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ORIGINAL

UNIVERSITY TRAINING IN PHYSICAL ACTIVITY: EXPLORING COMPETENCIES AND EVALUATION

FORMACIÓN UNIVERSITARIA EN ACTIVIDAD FÍSICA: EXPLORANDO COMPETENCIAS Y EVALUACIÓN DESDE LAS GUÍAS DOCENTES

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ABSTRACT

This study aims to analyse, explore and compare the teaching guides of two Spanish university degrees related to physical activity education using a competency-based model. A documentary analysis of the competencies and an analysis of the evaluation systems, from a formative point of view, were conducted for the teaching guides of 54 subjects from both degrees with similar typologies, and measurable variables were obtained. A MANOVA Biplot analysis was applied in order to represent the variables that characterised each subject profile. The results showed substantial differences between degrees and, also, among the three subject profiles from the Degree in Physical Activity and Sport Sciences, which did not appear in the Degree in Primary School

Education (Physical Education). The study presents a useful analysis model to assess teaching guide quality that could be extrapolated and adapted to other degrees.

KEYWORDS: University, Physical Education, Sport, Evaluation, Curriculum

RESUMEN

Este estudio persigue analizar, explorar y comparar guías docentes de dos titulaciones universitarias españolas de Grado referidas a la formación en actividad física desde el modelo basado en competencias. Se realizó un análisis documental de las competencias y un análisis de los sistemas de evaluación, desde un prisma formativo, de 54 guías docentes de asignaturas de tipología común en ambas titulaciones, consiguiéndose, tras ello, variables medibles. Se aplicó un análisis MANOVA Biplot que permitió representar gráficamente las variables que caracterizaron a las asignaturas. Los resultados mostraron diferencias sustanciales entre las titulaciones y entre perfiles de asignaturas en el Grado en Ciencias de la Actividad Física y el Deporte, que no acontecieron en el Grado en Magisterio de Educación Primaria mención Educación Física. El estudio muestra un modelo de análisis útil para la evaluación de la calidad de las guías docentes que podría ser extrapolado y ajustado a otras titulaciones.

PALABRAS CLAVE: Universidad, Educación Física, Deporte, Evaluación, Curriculum

INTRODUCTION

The incorporation of the Spanish university to the proposal for the harmonization of Higher Education across Europe has led to changes in the official programmes of all university degrees. Some of the changes discussed from the epistemological, theoretical and technical perspectives have turned out of paramount importance to the university context (González& López, 2010) and have been added to the degrees' accreditation reports and teaching guides. Nowadays, the interest in degree observation is increasing and studies focused on teaching guides are emerging in Spain (Arias, Cantón & Baelo, 2017 Arias, Cantón & Baelo, 2017; Ortega & Pagès, 2018). As a consequence, the university education related to physical activity in Spain has also been involved, and research regarding teaching guide programme observation has started (Fraile, Pardo & Panadero, 2017). It must be noted that both the Degree in Physical Activity and Sport Sciences and the Degree in Primary School Education (specialisation in Physical Education) accredit professionals that often occupy one same working field due to the lack of regulation. Consequently, it is understandable that both degrees have very similar teaching guides, with similar profiles such as didactics, physical conditioning and corporal expression. Exploring the consistency between the guides of both degrees, as well as the consistency between competencies and evaluation systems will allow for mapping of these education programmes, which is undoubtedly necessary after the consolidation period of the European Higher

Education Area.

