

Prior training and current legislation: impact on the development of didactic units

Formación previa y legislación vigente: incidencia en la elaboración de unidades didácticas

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Abstract

The didactic unit manifests the programmatic structure of the teacher for the implementation of the teaching-learning process. Despite its relevance, it is a genre with little research on the difficulties of its production. Thus, through the application of a taxonomic tool of analysis, this study aims to analyze the variation of the difficulties and omissions presented by students of the Master's Degree in Teacher Training in the production of this genre, taking as variables the educational legislation (LOMCE and LOMLOE) and the previous training of the students. For this purpose, 96 didactic units produced by Master's students during three academic years (2020-2021 to 2022-2023) are analyzed. The legislative variable shows variations (lower difficulty index with LOMLOE than with LOMCE) and, likewise, so does the previous training (lower difficulty in Humanities compared to areas such as Psychology, Science or Mathematics). In conclusion, these two variables have implications that must be addressed from the didactic point of view within the teaching-learning process of the programmatic action.

Keywords: curriculum design, educational legislation, learning difficulties, previous training.

Resumen

La unidad didáctica manifiesta la estructura programática para la implementación del proceso de enseñanza-aprendizaje. A pesar de su relevancia, se trata de un género con escasas investigaciones en torno a las dificultades de su producción. A través de la aplicación de una herramienta taxonómica este estudio tiene por objeto analizar la variación de las dificultades y omisiones que presentan los estudiantes del Máster en Formación del Profesorado en la producción de dicho género tomando como variables la legislación educativa (LOMCE y LOMLOE) así como su formación previa. Método: Se analizan 96 unidades didácticas producidas por estudiantes del Máster durante tres cursos académicos (2020-2021 a 2022-2023). Resultados: La variable legislativa evidencia sufrir variaciones (menor índice de dificultad con LOMLOE que con LOMCE) e, igualmente, la formación previa también (menor dificultad en Humanidades frente a áreas como Psicología, Ciencias o Matemáticas). Discusión: Estas dos variables refieren implicaciones que deben ser respondidas desde el punto de vista didáctico dentro del proceso de enseñanza-aprendizaje de la acción programática.

Palabras clave: dificultades de aprendizaje, diseño curricular, formación previa, legislación educativa, unidad didáctica.

1. Introduction

There is a fundamental competence for teachers: the ability to develop classroom programs. It is a technical task that is part of the teacher's daily work. However, curriculum design (CD) extends beyond technical development, with additional implications, as programming integrates scientific and didactic knowledge, transferring the results of research and educational innovations. This process considers adaptation to current legislation and various contextual conditions (Vílchez & Perales, 2018).

From a competency perspective, one of the main challenges faced by teachers is understanding the importance of classroom programming for their professional development. This involves designing and developing it according to the prescriptive curriculum, adapting it to the reality of each educational center, and specifying it in programs. The curricular implementation that programming implies is reflected as a complex task (Rodríguez, 2010), but it is necessary because it is where teachers contextualize the curriculum, enabling informed decision-making.

The competence of developing programs through Didactic Units (DU) requires a set of sub-competences, such as considering the purposes of education, knowledge of the educational community, application of the curriculum, management of the current curricular framework, and the basic knowledge of each subject; knowledge of the psychosocial characteristics of students; integration, according to various pedagogical assumptions, of the disciplinary and didactic field; adequacy of teaching and learning strategies, organization of learning activities and group/class management (Rodríguez, 2010). In addition, the authors of this study incorporate the application of evaluation processes by the curriculum and didactic assumptions.

Indeed, the complexity of implementing CD in classroom programs through DU is determined by the various variables involved in its development

and its qualities: legislative, contextual, curricular, didactic, and formative. In this scenario, this study considers two variables that can offer another perspective on understanding this complexity and, thus, generate teaching-learning processes that address these difficulties: the legislation in force and the student's previous training. On the one hand, the aim is to fill the existing gap in the literature on the Identification of the difficulties that may arise from the programmatic practice of students in training and, on the other hand, to provide an empirical action on the influence of the two variables mentioned in this task, which has not been studied so far. This aims to contribute to didactic actions that can improve teaching-learning practices in these programmatic tasks.

Thus, this research aims to analyze the variation of the difficulties and omissions (D&O) posed by the production of DU of students of the Master's Degree in Teacher Training (MFP), considering the educational legislation as a factor that determines the structure and content of the curriculum, and the previous training of the students. For this purpose, a corpus of 96 UD's produced in the Master's program during three academic years (2020-2021 to 2022-2023) is analyzed.

1.1. Educational legislation and previous training: their influence on the learning process of curriculum design.

The curricular activity in basic education is currently in a transitional phase, as the LOMLOE was implemented in the 2023-2024 academic year following the repeal of the LOMCE. Thus, it is interesting to highlight how both educational legislation and curricular decrees determine specific orientations regarding the meaning and treatment of the elements that constitute the CD and, consequently, the development and production of the DU. These orientations have an impact on the disposition of the basic structure of the curricular elements and their relationships. Regarding the layout of the structure, Figure 1 shows the differences between the two legislations:

