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Conditioning Factors of Sustainability of Dual Vocational Educational Training in Andalusia (Spain): Case Study of Three Educational Centres

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Abstract: From the incorporation of the Dual Vocational Educational Training (dual VET) in the Spanish educational panorama in 2012, and in the midst of the economic and financial crisis, this dual VET educational scheme has been a political priority of national and regional governments, who see it as a strategy for socioeconomic growth, employability, and youth entrepreneurship framed under an educational sustainability model. Despite the growing number of companies involved in the scheme, this model of educational training has not been free of debate and controversy. This study focuses on the autonomous community of Andalusia with the objective of identifying—using a complementary methodological perspective—the key factors that condition the successful implementation of dual VET in this region based on the experience of three educational centres and the opinions of those educators involved. Some of the weaknesses of dual VET identified in the autonomous community include the ambiguity of regulations, budgetary sustainability, governance models, the relationship between the training offered and industry, the involvement of companies, and the recognition of the teaching staff involved.

Keywords: dual vocational educational training; education for sustainability; entrepreneurship; case study

1. Introduction

In recent decades, European Vocational Educational Training schemes (hereinafter VET), referring to both vocational training in the education sphere and vocational training for employment, have faced great challenges and have evolved to become a key element for the economic and social development of territories, ensuring their sustainability, entrepreneurship, and innovation capacities. VET has advanced across Europe while maintaining sight of the scientific, technological, productive, and commercial specializations of each country as well as their competitive challenges in terms of innovation and training.

Alongside the commitment of many European governments, this progress has had a lot to do with the trust that companies have placed in this type of training, seeing it as an opportunity to adapt to current trends through new professionals who have acquired the skills necessary for a changing industrial and production context that is increasingly technological and digitized [1–6].

VET's commitment to quality qualifications and improvements to professional placing of youths entering the workforce constitutes the basis of the advances produced in it. Changes to company participation in the training of students, to training duration and substance and in the employer-student relationship are the foundation of the dual European system of vocational training, which is a system that is very advanced in countries like Germany, Switzerland, and Denmark, where these

systems are considered to be the best strategy for the transition between school and work. Furthermore, these schemes have been seen as a benchmark for youth employment policies [7–16].

This dualisation of the VET scheme has contributed to what we could call the Europeanisation of VET. This Europeanization process has generated joint spaces for debate, has allowed the exchange of good practices, and the implementation of improvements to benchmarking processes.

Spain, the country that is the object of this study, has also joined the Europeanization of VET, moving toward a more flexible, comprehensive, dynamic, sustainable system, which have been linked to the commitments made by Spain in the 2030 Agenda [17], under the umbrella of sustainable development objectives (SDG), and in reference to the principles of Education for Sustainability [18,19].

However, interest in VET is not new and there have been many initiatives launched in Spain with some more successful than others. Dual training has played a leading role in the advancement and modernization of VET in both the VET subsystem for employment and in the educational system, ensuring compliance with the goals associated with SDG 4 ‘quality education’ as well as with others linked to economic development through the commitment to decent work and economic growth (SDG 8), the reduction of inequalities (SDG 10), and the strengthening of sustainable cities and communities (SDG 11) by establishing alliances and networks (SDG 17).

Dual VET has been incorporated into the Spanish Educational System’s VET programme, in the midst of the economic and financial crisis, and the alarming unemployment rates (especially among young people) with the purpose of increasing the number of young people attaining a post-compulsory educational qualification, improving their employment opportunities and adapting their training to the requirements of a socioeconomic and employment context that is increasingly demanding professional profiles aligned to industries of the future, and characterised by the implementation of highly technological behavioural guidelines (References [20–27], among others).

It is true, however, that Spain’s level of implementation for this dualisation is far from what has been achieved in the rest of Europe [28]. In recent years, in Spain, VET—in both the educational and industry sectors—has become one of the strategic axes of government policies, and is considered to be an important engine for driving socioeconomic sustainability, and employability and youth entrepreneurship from the perspective of Education for Sustainability (ES).

Dual VET, which supports the dual system in Spain, was regulated in this country in 2012 through the Royal Decree 1529/2012 [29] and has continued to grow. This Royal Decree has become the regulatory framework for both the contract for training and learning, which has a long tradition in Spain, and for dual VET within the Spanish educational system, specifically within the Initial Vocational Training scheme. This study focuses on dual VET within the educational system.

In the autonomous community of Andalusia, which is the territory under study, dual VET was rolled out in an experimental way in the 2013–2014 academic year without a specific regulatory framework within the jurisdiction of various annual calls launched by the Andalusian government itself.

Despite a large number of contributions by various national and international organizations (the European Centre for the Development of Vocational Training (CEDEFOP), the European Alliance for Apprenticeships (EAA), the Organization for Economic Cooperation and Development (OECD), the Bertelsmann Foundation, the Alliance for Dual Vocational Training, the Dual + Centre for Dual Vocational Research developed by Bankia, the Princess of Girona Foundation, and the Spanish Chambers of Commerce, among others) that have endorsed the suitability of this training modality, there are also a number of others that have raised concern that Spain’s implementation of this initiative is not being carried out as it should be, putting its success at risk.

There have been repeated concerns about a number of obstacles in the consolidation of dual VET in Spain, including: its financing, its adaptation to the needs of a crisis economy, the exporting of the German model without proper contextualization to the Spanish environment, the lack of regulatory specification, the opportunity of industry and the involvement of companies, the adaptation of the training on offer to industry requirements, the support of administrations, recognition of teachers involved, the educational centre-company coordination, the ability of dual VET to cover the entire

official curriculum, the sufficiency of physical and human resources, and the suitability of its governance model or the adequacy of guidance systems [30–39]. Another issue adding to these concerns is the regional powers that each of Spain's autonomous communities have with regard to educational matters when adopting measures within their respective educational systems, which has contributed to the simultaneous implementation of different models under the same legal framework.