Since the incorporation to the European framework, the teaching guides have been designed from a theoretical, competency-based approach, which is also used by the institutions as a reference to prepare their accreditation reports. This procedure is not hassle-free, since the related theoretical and pedagogical corpora are not completely consolidated within the university context. Despite the final good purpose, it must be remembered that it is extremely difficult to predict the competencies that will be needed in future labour markets and which ones are required from an academic point of view. More and more researchers, institutions and teachers are confirming the urgent need to explore, describe and move forward in the analysis of the existing competency models, which are, of course, potentially needed in the labour market but also advisable in the academic context, with the aim to reach new and more effective theoretical models (Gargallo, Pérez, García, Giménez & Portillo, 2020). Tuning project (González & Wagenaar, 2010) initially classifies competencies into general (required for all graduates) and specific (related to the degree's field of knowledge). With regard to the latter, it must be highlighted that specific teaching competencies are essential in all degrees related to physical activity. Experience suggests that situations faced by professionals from both degrees involve, in the vast majority of cases, teaching motor skills. It is, therefore, necessary for professionals to acquire competency in the subject knowledge, didactics, leadership and student management (Del Valle, De la Vega & Rodríguez, 2015). This teaching competency, defined by Guzmán and Marín (2011) as the ability to use cognitive resources to solve complex situations in contexts and circumstances that are close to real teaching, is one of the prevailing ones in university education related to physical activity. It is obvious that its presence is important and logical, and so is studying its acquisition during the teacher's initial training (Palacios Picos, López-Pastor & Fraile Aranda, 2019). However, the necessity of keeping consistency with the different programme elements involved, according to Biggs' (2005) constructive alignment proposal, must also be underlined. And, despite this proposal not having been very present in the university context and not having been completely welcome (Jonnaert, Barrette, Boufrahi & Masciotra, 2012), it is considered a priority. While it is true that a guide's design must keep coherence between competencies and assessment systems, it must be borne in mind that, according to Martínez and Echeverría (2009), competency-based education requires formative evaluation. Previous studies have, therefore, established a turning point: in order to achieve the best results in competency learning, it is essential for them to be aligned (Biggs, 2005) with formative evaluation, which is a very sensitive system to assess teaching competency (Romero-Martín, Asún & Chivite, 2020).

This seems to be the perfect moment to defend the idea of making evaluation systems consistent with competencies. Nevertheless, difficulties arise due to the lack of a clear and consolidated theoretical corpus and the teachers' firm beliefs about learning assessment (Antón Nuño, 2012). University teachers' previous concepts regarding the evaluation system design continue to be various. While some university teachers stick to summative evaluation, others prefer to use innovative or alternative systems, with the main aim to teach

students by promoting and improving their learning, without forgetting their obligation to accredit them (Gulikers, Bastiaens & Kirschner, 2004). Changes in the assessment purpose start to appear, although in a much slower and more complex manner than the changes in the teaching methods applied by university teachers do (Antón Nuño, 2012). In addition, some authors claimed that, despite university teaching methods being innovative, students and their learning will always be subject to assessment. Therefore, if evaluation continues to be stuck in traditional systems, changes in the students' learning process will not occur (Cano García, 2008). At the same time, other studies highlighted the idea that evaluation means, techniques and instruments must be able to collect information from complex situations that involve students' knowledge, attitudes, and meta-cognitive and strategic thinking (Durand & Loye, 2015; Fraile, Catalina, De Diego & Aparicio, 2018). Others, by contrast, continue to defend that complex situations must be obtained from the labour context and be characterised by clarity, transparency and assessment criteria close to professional contexts (Gulikers et al., 2004; Valverde, Revuelta & Fernández, 2012). In any case, alternative or formative evaluation revealed to be appropriate to promote and improve students' competencies, but not to select those who already have them (Cano García, 2008), to improve assessment processes by focusing them on learning (Muñoz, Pastor & Oliva, 2017) or to motivate students towards specific contents (Bores-García, et al, 2021).

Nowadays, after the implementation and evolution of the two degrees under study and bearing in mind the above, it is interesting to explore the teaching guides to analyse how the theoretical construct is being built, which competencies are being defined and how able the evaluation systems are to identify teaching competencies through formative procedures. In fact, due to academic and professional coherence, they should present a considerable formative dimension and clear sensitivity towards the assessment of teaching competencies.

Consequently, the aims of the present study were: (1) to present a model of analysis that allows for description of the formative nature of university degrees by examining key programme elements of their teaching guides, in line with EHEA; (2) to analyse the formative nature of the teaching guides of physical activity university degrees using the competencies and evaluation systems of three representative subjects as source of information.