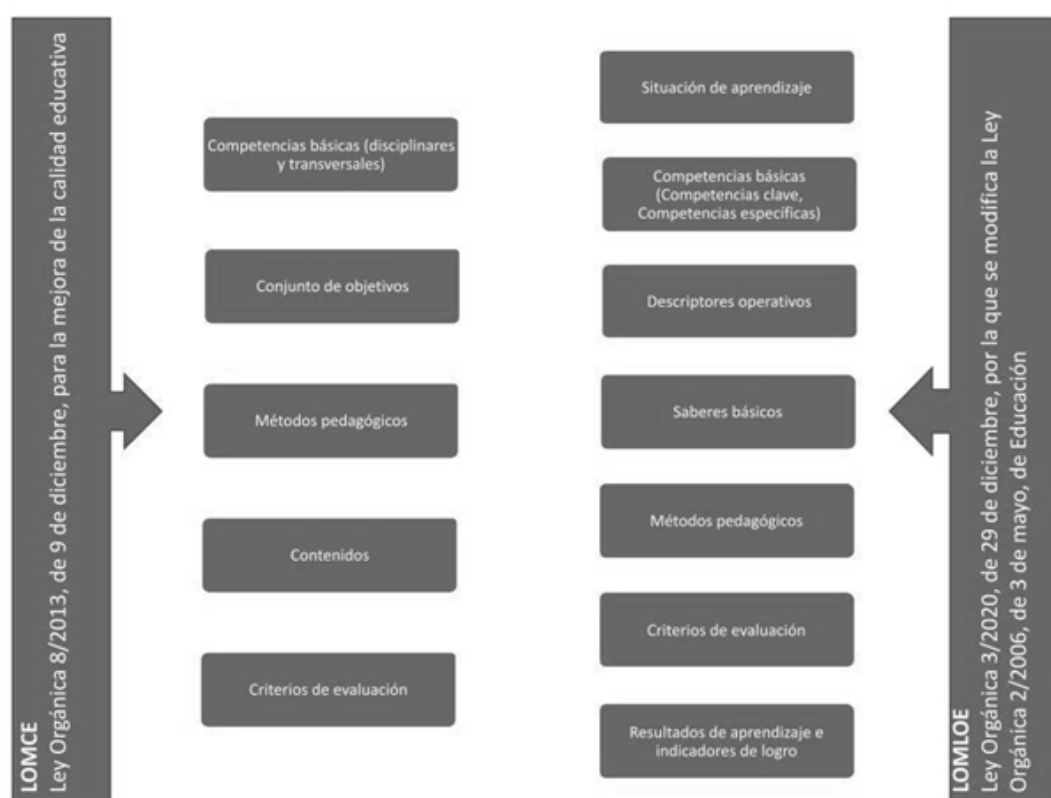


Figure 1: Nuclear elements of LOMCE and LOMLOE.

Source: Own elaboration.

The LOMLOE incorporates a new element that is significant and marks a notable difference: the catalytic effect of the learning situation (SA). While the LOMCE presents the problem situation as a tool for integrating curricular elements, the LOMLOE integrates them in the Context of a specific area (SA) and relation to the meaning and interconnection of competencies (Luengo et al., 2021). While the LOMCE emphasizes objectives and content, the LOMLOE focuses on competencies, including what is to be learned, how it is to be achieved, and how it is to be evaluated (Coll & Martín, 2021).

Figure 2 shows the relationship between all the elements of didactic programming in LOMCE and LOMLOE:

The SA, within the SU, acts as an axis that unites and integrates the rest of the elements, giving rise to a systematic programming based on the development of competencies (LOMLOE)

beyond the mere description and development of each curricular element, whose axis is the contents (LOMCE). This systemic character provided by the ES reflects a conception of integrated learning based on the development of competencies. It begins with the Context in which students live, presenting a problem to be solved and applying the key and specific competencies that correspond to the situation, as specified in learning objectives that, in turn, build upon the basic knowledge. The competencies provide descriptors and evaluation criteria, which enable the Identification of learning, thereby facilitating the evaluation process.

This reorganization of curricular elements is not exclusive to the Spanish Context. In various countries, legislative reforms have presented similar challenges in terms of designing didactic units and implementing programmatic didactic proposals. Studies conducted in Ecuador (Villagómez, 2012), Chile (Castro, 2017; Camus-

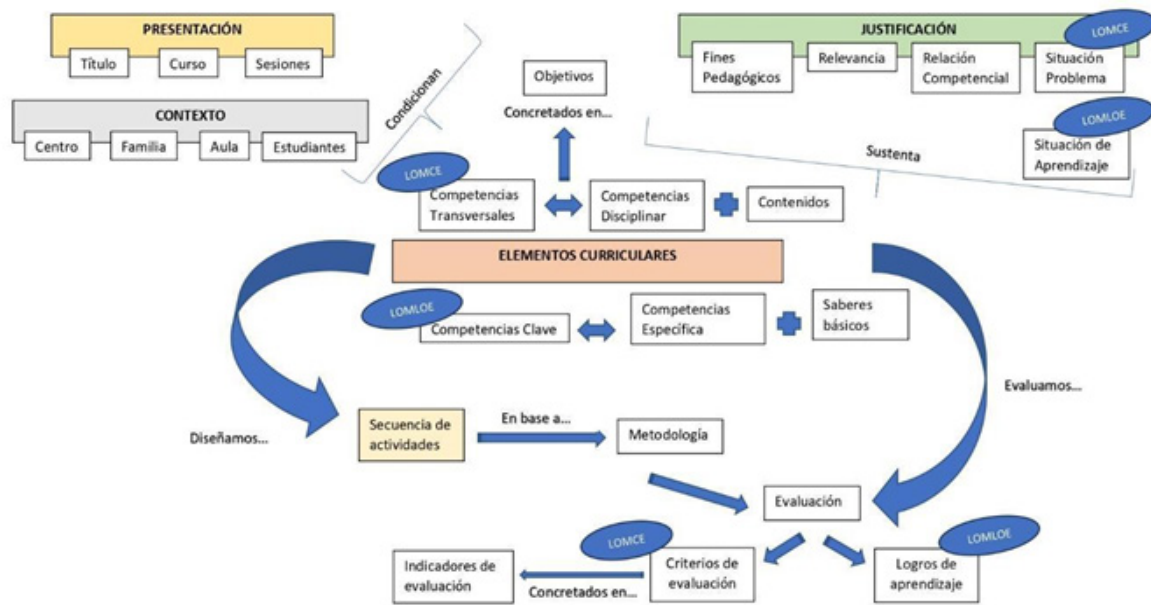


Figure 2: Relationship of DU elements.

