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Winter, climbing and mountaineering sports instructor qualifications in Spain: an instructors' and employers' perception

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Two alpinists climbing a snowy mountain in the Arctic under the northern lights. Adobestock ®Urdialex

Abstract

Physical and sporting activities in the natural environment have experienced a boom and have taken on a touristic, environmental, economic, and political dimension of great relevance. Previous research points to the need for the training of qualified personnel for the exercise of the related professional activity, in order to preserve the well-being, health, and safety of its practitioners and the general population. This article aims to evaluate the adequacy of the curricula of sports technician and advanced sports technician qualifications in winter, mountaineering and climbing sports to the needs of the professional activity, through the perception of key actors: technical staff and employers. A quantitative methodology has been used by means of a questionnaire designed *ad hoc* validated by expert judgement. The total number of valid questionnaires was 405, of which 372 were answered by technicians and 33 by employers. The results show data that become the basis for the optimisation of these degrees, seeking a better connection between education and the needs of professional activity and taking into account the agents involved. The comprehensive analysis provides information for decision-making in possible future curriculum developments.

Keywords: curricular adaptation, curriculum, physical-sport activities in nature, professional practice, qualifications, required competencies.

Introduction

Physical-sports activities in the natural environment (hereinafter PSANE) are increasingly diversified and changing, more numerous throughout the year, and have entered a cycle of constant creation that has led to a significant boom (Mulero & Rivera, 2018). The 21st century has seen an increase in the number of practitioners and professionals involved, as well as the growth of a large market (Izenstark & Middaugh, 2022; Kong & Sun, 2022; Mulero & Rivera, 2018). The offer of the PSANE in Spain has become an economic attraction for active tourism companies, professionals, sports clubs, regions, and other agents, going from being leisure activities to taking on a tourist, environmental, economic, and political dimension (Molina et al., 2017). Active tourism has seen a spectacular development in supply, demand, and the number of existing companies (ANETAE, 2014, 2020; Carrasco-Jiménez, 2020; Mulero & Rivera, 2018; SET, 2018).

There is a wide range of training and a multiplicity of qualifications related to physical activity and sport (hereinafter PA&S) and PSANE. This article focuses on special regime sports teaching (hereinafter SRSE), specifically the qualifications of sports technician and advanced sports technician (hereinafter ST and SST) in the specialities of winter sports (hereinafter WS) established by Royal Decree 319/2000 and the mountaineering and climbing sports (hereinafter MCS), established by Royal Decree 318/2000. Relatively recent legislative changes (Royal Decrees 701/2019 and 702/2019) established the new MCS, ST, and SST curricula. The specialisations under study are relevant within the group of SRSE in Spain since, of the total number of students enrolled in intermediate level vocational training (academic year 2019-2020), 11.4% were in WS specialisations and 12.3% were in MCS. In terms of superior level vocational training education, of the total number of students enrolled, 8.3% were from WS and 3.7% from MCS. Nevertheless, for the same academic year, the number of enrolments is far from the number of students who complete their studies, the latter being much lower: 28.9% of MCS ST students, 18.4% of WS students, 39.4% of WS SST students and only 3.7% of MCS SST students complete their studies (Ministry of Culture and Sport, 2022).

Although official qualifications are becoming more and more solidified in Spain, they coexist with other courses; as an example, see the case of canyoners in Martínez Cerón et al. (2022). According to recent data from guides associated to the Spanish Association of Mountain Guides (hereinafter AEGM), 89.5% have official training, 6.8% have a recognised qualification and 3.2% have a recognised qualification (Spanish Association of Mountain Guides, 2022). The number of people currently working as STs differs from the number of graduates. In Spain, there are a total of 1,290 registered guides: 323 canyoning technicians, 201 climbing technicians, 888 medium mountain guides, 222 high mountain technicians and 159 high mountain technicians (Spanish Association of Mountain Guides, 2022); although, for example, only 35.4% of canyoning STs belong to this association (Martínez Cerón et al., 2022). Given that not all people practising as guides are associated with the AEGM and that similar data is not available for WS, there is currently no database that accurately records the number of STs and SSTs who are practising or have practised in Spain.

There are studies in various fields (physical education, *fitness*, social education, administration, nursing, etc.) dedicated to curriculum adaptation or alignment, curriculum design, the relationship of the professional profile with professional practice, and competencies (Caballero et al. 2017; Freire et al., 2013; Gil et al., 2009; Harris & Metzler, 2018; Jiménez et al., 2019; Jornet et al., 2001; López-Gil et al., 2019; Meroño et al., 2018; among others) and, although it is true that there is more and more research on PSANE, more journals involved in the subject and more articles available (Baena et al., 2019), the situation of ST and SST degrees does not stand out in the literature. Studies are needed to address the educational curricula, content, and competencies of these degrees.

Thus, given the above context, we can justify the need to assess the adequacy of the curriculum of the ST and SST degrees of WS and MCS to the needs of the exercise of the professional activity, through the perception of key actors (Freire et al., 2013; Mirabelle & Wish, 2000): employers and graduate technicians (Jornet et al., 2001).

This article aims to provide relevant information for the optimisation of the existing connection between ST and SST training and the needs in the exercise of professional activity in WS and MCS in Spain.

Method

Methodological approach and variables

The design of this study, from a quantitative perspective, was non-experimental and cross-sectional (Latorre et al., 2003). Descriptive (Delicado et al., 2018) and relational elements were combined.

The analysis was approached on the basis of the structure and content of the State regulations establishing qualifications. Following the types of evaluation plans based on units of analysis (Jornet et al., 2001), the proposed analysis was divided into two broad dimensions that grouped the different variables into sub-dimensions: 1) The teaching, sub-dimensions referring to the general perception of the teaching (variables: general quality, students' expectations of the training and employers' expectations of the people recruited, suitability of the syllabus for subsequent professional activity and general satisfaction with the teaching) and to the curriculum (variables: modules and training gaps); and 2) Scope of professional activity (variables: fields of action, main occupations and relevant jobs, suitability of the studies for subsequent professional activity, and responsibility in the job).