METHOD

A multi-method study was designed, able to provide an answer to complex social research questions using different sequenced methods (Anguera, Blanco-Villaseñor, Losada, Sánchez-Algarra & Onwuegbuzie, 2018). Qualitative strategies were applied for content analysis, while quantitative ones were used to obtain a MANOVA Biplot for two-way treatments based on multivariate general linear models, making it an exploratory study. The study focused on the Degree in Physical Activity and Sport Sciences (PASS) and the Degree in Primary School Education (PSE), specialisation in Physical Education, during

the academic year 2018/2019. Three subject profiles common to both degrees were examined: didactics, physical conditioning and corporal expression.

Participants

A list was made of public Spanish universities that offered both degrees. The following inclusion criteria were established: (1) both degrees were offered at every university selected; (2) complete teaching guides were available for three key subject profiles common to both degrees: didactics, physical conditioning and corporal expression; and (3) there was geographical diversity among the universities selected. The programmes were requested from the universities and the degrees' websites were reviewed. The list finally contained nine universities (31% of all universities that met the mentioned criteria): University of Alcalá de Henares, Autonomous University of Barcelona, Autonomous University of Madrid, University of Granada, University of León, University of Murcia, University of Valencia, University of Valladolid and University of Zaragoza. A total of 54 teaching guides were analysed, six provided by each university.

Nine experts in university teaching were selected to analyse the teaching guides' formative nature. They (1) had made relevant publications in competency-based curriculum and formative evaluation, (2) had experience in research projects and/or (3) belonged to research groups of the field, and there was (4) geographical diversity among their universities (Murcia, Lleida, Valladolid and Zaragoza).

Instruments

The instrument to analyse the assessment system of university teaching guides, IASEG (acronym in Spanish), was extensively described by Romero-Martín et al. (2020). In order to examine their elements, an agreement among experts was followed (Keeney, Hasson & McKenna, 2006), and four dimensions were used (Figure 1): (1) *evaluation modality* (final, ongoing or mixed); (2) *evaluating agent* (teacher, external evaluator, self-evaluation, co-evaluation, peers, classmates); (3) *feedback*; and (4) *means*: exams/tests, individual projects, group projects, sessions and other assessment means (portfolio, field notebook, debates, interview, case study, reports, readings and content analysis, artistic or other representations). With the above, and using a Delphi method (Yañez & Cuadra, 2008), an index was obtained to express the ability to assess teaching competence through formative evaluation (ICCD, acronym in Spanish) of every element of the evaluation system. It ranged between 0 and 10, where 0 was absence of ability to assess teaching competence in a formative manner and 10 was maximum ability. After analysing the guides, the IATC indices were: (1) *modality*: 7.7; (2) *agent*: 3.1; (3) *feedback*: 2.8; (4) *means*: exams or tests: 6.1, sessions (simulations): 2.1, group projects: 5.9, individual projects: 6.3, and other means: 2.6.

A documentary analysis was performed to record and examine the competencies of every guide, and they were classified into generic or specific, following

González and Wagenaar (2010). Five typologies were defined for both types of specific competencies (Figure 1): (1) *instrumental-educative*: to programme, participate and evaluate within the standard education system; they correspond to the idea of *educating*; (2) *instrumental in other contexts*: like the previous ones but in other contexts than standard education, like performance, recreation, health...; they correspond to the idea of *teaching*; (3) *context*: they refer to the context, either institutions, entities, individuals or groups; (4) *personal*: abilities whose improvement directly and positively affects the teaching activity, usually attitudinal; and (5) *complementary*: knowledge on specific content, conditions and/or consequences to keep in mind for a better teaching intervention. The information was recorded into a *Microsoft Excel data sheet*, where percentages were calculated for every typology in every guide.

<table>
<tr><th colspan="4">Competencies</th><th>Assessment System</th></tr>
<tr><td colspan="4">Generic or transversal</td><td>Modality</td></tr>
<tr><td rowspan="5">Specific (teaching)</td><td rowspan="5">Common or Typical (Physical Activity)</td><td rowspan="2">instrumental</td><td>educative</td><td>Agent</td></tr>
<tr><td>other contexts</td><td>Feedback</td></tr>
<tr><td>context</td><td></td><td rowspan="3">Means: exams, individual and group projects, sessions and other means (portfolio, field notebook, debates, interview, case study, reports, readings and content analysis, representations)</td></tr>
<tr><td>personal</td><td></td></tr>
<tr><td>complementary</td><td></td></tr>
</table>