Source: Own elaboration.

Camus & Vergara-Núñez, 2023) or Mexico (Cuevas-Cajiga & Moreno-Olivos, 2022) have shown that the transition to new curricular frameworks generates specific difficulties in didactic design, especially among trainee teachers. Thus, the present study is part of a global debate on the challenges faced by future teachers in interpreting and applying renewed curricular frameworks in their programmatic practices, which reinforces the need to analyze the effects of legislative reforms on the development of programmatic competencies in initial teacher education.

On the other hand, and in conjunction with the elements involved in educational legislation, it is essential to start from a fundamental premise: the importance of prior learning for future teachers related to the pedagogy and didactics of each field of knowledge. Previous ideas about how to teach and gaps in disciplinary content can lead to understanding teaching work as a simple sum of the discipline to be taught and how to teach it (Caamaño, 2013) without considering the need to integrate them. In this sense, in the Spanish Context, Toma, Meneses, and Greca (2019) evidenced that students with a background in science but without a solid pedagogical base

presented greater difficulties in designing didactic units based on inquiry. Consistently, international studies (Nilsson, 2008; Friedrichsen et al., 2011; Gess-Newsome et al., 2019) have shown that the level of previous pedagogical and didactic knowledge significantly conditions the quality of the proposals designed by future teachers. Thus, the present study is part of an international debate on the impact of initial training and prior knowledge on the development of programmatic competencies in teacher education.

This circumstance should lead to deepening knowledge of the discipline and reflecting on the didactic implications of teaching it (Sánchez & Valcárcel, 2000), as well as the need to reconstruct pedagogical thinking through flexible schemes and actions that allow for analyzing the Context of the teaching-learning process. According to Sánchez and Pericacho (2022), students who take the MFP come with a clear understanding of what the teaching-learning process entails, having gained this knowledge through their experience, training, and cultural environment. There is no doubt that this background will shape their beliefs about what the teaching profession entails and how they approach their learning in the Master's degree. From this perspective, it can be considered that

the internal structure of a discipline and the type of tasks they performed in their previous training can influence the way they approach learning and its outcomes (Monroy, 2013).

1.2. Teaching units: definition and production difficulties associated with graduate students.

Since the appearance of the Organic Law 1/1990, of October 3, 1990, on the General Organization of the Educational System (LOGSE), and the Organic Law 2/2006, of May 3, 2006, on Education (LOE), the UD's have been established as a fundamental tool for the concretion of the teaching programmatic practice. In this line, the latest legislation, Organic Law 8/2013, of December 9, for the improvement of educational quality (LOMCE), and Organic Law 3/2020, of December 29, amending Organic Law 2/2006, of May 3, on Education (LOMLOE), reflect this importance by consolidating this academic and professional genre (Meza et al., 2021).

The UD is understood as an “ordered set of the elements of the teaching-learning process that are linked to each other in terms of interrelation” (Escamilla, 1993, p.12), which, in addition, require the linking of all the elements that allow generating the didactic practice (Rodríguez, 2010). This provides the DU with a unique value for understanding and designing pedagogical actions. Indeed, the coherence between the elements of the curriculum brings cohesion to the whole process by promoting a practice adapted to a specific group of students, taking into account the learning to be developed and the various didactic elements necessary to make this possible, such as methodological approaches or the timing and organization of spaces (Fernández-Cruz, 2004).

In structural terms, the production approaches of the UD genre, determined by legislation and curricula, have made it possible to observe that, although a continuum is maintained in the structural composition, the relational logic of the design poses more or less significant differences. Thus, according to a review of the existing literature (Gamboa, 2007; Rodríguez, 2010; Toma et al., 2017), it is concluded that the DU

has a relatively stable rhetorical and structural framework (beyond changes in the nomenclature of its elements). Figure 3 shows the components of the genre and its communicative functions:

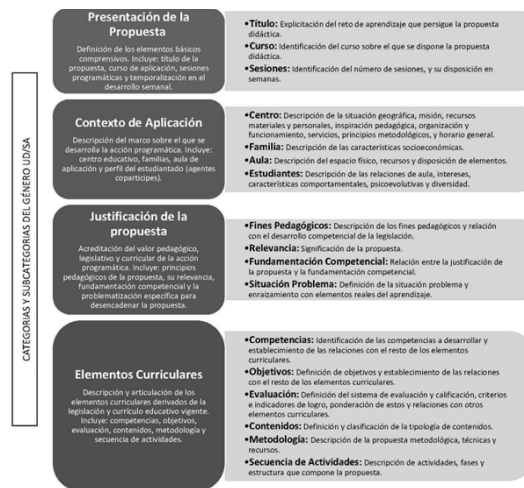


Figure 3: Rhetorical components of DU.

Source: Own elaboration based on Gamboa 2007; Rodríguez, 2010; Toma et al., 2017.