This study aims to characterize, based on the experience of three education centres in the region of Andalusia (Spain), the implementation of the dual VET scheme in this Autonomous Community, identifying those key factors that condition the scheme's success and those that constitute the weaknesses of this educational modality. This study also aims to contribute to work carried out by Echeverría and Martínez-Clares [34] who have outlined those factors they consider necessary to guarantee the incorporation of dual VET in the educational system. This occurred from the perspective of sustainability by sharing experiences and generate empirical evidence to justify the suitability of this educational modality. We have included the feedback of teaching staff involved in the dual VET across different areas of responsibility (centre managers, project coordinators, staff responsible for monitoring the programme, and staff involved in teaching). We highlight those factors that they see as key to ensuring the sustainability and success of this VET modality in educational centres in Andalusia.

2. Theoretical Framework

2.1. Dual VET across Its International Development

Looking across the statistics of countries in the European Union in relation to vocational training, it is noteworthy to mention the disparity between the individual countries in relation to the number of students enrolled in this training modality. Germany, Austria, The Czech Republic, Slovakia, Slovenia, and Switzerland have high student uptake in comparison to other countries, including Spain, where there is a lower percentage of students enrolled in VET [28].

This disparity is even greater when internal comparisons are made in relation to curricular programs, and it is here that educational differences greatly increase depending on whether or not these programs involve split delivery between the education centre and the company [40].

At present, the dual VET scheme has a strong and long-standing history in European countries such as Germany, Switzerland, France, and the Netherlands, which are all countries where the number of students enrolled in a dual VET scheme constitutes a fairly high percentage of the total VET [40].

The educational framework that sustains this educational modality makes it a well-valued and internationally prestigious scheme [16,33]. As Alemán states [14,33], this interchange allows students to expand and consolidate in practice what they have learnt at the education centre under the prism of what Euler [15] calls the 'dual principle, and highlights the value of the development of a teaching-learning model that is systematised and founded on real-world theoretical-practical content, thus, integrating knowledge (cognitive, theoretical, reflective knowledge, etc.) with know-how (practical, pragmatic, instrumental knowledge, etc.).

The previously mentioned countries are seen as benchmarks for countries such as Spain or Portugal when implementing dual VET schemes, and the reasons for their successful implementation are indicated below [5,25,41,42].

- Germany: This country has been seen as the country of reference for dual VET since it was formally established in 1969. It proposes a curricular model where the content is defined at the state level and takes into account the contributions of institutions including the Federal Employment Agency, Chambers of Commerce, unions, and trade unions, providing it with a way of ensuring it has control of the training content. In this sense, dual VET schemes in Germany contributes to the training of quality professionals who are responsible and accountable for their positions. The training cycle spans between 2 and 3.5 years and, during this time, students are placed at a company (about 2/3 of their training takes place at the company)

through a selection process undertaken prior to enrolment, and given a dual VET contract that includes a salary.

- Switzerland: The key factor of dual VET in this country is the high involvement of the production and business fabric as well as many public institutions, together with a wide variety of educational gateways culminating in high levels of participation in the scheme. More than two-thirds of Swiss students are involved in this training modality. For companies, training students is seen as just one of their objectives, and their role also involves participating in the curricular design for related qualifications. The duration of this scheme in Switzerland ranges from 3 to 4 years, and the students are responsible for finding a company to undertake their training prior to enrolling. As in the German case, they also receive a salary. Many of the qualifications generated within the dual VET framework in Switzerland are related to occupations that require basic qualification levels, which makes the training contract more of a short-term opportunity, and students, following completion of the scheme, are required to find employment elsewhere. For this reason, Switzerland emphasizes the productive role of apprentices and this means that almost 90% of Swiss VET is a dual offering—a possible key to the low youth unemployment rate in this country.
- France: Dual VET in this country is developed within specific centres (Centers de Formation d'Apprentis (CFA)). Here, we find two training itineraries with two levels of specialization (Medium: 2 years and Superior: 3 years) where 60–75% of the training is carried out within the company. As in other reference countries, students who want to enrol in dual VET must find a company where they can develop their training and obtain an apprenticeship contract. Without this contract, they will not be able to formalize their enrolment at the CFA centre. This contract can be either an apprenticeship or professionalization contract and, as in other countries, they also receive a salary, which, in this case, evolves according to the student's age and year of training.
- The Netherlands: Dual VET in this country leads curricular innovation processes linked to VET, and is characterized as a modality that mobilizes more than 55% of all VET students, who can choose the dual pathway scheme through two routes: a dual VET pathway undertaken at a company where 60–70% training is done onsite, or a school-based itinerary with 25% of the curriculum development and training undertaken at the company. The duration of the training cycles ranges from 6 months to 4 years (with an average of 3 years) and, like previous models, the student receives a salary that is regulated by the collective agreements of reference professional sectors.
- Austria: Supply and demand drive the role of the Chamber of Commerce, weakening the role of this institution in this training modality and making the involvement of companies highly variable. The peculiarity of this modality in Austria is that teachers working within the dual VET scheme are required to have industry experience, which means that the business world gains much more prominence given that it is an essential requirement for the teacher to have worked in both industry and academia. In this country, duality occurs at a micropolitical level (in contrast to schemes in Germany) with supply and demand regulated by the laws of the market, adjusting the scheme to these. Here, the orientation provided to the students is key and the professional interests of the students are not as important as the production interests.

In general, pioneers of the dualisation of VET in these and other countries have a marked series of factors where other countries are using as a reference to successfully implement their dual VET schemes. Among these countries is Spain, which includes the contextual framework of reference in this study and is defined below as an emerging country in the development of this training modality.

2.2. Dual Vocational Training within Spain's Educational System: Current Situation

In recent decades, Spain's VET has advanced significantly, not only in terms of its social image but also in its consideration as an option for post-compulsory studies [10]. On the other hand, as stated by Moso [43] (p. 11), the premise that professional training is a fundamental part of the educational system to generate talent and technology, key outcomes of these schemes has been

increasingly consolidated for the competitiveness of companies in the context of Industry 4.0. Contrastingly, and as the prospective studies of the European Centre for the Development of Vocational Training point out [44] between 2018 and 2030, 65% of all jobs that are generated in Spain will require professionals with an intermediate level qualification (Intermediate VET) while the remaining 35% will require higher qualifications (Higher Degree VET and university studies). Additionally, more technical profiles, including those with STEAM training (Science, Technology, Engineering, Mathematics, and Arts and Design), will be required. Prospective studies will need to be realigned with the new economic and employment outlook resulting from the COVID-19 health crisis.