Figure 1. Variables: competencies and assessment system elements

Procedure

For the qualitative part of the study, the units of analysis were the 54 teaching guides from the nine universities that met the inclusion criteria. After collecting the documents and conducting the documentary analysis, the instrument for competency recording was filled in and the nine experts were selected. In groups of three, they assessed the guides' competencies and assessment systems. Their expert's competence coefficient (K), a value that shows the knowledge an expert has on a specific topic, presented high values, as all experts had coefficients of K=0.8 or K=1 (Cabero & Barroso, 2013). An excel database was created upon this assessment with all the competencies organised, and the data from the analysis of the guides' evaluation systems using *IASEG* instrument were added. With this instrument, and after analysing all data, the originally categorical variables were transformed into quantitative variables through the process described in detail by Romero-Martín et al. (2020).

A MANOVA Biplot (Amaro, Vicente & Galindo, 2004), also known as Canonical Biplot (Varas, Vicente, Molina & Vicente, 2005), was used for quantitative data analysis. This technique was designed to represent in a small-size space the results of a multivariate analysis of variance, in which the dependent variables are used as continuous and the groups as regression variables. In other words, the directions of maximum separation between groups are represented on a two-dimensional plane with the aim to observe the differences between them, as well as the dependent variables causing such differences. MultBiplot software (Vicente, 2014) was used. More specifically, a two-way analysis with

degree and subject as supporting variables was used in this study. Each of the six *groups* resulting from the combination of degree and subject is represented by a circle, whose centre is the mean value and whose radius is the confidence level estimated through a univariate test. The competency and assesment system variables are represented by vectors and the angle between them is proportional to the correlation between variables.

RESULTS

For the consistency analysis of the teaching guides of both degrees, and in order to understand the differences found among the six groups of subjects, the distances between circles and the quadrant where they are located must be observed (Figure 2). Four groups can be clearly identified: didactics subjects from PASS are placed in the first quadrant, physical conditioning subjects from PASS are located in the second quadrant, a group made of corporal expression subjects from PASS and PSE and physical conditioning subjects from PSE is in the third quadrant, and didactics subjects from PSE are in the fourth quadrant. It is noteworthy that, while PASS subjects are clearly separated from each other (Figure 3), this is not the case for PSE subjects related to physical conditioning and corporal expression (Figure 4), which are very close to each other. Consequently, it can be stated that the three groups of PASS subjects present clearly different curricula as regards competencies and assessment systems. By contrast, the competencies and assessment systems were similar in the three PSE subject categories.