The UD is a fundamental tool that specifies all teaching-learning processes, where teachers must demonstrate more than sufficient competencies (Gamboa, 2007) to design, relate, and develop curricular elements. This leads to the conclusion that the design and development of the curriculum through the DU is not only where the elements are found and described but also where the coherent relationship between them is demonstrated (Cancelo, 1994).

Indeed, it is assumed that UD design is not an immediate process based on simple routines (Cañal et al., 2004). This suggests that the CD poses certain D&O in the students' production, which is evident in the deployment of the different curricular elements and in the arrangement of the framework that comprises the UD genre. This difficulty has been widely acknowledged by previous research, which warns that the absence of specific training or the lack of integration between curricular components can affect the quality of the design (Monroy, 2013; Gess-Newsome et al., 2019). Below (Figure 4), the categories and subcategories of the taxonomy difficulties and omissions in the production of DU analyzed in this study are reflected:

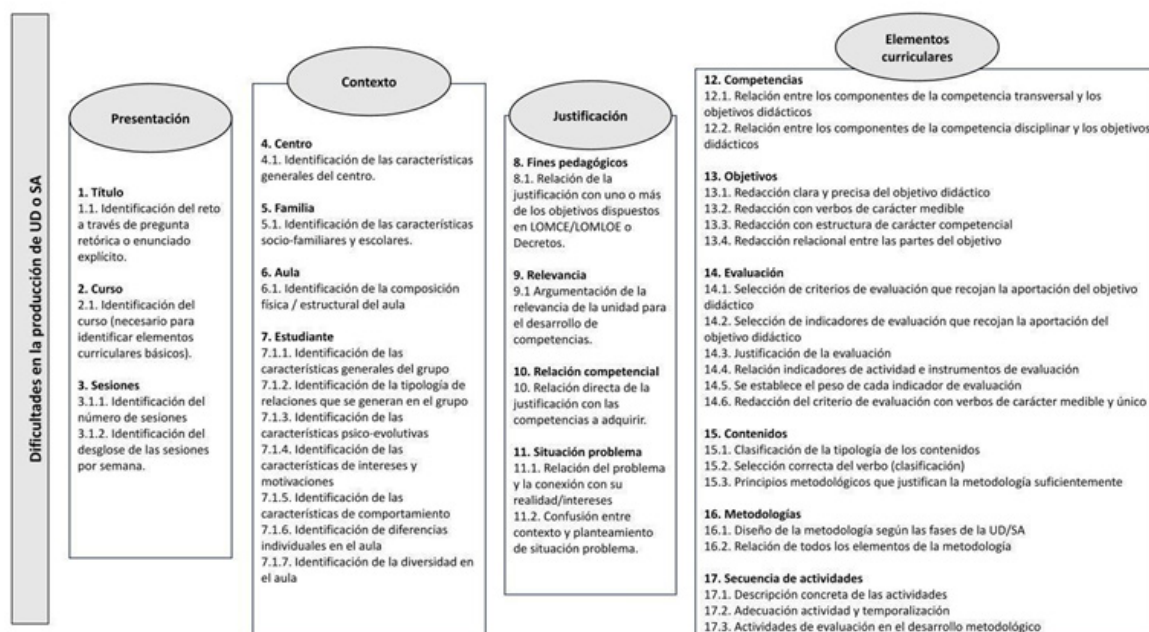


Figure 4: Taxonomy of difficulties and omissions in the production of DU.

Source: Own elaboration.

Considering all the above, the general objective is to compare the variation of D&O in the production of DU among MFP students, taking into account two nominal variables: current legislation and previous training. For the fulfillment of this objective, the following specific objectives are broken down:

1. To compare the degree of recurrence and density per document of D&O in the production of DUs according to the legislation applied (LOMCE and LOMLOE).

2. To compare the degree of recurrence and density per document of the D&O in the production of the DUs, according to the different previous training (Physical Education -PE-, Psychology -Ps.-, Languages -Id.-, Humanities -Hum.-, and Natural Sciences, Mathematics and Statistics CNME-).

2. Materials and Methods

2.1. Methodological design

This research is developed from a quantitative, contrastive approach (Creswell & Creswell, 2018), which provides measures of absolute frequency and ratios. The latter expresses the relationship between the number of D&O and the total number of each analysis segment. This study integrates ready-made variables, specifically legislation, and prior training.

2.2. Corpus

A non-probabilistic purposive sampling method was used, selecting all didactic units submitted by students that met the established inclusion criteria. The research is based on a corpus of texts composed of 96 DUs produced by students of the MFP of a Spanish university. Specifically, 80 DU were produced in the academic years 2020-2021 and 2021-2022, according to the LOMCE, while 16 were developed during the academic year 2022-2023, according to the LOMLOE. The

productions were developed after specific training in CD, lasting 6 weeks in the subject of Subject Learning (4 ECTS). Specifically, it is individual work related to a school subject within their basic disciplinary training. The students carried out this production using a series of fundamental indicators outlined in an activity guide. The work related to a school subject within their basic disciplinary training. The students carried out this production using a series of fundamental indicators outlined in an activity guide. The work was submitted through the university platform (all of them were informed that the task was to

be used for research purposes and gave their consent to that end). Thus, the texts that make up the corpus meet the requirements of provenance (Parodi, 2010), reputation (Nwogu, 1997), and integrity and authenticity (Parodi, 2010).

