Artículo original / Original Article

COMBAT SPORTS IN HIGHER EDUCATION: AN ANALYSIS OF SPANISH PHYSICAL ACTIVITY AND SPORT SCIENCES CURRICULA

Deportes de combate en la educación superior: Un análisis de los planes de estudio de Ciencias de la Actividad Física y del Deporte en España

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DOI: 10.17398/1885-7019.21.665

Recibido: 18/07/2024; Aceptado: 22/04/2025; Publicado: 30/12/2025

OPEN ACCESS

Sección / Section:
Social Science Applied to Sport

Editor de Sección / Edited by:
Sebastián Feu
Universidad de Extremadura

Citación / Citation:

Rodríguez-Sánchez, A. R., Mauricio Serrano-Brazo, M., Salado-Tarodo, J. (2025). Combat Sports in Higher Education: An Analysis of Spanish Physical Activity and Sport Sciences Curricula. *E-balonmano Com, 21*(4), 665-680.

Fuentes de Financiación / Funding:
No funding reported by autor

Conflicto de intereses / Conflicts of Interest:
All authors declare no conflict of interest

Abstract

The design of university programmes is fundamental for the professional training of higher education graduates. In the context of the Bachelor's Degree in Physical Activity and Sport Sciences in Spain, combat sports are an essential part of the sports education of future graduates. This research aimed to analyse courses that cover combat sports content during the 2021-2022 academic year, evaluating their methodology, contents, and objectives in the teaching guides. Using a documentary review design, the teaching guides of all offered courses were accessed, applying an exploratory analysis with the software Orange (v.3.32.0) and Jamovi (v.2.2.5). The results showed a predominantly practical, participative, and group-orientated methodology, with judo being the most prominent content (56.58%). The objectives ranged from the acquisition of specific technical skills to the development of transversal competencies such as discipline and teamwork. A lack of homogeneity was found in combat sports teaching in Spanish universities, with significant disparities in credits (Min = 3, Max = 12), contents, and pedagogical approaches. This notable bias towards judo and the variability in the curricular offer represent an opportunity to expand and improve the comprehensive training of future professionals in physical activity and sport sciences, promoting a broader and more enriching education in relation to combat sports.

Keywords: combat sports; initial training; physical activity and sports sciences; university studies.

Resumen

El diseño de los programas universitarios es fundamental para la formación profesional de los egresados en educación superior. En el contexto del Grado en Ciencias de la Actividad Física y del Deporte en España, los deportes de combate componen una parte esencial de la formación deportiva de los futuros titulados. Esta investigación tuvo como objetivo analizar las asignaturas que abordan los contenidos de combate durante el curso académico 2021-2022, evaluando su metodología, contenidos y objetivos en las guías docentes. Utilizando un diseño de revisión documental, se accedió a las guías docentes de todas las asignaturas ofertadas, aplicando un análisis exploratorio con los programas Orange (v.3.32.0) y Jamovi (v.2.2.5). Los resultados mostraron una metodología predominantemente práctica, participativa y grupal, con el judo como contenido más prominente (56.58%). Los objetivos variaron desde la adquisición de habilidades técnicas específicas hasta el desarrollo de competencias transversales como la disciplina y el trabajo en equipo. Se constató una falta de homogeneidad en la enseñanza de los deportes de combate en las universidades españolas, con disparidades significativas en créditos (Mín = 3, Máx = 12), contenidos y enfoques pedagógicos. Este sesgo notable hacia el judo y la variabilidad en la oferta curricular representan una oportunidad para ampliar y mejorar la formación integral de los futuros profesionales en Ciencias de la Actividad Física y del Deporte, promoviendo una formación en relación con los deportes de combate más amplia y enriquecedora.

Palabras clave: ciencias de la actividad física y del deporte; deportes de combate; estudios universitarios; formación inicial.

Introduction

Education in the sciences of physical activity and sport plays an important social role, as it prepares future graduates to promote health, well-being, and personal development, using physical activity and sport as a means of intervention. During their university education, students of the Degree in Physical Activity and Sport Sciences (DPASS) in Spain receive a broad and versatile education, allowing them to face the challenges of sports practice in today's society. Within this diverse education, a part is dedicated to combat sports, which are not only popular in society, but also used in educational and training contexts through individual opposition games.

In this context, it is important to note that the configuration and orientation of this university degree have undergone significant changes in recent decades. The European Higher Education Area (European Commission, 2024), which emerged from the Bologna Declaration in 1999, was established in Spain through Organic Law 6/2001 on Universities (Spanish Goverment, 2001). This law not only granted greater autonomy to academic institutions, but also increased their capacity to respond to the demands and needs of society (Capano & Piattoni, 2011). Parallelly, these measures have been reinforced by quality assurance systems (European Education and Culture Executive Agency, Eurydice, 2015). The Tuning Educational Structures in Europe project (2000) also became a pillar of coordination and consensus among institutions to achieve common educational goals (González & Wagenaar, 2003).

In particular, the Spanish educational model for DPASS was modified to configure a study plan of 240 ECTS credits distributed over four academic years (Silva et al., 2014), generating controversy by reducing the number of credits compared to the previous model, especially affecting the offer of electives and causing the disappearance of some courses from the old degree (López Fernández & Almendral Lara, 2001). In this context, Royal Decree 861/2010 (Ministry of Education, 2010) established guidelines for the design of university degrees, specifying the need to define objectives, competencies, and evaluation criteria, as well as to determine the number of credits for the courses that make up the study plan. Specifically, in the DPASS, the Resolution of 18 September 2018 (Ministry of Science, Innovation and Universities, 2018) proposed specific recommendations for its development in universities, establishing as mandatory training the technical-tactical fundamentals of combat sports and adversarial sports. The DPASS White Paper also highlights combat sports as fundamental content (National Agency for Quality Assessment and Accreditation of Spain, 2005). This perspective is reflected in school curricula, where fighting and combat disciplines are considered essential for motor learning in opposition contexts (Gomes & Avelar-Rosa, 2012), both in compulsory secondary education, through Royal Decree 217/2022 (Ministry of Education, 2022) and in primary education, by Royal Decree 157/2022 (Ministry of Education, 2022).

