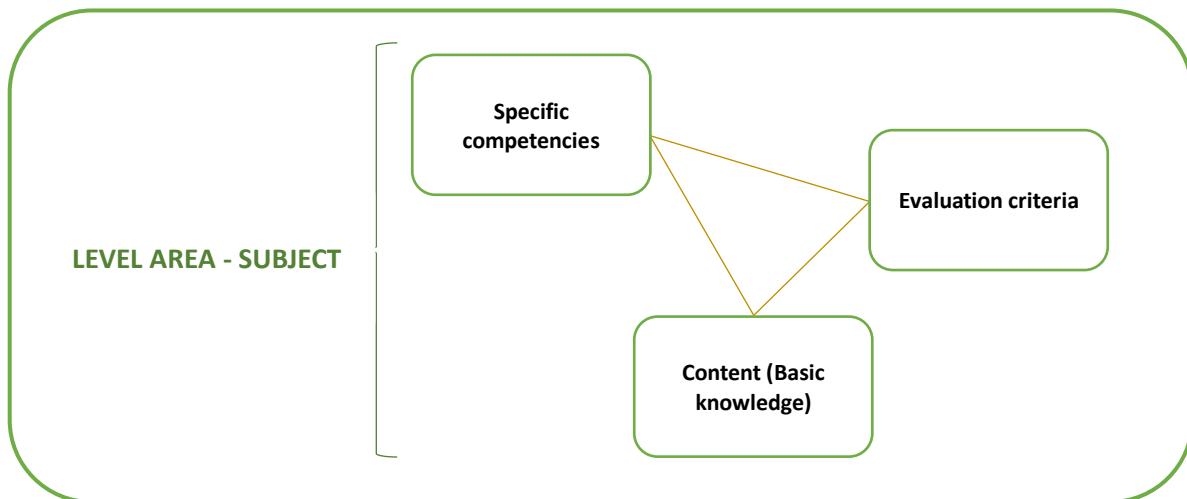


Figure 6. Representation of the link between specific competencies, evaluation criteria and the contents of the areas and subjects. Own elaboration.

Therefore, we would like to point out that it is difficult to treat any of them independently and independently of the other two. Choosing a specific competency of an area or subject, logically implies opting for the evaluation criteria pertaining to it, but, in addition, and always depending on the characteristics of the subject to which we are referring, it implies selecting, from the total of contents, those whose learning is necessary for the acquisition of said competency.

Based on this obviousness that we have just recalled, when grouping different fields of knowledge, one of the following two possibilities, with their variants, can be chosen:

a. Incorporate by juxtaposition, in the "new curriculum" (that of the field), the specific competencies, the evaluation criteria and the contents of the areas or subjects that are intended to be grouped in the area (represented in Figure 7).

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[16] The meaning and sense of specific competencies has already been discussed in the previous section. In order to analyze the other two elements of the curriculum, it is proposed to resort to the definitions established in article 2 of any of the Royal Decrees of minimum teachings, as well as to chapter 3 "Cambios en el currículo. Un modelo más comprensivo e inclusivo", by Moya, J. and Luengo, F., in "Educar para el siglo XXI. Reformas y Mejoras. LOMLOE: de la norma al aula".

b. Integrate, in the new curriculum, the specific competencies, the evaluation criteria and the contents of the areas or subjects that are intended to be grouped in the field (represented in Figure 8).

Regarding the first possibility presented, the reader will surely have already sensed that it can only be linked to the "multi-d" (but not to the inter-d, nor, of course, to the trans-d). In this regard, a first question may arise: should all the specific competencies, all the evaluation criteria and all the contents of the areas or fields to be grouped be incorporated?