The characteristics of the corpus and the participants are shown below (Table 1), according to the two variables of analysis (the classification of the areas of previous training is based on the distribution of scientific areas determined by UNESCO):

Table 1: Characteristics of the corpus and participants.
Source: Own elaboration.

Category	Legislation and academic year		
	LOMCE 2020-2021	LOMCE 2021-2022	LOMLOE 2022-2023
Physical Education	7	9	3
Psychology	5	5	3
Languages	6	22	5
Humanities	2	10	4
Natural Sciences, Mathematics and Statistics	7	7	1
Totals	27	53	16

2.3. Instrument

Regarding the instrument of analysis, the taxonomic description (Figure 4) is applied, consisting of four dimensions and a total of 39 D&O. This was designed in consideration of previous research (Monroy, 2013; Gess-Newsome et al., 2019) and the official curricular frameworks. Coding was performed on previously segmented units of analysis, allowing the Identification of common patterns and frequent difficulties in student production. The first dimension refers to the Presentation of the DU, where the definition of the basic elements is established: title, course, sessions, and timing. The second dimension, the Context of the application, refers to the description of the framework within which the programmatic action occurs, specifying educational centers, families, classrooms, and student profiles. The third dimension, Justification of the proposal, establishes the pedagogical, legislative, and curricular value through the Identification of pedagogical principles, relevance, competence foundation, and the specific problematization that triggers the proposal. Finally, the fourth

dimension, Curricular elements, describes and articulates the elements according to current legislation and educational curriculum through competencies, objectives, Evaluation, contents, methodology, and sequence of activities.

2.4. Data collection and analysis procedure

The research was carried out in three phases. The first step consisted of downloading and subsequently uploading the 96 DU to the Atlas—ti software. Once the corpus was formed, an identification code was assigned to each unit of analysis, maintaining the terms of anonymity previously mentioned. The second stage consolidated the data analysis. This process was developed through pre-piloting (5% of the corpus), piloting (28% of the corpus), and, finally, an analysis of the total research corpus (67%). In the third and final stage, the data were systematized and graphically represented, considering the two variables of the study: legislation and previous training.

3. Results

The results of the study are shown below.

3.1. Comparison of recurrence and density of D&O as a function of the legislative variable

Table 2 presents the degree of recurrence and the density of D&O identified in the corpus as

a function of the legislative variable based on absolute data and incidence ratios. First, data are provided for the categories of analysis, then for the subcategories, and, finally, for the D&O with the most significant statistical data:

Table 2: Difficulties according to legislation.

Source: Own elaboration.

Category	TOTAL	LOMCE		LOMLOE	
	NDO	NDO	Ratio	NDO	Ratio
Context	546	452	5,65	94	5,87
Presentation	113	101	1,26	12	0,75
Justification	238	209	2,6	29	1,81
Curricular elements	616	568	7,1	48	3,0
Overall ratio	-	-	16,61	-	11,43

Table 2 refers to a total of 1513 D&O in the corpus, of which 616 are placed in the development of aspects of the Curricular Elements category, 546 in Context, 238 in Justification, and 113 in Presentation. There is evidence of a decrease in the total incidence of the D&O in the application of the LOMLOE compared to the LOMCE (11.43 vs. 16.61, respectively). In this sense, the categories Presentation (from 1.26 to 0.75), Justification (from 2.6 to 1.81), and Curricular elements (from 7.1 to

3.0) show this decrease in the application of the LOMLOE. The Context category is the only one in which the index of difficulties with LOMLOE increases (by 0.22 points). It is interesting to note that the category with the most significant number of errors in absolute terms (616) is the one with the most significant decrease in the difficulty ratio, as indicated, with more than four points.

The 17 subcategories of analysis show the following data (Table 3):

Table 3: Incidence of each subcategory according to legislation.

Source: Own elaboration.

Category	Subcat.	TOTAL	LOMCE		LOMLOE		Global Ratio
		NDO	NDO	Ratio	NDO	Ratio	
Context	Center	77	65	0,81	12	0,75	1,56
	Family	84	69	0,86	15	0,93	1,79
	Classroom	71	59	0,73	12	0,75	1,48
	Student	314	258	3,22	12	0,75	1,48
Presentation	Titles	59	52	0,65	7	0,43	1,08
	Course	2	2	0,02	0	0	0,02
	Sessions	52	47	0,58	5	0,31	0,89
Justification	Pedagogical Purposes	73	60	0,75	13	0,81	1,56
	Relevance	38	35	0,43	3	0,18	0,61
	Competence Relationship	38	30	0,37	8	0,50	0,87
	Situation Problem	89	84	1,05	5	0,31	1,36
Curricular Elements	Competencies	61	57	0,71	4	0,25	0,96
	Objectives	90	87	1,08	3	0,18	1,26
	Evaluation	263	245	3,06	18	1,12	4,18

NDO: Number of difficulties and/or omissions

Table 3 shows that, of the 17 subcategories, 12 show a decrease in the D&O ratio with the application of the LOMLOE. Only five of them show a lower rate with the LOMLOE. There are three categories in the Context category: Family, Classroom, and Student (with differences ranging from 0.02 to 0.33), and two categories in the Presentation category: Pedagogical Purposes and Competency Ratio (with differences ranging from 0.06 to 0.13).

The subcategories of the Curricular Elements category (Competencies decreases from 0.71 to

0.25; Objectives from 1.08 to 0.18; Assessment from 3.06 to 1.12; Content from 0.51 to 0.31; Methodology from 0.75 to 0.31; and Sequence of activities from 0.95 to 0.92) show a greater decrease than the rest. This is significant since, with the implementation of the LOMCE, these are the subcategories with the highest D&O index.