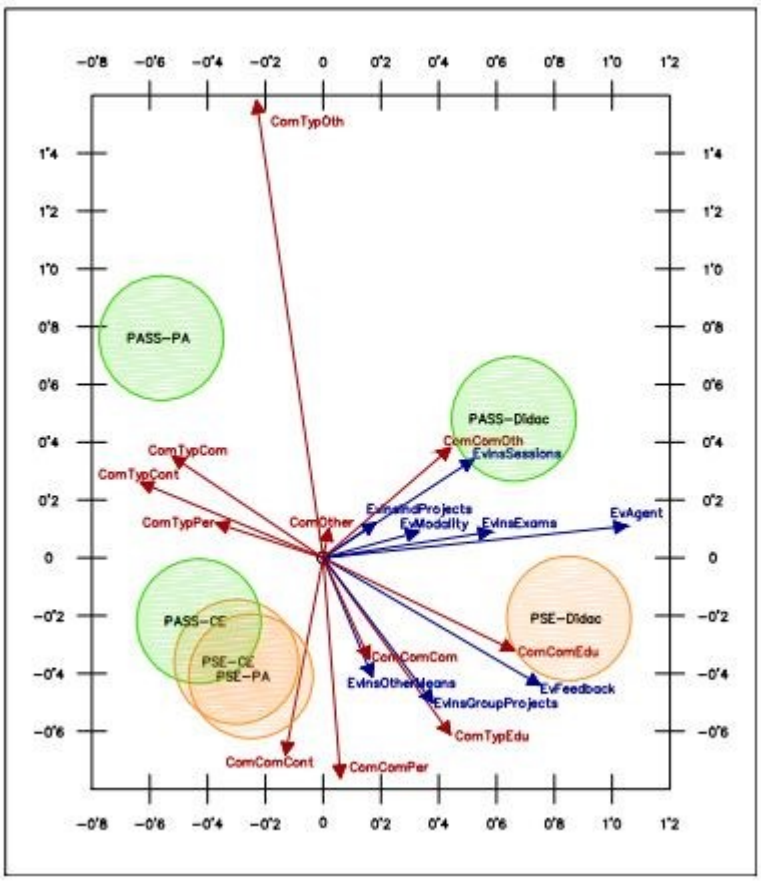

Figure 2. Distribution of the six degree-subject groups

The competency and assessment system variables (vectors) that are involved in the subjects from the Degree in PASS can be observed in Figure 3. The first group of variables is located in the first quadrant (top right), directly pointing at the PASS didactics profile and along the positive side of the horizontal axis. These variables are: '*common competencies in other contexts*' and '*evaluation through sessions*', which can be considered as plane variables, i.e. they characterise this quadrant; and the assessment variables '*agent*', '*exams or tests*', '*modality*' and '*individual projects'.* All the above define the group of PASS didactics-profile subjects.

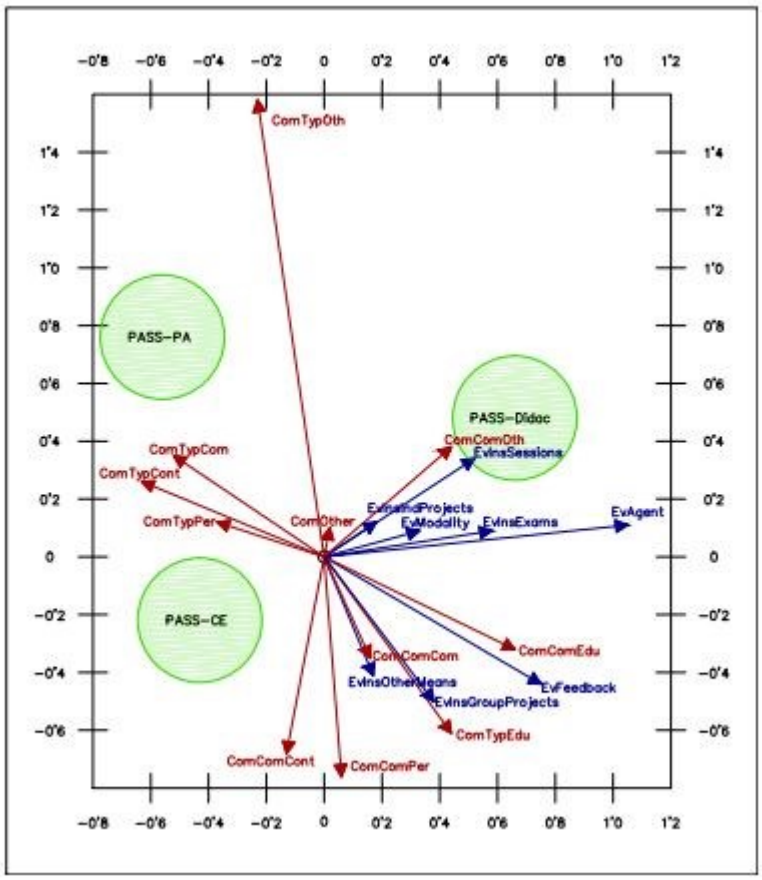

Figure 3. Degree in PASS

It can be seen that PASS physical conditioning profile is located in the second quadrant (top left). This group of variables, closely related to each other, is composed of all '*typical competencies*' except the '*typical, educative*' ones. These variables are pointing at the negative side of axis 1 (horizontal), in contrast to the variables characterising the didactics-profile subjects in both degrees. This indicates a significantly lower presence of '*common educative* and *complementary competencies*' and '*typical educative competencies*' in the physical conditioning profile. With regard to assessment, there was also significantly lower presence of '*feedback*' and '*evaluation through group projects*' or '*other means'.* The corporal expression profile in PASS is distinguished by a group of variables located mainly along the second axis (vertical) and pointing at the positive side: '*typical competencies in other contexts*', and the negative side: '*common context competencies*' and '*personal' competencies.* All this reveals a significantly lower presence of '*typical competencies in other contexts*' and a higher presence of '*common context and personal competencies'.* Lastly, with regard to the assessment system, the presence of '*evaluation through group projects*' and through '*other means*' must be noted.