Scholarly research has examined the teaching of combat sports, including martial arts, within school settings. Avelar & Figuereido (2009) advocate for a pedagogical approach centered on developing fundamental fighting knowledge and generic skills suitable for later specialization, thereby moving away from early sport-specific training. In contrast, other studies have focused on the educational application of specific martial arts, utilizing disciplines such as kickboxing (Menéndez Santurio & Fernández-Río, 2014, 2016) or karate (Pinto-Escalona et al., 2022) as pedagogical content.

Beyond the school setting, interest and participation in combat sports are also reflected in the sports habits of the population. According to the Survey of Sports Habits in Spain 2022 (Ministry of Culture and Sport, 2022), combat sports are divided into three main categories: boxing, wrestling or self-defence, and martial arts. In terms of participation, 3.3% of the respondents practised boxing, 3.1% martial arts, and 1.1% wrestling or self-defence. These figures show a notable inclination toward these disciplines, highlighting their relevance in the Spanish sports context. However, despite formal recognition of the importance of combat sports in education, a discrepancy has been observed in educational practice (Molins-Nimo et al., 2019), as teaching these sports in physical education classes is infrequent (Menéndez Santurio, 2017; Robles, 2008; Ruiz-Sanchis, 2019; Torres, 1991), especially by teachers who lack specific training in these disciplines. This gap is even more evident considering that, despite the presence of combat sports in the DPASS, Gutiérrez-García et al. (2003) noted that 63.6% of the students enrolled in the course "judo and its fundamentals" had no

previous experience in combat sports and 93.9% stated that they had no such experience during their physical education classes at school. This underscores the need to include courses in DPASS that deal with combat sports in depth and to innovate teaching methodology and assessment, such as the use of technology in the teaching process to enhance learning (Fan, 2021; Liu Xian, 2010; Yuanchao, 2013; Zhu, 2013).

Teaching these disciplines at the university level presents specific challenges. The specificity of the training required for professionals responsible for teaching combat sports is crucial and can generate divergences in terms of organisation and content of the courses. Universities must recognise and address these specificities to ensure an education that reflects the demands and realities of the professional field. In Spain, the regulation of combat sports, managed by the Higher Sports Council, shows notable fragmentation due to the unequal recognition of the different sports modalities. Currently, only fencing, included in Royal Decree 912/2012 (Ministry of Education, 2012), and judo, contained in Royal Decree 705/2011 (Ministry of Education, 2011), have official recognition and the category of special regime teachings. However, other modalities, such as boxing, karate, kickboxing, Olympic wrestling, and taekwondo, are still in the transition state.

For all these reasons, training in combat sports for future professionals in physical activity and sport is a significant milestone within the complex framework of the DPASS. Integration of these sports into the curriculum requires a multifaceted approach. This implies adopting effective teaching strategies (how) that allow future professionals to convey complex techniques and concepts in an accessible manner, enabling them not only to acquire the physical skills associated with these sports but also to understand how to instruct others. Additionally, these courses must provide comprehensive and detailed content (what) that addresses the unique demands of combat sports. Establishing clear educational goals (what for) for training in these sports is essential, as it provides a structured framework that guides both teaching and learning processes, ensuring that the desired results are achieved effectively.

Therefore, the main objective of this article is to describe and analyse the characteristics of combat sports courses offered by Spanish universities, paying special attention to three fundamental aspects that govern their delivery: the methodologies used, the contents taught, and the educational objectives established by these programmes. In this way, the aim is to map the situation of combat sports courses in Spanish higher education, providing a comprehensive understanding of how these sports are taught and what they are intended for future professionals in physical activity and sport in Spain.

Materials and method

Research design and instruments

To answer the research question, a documentary research design was chosen, following Bowen's (2009) approach to document analysis. This method facilitates the systematic evaluation of the documents under study and provides information on the content and context of the course under investigation. Specifically, this study analysed the teaching guides of all Spanish universities where the DPASS degree was offered, to explore the structure and content of combat sports courses.

This documentary analysis approach is particularly appropriate for the design of this research, since teaching guides, which are public documents on official university platforms, provide detailed descriptions of course objectives, contents, teaching methodologies, and assessment strategies, allowing a comprehensive understanding of how combat sports are taught at the university level.

Sample and Data Collection

Data collection was carried out by three lecturers from the Physical Activity and Sport Sciences degree. It started in April 2022 and ended in June 2022, with a further review in November 2022. The reason for the review was to access some teaching guides for the 21-22 academic year that were not available at the time of data collection. For this purpose, the platform of the Registry of Universities, Centres, and Degrees (hereinafter referred to as RUCD; RUCT in Spanish)

was used. All the information was collected as part of the recording process in the sections corresponding to the objectives, methodology and content specified for the courses in the teaching guides.

Of the 58 Spanish university centres that offer DPASS in the 2021-22 academic year, 36 were selected (seven affiliated centres and 29 university-owned centres), both public (61.11%) and private (38.89%), where a course related to combat sports and/or martial arts was taught and whose teaching guide was available on the course's official website at the time of data collection (N = 55).

It should be noted that in the case of centres that did not include combat contents in the title of their courses (e.g., "Fundamentals of Sports and Their Didactics"), a manual search was conducted in their annual project to determine whether there was a block of content related to combat sports and/or martial arts that implied its inclusion in this study.