Samples and sampling

The sampling was non-probabilistic and casual (Latorre et al., 2003) and the inclusion criteria were: 1) Sports technician: trained and qualified in Spain in one of the specialities of winter, mountain and climbing sports and who has practised or is practising the profession; and 2) Employer: registered in Spain and who hires or has hired technicians in winter sports and/or mountain and climbing specialities. There is no complete sampling base of such populations to facilitate drawing a sample; the final sample included people from various regions, levels and specialities, and is considered reasonably representative of the researched population.

The total number of participants was 350, of whom 328 were technicians (see Table 1 for demographic characteristics) and 22 were employers (see Table 2 for demographic characteristics). Due to the objective of the study, the design of the questionnaire allowed the same person to answer for more than one speciality and training level (a technician can be qualified in two different specialities and/or levels; an employer can have technicians hired in different specialities and/or levels); for this reason, the number of participants was lower than the number of valid cases, so that, out of 405 valid cases, 372 were answered as a sports technician and 33 as an employer. There were 629 responses to the questionnaire, of which 405 were complete responses and were considered valid cases; the remaining 224 responses were not considered valid cases because they were incomplete questionnaires.

The characteristics of the teaching taken by technicians in reference to the training centres are detailed in Table 3.

Table 1
Demographic characteristics of technicians; n = *328.*

Age (years)		42.63 ± 10.79
Experience (years)		10.29 ± 14.13
Gender	Woman	61 (18.6 %)
	Man	265 (80.8 %)
	Non-binary	2 (0.6 %)
Studies	ESO (mandatory secondary education)	39 (11.9 %)
	Baccalaureate	106 (32.3 %)
	Degree	112 (34.1 %)
	Postgraduate studies	15 (4.6 %)
	Master's degree	47 (14.3 %)
	PhD	9 (2.7 %)
Employment status	Employed, full-time	78 (23.8 %)
	Employed, part-time	56 (17.1 %)
	Cooperativist	4 (1.2 %)
	Self-employed	137 (41.8 %)
	Unemployed, looking for work	31 (9.5 %)
	Unemployed, not looking for work	2 (0.6 %)
	Retired	5 (1.5 %)
	Other	15 (4.6 %)

Table 2
Demographic characteristics of employers; n = *22*

Age (years)		46.09 ± 9.32
Gender	Woman	3 (13.6 %)
	Man	19 (86.4 %)
	Non-binary	0 (0.0 %)
Experience (years)		11.43 ± 7.29
Studies	ESO (mandatory secondary education)	2 (9.1 %)
	Baccalaureate	7 (31.8 %)
	Degree	6 (27.3 %)
	Postgraduate studies	1 (4.5 %)
	Master's degree	6 (27.3 %)
	PhD	0 (0.0 %)
Peak employees		13.05 ± 9.6

Table 3
Characteristics of the teaching attended by technicians in reference to training centres; valid cases n = *372.*

Type of training centre where the education was received	Public	201 (54.03 %)
	State-funded private	38 (10.22 %)
	Fully private	133 (35.75 %)
Region of training where the education has taken place	Andalusia	21 (5.65 %)
	Aragon	71 (19.09 %)
	Asturias	8 (2.15 %)
	Balearic Islands	3 (0.81 %)
	Canary Islands	4 (1.08 %)
	Cantabria	11 (2.96 %)
	Castile and León	2 (0.54 %)
	Castile-La Mancha	0 (0.00 %)
	Catalonia	172 (46.24 %)
	Community of Madrid	42 (11.29 %)
	Navarra	3 (0.81 %)
	Valencian Community	5 (1.34 %)
	Extremadura	1 (0.27 %)
	Galicia	6 (1.61 %)
	Murcia	3 (0.81 %)
	Basque Country	20 (5.38 %)

Resources

An online questionnaire was administered, both autonomously and directly, and designed *ad hoc* based on existing literature (Barbera, 2014; Freire et al., 2013; Gil et al., 2009; Misener & Danylchuk, 2009; Santos et al., 2010; Tejada, 2001). Similar studies have used online questionnaires and *ad hoc* design (Damián et al., 2010; Harris & Metzler, 2018; Iranzo et al., 2018). The questionnaire was reviewed and validated by experts, who assessed the degree of clarity and relevance of all the questions; their professional profile was that of a university lecturer with expertise in PSANE, with an extensive research background, as well as Senior Researcher in European competitive projects related to the subject, in addition to having ST degrees and professional experience in PSANE. The research protocol received a positive evaluation (no. 22/CEICGC/2020) from the Clinical Research Ethics Committee of the Catalan Sports Administration.

The final version was structured in blocks: 1) Welcome to the questionnaire; 2) Inclusion criteria; 3) Socio-demographic data; and 4) Questions according to modality and educational level. The response format was: ordinal Likert rating scale (1-5), multiple choice, and checkbox.

Procedure

Participants were informed of the purpose of the study, the voluntary participation, and the anonymity of the data. They had the opportunity to ask the research team about the characteristics of the study, freely agreed to participate, and signed the informed consent form. They were provided with a web link to the SurveyMonkey® platform. Although the questionnaire was administered en masse, it was answered individually.

Analysis of results

Quantitative data analysis was performed using IBM-SPSS-Statistics (v. 23). First, a descriptive analysis was developed, using frequencies and percentages. Secondly, the Wilcoxon's W test for related samples was used to compare usefulness and module mastery scores, separately for the technician data and the employer data. Thirdly, the Mann-Whitney U test for independent samples was used to compare the technicians' and employers' perceptions of the usefulness and mastery of the teaching modules. Finally, the data from technicians and employers were also compared in terms of the need to incorporate other competencies and in terms of the training gaps identified. For this purpose, the Chi-square test was used for nominal variables, incorporating Fisher's exact test where necessary. Comparisons between technicians and employers were only made when the sample of employers contained a minimum of ten cases. In addition, it is important to note that in all statistical comparisons, cases were grouped by educational level where possible. In all analyses, the *p* values of less than .05 were considered statistically significant.

Results

The teaching. General perception

a. General quality

The perception of the overall quality of the training received was higher in MCS than in WS, both by technicians and employers (see Figure 1).