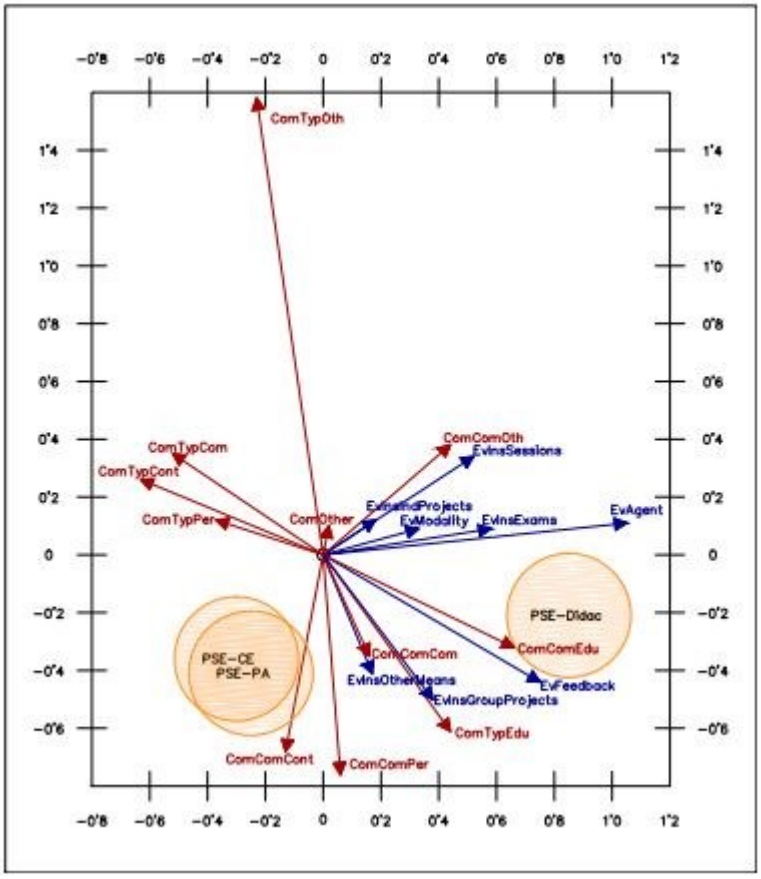

Figure 4. Degree in PSE (PA)

PSE subjects (Figure 4) cannot be as clearly distinguished as PASS subjects, except for didactics. The corporal expression and physical conditioning subjects are characterised by a combination of '*typical and common competencies*', in particular '*common context and personal*' competencies, but moderately, in light of the data, since they lie close to the centre of coordinates. In the PSE didactics profile, there is a strong presence of '*common educative competencies*', which can be considered as a plane variable, and also of '*feedback*'. As regards the assessment systems, the combination of the assessment through '*group projects*' and '*other means*' must be highlighted.

In conclusion, PSE subjects are not as clearly distinguished as they are in PASS, except for didactics. The corporal expression and physical conditioning subjects are characterised by a combination of '*typical* and *common competencies*', while didactics reveals a higher presence of '*common educative competencies*'. With regard to assessment, there was a high presence of '*feedback*' and a moderate representation of individual evaluation means ('*exams/tests and projects*') and '*group projects*'.

DISCUSSION

The data collected allow for definition of a theoretical model to analyse teaching guides of Physical Activity university degrees, which can be useful to assess them as regards the curriculum and degree quality. This idea is in line with the

study by Gallego-Ortega and Rodríguez-Fuentes (2018), who acknowledged that higher education is involved in a process of change that considerably affects teaching processes. It is also in keeping with various recent studies from different countries that analysed and described curricula and subject programmes in higher education. Some of them aimed at updating competency-based curricula (Almetov, Zhorabekova & Tulenova, 2020), others investigated curriculum alignment (Haning, 2020) and others had the purpose to improve the quality of teacher education (Davis & Peck, 2020). The model presented enables the analysis of curriculum alignment and the description and interpretation of teaching guides in order to compare the training provided by two university degrees that educate physical activity professionals. The results showed a horizontal axis defined by the dichotomy between *didactics and physical activity*, revealing a clear difference between the actual physical activity contents and their teaching. On the vertical axis, standard *education* and intervention in *other professional contexts other than education* lay on opposite ends (Figure 5).