Affiliated centres were also included in this sample, assuming that these centres had the same curriculum as their university-owned centres (official centres) to which they belonged. In those centres where DPASS and another double degree were offered, only the original degree was considered, as it is common for students of this double degree to co-exist in the groups of the original (stand-alone) degree. Only in those centres where the double degree was the only one offered was it considered for inclusion in the sample.

In centres where the same degree was taught on different campuses, each campus was considered an individual and separate centre, as there are sometimes differences in course contents despite sharing the same curriculum.

Regarding the sample and the geographical distribution of courses by autonomous community, 10 were taught in centres in Andalusia, two in Aragon, one in the Canary Islands, two in Castilla-La Mancha, three in Castilla y León, seven in Catalonia, three in the Valencian Community, one in Extremadura, one in Galicia, one in the Balearic Islands, 17 in Madrid, one in Melilla, four in Murcia and two in the Basque Country.

Regarding the curricula of the centres teaching these courses, four of them (8%) were at that time in the process of being published in the Official State Gazette (https://www.boe.es), while 45 (90%) of these centres were in the process of renewing their degrees; one (2%) of the centres had a degree that was no longer in force.

Data analysis

Two analyses were carried out on the teaching guides that made up the sample: a descriptive quantitative analysis of the general data that comprise the sample, conducted using the open source statistical software Jamovi, version 2.2.5 (https://www.jamovi.org), and a lexicometric content analysis (Krippendorff, 2004) of sections corresponding to the objectives, methodology, and contents specified for the courses. Content analysis is based on the assumption that the quantitative description of the content of communication is meaningful. This assumption implies that the frequency of occurrence of various content features is an important factor in the communication process (Berelson, 1952), which may be because language is not a random affair. Words tend to appear in relation to other words with a remarkable degree of predictability (Baker, 2023). This makes lexicometrics provide statistical indicators and a corpus-based visual representation of the data. These indicators effectively summarise information from large texts based on frequency and offer an interpretation in perspective (Baber et al., 2024). To support this second analysis, Orange open-source data mining software (https://orangedatamining.com), version 3.32.0 (Demšar et al., 2013), was used. It should be noted that for courses that did not present objectives in their teaching guide, this section was replaced by the section on learning outcomes (if this section was included).

The procedure followed with the Orange software consisted of applying the topic modelling modules (generation of text topics using the Latent Semantic Indexing algorithm; Deerwester et al., 1990; Sebastiani, 2002), word cloud (word cloud based on frequency of occurrence), and corpus to the network and network explorer as a whole. The Fruchterman-Reingold algorithm (Fruchterman & Reingold, 1991) was used to generate the network of convergent terms in the different guides.

Using these modules, three analyses were carried out, one for each dimension of content analysed in the projects (learning objectives/outcomes; methodology; contents), following the protocol below:

1. Filtering of the dimension to be analysed and elimination of all terms of three or fewer characters.
2. Generation of the main theme of the sample in this dimension (selection of the 10 most important terms according to the Latent Semantic Indexing algorithm).
3. Comparison of the 10 main theme terms with the frequency of the word cloud module. In this case, the last term of the theme would be the last term entered in the next step of the analysis protocol.
4. In the Corpus-to-Network module, the frequency of occurrence of the last term to appear in the analysis is specified before the network is generated in the Network Analysis module. In this case, these data correspond to those marked in the previous step (frequency of occurrence of the last term that constitutes the main topic).

Results

The data obtained from the descriptive and lexicometric analysis of the sample are presented below.

Descriptive statistics

From a structural perspective, when examining the typology of the teaching guides for the courses analysed according to the curriculum, six centres offered core courses (n = 6) and elective courses (n = 13). Another 25 centres had only core courses (n = 28). The remaining six centres offered only elective courses (n = 9).

Regarding the assignment of credit to guides in the courses analysed, the mode was 6 ECTS credits (SD = 2.01, Min = 3, Max = 12), with 33 of the 54 courses (61.1%) being the core type (taught in 30 centres) and 21 (38.9%) elective type. The median year in which they were taken was the second year of study. 41 of these courses (75.9%) did not share combat sports with other sports, while 13 of them (24.1%) did. In terms of the number of combat sports (or martial arts) taught per course, 46 courses (85.2%) taught only one, four (7.4%) taught two combat sports simultaneously in the same course, and three courses (5.6%) offered three or more combat sports together. In the latter case, there is only one course that covered eight combat sports simultaneously.

The distribution of this content is shown in Table 1:

Table 1. Combat and/or martial arts content in the subjects analysed.

	Typology					
Combat Sports	Core	%	Elective	%	Total	% of the total
Aikido	0	0.00%	1	100.00%	1	1.32%
Body Combat	1	100.00%	0	0.00%	1	1.32%
Boxing	0	0.00%	1	100.00%	1	1.32%
Canarian wrestling	1	50.00%	1	50.00%	2	2.63%
Combat sports with weapons	0	0.00%	1	100.00%	1	1.32%
Fencing	5	62.50%	3	37.50%	8	10.53%
Generic fighting skills	4	66.67%	2	33.33%	6	7.89%
Jiu Jitsu	2	100.00%	0	0.00%	2	2.63%
Judo	28	65.12%	15	34.88%	43	56.58%
Karate	1	100.00%	0	0.00%	1	1.32%
Leonese wrestling	0	0.00%	1	100.00%	1	1.32%
Olympic wrestling	3	75.00%	1	25.00%	4	5.26%
Sambo	0	0.00%	1	100.00%	1	1.32%
Self-defence	0	0.00%	1	100.00%	1	1.32%
Sumo	0	0.00%	1	100.00%	1	1.32%
Taekwondo	2	100.00%	0	0.00%	2	2.63%
Total	47	61.84%	29	38.16%	76	100%

The number of combat sports courses offered was uneven between centres. Although the total number of centres teaching the courses analysed in the 2021-22 academic year was 36, the number of courses analysed was 55. Specifically, the origin of the data lies in universities that offer two or more courses within the degree, so 50.91% of the total number of courses offered are represented by nine universities, as shown in Table 2.