The answer is provided by the norm itself: article 11.5 of Royal Decree 157/2022, of March 1, determines that in the case that fields are established, their curriculum will include the specific competencies, the assessment criteria and the basic knowledge of the areas that comprise them; in a similar line, article 13.5 of Royal Decree 217/2022, of March 29, states that the groupings by areas that are established must respect the specific competencies, the assessment criteria and the basic knowledge of the fields that are integrated in these areas.
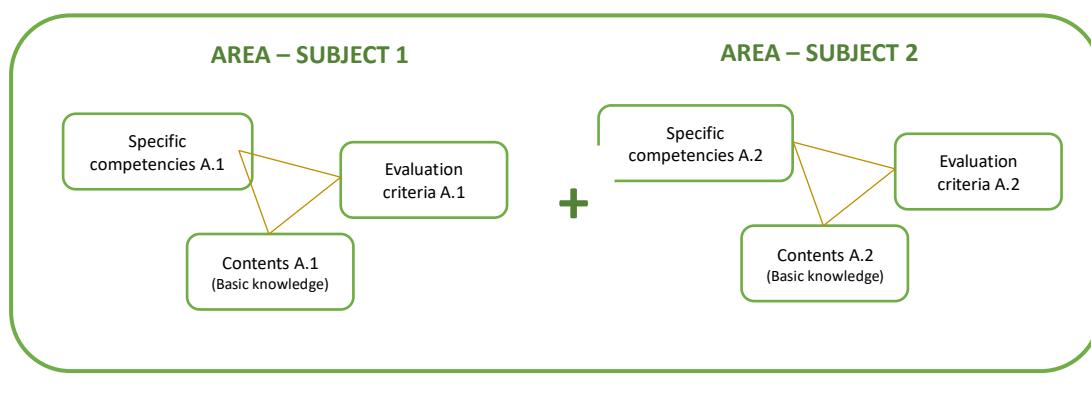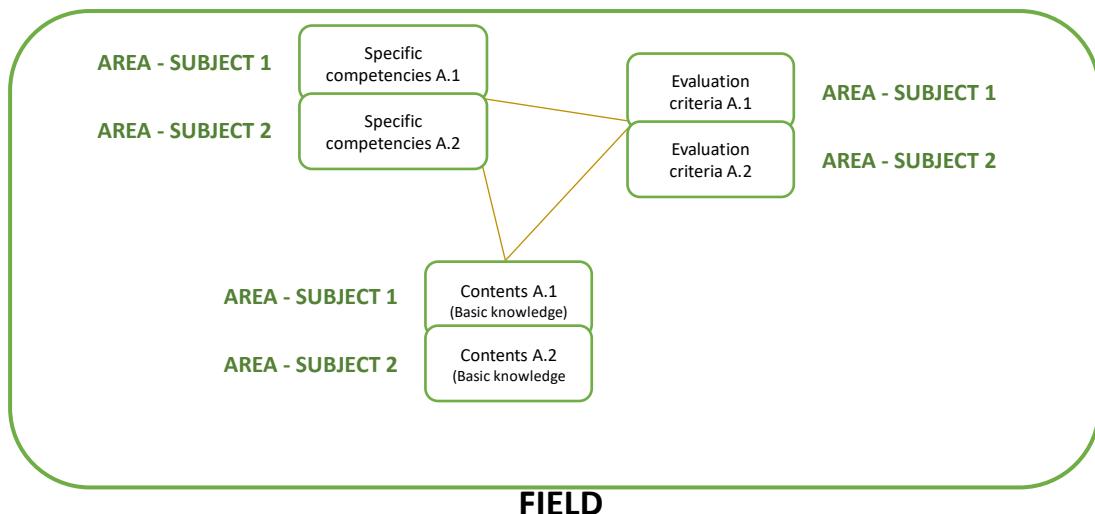


**FIELD**

Figure 7. Grouping of curricular elements by juxtaposition. Own elaboration.

According to this possibility, the account is very simple: if area 1 consists of 8 specific competencies, 19 evaluation criteria and 5 content blocks, and area 2 incorporates 5 specific competencies, 17 evaluation criteria and 5 content blocks, the resulting domain will be configured with a total of 13 specific competencies, 36 evaluation criteria and 10 content blocks. It is now when a second question becomes visible, which we will not answer, leaving the possible answer in the hands of the reader: does this option really represent a grouping of areas or subjects in areas of knowledge, or is it simply a school organization where a single teacher teaches two or more different subjects?

In case it is helpful, we provide the interpretation of "learning domain" offered by Elizondo (2020, p. 29):

In education, to speak of domains is to configure the curriculum in a globalized and interdisciplinary way, relating various disciplines to each other, so that the domain represents much more than the sum of its parts, in this case, of the subjects or areas that compose it.

The second option proposed has a clear inter-d or trans-d vocation, depending on how the integration of the three curricular elements is handled. The possibilities that emerge belong to two levels that are made compatible.



Integration of specific competencies, evaluation criteria and contents. Own elaboration.

On the first level, we will say that integration will be minimal when only the specific competencies are integrated; it will be clearly higher when the specific competencies are integrated together with the evaluation criteria; and it will be total when the specific competencies, the evaluation criteria and the contents of the areas or subjects grouped together are integrated.