Figure 1
The technical staff consider that the training they received was of high quality; the employers consider that the training received by the technicians was of high quality; from 1 (strongly disagree) to 5 (strongly agree).

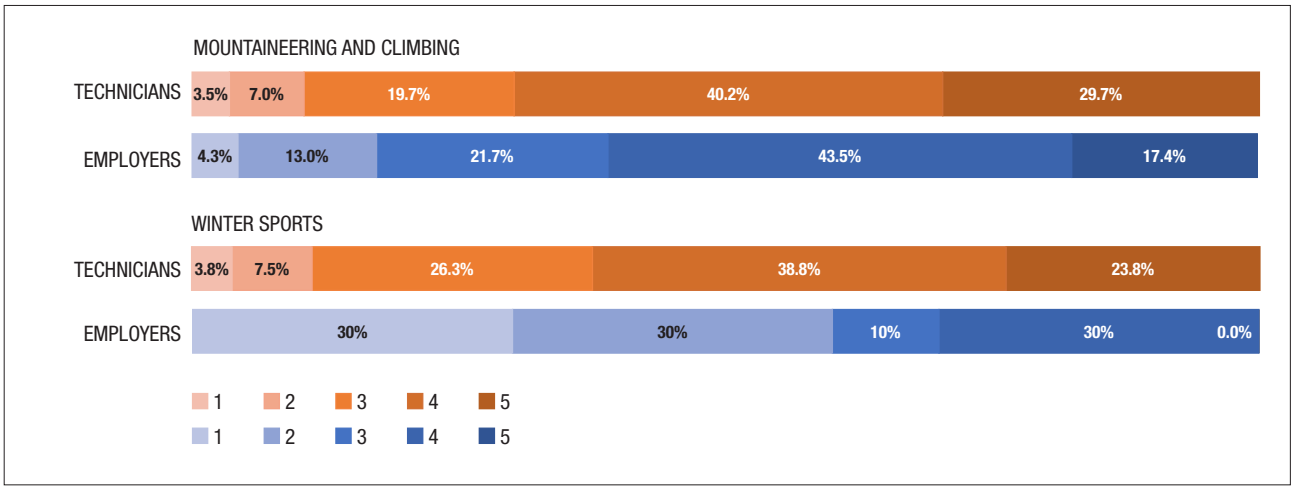


Figure 2
The teaching contents met the expectations of the technical staff; the training of the recruited technical staff met the expectations of the employers in terms of professional practice; from 1 (strongly disagree) to 5 (strongly agree).

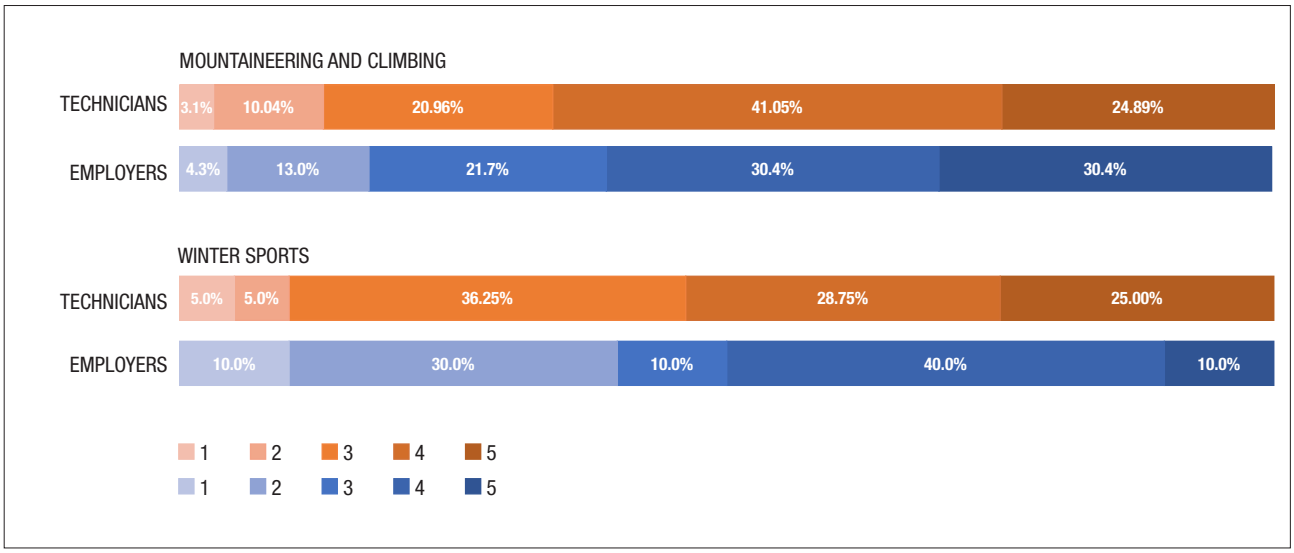
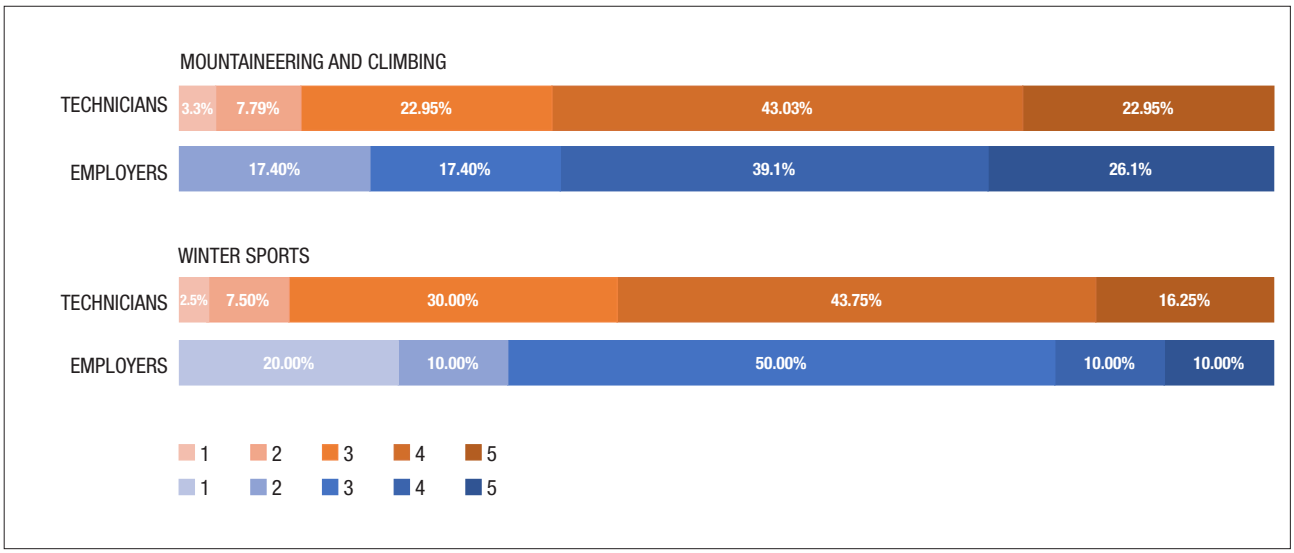