Table 2. University centres analysed with more than one combat sport or martial arts course offered in the academic year 2021-22.

	Tipology			
Centre	Core	Elective	Total	% of the total
European University of Madrid	0	3	3	5.45%
National Institute of Physical Education of Catalonia (Barcelona Campus)	4	0	4	7.27%
Pablo de Olavide University	1	1	2	3.64%
Polytechnic University of Madrid	1	7	8	14.55%
University of Castilla-La Mancha	0	2	2	3.64%
University of Granada	1	2	3	5.45%
Universidad of León	1	1	2	3.64%
University of Murcia	1	1	2	3.64%
University of Valencia (Estudi General)	1	1	2	3.64%
Total	10	18	28	50.91%

Additionally, universities offer several courses in which content related to combat sports has been diversified, forming a conglomerate that combines other physical or sporting activities. Fifteen courses were identified as having this characteristic, with an average credit allocation of 7.4 ECTS (SD = 2.50). The disciplines and sports that are most frequently included in courses that converge with combat sports are gymnastics, football, and handball. To illustrate this, a detailed breakdown of this issue is provided in Table 3 below:

Table 3. Combat subjects analysed that share content with other sports in the 2021-22 Academic Year.

Type of centre	Centre	If sharing, which sports?	Combat sports	ECTS	Tipology
Affiliated centre	Alberta Giménez Higher Education Centre	Racket	Judo	6	Core
Affiliated centre	San Isidoro Study Centre	Rugby and racket	Taekwondo	12	Core
Affiliated centre	National Institute of Physical Education of Catalonia (Barcelona Campus)	Rhythmic gymnastics and artistic gymnastics	Fencing	6	Core
Affiliated centre	National Institute of Physical Education of Catalonia (Barcelona Campus)	Handball and rugby	Judo	6	Core
Affiliated centre	National Institute of Physical Education of Catalonia (Lleida Campus)	Rhythmic gymnastics and artistic gymnastics	Judo	6	Core
Affiliated centre	Terres de l'Ebre University School of Health and Sport (Salt Campus)	Tennis	Judo	12	Core
University-owned centre	Camilo José Cela University	Gymnastics	Generic wrestling, judo, and Olympic wrestling skills	6	Core
University-owned centre	Comillas Pontifical University	Racket	Karate and judo	6	Core
University-owned centre	Pablo de Olavide University	Rugby and racket	Judo	12	Core
University-owned centre	University of A Coruña	Football	Judo	6	Elective
University-owned centre	University of Almeria	Gymnastics	Taekwondo, judo, body combat	6	Core
University-owned centre	University of Extremadura	Cycling and Racquet Sports	Generic fighting skills	6	Elective
University-owned centre	University of Murcia	Basketball and football	Olympic wrestling	6	Elective
University-owned centre	University of the Basque Country/Euskal Herriko Unibertsitatea	Gymnastics	Judo	9	Core
University-owned centre	University of Zaragoza	Badminton	Judo	6	Core

Lexicometric analysis

Of the 55 teaching guides in the sample, not all contain complete information on each of the three dimensions proposed for analysis. Regarding the generation of themes (the 10 most relevant for each dimension of analysis) using the Latent Semantic Indexing algorithm, Table 4 shows the results obtained:

Table 4. Topics for each dimension were analysed using the Latent Semantic Indexing algorithm.

Learning objetives/outcomes	Methodology	Contents
activities	activities	force
activity	contents	group
combat	group	introduction
different	learning	judo
judo	practises	judokas
know	practise	practise
learning	professor	resistance
physics	sessions	techniques
sport	student body	training
sports	work	waza

For each of these dimensions, after counting the frequency of words in each, the terms of the topics with these frequencies were cross-referenced, obtaining the results shown in Table 5. The term with the lowest frequency in each theme represents the cutoff point for the generation of the terminological networks for each dimension.

Table 5. Lexicometries of each dimension and matching with topics of interest.

Lexicometrics 'learning objectives / outcomes'		**Lexicometrics 'methodology'**		**Lexicometrics 'content'**	
Frequency	**Words**	**Frequency**	**Words**	**Frequency**	**Words**
82	sports*	54	learning*	328	judo*
78	judo*	52	classes*	258	theme*
74	know*	52	practises*	147	techniques*
55	fight	50	activities*	132	waza*
54	different*	44	work*	125	sports
52	learning*	38	practise*	125	fight
48	techniques	34	subject	100	training*
47	physics*	33	problems	57	combat
47	activities*	32	teacher*	50	basics
46	practice	31	students*	47	teaching
44	apply	28	group*	46	learning
42	sport*	25	student	43	block
42	teaching	25	resolution	42	technique
41	combat*	25	content	41	initiation
35	skills	24	works	39	development
34	sporty	24	sessions	36	competition
33	activity*	23	classroom	36	practise*
		23	each	35	regulation
		22	study	35	ground
		22	part	35	group*
		22	form*	35	fencing
				33	physics
				31	aspects
				31	gatame
				30	introduction
				30	history
				30	technician
				30	strenght*
				28	judokas*

Note. The words appearing in the topic of each dimension have been marked with * for better identification. In the lexicometric column 'content', all terms between 'judokas' and 'resistance' (CF = 14) have been excluded for the operability of data visualisation.

The terminological networks for each dimension are presented below, generated under the words that have a frequency equal to or greater than the last term of each dimensional topic, marking the terms of the topic, and observing their connections. In the same way, terms from topic modelling have been left surrounded by a yellow circle to differentiate them from those that are the exclusive product of lexicometry.