On the second level (parallel to the previous one), we will say that integration will be minimal when few elements of each of them are integrated, that is, few competencies, few criteria, or few contents, as the case may be; it will be high when many competencies, criteria or contents are integrated, depending on the option chosen; and it will be total when all competencies, all criteria or, as the case may be, all contents are integrated.

Therefore, the possibilities are multiple, and as you may have already guessed, as long as curricular integration is not maximized, we should not speak of a trans-d proposal.

The difficulty of the operation will depend fundamentally on the nature of the areas or subjects to be integrated (there are subjects with more "common curricular spaces" and others with less), although the "expertise" of those who carry out the task will also be a factor to be considered.

For this reason, we propose below a strategy to be followed, which in our case helped significantly in the development of the integrated curriculum[17] and which involved starting from the highest educational level and moving down to lower grades:

1st. Elaboration of the specific competences of the field and determination of the new links with the operative descriptors of the Exit Profile.

2nd. Elaboration of the evaluation criteria for the higher course for which the grouping is proposed (e.g., 3rd year of ESO).

3rd. Elaboration of the contents of the maximum level for which the grouping is proposed (e.g., 3rd year of ESO).

4th. Sequencing of the evaluation criteria for the rest of the levels, if applicable (2nd EO and 1st ESO).

5th. Sequencing of the contents for the rest of the levels, if applicable (2nd year of ESO and 1st year of ESO).

The experience leads us to assure that the first question turned out to be the costliest of all. For its proper execution, we recommend following these steps:

a) Identification of the parts that integrate the specific competencies of the subjects to be integrated, according to their syntactic structure: what (infinitive), how (gerund, through...) and for what (for + infinitive).

Example (Geography and History): Search, select, process, and organize information on relevant topics of the present and the past, critically using historical and geographical sources, to acquire knowledge, elaborate and express content in various formats.

b) Identification of the themes or axes on which each of the specific competencies to be integrated is based.

Example (Geography and History):

1. Search, select, process, and organize information on relevant topics of the present and the past, critically using historical and geographic... acquire knowledge, elaborate and express content in various formats.   **Information, sources**

2. Investigate, argue, and elaborate their own products or ~geographic~ historical, and social problems that are relevant today, from th   **Problems, critical thinking**

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[17] We refer to the elaboration of the curriculum of the areas of the new CPD and BVTM by the Academic Organization, Titles and Coexistence Service of the General Directorate of Planning, Organization and Educational Equity of the Department of Education of the Regional Government of Castilla y León.

global, to develop critical thinking, respectful of differences, which contributes to the construction of their own identity and enriches the common heritage.

3...

Example (Spanish Language and Literature):

1. Describe and appreciate the linguistic diversity of the world based on the recognition of the students' languages and the plurilingual and pluricultural reality of Spain, analyzing the origin and sociohistorical devel **Linguistic diversity** languages and the characteristics of the main dialectal varieties of Spanish, to favor interlinguistic reflection, to combat linguistic stereotypes and prejudices and to value such diversity as a source of cultural richness.

2...

6. Select and contrast information from different sources in a progressively autonomous manner, evaluating its reliability and relevance according to the reading objectives and avoiding the risks of manip **Information, sources** misinformation, and integrate and transform it into knowledge, to communicate it from a critical and personal point of view while respecting intellectual property.

c). Association of specific competencies that share themes or axes.
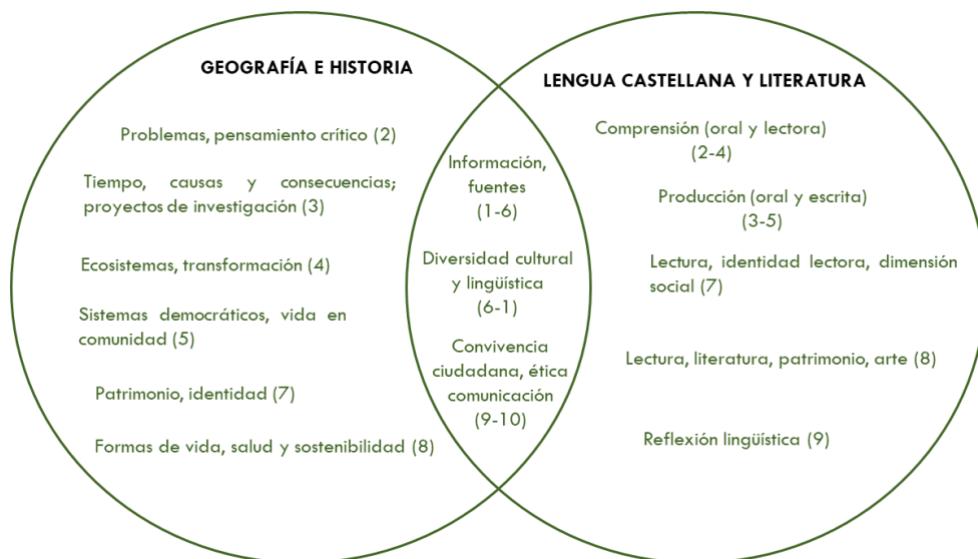Example (Geography and History - Spanish Language and Literature):



Figure 9. Association of specific competencies through common themes. Own elaboration.