Figure 3
The technical staff assessed the adequacy of the training curriculum with the subsequent professional practice; from 1 (very poor) to 5 (very good). Employers think that the training prepared the technical staff to do their job successfully; from 1 (strongly disagree) to 5 (strongly agree).



b. Expectations

Employers' expectations of the training of the technical staff recruited were more satisfied in MCS than in WS; the same is true for the expectations of the technical staff's teaching (see Figure 2).

39% of MCS and 50% of WS employers were not satisfied with their expectations of the technical staff recruited (scores between 1 and 3).

c. Adequacy of the curriculum for subsequent professional practice

The matching of the curriculum with the subsequent exercise of the professional activity followed a similar dynamic; it was better valued in MCS than in WS, both by technical staff and employers.

d. Overall satisfaction

90% of WS technicians and 84.3% of MCS technicians would study the teaching contents again. The reasons of

the participants were collected. In the reasons for "yes", it stands out that the degree enables access to the labour market (see Figure 4). Among the reasons for "no", the poor quality of teaching and the fact that all participants would change study centres, as well as the high financial cost in the case of WS, stand out (see Figure 5).

Figure 4
For what reasons would participants study the same again? Multiple choice.

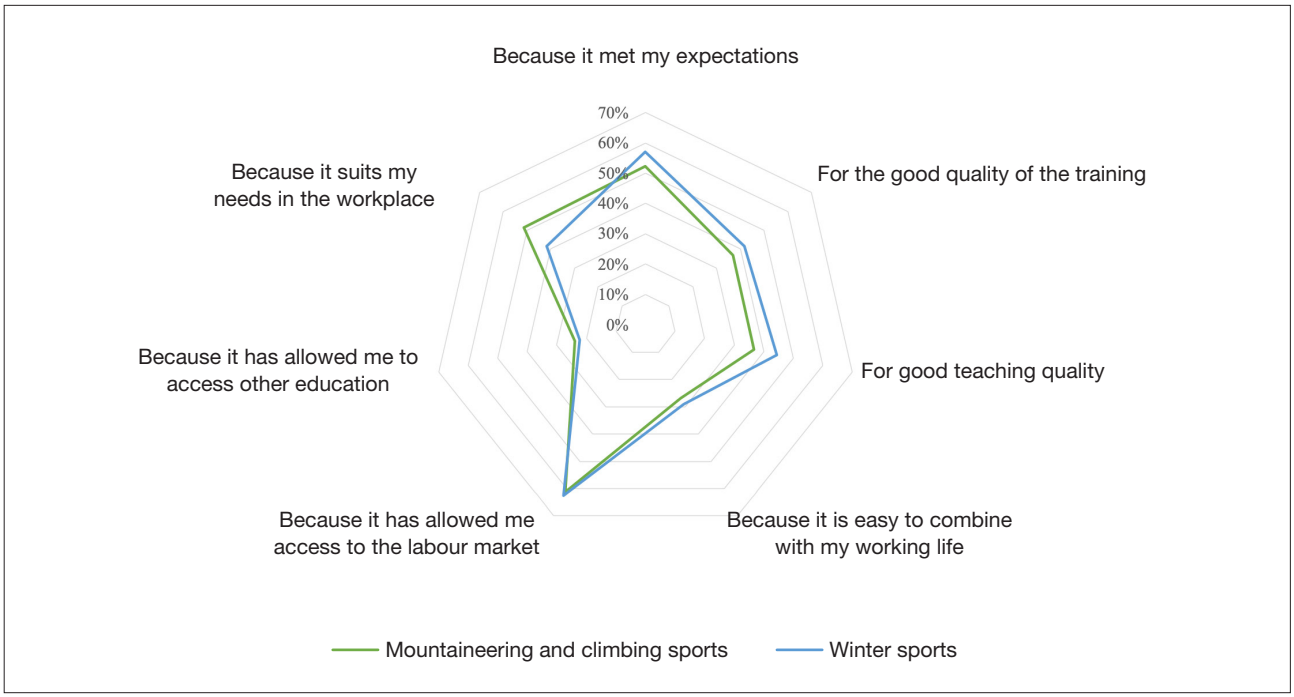
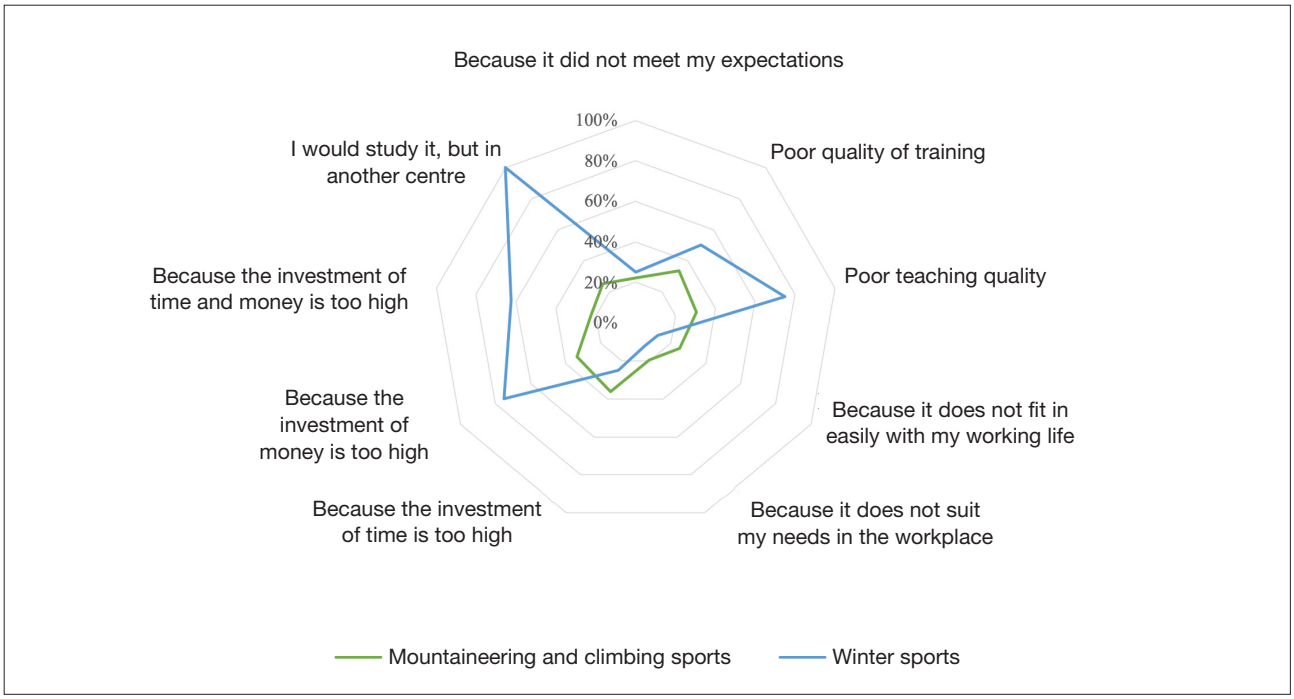