There have been many efforts made across various sectors to consolidate the VET system in Spain including its first normative regulation known as the General Law of Education in the 1970s [45] in which it was given a marked compensatory nature to the latest reforms introduced in the Organic Law for the Improvement of Educational Quality (LOMCE) of 2013 [46], which proposes the VET system as a solution for school dropout and youth unemployment rates.

VET in Spain (and the dual VET offering) is structured into professional disciplines (related to specific industry types) and within these are training cycles, the content of which are organized into professional modules of theoretical-practical knowledge depending on the industry sector and aligned with both competence units in the National Catalogue of Professional Qualifications [47] and with industry modules not associated with said units. As established in Royal Decree 1538/2006 [48] for VET and in RD 1529/2012 [29] for dual VET, these qualifications must respond to the professional profiles of industry requirements and should relate to the needs of the work activity it is providing training for. These units provide students with the necessary professional skills that respond to the requirements of various sectors and an understanding of their specific professional context, adjusting the design and offering these cycles to industry demands and specific geographical areas. The VET title officially accredits, recognised by the state, the qualifications and competencies of each training cycle.

Next, the model of the Spanish and Andalusian educational system is shown to facilitate the understanding of the place of VET in this country (Figure 1).

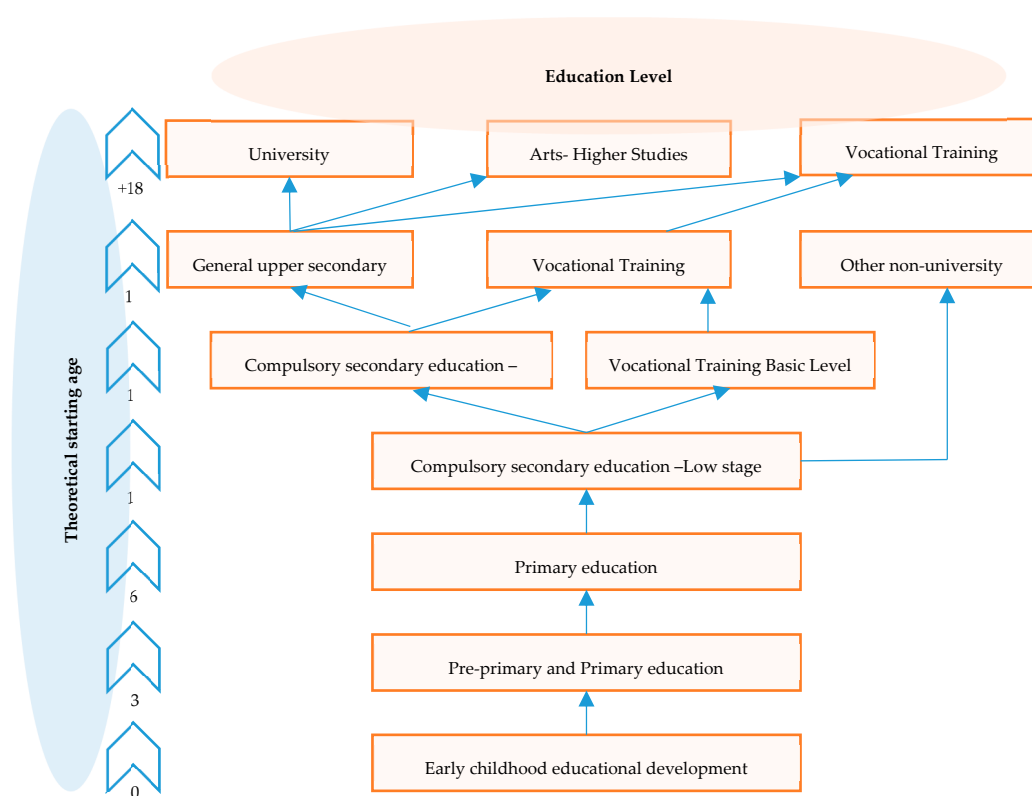


Figure 1. Spain and Andalusia Educational system. Own elaboration. (Source: Organisation for Economic Co-operation and Development, OECD, 2020) [49].

The design and approval of the minimum teaching content for each training cycle (between 55% to 65% of all content) is the responsibility of the central government, leaving the adaptations of the curriculum that respond to regional socio-productive and educational environments to regional regulations.

As stated previously, 2012 saw the incorporation of the dual VET into the Spanish educational system within the scope of the Initial VET Programme. This training modality is characterized by the alternation between the two training environments: the educational centre and the company.

There are two differentiating aspects between this and other VET programmes: the duration of the training being provided by the companies, which must be at least 33% of the total VET training cycle (dual VET has this requirement as well), and the purpose of the training that students receive while at the company. Therefore, it is not just a matter of putting what they have learned at the educational centre into practice, but rather to continue with their training while at the company in a practical way.

It is a training model that requires the company to be both fully committed and involved to ensure success. This has been a prominent aspect in the *First Strategic Plan for Professional Training of the Spanish Educational System 2019–2022* [50], which highlights the need to attract committed companies to dual VET, turning training into a sector of sustainable innovation and development, making their participation simple and attractive. For this, administrations must think of 'flexible formulas that allow the incorporation of dual VET to small and medium-sized companies through the constitution of consortia or other formulas to be analysed with industry and union representatives, in addition to all other Educational Administration areas [50] (p. 37).

The educational administrations of the 17 autonomous communities that make up Spain's state structure have developed complementary regulations through which it regulates the regional dual training offerings, adaptations of the curriculum to the educational context, the socio-productive environments, and the development modalities of the educational dual project.

The outlook for VET in Spain, specifically for dual VET, is optimistic. Since its incorporation into the Spanish VET system, dual VET has been a political and strategic priority for central and regional governments. The national and regional strategies for Intelligent Specialization in Research and Innovation (RIS3 strategies) [51] consider dual VET as well as its promotion and support to be some of their strategic axes. The last two previously mentioned national plans approved in 2020 [50,52] point in the same direction in terms of securing the success of the dual VET in Spain. They have specific financing norms, ensuring the scope of dual VET is expanded across the entire national territory (rural and urban), committing industry sectors to these training schemes, and bringing the offering closer to industry [50].