Finally, the focus is on those D&O deployed in the subcategories with the most statistically significant expressions, namely, Student and Evaluation (Table 4):

Table 4: Incidence of D&O of the student category and evaluation according to legislation.

Source: Own elaboration.

Category	D&O	LOMCE		LOMLOE	
		NDO	Ratio	NDO	Ratio
Student	Identification of the general characteristics of the group	19	0,23	1	0,06
	Identification of the type of relationships generated in the group.	59	0,73	7	0,43
	Identification of psycho-evolutionary characteristics	24	0,3	4	0,25
	Identification of the interests and motivations of the group of students.	16	0,2	8	0,5
	Identification of behavioral characteristics	54	0,67	11	0,68
	Identification of individual differences in the classroom	56	0,7	14	0,87
	Identification of diversity in the classroom	39	0,48	14	0,87
Evaluation	Selection of evaluation criteria that reflect the contribution of the didactic objective.	61	0,76	3	0,18
	Selection of evaluation indicators that reflect the contribution of the didactic objective.	55	0,68	4	0,25
	Writing the evaluation criterion with measurable and unique verbs	25	0,31	-	-
	Justification of the evaluation	35	0,43	5	0,31
	Relationship of indicators with activity and evaluation instrument	33	0,41	1	0,06
	The weight of each evaluation indicator is established	36	0,45	1	0,06

NDO: Number of difficulties and/or omissions.

Table 4 shows that four of the seven D&Os in the Student subcategory increase the ratio with LOMLOE, specifically in the areas of identifying student interests and motivations, identifying behavioral characteristics, and identifying individual differences and diversity. On the other hand, in the Evaluation subcategory, the six underlying D&O show a decrease (between 0.10 and 0.58) with the LOMLOE. Thus, it is easier to select evaluation criteria (from 0.76 to 0.18), select indicators (from 0.68 to 0.25), assign qualifying weights to indicators (from 0.45 to 0.06), or write criteria with measurable verbs (from 0.31 to 0). The Justification of the Evaluation and the relationship between indicators (from 0.43 to 0.31) and the relationship with the evaluation

instruments (from 0.41 to 0.31) are at a lower rate of decline.

3.2. Comparison of recurrence and density of D&O as a function of prior training variable

The degree of recurrence and density of D&O identified in the corpus as a function of the prior training variable is shown below. For this purpose, absolute data on the incidence in the corpus, as well as the incidence ratio, will be shown. First, data are given for the categories of analysis; secondly, for the subcategories; and finally, data are given for those D&O that are most significant (Table 5):

Table 5: Incidence of each category according to previous training.

Source: Own elaboration.

Category	TOT.	EF		Id.		Hum.		Ps.		CNME	
	NDO	NDO	R	NDO	R	NDO	R	NDO	R	NDO	R
Context	546	66	3,47	118	3,57	112	7,0	123	8,6	127	8,4
Presentation	113	12	0,63	26	0,78	20	1,25	32	2,46	23	1,5
Justification	238	34	1,78	60	1,88	40	2,5	50	3,84	54	3,6
Curricular Elements	616	74	3,89	116	3,55	138	8,6	152	11,6	136	9,06
Global Ratio	-	-	9,77	-	9,78	-	19,35	-	26,5	-	22,56

NDO: Number of difficulties and/or omissions; R: Ratio.

The analysis assigned to the previous training variable shows a decrease in the incidence of D&O in areas with previous pedagogical training, specifically Physical Education, with an overall ratio of 9.77, and Languages, with a ratio of 9.78. On the other hand, those without such training show a humanities overall ratio of 19.35, while Psychology and Natural Sciences, Mathematics, and Statistics accumulate 22.56 and 26.5, respectively.

It should be noted that, in the case of disciplines with prior training in pedagogy, the D&O ratio is less than half that of other disciplines, with Psychology being the discipline that shows

the highest incidence ratios in all categories of analysis.

On the other hand, it is noteworthy that although Physical Education shows a difficulty index slightly lower than Languages (0.01), in three of the four categories (Context, Presentation, and Justification), it shows a higher D&O index. It is the category of Curricular elements that are the determining factor between the two disciplines (3.89 vs. 3.55). On the other hand, it is the category with the highest D&O in all disciplinary areas.

The following data are provided for the 17 subcategories of analysis (Table 6):

Table 6: Incidence of each subcategory according to previous training.

Source: Own elaboration.

Subcat.	TOT.	EF		Id.		Hum.		Ps.		CMNE		Global Ratio
	NDO	NDO	R	NDO	R	NDO	R	NDO	R	NDO	R	
Center	77	10	0,53	17	0,52	14	0,88	16	1,23	20	1,33	4,48
Family	84	11	0,58	16	0,48	18	1,13	19	1,46	20	1,33	4,98
Classroom	71	7	0,37	14	0,42	16	1,00	19	1,46	15	1,00	4,25
Study.	314	38	2,00	71	2,15	64	4,00	69	5,31	72	4,80	18,26
Title	59	6	0,32	14	0,42	11	0,69	17	1,31	11	0,73	3,47
Course	2	0	0,00	0	0,00	0	0,00	1	0,08	2	0,07	0,14
Sessions	52	6	0,32	12	0,36	9	0,56	14	1,08	11	0,73	3,05
Fines Pedagó.	73	0	0,47	17	0,52	10	0,63	16	1,23	21	1,40	4,24
Relieve.	38	4	0,21	12	0,36	8	0,50	8	0,62	6	0,40	2,09
Relationship Competence.	38	7	0,37	12	0,36	7	0,44	8	0,62	4	0,27	2,05
Situation - Problem.	89	14	0,74	19	0,58	15	0,94	18	1,38	23	1,53	5,17
Competition.	61	6	0,32	11	0,33	13	0,81	17	1,31	14	0,93	3,70
Objective.	90	12	0,63	18	0,55	21	1,31	23	1,77	16	1,07	5,33
Evaluates.	263	25	1,32	49	1,48	62	3,88	63	4,85	64	4,17	15,79
Conten.	46	6	0,32	8	0,24	11	0,69	11	0,85	10	0,67	2,76
Metod.	65	10	0,53	14	0,42	12	0,75	16	1,23	13	0,87	3,80
Sec. of activi.	91	15	0,79	16	0,48	19	1,19	22	1,69	19	1,27	5,42