In Figure 1, strong relationships are evident between the terms that form the main theme of 'learning objectives/outcomes' dimension. The weight of the edge varies from the strongest connections, such as 'judo', 'sports' ('deportes') and 'to know' ('conocer'), to less intense ones, such as 'activities' ('actividades'), 'different' ('diferentes') and 'learning' ('aprendizaje'). In particular, the graph also shows relationships for terms not central to the theme, with 'fight' ('lucha') being the most prominent example.

This figure highlights several important clusters. The terms 'physics' ('física'), 'sport' ('deporte'), and 'activity' ('actividad') form a closely connected group, indicating their significant relationship with learning objectives. Similarly, the strong connection between 'learning' ('aprendizaje'), 'teaching' ('enseñanza') and 'activities' ('actividades') underscores the importance of practical activities in educational goals. Furthermore, terms such as 'judo', 'sports' ('deportes'), and 'combat' ('combate') create another significant group, highlighting the importance of combat sports in the curriculum. The peripheral placement of terms such as 'skills' ('habilidades') and 'practise' ('práctica') suggests that, although relevant, these terms are not as central as others in the network.

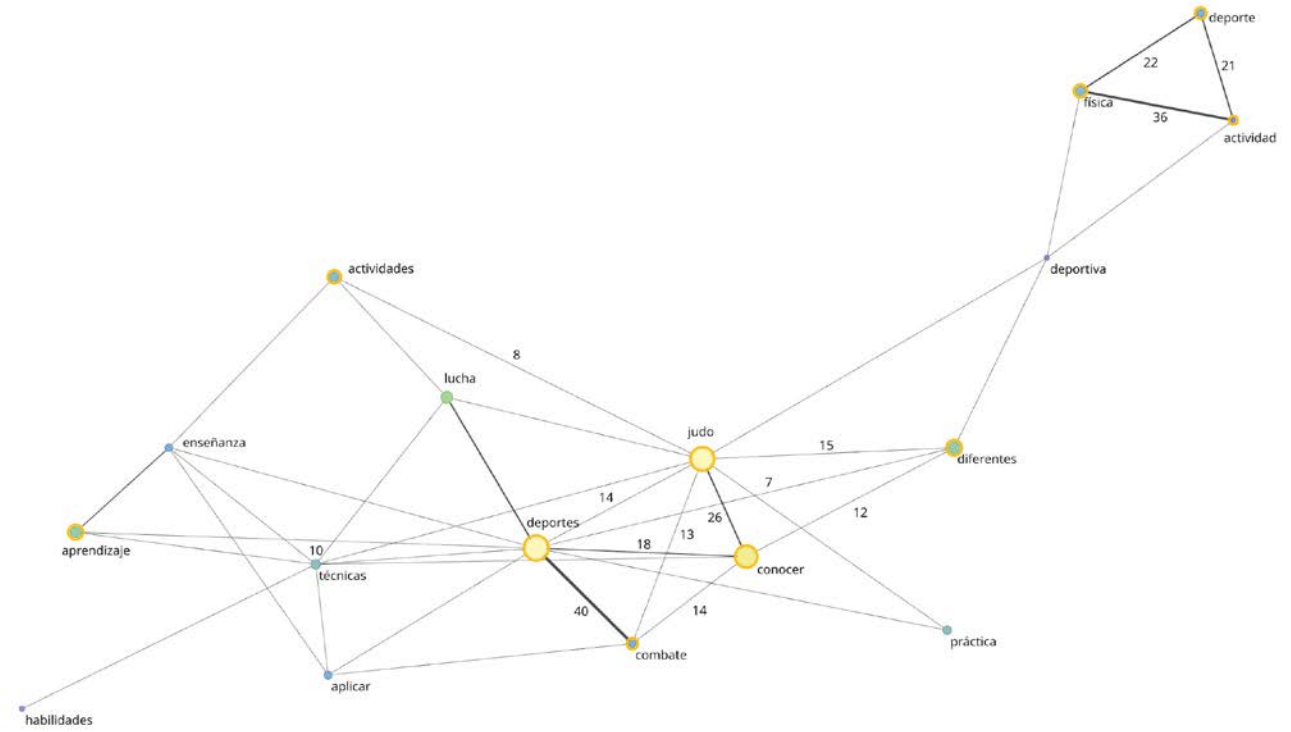

Figure 1. Terminology network of dimension 'learning objectives/outcomes'.

The terminological network established for the 'methodology' dimension (Figure 2) shows that the most intense relationships between the terms in the theme are those observed between 'activities' ('actividades') and 'practices' ('prácticas'), indicating that these terms define the pedagogical dynamics of the content and the focus on practical activities within teaching methodologies. The strong connection between 'problems' ('problemas') and 'resolution' ('resolución') also indicates that problem-solving is a key component of the methodologies used.