Figure 5
For what reasons would participants not study the same again? Multiple choice.



Contents. Modules

Technical staff and employers were asked how useful each module is for the technician's work; from 1 (not useful at all) to 5 (maximum usefulness). We asked whether at the end of the degree they felt mastery or demonstrated mastery of the content associated with the module; from 1 (strongly disagree) to 5 (strongly agree).

a. Common modules

Generally speaking, the technical staff considered that the modules taken were useful for their professional activity; this contrasted with a lack of a feeling of mastery of them. In this respect, there were significant differences in the modules Psychopedagogical bases of teaching and training, First aid, Sport theory and sociology, Sport biomechanics, High performance coaching, Physiology, Sport management, and High performance psychology.

According to the employers themselves, in the comparison between usefulness and mastery of the modules taken by the technical staff, there were no significant differences. Employers found some modules relatively unhelpful and the technical staff showed little mastery. This was the case, for example, with the module Organisation and Legislation of Sport (MCS). The technical staff, in contrast, did find the module useful and felt mastery, with statistically significant differences between the assessment of technicians and employers.

There were significant differences between the comparisons made by technicians and employers with regard to the usefulness of all the modules of the 2nd level of MCS. In contrast, this was not the case in WS.

In terms of mastery, it contrasted the perceived mastery of the technical staff with the employers' assessment of the mastery shown by the hired technicians. Significant differences existed in Coaching (2nd level MCS); Sport Organisation and Legislation (2nd level MCS, 1st and 2nd level WS), and Sport Theory and Sociology (2nd level MCS and WS). For detailed results, see Table 4 and Table 5.

Table 4
Common modules by WS level. Response rates and comparisons are shown. Only the comparisons that could be made due to the specific sample size for each speciality and level are shown.

Technicians. Level 1 WS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Anatomical and physiological bases of sport	0	7.1	39.3	35.7	17.9	3.6	21.4	42.9	10.7	21.4	51,500 (.128)
Psycho-pedagogical bases of teaching and coaching	3.6	7.1	14.3	39.3	35.7	3.6	21.4	32.1	17.9	25.0	**58.000 (.040)***
Sports coaching	10.7	7.1	28.6	28.6	25.0	7.1	21.4	32.1	21.4	17.9	60,500 (.265)
Sociological foundations of sport	7.1	25.0	32.1	28.6	7.1	7.1	10.7	28.6	28.6	25.0	113.000 (.079)
Organisation and legislation of sport	7.1	25.0	32.1	25.0	10.7	3.6	14.3	35.7	21.4	25.0	92,500 (.198)
First aid and hygiene in sport	0.0	3.6	17.9	25.0	53.6	10.7	17.9	28.6	25.0	17.9	**21,500 (.002)***
Employers. Level 1 WS											Comparison of technicians and employers
	USEFULNESS					MASTERY					USEFULNESS / MASTERY
	1	2	3	4	5	1	2	3	4	5	U Mann Whitney U (*p*)
Anatomical and physiological bases of sport	0	40	0	20	40	20	0	20	40	20	71.000 (1.000) / 79,500 (.643)
Psycho-pedagogical bases of teaching and coaching	0	0	0	0	100	20	0	60	20	0	**115.000 (.022)*** / 53,500 (.419)
Sports coaching	0	0	40	20	40	20	20	40	20	0	84.000 (.509) / 51.000 (.364)
Sociological foundations of sport	0	0	60	20	20	20	20	40	20	0	89,500 (.338) / 39,500 (.129)
Organisation and legislation of sport	0	40	20	20	20	20	40	40	0	0	72,500 (.903) / **26,500 (.026)***
First aid and hygiene in sport	0	0	0	40	60	20	0	20	40	20	80,500 (.609) / 78.000 (.715)

Note: * Statistically significant differences

Table 4 (Continued)
Common modules by WS level. Response rates and comparisons are shown. Only the comparisons that could be made due to the specific sample size for each speciality and level are shown.