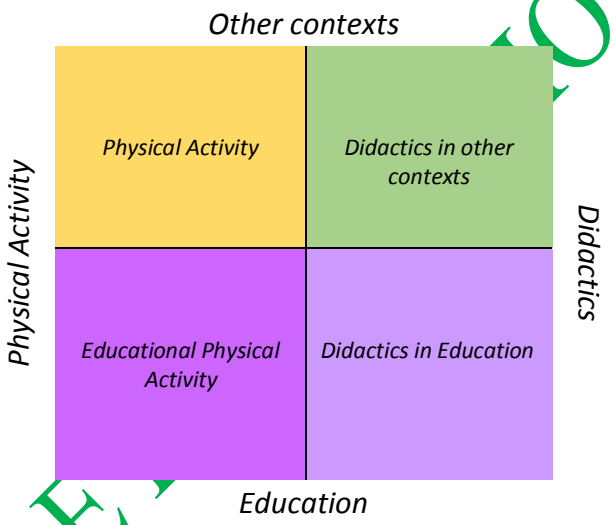

Figure 5. Teaching guide analysis model

The findings revealed that the two degrees present different models. While the subjects from the Degree in PSE showed more homogeneous competencies and assessment systems, the Degree in PASS was characterised by three clearly different subjects, possibly because they correspond to different educational profiles. Actually, the differences in competency acquisition between the two degrees as perceived by students, teachers and graduates were previously identified in the study by Cañadas, Santos-Pastor and Castejón (2018). They observed that, in PASS, more competencies related to healthy habit promotion and physical activity contents were acquired, while in PSE, students achieved greater competence in the implementation of motor content proposals and better knowledge of corporal expression. This fact confirmed the connection of the Degree in PSE with a clear subject matter, as it focuses on the Primary Education Teacher profession (Maldonado, 2005). By contrast, in PASS there is no unique subject matter, as revealed, for example, by the epistemological distance between the *human movement* proposed by Del Villar

(2005, p.27) and the *motor action* described by Parlebas (2001). In fact, it even generates controversy among experts (Martínez Santos, 2014; Pérez-Pueyo, Vicente & Hortigüela, 2018), which was confirmed by the findings of the present study.

With regard to the competencies that define the subjects, the group of *physical conditioning* subjects from the Degree in PASS is characterised by a high presence of typical competencies, except the educative ones; the *didactics* group, by a high presence of common competencies in other contexts; and the *corporal expression* group, by a middle position between typical (except typical competencies in other contexts) and common competencies. This proves that the Degree in PASS is based on specific content (physical activity), and on other contexts than standard education (Llorent-García & López-Azuaga, 2017).In particular, PASS corporal expression has a strong educative component since it is closer to PSE contents than to PASS contents. A study conducted by Romero-Martín and Chivite (2013) concluded that the presence of corporal expression in Spain is mostly limited to standard education. Besides, Caballero (2018) showed how the institutionalisation process of this discipline is linked to the development of the Spanish education system. This aspect should be revised in the teaching guides in order to match the degree's distinctive features if, as exposed in the degree's *White Paper* (Del Villar, 2005), there is a broad and varied area of work for graduates.

The differentiation among PSE subjects as regards competencies is not as clear as in PASS. Nonetheless, a clear separation can be observed between didactics and the other two profiles. Physical activity and corporal expression are characterised by the presence of common competencies, except those referred to other contexts than standard education. Doubtlessly, the fact that the three PSE profiles are described like this, indicates a two-fold coherence with the degree's subject matter (Maldonado, 2005). On one hand, because it is a teaching-oriented degree, and on the other, because it develops common teaching competencies with limited presence of Physical Education contents.