2.3. Dual VET from a Sustainability Perspective: Debates and Controversies

There have been many debates about dual training schemes and their implementation in Spain. One of the most common relates to the adoption of the German model. Among the social, economic, and educational differences between these two countries, the financing of the model is an area that will have a significant impact on its sustainability. As Echeverría points out [12,37], in Germany, it is the company that bears the majority of costs associated with dual VET, and around 70% of the expenses are borne by the participating companies (social insurance, tutor and student salaries, expenses derived from carrying out workshops or training sessions at the company, etc.). The remaining 30% of costs are distributed among the different state's public administrations. In addition, Germany allocates approximately 7% of the country's educational budget to this training.

In Spain, six of its 17 autonomous communities are providing financial assistance to companies to offset expenses resulting from this training and only four have specific funds earmarked for dual VET. In Spain, companies are not financially co-responsible for this training modality, and there are no proposals being put forward to change this within the regulatory framework. As noted by Vila & Chisvert [35] (p. 131), the absence of references to financing in most of the regulations suggests that commitment to this type of training seems to be improvised, carried out hastily by the Government

and imposed by the different administrations as a public relations mechanism rather than as a real stake in improving employability and the productive fabric.

Another issue that generates debate and conflicting positions relates to the motivation behind incorporating the dual VET into Spain's current Initial VET System. In this sense, the argument given by Marhuenda, Gisvert, and Palomares [39] stands out where the authors claim that this incorporation does not stem from a business demand or from a system deficiency. However, in their view, the companies were not demanding a reform of the VET but rather improvements to the agility of the processes and its coordination.

The regulatory framework underpinning this training is the subject of a double debate—first ambiguity, and, second, the suitability of unifying the dual VET regulations at a national level to ensure a common single model exists rather than a different model in each autonomous community. Thus, as Echeverría and Martínez-Clares [34] (p. 190) point out, it is necessary to have a clear, coherent, and consistent legal framework, which allows the agents involved to not only act effectively but also guarantee mutual rights and responsibilities. As Bentolila and Jansen [32] indicate, current regulations do not regulate many important aspects including the role of the company's tutor, the remuneration of students, their contractual situation, and the dual training scheme, the obligations of participating companies, and the benefit of the scheme for them.

Although it is true that each autonomous region established dual VET based on two ministerial normative references—RD 1529/2012 [29] and the Organic Law for the Improvement of Educational Quality (LOMCE) of 2013 [46] where the latest reform VET is incorporated—the regional contextualization of dual VET has resulted in dual training programmes with differentiating characteristics.

Although all of the autonomous communities involved in the dual training projects across Spain have considered the alternation between the educational centre and the company, when we look at specific aspects including company involvement, the formalisation of a student's time at a company, remuneration, or the organisation of the division of time between education and training, as indicated by the CEDEFOP [44], we can identify three different scenarios in Spain (Table 1).

Table 1. Scenarios of dual VET in Spain.

Dual Professional Training in Spain		
Scenario 1	Scenario 2	Scenario 3
Dual VET is centre-based. The student has a work contract and the alternation is organized in short periods. This is the model that the community of the Basque Country has chosen.	A scenario similar to the previous one, although without a contract, but with a scholarship (although not always). This is the case, although with minimal differences, in communities such as Catalonia, La Rioja, or Andalusia.	A dual VET based on the company, without a contract and with the alternation defined in two phases (first year in the centre and second in the company) This is the model that the Community of Madrid has chosen).

Source: Own elaboration.

Currently, the ministerial commitment to dual VET regulations is to have a common regulatory framework for dual VET, as indicated in the *First Strategic Plan for Professional Training of the Educational System 2019–2022* [50], the accumulated experience advises, and the Organic Law of Education obliges, which is the establishment of a common regulatory framework for dual training [50] (p. 36).

The advantages that companies have when participating in this training is another subject for discussion and debate. Despite the interest shown by these business organizations and the importance of their involvement in this model to guarantee its sustainability and success, there are many obstacles these organizations face including (but not limited to): the bureaucracy and

complexity of some administrative and training tasks, the lack of support from the administration, the complexity of the governance models, the inflexibility of the training structure, the lack of tax incentives, and the heterogeneity of the dual VET legal framework in many autonomous communities [33,37–39,53–56].

For Pineda-Herrero, Ciraso-Calí, and Arnau-Sabatés [10] (p. 19), the advantages that their participation in dual VET schemes entail for companies are defined in terms of economic benefits and efficiency in the recruitment process as well as improving their image and reputation by linking dual VET with the corporate accountability of the organization. According to these authors, dual VET offers companies five great advantages: 1. an in-depth understanding of the apprentices, their willingness to learn, responsibility or capacity for teamwork, 2. ability to train students in both the curriculum and in the culture of the company, 3. creation of a pool of candidates, 4. chance to retain students and create sense of company loyalty once they have completed the training, and 5. opportunity to ensure generational succession planning.

2.4. Dual VET in the Autonomous Community of Andalusia

The dual VET scheme was launched experimentally in the Andalusian autonomous community in the 2013–2014 academic year and, since then, it has been increasingly present in the Andalusian political, educational, and business scenes as a measure that looks to alleviate the youth unemployment situation. As the European Commission [57] points out, the economic crisis of 2007 contributed to 55.5% of young Spaniards aged between 15 and 24 (66% in the Andalusian region) being unemployed in 2013.

The Andalusian Government's commitment to dual training responds to one of the priority lines established in the 2020 *Andalusian Smart Specialization Strategy* [51] drawn up within the framework of the European Union Regulation 1301/2013 of the European Parliament and of the Council of 17 December 2013 [58].

From its inception, dual VET in Andalusia has been structured into training projects that have been designed by educational centres in collaboration with industry, and is then submitted for accreditation or renewal to the Andalusian government's annual call based on norms established in RD1529/2012 [29]. These projects are developed within the Basic, Intermediate, and Higher-level VET Training Cycles, as dual training positions across the entire programme.