NNDO: Number of difficulties and/or omissions; R: Ratio.

Table 6 shows that Physical Education and Language Arts, with only 8 and 6 subcategories, respectively, have a ratio higher than 0.5. In this case, it is interesting to note that although the area of Languages shows a higher difficulty ratio in the overall categories and subcategories, the incidence is less localized than in the case of Physical Education. In the case of previous training without contact with pedagogy, in Sciences, Mathematics, and Statistics, 14 out of 17 are situated in a ratio above 0.5 D&O; in Humanities, 15 out of 17, and in the case of Psychology, 17 out of 17.

In addition, it is interesting to note that Physical Education (2 out of 17), Languages (2 out of 17), and Humanities (6 out of 17) show less than half of their subcategories below the D&O ratio point. Meanwhile, Science, Mathematics and Statistics (9 out of 17), and Psychology (13 out of 17) show higher levels.

Finally, in this case, the focus is on those D&O deployed in the subcategories with a higher ratio at one point in all the disciplinary areas analyzed: Students and Evaluation (Table 7):

Table 7: Incidence of the D&O of the categories student and evaluation as a function of previous training.

Source: Own elaboration.

DO	EF		Id.		Hum.		Ps.		CNME	
	NDO	R	NDO	R	NDO	R	NDO	R	NDO	R
Identification of the general characteristics of the group	1	0,05	6	0,18	5	0,31	4	0,31	4	0,27
Identification of the type of relationships generated in the group	6	0,32	14	0,42	14	0,88	17	1,31	15	1,00
Identification of psycho-evolutionary characteristics	3	0,16	5	0,15	6	0,38	8	0,62	6	0,40
Identification of the interests and motivations of the group of students	3	0,16	6	0,18	5	0,31	5	0,38	5	0,33
Identification of behavioral characteristics	8	0,42	11	0,32	12	0,75	14	1,08	16	1,07
Identification of individual differences in the classroom	9	0,47	17	0,52	13	0,81	12	0,92	15	1,00
Identification of diversity in the classroom	8	0,42	12	0,36	9	0,56	9	0,69	11	0,73
Selection of evaluation criteria that reflect the contribution of the didactic objective	8	0,42	13	0,39	10	0,63	16	1,23	17	1,13
Selection of evaluation indicators that reflect the contribution of the didactic objective	7	0,37	9	0,27	13	0,81	15	1,15	15	1,00
Writing the evaluation criterion with measurable and unique verbs	1	0,05	4	0,12	4	0,25	5	0,38	11	0,73
Justification of the evaluation	4	0,21	8	0,24	11	0,69	10	0,77	7	0,47
Relationship of indicators with activity and evaluation instrument	3	0,16	8	0,24	11	0,69	10	0,77	6	0,40
The weight of each evaluation indicator is established	2	0,11	7	0,21	13	0,81	7	0,54	8	0,53

DO: Difficulties and/or omissions; NDO: Number of difficulties and/or omissions; R: Ratio.

As shown in Table 7, in the Student subcategory, the Identification of behavioral characteristics, as well as the Identification of individual differences and diversity, pose the most difficulties for students, with scores remaining close to 0.5 points in the areas of Physical Education and Languages, and exceeding 0.5 in the rest of the areas.

On the other hand, the subcategory 'Evaluation, Selection of Evaluation Criteria and Indicators' is the most difficult for students, exceeding one point in Psychology and Science, Mathematics and Statistics, and 0.5 in Humanities, while maintaining the highest values of the D&O in the cases of Physical Education and Languages.

4. Discussion and Conclusions

The objective of this study was to compare the variation of the D&O presented by MFP students in the production of programs, taking as variables the educational legislation and the previous training of the students, taking into account the complexity of this academic genre (Rodríguez, 2010) due, among other aspects, to the diversity of factors and elements that intervene in its elaboration (Cañal et al., 2008).

In general terms, it can be concluded that there is a significant variation in the recurrence and density of D&O after the application of both the legislation variable (Vílchez & Perales, 2018) and the student's previous training (Caamaño, 2013). Both are elements with significant implications and influence in the development of programming. Thus, these results generate significant interest in identifying ways to improve the development of this genre in postgraduate training.

Regarding the first specific objective, related to the legislation variable, the study draws the following conclusions. First, it is noted that the application of the curriculum with the LOMLOE lowers the overall D&O ratio. It can be thought that the curricular provisions are more closely related and involve less difficulty when interpreting them. Furthermore, this study suggests that the inclusion of ES (a differentiating factor concerning the LOMCE) as an axis may contribute to a better overall understanding of the DU and the relationship between its elements. This assertion is also supported by the results of some of the subcategories correlated with ES, which considerably lower their D&O ratio.