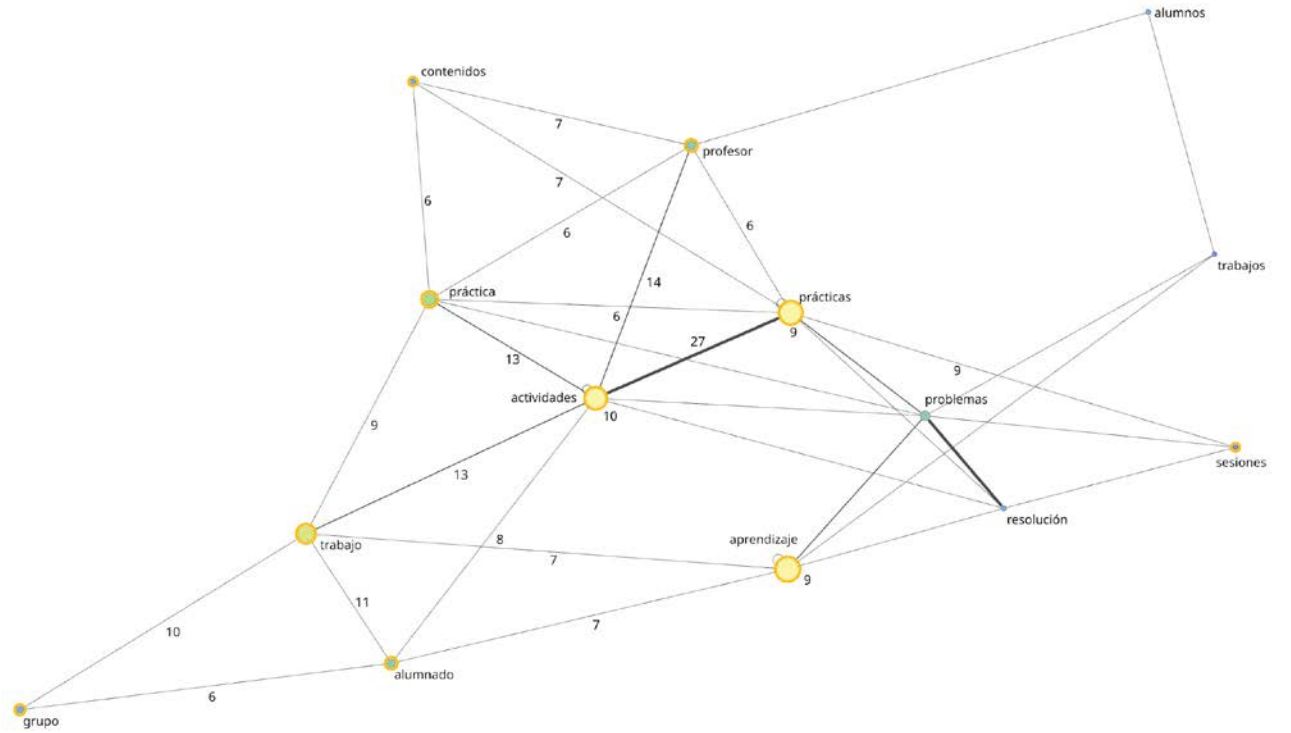

Figure 2. Terminology network of the 'methodology' dimension.

Furthermore, terms such as ‘work’ (‘trabajo’), ‘practice’ (‘práctica’), and ‘teacher’ (‘profesor’) form another significant cluster, underscoring the importance of practical work and teacher participation in methodologies. The peripheral placement of terms such as ‘students’ (‘alumnado’), ‘sessions’ (‘sesiones’) or ‘group’ (‘grupo’) suggests that while these are relevant, they are not as central as other terms in the network.

The terminological network for the ‘content’ dimension 'content' (Figure 3) shows that the strongest relationships are between terms such as ‘judo’, ‘techniques’ (‘técnicas’), and ‘waza’, suggesting that these are central to the course content. Thick lines indicate strong relationships, while thin lines represent weaker connections. This figure highlights several important clusters. The terms ‘judo’, ‘techniques’ (‘técnicas’), ‘waza’ and ‘training’ (‘entrenamiento’) form a closely connected group, indicating a focus on judo techniques and training. Strong connections between ‘training’ (‘entrenamiento’), ‘strenght’ (‘fuerza’), and ‘endurance’ (‘resistencia’) emphasise the importance of physical preparation and endurance in judo training.

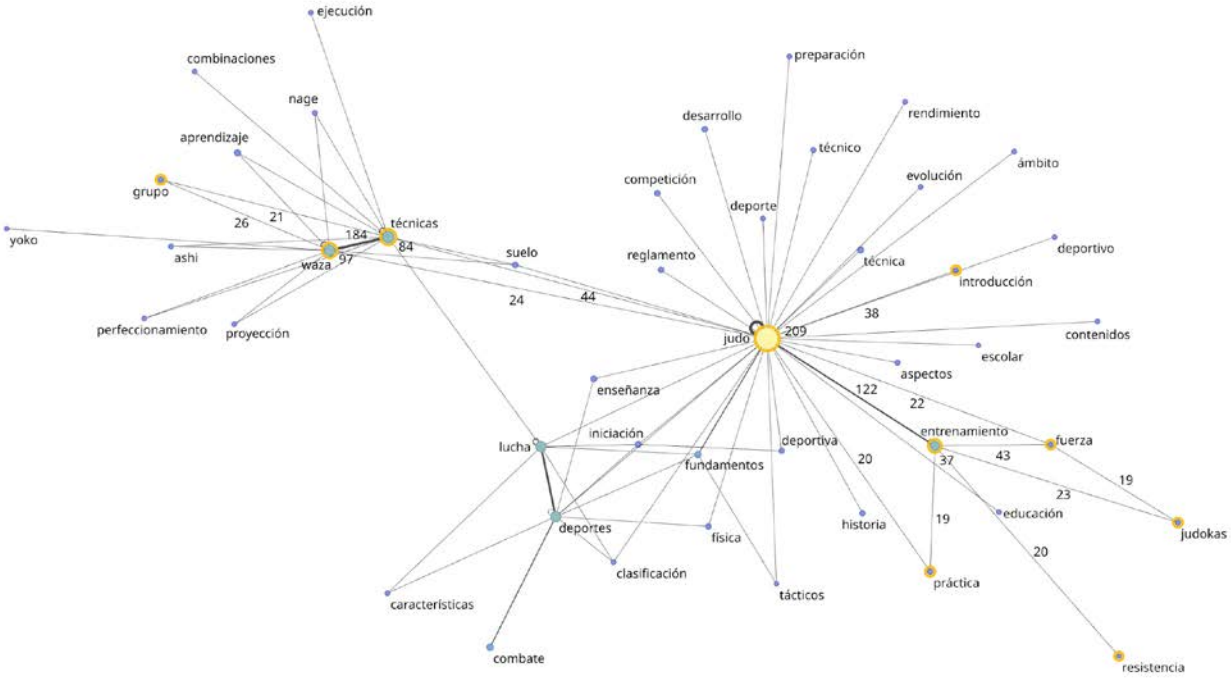

Figure 3. Terminology network of the ‘content’ dimension.