The dual VET project outlines those activities that will be delivered at both the educational centre and at the company. These projects must be aligned with the socioeconomic and business environments of the educational centre in which they are developed as well as to those industries with greater employment opportunities in the future of work. This alignment ensures the sustainability of the model and the development of entrepreneurial initiatives for youth labour development, which are issues addressed in the SDGs mentioned above. This sustainable modelling of dual VET is also related to Education for Sustainability, which, among other principles, is based on the idea of training highly qualified professionals and responsible citizens, who combine theoretical and practical knowledge, and who are constantly adapting to the current and future needs of society. Theoretical knowledge, skills, and behavioural processes that are flexible, transferable, and versatile become tools for encouraging new learning processes and not as fixed knowledge to turn to [59].

Each position at a given company aligns with a study program that details the activities that students will undertake, their duration, and the evaluation criteria used to assess their undertaking of these. The duration of dual VET projects must be adapted to the relevant Training Cycle—that is 2000 h—which, in the Andalusian Community, involves two academic years.

The commitment of Andalusia's successive governments to this dual VET system has been very high. Since its launch in the 2013–2014 academic year, dual VET in Andalusia has grown annually. As can be seen in the following table (Table 2), it has gone from 12 projects, 207 students, 10 educational centres, and 87 companies in the 2013/2014 academic year to 528 projects, 6750 students, 259 educational centres, and 4725 companies in the last academic year (2019/2020).

Table 2. Offer in the Andalusian dual VET.

Course	Projects (New and Renovated)	Students	Schools	Companies
2013–2014	12	207	10	87
2014–2015	41	536	26	273
2015–2016	110	1512	76	1053
2016–2017	194	2293	120	1543
2017–2018	323	4451	168	2832
2018–2019	408	6118	203	3282
2019–2020	528	6450	259	4725

Source: Own elaboration based on data from the Regional Government of Andalusia (Education Department) (2020) [60].

During the 2018–2019 academic year, in which the information for this study was collected, a total of 408 of the 446 presented dual projects (including both new and renewed projects) were approved by the Regional Government of Andalusia (*Junta de Andalucía*). During this year, there was an increase of 28.04% for approved dual VET projects with respect to the previous academic year of which practically half of all projects (207 projects) relate to the public education sector.

During the 2019–2020 academic year, the number of dual VET projects increased by 29.4%, that is, 120 more than the previous academic year. The participation of companies grew by 43.9%, the number of training positions at companies or entities increased from 3282 to 4725, and the number of students grew by 5.4%.

At present, according to data from the Department of Education [60], the cycles with dual places in Andalusia address 23 of the 26 professional disciplines included in the National Catalogue of Professional Qualifications [47]. The professional disciplines that are not represented in the dual offerings in Andalusia are those related to Glass and Ceramics, Arts and Crafts, and Image and Sound.

As shown in the following table (Table 3), the professional disciplines with the most dual projects in the last three years in Andalusia are Administration and Management (with 166 projects), which is followed by Sociocultural and Community Services (128). The professional disciplines with the lowest representation in the Andalusian dual offering are Energy and Water, Extractive Industries, Textile, Clothing and Leather, and Maritime-Fishing sector.

Table 3. Dual projects (new and renovated) grouped by a professional family in Andalusia.

Professional Family	2017/2018	2018/2019	2019/2020
Physical and sports activities	7	3	8
Administration and management	50	52	64
Agrarian	20	24	44
Graphic arts	5	3	4
Trade and marketing	39	43	52
Building and civil works	9	12	17
Electricity and electronic	25	29	36
Energy and water	0	1	2
Mechanical manufacturing	14	17	25
Hostel and tourism	14	15	17
Imagen personal	7	8	10
Food industries	10	12	19
Extractive industries	1	1	2
IT and communications	18	28	33
Installation and maintenance	14	17	16
Wood, furniture, and cork	4	4	6
Maritime-fishing	2	2	3

Chemistry	6	6	4
Health	20	28	32
Sociocultural and community services	34	41	53
Textile, clothing, and leather	2	2	2
Transportation and maintenance of vehicles	22	27	34

Source: Own elaboration based on data from the Andalusian Government (Education Department) (2020) [60].

According to data published by the Department of Education of the Andalusian Public Administration, of the eight provinces that make up the Andalusian Autonomous Community, Seville is the most participatory province (with 334 projects), which is followed by Malaga, Cordoba, and Cadiz. Granada, the province in which this study is contextualised, is the fifth ranking province in terms of dual training offerings (Table 4).

Table 4. Andalusian dual offer.

Course	Andalusian Provinces							
	Almeria	Cadiz	Cordoba	Granada	Huelva	Jaen	Malaga	Seville
2013–2014	3	2		3	1			2
2014–2015	3	11	1	11	1	2	1	11
2015–2016	10	29	15	20	4	9	13	19
2016–2017	9	33	30	31	11	19	28	33
2017–2018	16	45	50	40	18	27	55	70
2018–2019	16	55	52	38	23	31	71	89
2019–2020	28	74	68	51	31	40	84	110
Total	85	249	216	194	89	128	252	334

Source: Own elaboration based on data from the Andalusian Government (Education Department) (2020) [60].

2.5. Dual VET in Granada

Granada's population is around 235,000 inhabitants with about 8% being foreigners residing in this province and the majority from Morocco. Approximately 20% of the population is aged under 20 and its unemployment rate is 23.20% [61].

Granada is the fourth largest Andalusian province in a geographical extension.

As with all other provinces, dual VET has been growing from the outset, increasing from 4 projects, 67 students, 3 educational centres, and 21 companies involved in the 2013/2014 academic year to 51 projects (new and renewed), 674 students, 25 educational centres, and 412 companies in 2019/20 (Table 5).

Table 5. Dual offer in Granada.

Course	Projects	Students	Schools	Companies
2013	3	67	3	14
2014	11	251	6	195
2015	20	227	9	173
2016	31	443	16	262
2017	40	628	20	444
2018	36	365	18	468
2019	51	674	25	412

Source: Own elaboration based on data from the Andalusian Government (Education Department) (2020) [51].

Unlike the majority of provinces in Andalusia, in the province of Granada, Higher Degree dual training projects predominate with respect to those of an intermediate level and basic training (Figure 2).