Technicians. Level 2 WS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Anatomical and physiological bases of sport	0.0	14.3	25.7	40.0	20.0	2.9	14.3	42.9	11.4	28.6	122.000 (.402)
Psycho-pedagogical bases of teaching and coaching	0.0	8.6	14.3	37.1	40.0	2.9	17.1	40.0	20.0	20.0	**62,500 (.006)***
Sports coaching	0.0	11.4	17.1	37.1	34.3	5.7	17.1	22.9	37.1	17.1	56.000 (.031)
Organisation and legislation of sport	8.6	25.7	25.7	17.1	22.9	5.7	14.3	25.7	28.6	25.7	235,500 (.251)
Theory and sociology of sport	5.7	25.7	25.7	25.7	17.1	2.9	11.4	28.6	25.7	31.4	**198.000 (.062)***

Employers. Level 1 WS											Comparison of technicians and employers	
	USEFULNESS					MASTERY					USEFULNESS	MASTERY
	1	2	3	4	5	1	2	3	4	5	U Mann Whitney U (*p*)	
Anatomical and physiological bases of sport	0	0	20	20	60	20	40	20	20	0	125.000 (.133)	44.000 (.078)
Psycho-pedagogical bases of teaching and coaching	0	0	20	0	80	20	40	20	20	0	117,500 (.228)	47.000 (.103)
Sports coaching	0	0	20	40	40	20	20	60	0	0	98.000 (.691)	42.000 (.065)
Organisation and legislation of sport	0	20	40	0	40	20	40	40	0	0	102,500 (.551)	**33,000 (.024)***
Theory and sociology of sport	20	0	20	0	60	20	40	40	0	0	112,500 (.317)	**26,500 (.009)***

Technicians. Higher Level WS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Sports biomechanics	11.8	0.0	11.8	17.6	58.8	23.5	17.6	23.5	11.8	23.5	**12,500 (.020)***
High-performance sports coaching	5.9	0.0	11.8	23.5	58.8	11.8	41.2	0.0	23.5	23.5	**0.000 (.002)***
Exercise physiology	11.8	0.0	11.8	11.8	64.7	11.8	23.5	11.8	23.5	29.4	**11,500 (.027)***
Sport management	11.8	0.0	5.9	29.4	52.9	17.6	23.5	17.6	23.5	17.6	**12,500 (.020)***
Psychology of high performance in sport	5.9	5.9	17.6	11.8	58.8	23.5	11.8	17.6	23.5	23.5	**11,500 (.028)***
Sociology of high performance sport	11.8	5.9	17.6	23.5	41.2	23.5	5.9	17.6	29.4	23.5	26,500 (.322)

Note: * Statistically significant differences

Table 5
Common modules by MCS levels. Response rates and comparisons are shown. Only the comparisons that could be made due to the specific sample size for each speciality and level are shown.

Technicians. Level 2 MCS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Anatomical and physiological bases of sport	2.8	12.5	21.6	34.7	28.4	7.4	9.1	22.7	26.7	34.1	3,053.000 (.869)
Psycho-pedagogical bases of education	2.8	13.6	20.5	27.3	35.8	9.1	14.8	23.9	19.9	32.4	**2,376.500 (.029)***
Sports coaching	9.1	10.8	17.6	32.4	30.1	9.7	9.7	25.6	25.6	29.5	2,812.000 (.463)
Organisation and legislation of sport	5.7	12.5	25.6	26.1	30.1	9.7	13.1	24.4	22.7	30.1	3,040.000 (.323)
Theory and sociology of sport	9.1	19.9	34.1	20.5	16.5	9.1	10.8	25.0	21.6	33.5	**5,204.000 (< .001)***

Employers. Level 2 MCS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Anatomical and physiological bases of sport	0.0	33.3	38.9	11.1	16.7	0.0	27.8	27.8	33.3	11.1	28,500 (.454)
Psycho-pedagogical bases of teaching and coaching	11.1	22.2	33.3	22.2	11.1	5.6	22.2	33.3	33.3	5.6	38,500 (.593)
Sports coaching	5.6	33.3	44.4	5.6	11.1	11.1	22.2	33.3	33.3	0.0	42.000 (.796)
Organisation and legislation of sport	44.4	27.8	16.7	11.1	0.0	16.7	16.7	44.4	22.2	0.0	28,500 (.680)
Theory and sociology of sport	22.2	27.8	33.3	11.1	5.6	11.1	22.2	44.4	22.2	0.0	31,500 (.273)

	USEFULNESS	MASTERY
	U Mann Whitney U (*p*)	
Anatomical and physiological bases of sport	**1,062.000 (.017)***	1,197.000 (.077)
Psycho-pedagogical bases of teaching and coaching	**1,000.000 (.008)***	1,258.500 (.140)
Sports coaching	**958,500 (.004)***	**1,067.000 (.019)***
Organisation and legislation of sport	**1,039.500 (.013)***	**1,015.000 (.010)***
Theory and sociology of sport	**1,105.000 (.029)***	**966.000 (.005)***

Technicians. Higher Level MCS											Comparison of usefulness and mastery
	USEFULNESS					MASTERY					Wilcoxon W (*p*)
	1	2	3	4	5	1	2	3	4	5	
Sports biomechanics	7.4	18.5	29.6	29.6	14.8	11.1	33.3	14.8	22.2	18.5	91,500 (.395)
High-performance sports coaching	14.8	18.5	22.2	22.2	22.2	18.5	33.3	18.5	11.1	18.5	81,500 (.373)
Exercise physiology	0.0	11.1	37.0	25.9	25.9	11.1	18.5	37.0	14.8	18.5	49.000 (.058)
Sport management	3.7	14.8	25.9	40.7	14.8	11.1	22.2	29.6	22.2	14.8	75,000 (.254)
Psychology of high performance in sport	0.0	11.1	33.3	33.3	22.2	11.1	18.5	37.0	14.8	18.5	45,500 (.075)
Sociology of high performance sport	3.7	29.6	33.3	18.5	14.8	18.5	7.4	37.0	18.5	18.5	94,500 (.984)

Note: * Statistically significant differences

Table 6
New common modules of 2nd level MCS. Percentages and comparisons are shown