Furthermore, terms such as ‘fight’ (‘lucha’), ‘sports’ (‘deportes’) and ‘introduction’ (‘iniciación’) form another significant cluster, suggesting a structured presentation of course content. The peripheral placement of terms such as ‘combinations’ (‘combinaciones’) and ‘execution’ (‘ejecución’), for example, indicates that although important, they do not appear uniformly in most of the teaching guides and are therefore less related to the central terms that form a common basis.

Discussion

The analysis of study plans and curricula of subjects has been a recurrent aspect in the scientific literature (Gallardo-Guerrero et al., 2021; Gómez-López et al., 2016; Moreno et al., 2006) providing an overview of the state of the subjects of certain subjects like contents, methodology, or evaluation.

In the case of combat sports, generally considered disciplines that go beyond mere physical confrontation, integrating values, techniques, and tactics that can enrich the integral formation of students (Avelar-Rosa et al., 2015), even though the implementation and focus of these contents in the DPASS curriculum varies considerably.

Beginning with the terminological network in the 'learning objectives' dimension, the key relationships between terms such as 'judo', 'sport' and 'to know' suggest that the primary goal in teaching combat sports, and specifically judo, is not only to develop physical skills but also to foster a deep and applicable understanding of these sports. This implies an educational intention that values both the acquisition of technical skills and the theoretical understanding of the combat modalities presented. The presence of terms such as 'activities', 'different' and 'learning' highlights the importance of diverse and practical learning experiences, suggesting that these courses are designed to provide students with a holistic education. However, the peripheral placement of terms such as 'skills' and 'practice' could indicate that, although relevant, these competencies are not as integrated into the combat curriculum as they should be, suggesting the need to strengthen the incorporation of practical skills into learning objectives. Furthermore, the term 'wrestling' appears as a prominent example of terms that, while not central, are significantly related to the topic, indicating that despite the dispersion of disciplines, all are orientated toward individual opposition.

In the terminological network of the 'methodology' dimension, there is a strong association between 'activities' and 'practices', highlighting a pedagogical approach focused on motor practice above other approaches. This relationship suggests that combat sports teaching methodologies are designed to be highly interactive and practice-based. The significant connection between 'problems' and 'resolution' highlights the prominent use of problem-solving, indicating that these courses not only teach physical techniques, but also develop critical skills to face and solve challenges. The centrality of terms such as 'work', 'practice', and 'teacher' indicates a collaborative and practical approach, where active student participation is crucial.

Regarding the terminological network of the 'content' dimension, the centrality of terms such as 'judo', 'techniques', and 'waza' indicates a strong emphasis on technical skills and specific knowledge of this Japanese discipline. The robust connections between 'training', 'strength' and 'endurance' underscore the importance of physical preparation in the curriculum, demonstrating a commitment to developing the athletic performance of students enrolled in these courses. The structured approach to the content of these combat disciplines, as suggested by terms such as 'introduction' and 'content', assumes that this training will support students even those who have never had contact with combat sports.

The comparison of these dimensions' points to a coherent curriculum design adjusted to the needs posed by the various guidelines shaping higher education today, assuming a prominent centrality of judo in combat sports training. The alignment between the practical focus of the methodology and the emphasis on activities in the learning objectives indicates the coherence between what students are expected to learn and how they are taught. Furthermore, the emphasis of the content dimension on judo techniques and physical training is consistent with the practical approach to problem-solving highlighted in the methodology, always with a bias toward the Japanese discipline. However, the identification of peripheral terms in each dimension indicates potential areas for improvement to achieve a more complete and balanced integration of all relevant aspects in combat sports teaching: Training in combat sports should not be merely anecdotal or secondary, but should be an integral part of the DPASS curriculum (Vertonghen et al., 2012; Winkle & Ozmun, 2003). The choice of content, teaching methodology, and the relationship between theory and practice are fundamental aspects that need continuous review and adaptation (Panasiuk et al., 2022; Pedraz & Brozas, 2014), ensuring that combat sports training is adapted to current and future needs of the professional field (Avelar-Rosa & Figueiredo, 2012; Yunfeng, 2023). In this sense, it seems of interest to assume the integration and feasibility of using current technological innovations and the benefits of integrating information technology into combat sports education (Fan, 2021; Yuanchao, 2013; Zhu, 2013), including the incorporation of large language models and their implementation in the teaching-learning processes carried out at the university, specifically in combat sports courses (Yunfeng, 2023). These innovations could transform the way combat sports are taught and learnt, providing new opportunities to improve training, make it more accessible, and adapt to the individual needs of students.