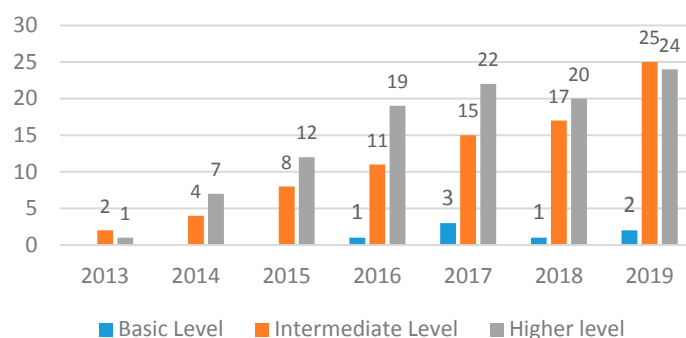


Figure 2. Dual offer in Granada according to educational level. Source: Own elaboration based on data from the Andalusian Government (Education Department) (2020) [60].

The training cycles for dual training in Granada are grouped into 17 professional disciplines, which is six less than the 23 offered in the rest of Andalusia. As shown in Table 6, the professional disciplines with the most projects in this province, and in the last three academic years, are Administration and Management (25), Health (23), and Commerce and Marketing (21).

Table 6. Dual projects (new and renovated) grouped by professional family in Granada.

Professional Family	2013	2014	2015	2016	2017	2018	2019	Projects (TOTAL)
Physical and sports activities				1	1	1	1	4
Administration and management	1	2	3	2	4	5	8	25
Agrarian		1	1	1	2		6	11
Graphic arts				1	2	2	1	6
Commerce and marketing				5	5	5	6	21
Building and civil works		1	3	4	3		1	12
Electricity and electronic		1	3	3	3	5	3	18
Energy and water				1			1	1
Mechanical manufacturing								0
Hostel and tourism					2		1	3
Imagen personal		1	1	1	1	1	1	6
Food industries				1	2	2	2	7
Extractive industries								0
IT and communications		1	1	1	1	1	2	7
Installation and maintenance	1		1	2	3	3	3	13
Wood, furniture, and cork								0
Maritime-fishing								0
Chemistry	1	1	2	2	3	3	3	15
Health		1	3	3	4	6	6	23
Security and environment								0
Sociocultural and community services		1	1	2	3	3	3	13
Textile, clothing, and leather								0
Transportation and maintenance of vehicles		1	1	2	3	3	3	13

Source: Own elaboration based on data from the Andalusian Government (Education Department) (2020) [60].

3. Materials and Methods

This descriptive study has been carried out in line with a complementary methodological perspective. Addressing the complexity of this research topic forces us to work from a mixed methodology (quantitative and qualitative) betting on a process of triangulation of information that helps to understand the subject studied in greater depth [62].

Specifically, this research is considered to be an evaluative research (diagnostic evaluation) based on case studies. This allows us to go beyond data collection and investigate the problem at different levels of depth in order to improve the initial reality from the principles of sustainability [63,64].

This diagnosis will allow us to identify the deficiencies and weaknesses of Dual VET in the study context and will determine proposals for improvement in order to strengthen the dual VET scheme in this context. Hence, the suitability and relevance of this type of methodology takes into account the object and aims of this research.

The contextualization of this research to three Secondary Education High Schools in Granada, which is a capital city with a record of accomplishment for dual VET, the information gained from these scenarios and the unique educational situations of these institutions are all factors that have shaped the direction of this study from a methodological perspective. With this approach, we address 'the study of the particularity and complexity of a singular case in order to understand its activity in important circumstances' [65] (p. 11).

3.1. Description of the Participating Educational Centres

As Muñiz [66] along with Wood and Smith [67] suggest, when the case study is a technique for collecting information and is part of the selection of the sample, it is necessary to explain the selection of these cases to understand the interest that they pose and the reasons that have led to their selection. In this study, the selected cases represent the most prevalent types of educational centres in the capital of Granada and across Andalusia with one public educational institution and two private institutions (in this case, one is a religious school while the other is secular, and all three are charter schools). These are three large educational centres located in the capital city. They have extensive experience in VET and have been participating in dual VET from its inception in this autonomous community.

Table 7 provides information about dual VET participation at these centres in the 2018–2019 academic year, which is the year when the information used in this study was collected.

Table 7. Dual offer of the educational centres participating in the study (Curse 2018/2019).

Case	Professional Family	Training Cycles with Dual Projects	Educational Level	Dual Students (First and Second Academic Year)
Educational Centre 1: Public	Chemistry Trade and marketing	Laboratory of Analysis and Quality Control Commercial activities	Intermediate Level	51
		Manufacture of Pharmaceutical, Biotechnological, and related Products	Higher Level	
Educational Centre 2: Private, secular, concerted teaching	Health Chemistry	Pharmacy and Parapharmacy Laboratory operations	Intermediate Level	8
Educational Centre 3: Private, religious, concerted teaching	Electricity and electronic Administration and management Graphic arts	Digital prepress Commercial activities	Intermediate Level	28
		Automation and industrial robotics	Higher Level	

Trade and marketing	Administration and finance Design and edition of printed and multimedia publications
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Source: Own elaboration based on data from the Andalusian Government (Education Department) and the data provided by the management teams of the centres interviewed [68,69].

3.2. Characterisation of the Sample

A total of 97 VET teachers (36.1%), and female teachers (63%) participated in this study. In addition, 72.2% had taught into dual VET previously. The teaching experience for half of these teachers ranged from between 1 and 5 years (26.8%), and between 11 and 20 years (24.7%). Only 14.4% have more than 30 years' teaching experience.

The type of teaching staff is characterised by an interest in life-long learning. When asked about their own training, 90.7% of these teaching staff participate in training activities. Of those surveyed, 74.2% have previous professional experience and 25.8% have professional relationships with industry and 31.1% have worked at a private company in the last 10 years.

72.2% of the participants worked at a private educational centre (charter schools) while the remaining 27.8% worked at the only public educational institution in the sample. The vast majority of these teachers have a degree related to their teaching activity, while only 2.1% hold VET qualifications.

The different roles established in the regulations regarding dual VET at educational centres are present in the three institutions that are the object of this study. 79.4% of the participants did not hold management positions related to dual VET. The following table (Table 8) lists the different profiles.

Table 8. Profile of the surveyed teaching staff and their relationship with dual VET.