As regards assessment systems, competency evaluation through a formative approach in PASS is more clearly shown in *didactics*. The most frequent system is the evaluation by session, with various agents and modalities, followed by exams and individual projects. This is logical, since assessment is part of the subject's contents and, therefore, teachers are possibly more up-to-date on this topic. The other two profiles in PASS are only very slightly characterised by evaluation variables. This could indicate that competency-based evaluation in a formative manner is not sufficiently conducted, as the competency-based model requires (Martínez & Echeverría, 2009).

Among the assessment methods used in PSE subjects, there is a high presence of group projects and other means of evaluation (portfolios, learning folders, etc.) and, in didactics, also exams and individual projects. However, the most noticeable fact is the strong presence of feedback, especially in didactics. Feedback is a key element of learning (Hattie & Clarke, 2020), and the assessment that provides it turns out to be more effective and efficient in order

to generate curricular learning (Hernández, 2012). It is important in all fields, but essential in the Degree in PSE. The professional field of PSE graduates is compulsory education, where the acquisition of basic competencies must be guaranteed: a combination of practical skills, knowledge, motivation, ethical values, attitudes, emotions and other social and behavioural components that are brought together in order to achieve an effective action (Tiana, 2011, p.64). These are the key aspects in the students' academic and personal education as members of modern society. Besides, the use of group projects as evaluation instrument is consistent with the primary school teacher's tasks.

If we examine the assessment systems of the didactics subjects from the two degrees jointly, we will see that they are characterised by: (1) a wide range of instruments and procedures, what, in principle, makes it easier to collect information on complex situations involving students' knowledge, attitudes, and meta-cognitive and strategic thinking (Durand & Loye, 2015). This is in accordance with Castejón, Capllonch, González and López-Pastor (2011), who considered that using instruments that involve different abilities or processes helps in competency acquisition; (2) the participation of various evaluation agents: apart from the teacher, the student and their classmates. This is in contrast with the study by Rodríguez-Gómez, Ibarra-Sáiz and García-Jiménez, 2013, who found a clear lack of these assessment techniques in Spanish universities; and (3) feedback, an essential aspect as previously mentioned, since self-regulated evaluation with feedback allows the student to perceive and regulate their own competency level and, furthermore, making the student the main agent in their own assessment helps them acquire higher cognitive skills (Larrea, 2016). This is, of course in keeping with the level of higher studies we are referring to. All this evidences the richness in teaching resources, as expected from subjects focused on teaching competence. According to Guzmán and Marín (2011), teaching competence consists in the ability to use cognitive resources to solve complex situations related to a teacher's professional tasks, in order to achieve optimal *transference* to future professional applications. As Lorente and Kirk (2013) indicated, it is important to learn by doing, since it has been proved that teachers tend to apply methodologies that they had experienced during their initial training (Hidalgo & Murillo, 2017). Lastly, it must be highlighted that in both didactics subjects there was a high presence (slightly higher in PSE) of instruments like exams or tests. Although according to Castejón et al. (2011) they could be formative, this is not the most extended opinion (e.g. Morillas Pedreño & García Sanz, 2011). This could reveal that traditional assessment continues to be strongly installed in the teachers' mindset, although it coexists with other cutting-edge currents that allow for advancement towards formative competency-based evaluation models in line with the new models.

CONCLUSIONS

The study of university curricula is a need that cannot be ignored. Their academic and professional coherence is essential. While the Degree in PSE focuses on the primary school teacher regulated profession, the Degree in PASS still needs coherent professional regulation by the government. It is advisable that future modifications in the study programmes are appropriately

conducted based on scientific evidence and on reflection upon the results of that research. This model goes beyond the present study and is considered to be an analysis model suitable for the study of Physical Activity university programmes.

In conclusion, the degrees under study were mapped based on the teaching guides of representative subjects, which generated a useful map for Quality Assurance Commissions to make robust and justified decisions to improve them, some of them urgently. The examination of the teaching guides of these university degrees in Spain with regard to competencies and assessment systems can result in better guidance for university programmes and, therefore, better service to society.

Lastly, as a study limitation we can mention that the selection of three subjects could have been extended to other subjects on classical Physical Education contents, such as sports, which would have provided a more comprehensive perspective on the degree.

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