Secondly, it can be seen that most of the D&O are placed in aspects related to the category of curricular elements, regardless of the legislation under which the DU was carried out. This result is relevant to the teaching processes of programmatic action, as it is a first-order element for understanding the teaching action itself (Fernández-Cruz, 2004) and, in turn, for understanding the coherence of the design

(Corrales, 2009). However, the LOMLOE poses a significant decrease in core elements such as the subcategory Competencies or Objectives, which show a greater comprehensive logic. In conclusion, the data allow us to affirm that the LOMLOE establishes a clearer relationship between curricular elements. The understanding of this relationship on the part of teachers in training could lead to an adequate approach to Evaluation.

Thirdly, although the LOMLOE poses a lower overall D&O ratio, it should be noted that the Context category appears to increase its difficulty compared to the LOMCE. This conclusion may be because the guidelines for program development in Educational Administration do not emphasize this element, which would lead to considering it in possible teaching-learning actions from the initial training.

Lastly, we would like to highlight the subcategory with the highest D&O ratio: Evaluation. This should encourage the trainers in the area to give more consideration to this aspect. However, it is once again pointed out that the LOMLOE presents a better resolution when it comes to mobilizing and operationalizing Evaluation, which, as the literature reveals (Más-Torello, 2012), is usually one of the most challenging comprehensive elements.

Regarding the second specific objective, the behavior of the student's previous education variable yields the following conclusions.

Firstly, the analysis reveals that disciplinary areas with prior pedagogical training exhibit a lower incidence of D&O, with an error ratio that is less than half that of the other areas. There is no doubt that previous knowledge related to the DOU genre facilitates the learning of this and its design (Sánchez & Pericacho, 2022; Monroy, 2013). Secondly, it is noteworthy that the highest incidence ratios in each category of analysis are in the discipline of Psychology. This may be

because students' previous training in aspects related to pedagogy and didactics is nonexistent or scarce (García, 2009). Similarly, Humanities and Sciences, Mathematics, and Statistics also present similar (although lower) rates of D&O. Thus, there is a need for greater intervention in these areas and their students in terms of training and learning support. Thirdly, Physical Education and Languages are the areas in which a lower incidence of D&O is observed. In the curricula of these disciplines, areas, subjects, and practices related to education and teaching are deployed. This means that students begin with prior knowledge that enables them to approach the development of the DU with greater confidence in their success.

In conclusion, this study highlights the importance of considering these two variables, legislation and previous training, as key elements that have implications and influence on the training process of future teachers, as they are related to the D&O presented by the students in the elaboration of the UD. Educational legislation establishes guidelines for the curriculum regarding the meaning and treatment of curricular elements and, therefore, in the development and production of the DU. This aspect is especially significant given the limited progress made in recent years in the Spanish Educational System regarding educational laws. This leads to constant changes in the guidelines for the elaboration of curricular designs and programs, which can increase D&O in teachers in training. The results of this study are aligned with international studies conducted, for example, in Ecuador (Villagómez, 2012), Chile (Castro, 2017; Camus-Camus & Vergara-Núñez, 2023) or Mexico (Cuevas-Cajiga & Moreno-Olivos, 2022), which point out that the implementation of curricular reforms brings challenges for teacher training, which reinforces the relevance of considering this phenomenon from a comparative and global perspective. These results are relevant for educational policies in that they underscore the need to review them to emphasize specific training in the development of didactic units. Since the results of this study indicate that students' difficulties are related to the relationship between curricular elements (competencies, criteria, and basic knowledge), it

would be necessary to place special emphasis on the explicit teaching of this aspect.

Regarding previous training, it is evident that a lack of knowledge related to Pedagogy and Didactics increases the incidence of D&O. Students who have worked on these topics in their disciplines perform better and with greater confidence in the elaboration of DUs. Thus, the results obtained in this study align with the international evidence that highlights the impact of prior training on the quality of curriculum design in initial teacher training. International studies (Nilsson, 2008; Friedrichsen et al., 2011; Gess-Newsome et al., 2019) have shown that deficiencies in prior pedagogical and didactic knowledge limit the ability of prospective teachers to integrate competencies, pose inquiry approaches, and design quality curricular proposals. These results are significant in highlighting that it could be interesting for secondary education teacher training to offer specific support for students with less previous pedagogical training. This leads to the conclusion that, in general, there is a significant challenge in developing programs for students in training, which necessitates specific approaches to alleviate this difficulty.

As proposals for the future, we suggest examining how the various regional curricula impact the deployment and development of the DU. Thus, as a limitation of this study, the need is stated to extend the sample to, for example, all state communities in order to establish more concrete elements of where the difficulties in student training are located. This would mean adding the curricular variable to the study of the D&O of production and occupying a completely unexplored territory in both agent training and novice agents. Complementarily, and broadening the quantitative approach of this study, it would be pertinent to incorporate qualitative methods, such as interviews or focus groups with students, which would allow us to delve deeper into their perceptions and experiences of the difficulties they face when designing didactic units. This would allow for a better understanding of the underlying factors—cognitive, attitudinal, or contextual—that contribute to the difficulties detected. Finally, it is suggested that longitudinal studies following prospective teachers during

their professional insertion are advisable, which would enable the observation of the evolution of competencies for designing didactic units in authentic teaching contexts and how initial difficulties are transformed or overcome with

experience. These approaches would not only deepen the understanding of the identified difficulties but also guide the improvement of teacher training programs to strengthen didactic planning skills.

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