Profile	Total Number	Percentage (%)
Management team member	7	7.2
Dual VET Coordinator	8	8.2
Responsible for company coordination (monitoring)	5	5.2
Centre tutor	19	19.6
Teacher	32	33.0
None (currently)	26	26.8
Total	97	100.00

Source: Own elaboration based on data provided by the management teams of the centres interviewed.

3.3. Information Collection Strategy and Quality Criteria

Two strategies have been used to collect information: a questionnaire and the SWOT technique.

3.3.1. Questionnaire

We used an online questionnaire that was focused on the educational agents involved in dual VET at the three participating educational centres (hereinafter, the CAEI Questionnaire). This questionnaire is structured into three parts.

- In the first part, we have those incorporated independent variables necessary to be able to identify the participating subjects and understand their professional relationship and knowledge of dual VET: type of educational centre (public-private), discipline knowledge (science-technology-services), management position (yes-no), gender (male-female), and knowledge of dual VET (in-depth basic).
- The second part consisted of two ranking scales through which we collect the teachers' opinions regarding the obstacles that dual VET faced at their respective educational centres (first scale with 18 items and three response alternatives: -1: Hinders implementation, 0: Does not influence

implementation, +1: Helps implementation), while the second scale with 19 items was about this training modality in general (this scale was a 4-point Likert scale ranging from 1: Totally Agree to 4: Totally Disagree).

3.3.2. SWOT Technique

Concerning to the Strengths, Weaknesses, Opportunities and Threats (SWOT technique), these has been provided to the participants in the study together with the questionnaire. Through open-ended questions, the respondents gave their opinion about any internal and external factors that could be seen as weaknesses, strengths, threats, and opportunities for dual VET. This work will only focus on an analysis of any factors listed in the section weaknesses.

Both data collection strategies have been designed ad hoc with questions relevant to the purpose of the study.

For the design of the instruments, the theoretical framework previously exposed has been taken as a reference and responds to the research topic, which makes it suitable for this exploratory study that we propose in this research.

3.4. Quantitative and Qualitative Analysis Procedures and Techniques

As Wood and Smith [67] (p. 80) lay out, case studies focus on depth as opposed to range, which is a fact that can lead to a large volume of data if done well. Analysing and interpreting this amount of data effectively can be time-consuming. Although this work responds to the previously mentioned objectives, focusing on an analysis of the opinions contributed by the participating teachers in the CAEI Questionnaire, the analyses that we present are complemented with references to the contributions made by the respondents in the initial cycle of interviews using the SWOT technique.

3.4.1. Quantitative Analysis: Questionnaire

The two aspects on which we have based the quality of this questionnaire have been the reliability of the data, and the validity of the content and of the construct.

Regarding the reliability of the data, we have calculated the Cronbach's Alpha value (Table 9) on the two sets of the questionnaire. We highlight that the value of this is quite acceptable, and, in both cases, the values reached are close to 0.90 points.

Table 9. Cronbach's Alpha Coefficient of the questionnaire batteries of this study.

	Cronbach's Alpha	Items (Number)
Scale 1	896 *	18
Scale 2	900 *	19

* high significance close to value 1.

Additionally, a review of the documentation used (regulations, reports, and scientific production) and the opinions of a group of experts on this subject have allowed us to confirm the validity of the content of the CAEI Questionnaire.

For the analysis of the construct validity of the two scales used, a Maximum Likelihood Factor Analysis with Kaiser Varimax Rotation with a goodness-of-fit has been carried out for the two highly significant scales with fairly consistent factorial solutions whose results are shown below (Tables 10 and 11).

Table 10. Goodness-of-fit test scale 1.

Goodness-of-Fit Test Scale 1		
Chi-squared	DF.	Significance
167.553	102	000 *

* significance close to 0.000.

Table 11. Goodness-of-fit test scale 2.

Goodness-of-Fit Test Scale 2		
Chi-squared	DF.	Significance
164.678	117	002 *

* significance close to 0.000.

On the other hand, a diagonal test of the anti-image correlation matrix has been carried out to inform decisions about which items were used in the factorial analysis. All the items of both scales have obtained values >0.5 , which also supports the application of factor analysis, with the results as detailed below.

- **Scale 1.**

After undertaking the Kaiser-Meyer-Olkin (KMO) test with a value of 0.789 points and sampling adequacy and Barlett's sphericity test with a Chi-square value of 64.86 points the conclusion was that it is appropriate and pertinent to carry out the factor analysis for this scale (Table 12).

Table 12. Kaiser-Meyer-Olkin and Barlett test. Scale 1.

KMO and Bartlett Test		
Kaiser-Meyer-Olkin measure of sampling adequacy		789 *
Bartlett's test of sphericity	Approximate Chi-square	64.86
	DF.	153
	Sig.	000

* high significance close to value 1.

Scale 1, after factor extraction and rotation, explains a total of 49.5% of the variance for three factors, being visually evident in the associated sedimentation graph (Figure 3), taking a Labda eigenvalue standard as a cut-off point greater than 1 ($\lambda > 1$). Table 13 shows the rotated factorial solution that shows highly satisfactory results of simplicity and parsimony in the grouping of variables in each of the factors with some factorial loads with negative sign items, whose increase or decrease is inverse to the direction of the other items that load in the same factor.

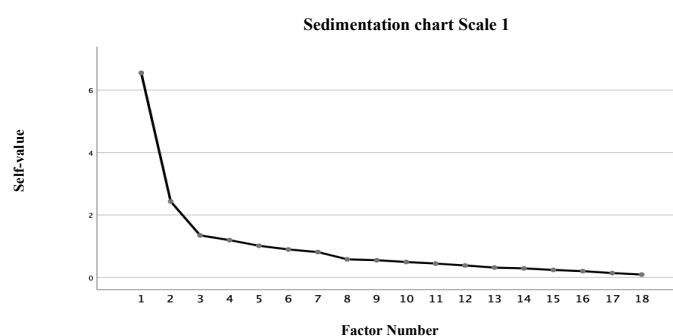
**Figure 3.** Sedimentation chart scale 1.

Table 13. Scale 1. Factorial validity of the instrument through a Maximum Likelihood. Kaiser Varimax rotation.