	Technicians					Employers					Comparison
	USEFULNESS					MASTERY					
	1	2	3	4	5	1	2	3	4	5	U Mann Whitney U (*p*)
Basis of sports learning	6.2	14.3	36.6	26.1	16.8	0.0	29.4	29.4	35.3	5.9	1,245,500 (.527)
Bases of sports coaching	7.5	13.0	24.2	34.2	21.1	0.0	23.5	47.1	23.5	5.9	1,052.000 (.105)
Adapted sport and disability	1.9	12.4	21.7	29.2	34.8	11.8	0.0	35.3	41.2	11.8	1,082.500 (.141)
Sports organisation and legislation	4.3	13.7	28.6	30.4	23.0	0.0	23.5	41.2	23.5	11.8	1,119,000 (.201)
Gender and sport	10.6	20.5	19.3	23.6	26.1	5.9	29.4	29.4	23.5	11.8	1,183,500 (.348)
Hiking school	6.2	13.7	21.1	23.0	36.0	0.0	0.0	41.2	41.2	17.6	1,330.500 (.845)
Technical training in mid-mountain in summer	2.5	4.3	13.7	18.6	60.9	0.0	5.9	11.8	47.1	35.3	1,107.500 (.146)
Guidance and orientation in mid-mountain	1.2	1.9	7.5	10.6	78.9	0.0	0.0	11.8	23.5	64.7	1,196.500 (.243)

Table 7
MCS, training gaps: response rates and comparison.

Technicians		Employers		Comparison of technicians and employers
Yes	No	Yes	No	Pearson's Chi-square (*p*)
68.6	31.4	73.9	26.1	.647

Table 8
WS, training gaps: response rates and comparison.

Technicians		Employers		Comparison of technicians and employers
Yes	No	Yes	No	Fisher's Exact Test (*p*)
65	35	100	0	**.028***

Note: * Statistically significant differences

b. Modules of the new curriculum: usefulness

With regard to the assessment of the new modules (2nd level LOE of MCS), those considered most useful are Guidance and orientation in mid-mountain, Technical improvement in mid-mountain in summer and Hiking School; there are no significant differences between the assessment made by technical staff and employers of the usefulness of these new modules. For detailed results, see Table 6.

Contents. Training gaps

In MCS, 68.6% of the technical staff stated that they would have needed more training, and 73.9% of the employing staff have identified shortcomings in the training of the technical staff hired. There were no statistically significant differences in the comparison between technical staff and employer (Pearson's chi-square $p = .647$) (see Table 7).

In WS, 65% of the technical staff stated that they would have needed more training and 100% of the employing staff identified gaps in the training of the technical staff recruited. Analyses pointed to statistically significant differences between technical staff and employers (see Table 8).

Furthermore, 69.6% of employers in MCS and 80% in WS thought it was necessary to provide additional technical training related to the competencies needed in the workplace for technical staff.

Figure 6
The technical staff assessed whether at the end of the degree they clearly knew about the main occupations they could develop in the labour market; from 1 (strongly disagree) to 5 (strongly agree).

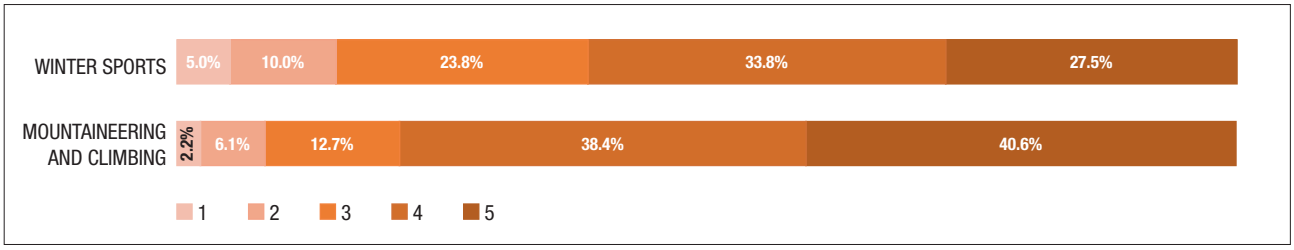


Table 9
Preparation for professional activity: response rates and comparison between technicians and employers.

	Technicians					Employers					Comparison
	1	2	3	4	5	1	2	3	4	5	U Mann Whitney U (*p*)
MCS	1.1	6.3	18.7	45.9	28	4.3	13	26.1	43.5	13	**2,312.500 (.034)***
WS	5	6.9	23.8	44.6	19.8	30	20	20	30	0	**248.000 (.005)***

Note: * Statistically significant differences

Scope of professional activity

a. Areas of action

It was found that 69% of MCS and 67% of WS technicians do not know all the fields of action (established in the Royal Decree) in which they can work with their degree.

b. Main occupations

27.5% in WS and 40.6% in MCS rated that they strongly agreed that they were clear about the occupations they could develop in the labour market (see Figure 6).

c. Preparation for the exercise of the professional activity

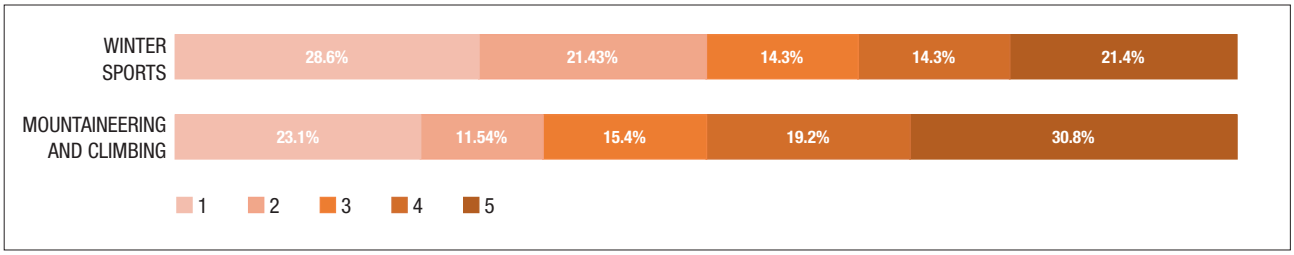
Technical staff assessed whether at the end of the qualification they felt fully prepared for immediate professional practice; employers assessed whether, at the end of the training, the recruited technical staff were prepared for immediate professional practice. From 1 (strongly disagree) to 5 (strongly agree).