- SG 1 of GH and SG 6 of LCL are integrated.
- SG 6 of GH and SG 1 of LCL are integrated.
- SG 9 of GH and SG 10 of LCL are integrated.

d) Thorough analysis of the specific non-related competencies from their constituent parts, breaking them down into parts through keywords (they are shaded in the example).

Example (Geography and History):

2. Investigate, argue, and elaborate their own products on geographic, historical, and social problems that are relevant today, from the local to the global, to develop critical thinking, respectful of differences, which contributes to the construction of their own identity and enriches the common heritage.

Example (Spanish Language and Literature):

2. Understand and interpret oral and multimodal texts, gathering the general sense and the most relevant information, identifying the point of view and the intention of the sender, and assessing its reliability, form, and content, to build knowledge, to form opinions and to broaden the possibilities of enjoyment and leisure.
4. Understand, interpret, and evaluate written texts, with a critical sense and different reading purposes, recognizing the general sense and the main and secondary ideas, identifying the intention of the issuer, reflecting on the content and form, and assessing their quality and reliability, to respond to different communicative needs and interests and to build knowledge.

e) Association of different competences from these keywords.
Example (Geography and History - Spanish Language and Literature):

1. Comprehension (oral, written, multimodal texts) → geography, history, social problems → critical thinking, opinion (CE2/CE2-CE4).

- The EC 2 of GH, EC 2 of LCL and EC 4 of LCL are integrated.

f) Ordering of the specific competencies of the new field. At this point all the competences are ordered, both those that have been integrated because they share themes or axes (step c), those that have been integrated by keywords (step e), as well as the specific competences that, if necessary, have been decided not to integrate.

g) Determination of the links between the new competencies and the operational descriptors of the Output Profile. At this point, when a global perspective of the field is already available through the final drafting and ordering of the specific competencies that comprise it, the links between these competencies and the operational descriptors will be established. From our point of view, this task is extremely important, since these links represent the contribution of the field to the development of the key competences and, as a minimum, they must be the sum of the links of the areas or subjects that are grouped together.

## Conclusions

We have started with the conceptualization of the term "interdisciplinarity", along with its various variants, and that of "transversality", with the two most used meanings. As a result, we have identified the expressions of disciplinarity, multi-d, inter-d, and trans-d, representing them on a continuum concerning the interaction and integration of disciplinary knowledge.

Furthermore, we have thoroughly analyzed the notion of transversality from its dual etymological sense, one denoting the "axis" that traverses different subject areas and courses, and the other representing the "globalizing topic" around which curricula from various disciplines come together.

Through this meticulous terminological review, we have emphasized the different meanings, particularly when establishing connections between both conceptual spaces. The first meaning of the term "transversality" has been linked to disciplinarity and multi-d, whereas the second meaning is associated with inter-d and trans-d.

The publication of the Organic Law 3/2020, of December 29, which modifies the Organic Law 2/2006, of May 3, on Education, aims, among other things, at the curricular modernization of the educational system. The three pillars on which this process of curricular modernization is based, which are also clearly innovative elements compared to previous educational regulations, are closely related to an interdisciplinary and cross-cutting approach to the curriculum. This is the first conclusion we would like to leave in the reader's memory.

However, and here comes the second conclusion, it does not seem sufficient for the new curricular structure to enable (and even promote) this cross-cutting approach so that a truly global and competency-based approach is implemented in the classroom. For this to happen, it is necessary for teachers to connect the subjects they teach, coordinate their teaching interventions, and work with shared temporal and spatial resources. Achieving this requires the willingness of the main actors, but it also involves addressing the current organizational, management, and planning difficulties, which fall within the responsibility of educational administrations.

Finally, we have outlined the possibilities offered to schools of grouping the areas of Primary Education and the subjects of the first three years of Compulsory Secondary Education into areas of knowledge, as part of increasing their organizational and pedagogical autonomy. Once again, we conclude that the desired inter-d will only be achieved through the development of integrated curricula.

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