A review of the current situation reveals several challenges that must be addressed to improve the quality and relevance of combat sports education in Spanish universities (Caravaca et al., 2018; Correia & Franchini, 2010). The heterogeneity in the teaching of these sports is reflected not only in the content and methodology, but also in the

structure and organisation of the courses. In some universities, the contents of combat sports are combined with other disciplines, which can dilute the depth and specificity of the approach. Furthermore, the credits assigned to these courses vary considerably, and many offer only 6 ECTS credits in their study plan; this coincides both in number of credits and variability with other sports subjects in the curricula (Gómez-López et al., 2016; Moreno et al., 2006). This variability can impact the preparation and competence of future graduates and raises questions about how these contents are prioritised and valued in the overall context of their DPASS education. Training combat sports teachers is crucial to addressing these challenges. The specificity and complexity of these sports require highly trained teachers with practical experience (Avelar-Rosa et al., 2015; Avelar-Rosa & Figueiredo, 2012). Without adequate training, it is difficult to communicate the essential nuances and details of these disciplines to students (Dong, 2011; Vertonghen et al., 2012). Judo, as mentioned above, is the predominant content in combat sports, which can be explained by being one of the main martial traditions in Spain (Caravaca et al., 2018). The specialisation of the teaching staff responsible for this instruction may polarise its exclusive delivery; although its importance and educational value are undeniable, combat sports training would benefit from a broader range of martial and combat disciplines taught in the course. In this sense, Vertonghen et al. (2012) highlight the need to identify and adapt different approaches to teaching combat sports, especially to young people, and the approach of combat sports to young people is sometimes affected by the cultural barriers to which some of these sports are subjected from the perspective of trainers (Ruiz-Sanchis, 2019).

To address these challenges, universities should adopt a holistic and reflective approach to sports education, specifically with respect to combat sports. This would involve constantly reviewing the curricular composition of this course (Pedraz & Brozas, 2014), adapting teaching methods to reflect the practical nature of these disciplines (Yuanchao, 2013; Zhu, 2013), and even increasing collaboration between institutions to share best practices and resources in other combat disciplines (Yunfeng, 2023). In any case, teachers responsible for combat sports courses must be attentive to social and educational trends to ensure that the training provided is relevant and appropriate for current and future needs (Dong, 2011).

Conclusions

Combat sports are evidently lacking a homogeneous framework in Spanish university education, leading to significant disparities in credits, contents, and pedagogical approaches between universities. In this sense, of the 58 centres, 34 (58.62%) did not offer any core course related to combat sports; and within this group, 32.76% did not offer any course related to combat sports, not even as an elective. Furthermore, there is a tendency to integrate combat sports contents with other disciplines, as evidenced by the fact that 15 courses share themes with other non-combat sports, often without increasing the number of credits, which dilutes the specific teaching load on these combat sports. These curricular choices, particularly the decision to offer these contents as electives, may indicate that combat sports do not have the relevance or consideration that the academic prescribers of the DPASS give them in Spain.

Analysis of teaching guides shows that learning objectives focus on developing both technical skills and a theoretical understanding of combat sports. Despite the variety of combat sports, judo remains the main focus in the configuration of these DPASS courses. Although combat sports training has the potential to equip students with essential skills and competencies for their professional development, the current focus on judo can limit students' exposure to the richness and diversity of other combat sports. With regard to teaching methods, guides tend to favour problem-solving and lectures. However, these are described in general terms without specific details on their application to combat sports contents, assuming that these details will be developed during the course delivery. This generality prevents the identification of possible methodological preferences related to the teaching of these disciplines.

Similarly, it is important to note a limitation in the findings related to the distinction between the initiation and specialisation stages. Considering that 11 of the 36 university centres offer more than one combat sport course, this could indicate the existence of specialisation levels. The absence of the term 'initiation' in lexicometric analysis suggests that training is not limited to an introduction to combat sports, but can also cover more advanced levels.

Another limitation is that the study analysed the curricular offer and structure based only on available data from teaching projects and the RUCD, without direct feedback from students and teachers. Their perceptions and experiences could provide a deeper understanding of the effectiveness and relevance of combat sports training.

The findings of this research highlight the existing disparities and potential areas for improvement, encouraging a more thorough and critical examination of how combat sports are currently taught and how the current approach can be improved. For those interested in addressing these issues, the data and ideas provided here can serve as a constructive foundation for advocating for a broader and more diverse education in combat sports.

Given the nature and limitations of this study, we propose three lines of future research:

Expanding the research to include universities from other countries could provide a broader understanding of how combat sports are addressed in higher education worldwide, helping to identify best practices. This international perspective could offer valuable information on effective teaching methodologies and curriculum designs that can be adapted to improve combat sports education in Spain.

In addition to this global comparison, conducting surveys and/or interviews with students and faculty would help to understand their experiences, perceptions, and needs about the teaching and learning of combat sports. These insights could guide the adaptation and improvement of curricula and teaching methods, ensuring that they meet the expectations and requirements of both students and educators.

Based on the potential specialisation levels identified in some institutions, it would be of interest to explore what is offered in these specialised courses, how they differ from introductory courses, and the impact this may have on the education of DPASS graduates. Understanding these distinctions can help refine the structure and contents of combat sports programmes, improving their effectiveness and relevance in preparing students for professional careers.

Regarding the practical applications of this work, they may offer reference information on the training graduates in physical activity and sport sciences are obtaining in combat sports and the competences associated with their teaching. On the other hand, this information is also provided so that it can be discussed and used to improve the training of future graduates in this subject, making it more complete and orientated to respond to the needs of students and society. Additionally, it offers information on the homogeneity of combat sports teaching, which allows more space to generate new proposals that more closely resemble the variety and breadth of combat sports.

Author Contributions: Conceptualization, A.R.R.-S., M.S.-B. and J.S.-T.; methodology, A.R.R.-S., M.S.-B. and J.S.-T. Software, A.R.R.-S.; statistical analysis, A.R.R.-S.; data preparation, A.R.R.-S., M.S.-B. and J.S.-T.; manuscript preparation, A.R.R.-S., M.S.-B. and J.S.-T.; redaction, revision y edition, A.R.R.-S., M.S.-B. and J.S.-T.; supervision, A.R.R.-S. and M.S.-B. All authors have read and accepted the published version of the manuscript.

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