Especially in WS, technicians in general perceived themselves as more prepared than employers perceived technicians. There are significant differences (see Table 9).

d. Responsibility in the workplace

Royal Decree 319/2000 (in force for WS) stipulates that qualified people at the first level of teaching must always act under the supervision of professionals at a higher level. In contrast, the current LOE curriculum for MCS no longer establishes such a limitation for the first level of MCS, and they can act without supervision. Technicians were asked whether they felt the need to always act under the supervision of senior professionals. Some heterogeneity appeared in the ratings, with 50% in MCS and 35.7% in WS scoring between 4 and 5 (see Figure 7).

Figure 7
With the training they received, they felt they always needed to act under the supervision of senior professionals; from 1 (strongly disagree) to 5 (strongly agree).



Discussion

The results of the present study highlight that there are weaknesses in the ST and SST curricula of WS and MCS that should be remedied in future curricular updates, such as training gaps, the need for additional technical training, common modules, fields of action, main occupations, preparation for professional activity, and responsibility in the workplace. In this sense, previous studies of various kinds also highlight that the design of sports training in Spain, and specifically of the SRSE, needs to be supervised and become homogeneous (Feito, 2016; López, 2013; Madrera, 2016) and for that it is necessary, for example, to amend the lack of publication of LOGSE curricula adapted to the LOE (organic law of education) system, as in the case of winter sports (Feito, 2016; Sans & Inglés, 2020).

In accordance with the results of the present study, it is also necessary to homogenise some aspects of training in the field of the PA&S since, in general, the levels and professional profiles are not clearly differentiated, with overlaps in competencies even between non-academic training; this also happens with the SRSE, in important aspects such as competences, modules, time distribution by modules, duration of the teaching, among others (Madrera, 2016; Sans & Inglés, 2020, 2021). The diversity of teaching facilitates access to the majority of the population, but causes confusion in reference to competencies in the exercise of professional activity and this prevents a clear and direct relationship between the qualification obtained and the position that will be occupied in the professional space (Espartero, 2021; Feito, 2016; Javaloyes, 2019; Madrera, 2016; Madrera et al., 2015).

The curricular context generated by the Spanish government is flexible; for example, in the field of physical education, the regions and schools can modify it (López-Gil et al., 2019); in the case of SRSE, each region implemented SRSE in its own way in different training centre models (López, 2013; Madrera, 2016; Madrera et al., 2015) and, as confirmed in the present work at various points, the current scenario is assimilated and can have two conceptions: 1) curricular flexibility, adaptation to the needs of each region, school, and area; and 2) loss of stability and educational coherence in the country as a whole (López-Gil et al., 2019; Madrera et al., 2015; Nasarre, 2016). Previous work suggests that the State should have basic regulations that homogenise and unify training and access to professional practice regardless of the region (Espartero, 2021; Madrera, 2016) and studies in other countries suggest the need to align curricula with state standards (Harris & Metzler, 2018).

The results of the present work could be used for future curriculum change; study plans and educational programmes, in order to be considered quality, need to be reviewed and updated on a regular basis (Harris & Metzler, 2018). For such a review, it is recommended that an assessment be made of various sources or stakeholders to ensure that it meets the needs and expectations of interested parties, which may be former students and employers, among others (Mirabelle & Wish, 2000), as has been done in the present study. Strategic plans to improve curricula and syllabus designs are needed in PA&S technical degrees (Madrera et al., 2015). Any implementation of curricular change is notoriously complex, but in order to optimise the adaptation of qualifications to the changing reality of professional practice it is necessary for the Spanish education system to implement systematic studies that take into account acquired and required competencies (Freire et al., 2013), as well as the vision of the various agents involved.

Conclusions

The following conclusions emerge from this research:

In terms of overall quality of training, fulfilment of expectations, suitability of the curriculum to the subsequent exercise of professional activity, and general satisfaction, there is substantial room for improvement in WS and MCS, with the need to accentuate attention to the former, according to the view of technicians and employers. On the other hand, the majority of qualified technical staff stated that they would study the teaching again, mainly for access to the labour market. The technical staff who would not study again highlighted a bad teaching centre, poor teaching quality, and high financial cost in winter sports.

The analysis of the modules contrasts the evaluation of the usefulness for professional practice with the technicians' lack of feeling of mastery. This perception also contrasts with the employers' assessment in this respect. The concrete analysis in the results section shows which modules suggest the greatest scope for improvement.

Employers highlight the need for additional training for qualified technical staff and, in the same vein, technical staff report significant training gaps for their professional performance.

Technical staff are not aware of the areas of professional activity, nor are they clear about the main occupations that they can carry out with their qualifications at the end of their training, with particular emphasis on WS.

MCS technicians feel more prepared for the profession when they finish their training than WS technicians.

This feeling on the part of technicians contrasts with a lower perception of such preparation on the part of employers, especially in WS.

As far as the job responsibility of 1st level technical staff is concerned, the fact that they can work without supervision of higher level professionals should be reviewed with the new LOE, or training should be adjusted so that 1st level technicians feel secure and autonomous in the exercise of their professional activity.

On the one hand, the present work is a pioneer in analysing specific aspects of the curriculum of ST and SST degrees, and it confirms data that become the basis for an optimisation of these degrees, seeking greater connection between teaching and needs in the exercise of professional activity, taking into account the agents involved. The comprehensive analysis provides information for decision-making in future curriculum development. On the other hand, a questionnaire has been designed that can be replicated periodically for the analysis of the degrees under study and to add the vision of new graduates entering the labour market, as well as being replicated in other technical degrees.

The sample, especially of employers, would be a limitation of the study, as well as the use of mostly closed questions in the questionnaire, which limits the extensive expression of opinions and experiences.

These limitations suggest that a prospective study is needed: 1) to extend the sample of the present study; 2) to take qualitative data to ascertain the in-depth vision of other key agents involved (guides, coaches, employers, teachers, ST and SST teaching coordination, federations, professional associations and companies in the sector) in order to go deeper into the subject; and 3) to replicate the questionnaire to expand the study to other sports technician qualifications.

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