Determinants in the Implementation and Success of DT in the Centre	Communality	Rotated Factor Matrix ^a		
		1	2	3
The current regulations governing dual VET	752	084	845	177
The role played by the administration	540	013	734	042
The resources assigned by the Administration to the centre for the implementation of this VET modality	549	153	695	208
Dual-VET's ability to cover the official curriculum	336	494	283	109
The consensus of the contents with the company	606	752	190	059
The administrative recognition of the coordinator of the centre	779	043	311	824
The administrative recognition of the tutor of the centre	921	157	316	893
Work in coordination with the company	465	641	126	195
The training and didactic and pedagogical capacity of the company tutor	561	671	139	304
The available socio-economic and business environment	470	522	343	283
The network of contacts that the centre maintains with the surrounding companies	328	572	030	022
The role played by macro-business organizations (chambers of commerce, confederations, business associations)	377	298	468	264
The tax advantages of companies for participating in dual VET	397	297	515	208
The information that companies have about dual VET	421	440	409	246
The duration of the stay in the company	346	566	145	067
The lack of homogeneity regarding the financing or economic compensation to alternate students	420	294	506	278
The current system for selecting students for this training modality	336	567	112	040
Student motivation	304	546	045	−058
Self-value		6.56	2.43	1.35
% Variance		36.38	13.52	7.49
% Accumulated		36.38	49.90	57.39
Sum of loads to square after rotation (% variance)		20.70	17.47	11.33
Sum of loads to square after rotation (% accumulated)		20.70	38.17	49.50

Extraction method: maximum likelihood. Rotation method: Varimax with Kaiser normalization. ^a The rotation has converged in five iterations.

From this analysis, we can identify three clearly differentiated factors or dimensions.

- Factor 1. Dual VET Governance Model in Andalusia (GM-S1): 10 items related to the management model built into dual VET in this autonomous community load on this factor.
- Factor 2. External conditioning factors for the sustainable implementation of dual VET in Andalusia (EF-S1). This factor is represented by six items that expose those elements that condition, from the respondents' perspective, the implementation of dual VET in Andalusia when considering sustainability.
- Factor 3. Recognition of the educational agents involved in the implementation of dual VET (RA-S1). This is explained by two items that refer to the recognition that, from the perspective of the respondents, educational agents receive for their participation in the dual VET scheme in Andalusia.
- **Scale 2**

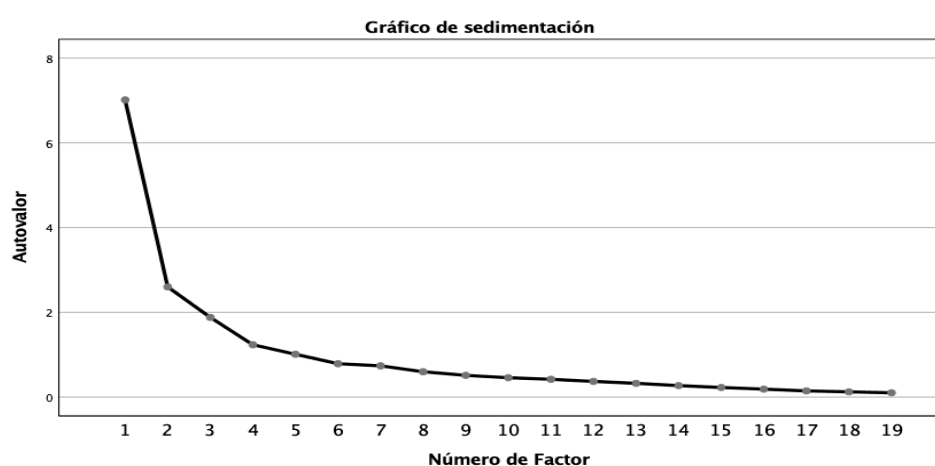
After performing the Kaiser-Meyer-Olkin test with a value of 0.816, points and the sampling adequacy and Barlett's sphericity test with a Chi-square value of 698.783 points (Table 14), a conclusion was reached confirming that it is appropriate and pertinent to carry out the factor analysis for this scale.

Table 14. Kaiser-Meyer-Olkin and Bartlett test. Scale 2.

KMO and Bartlett Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.816 *
Bartlett's test of sphericity	Approximate Chi-square	698.783
	DF	153
	0.000	0.000

* high significance close to a value of 1.

Scale 2, after factor extraction and rotation, explains a total of 53.17% of the variance for three factors, which is visually evident in the associated sedimentation graph (Figure 4), taking a standard Labda eigenvalue greater than 1 ($\lambda > 1$) as the cut-off point for their selection of factors. Table 15 shows the rotated factorial solution indicating highly satisfactory results, as with the previous scale.

**Figure 4.** Sedimentation chart. Scale 2.**Table 15.** Scale 2. Factorial validity of the instrument through a maximum likelihood. Kaiser Varimax rotation.

Degree of Agreement with the Statements	Communality	Rotated Factor Matrix ^a		
		1	2	3
Implementing dual VET in the centre implies greater complexity in its organization and management	0.606	0.690	0.249	0.262
With dual VET, the image and external projection of the educational centre is improved	0.733	0.401	−0.034	0.756
One of the benefits of dual VET is that it forces teachers to keep up to date with the latest technical and professional advances and innovations	0.371	0.258	−0.055	0.549
It implies the reduction of teaching hours, which can translate into a loss of teaching staff	0.143	0.043	0.222	0.304
It involves an added workload for teachers	0.856	0.896	0.096	0.209
The management and supervision of dual VET takes more dedication than non-dual training	0.808	0.844	0.185	0.250
The task as dual VET coordinator or tutor is not recognized	0.521	0.692	0.185	0.094
It is very difficult to have dual VET students and non-dual students in the same group	0.557	0.658	0.298	0.188

It is difficult for me to adapt to the changes in the schedules implied by dual VET	0.498	0.485	0.499	−0.119
It is difficult for me to adapt to the changes in the training program that dual VET implies	0.607	0.404	0.666	−0.024
Dual VET is the same as non-dual training but with more hours of internships	0.424	0.013	0.587	0.283
Dual VET does not cover the official curriculum	0.539	0.184	0.710	−0.014
Students lose training content necessary to complete their professional training	0.645	0.219	0.770	−0.071
There are training contents of the curriculum that are not worked on in the company	0.514	0.556	0.449	0.052
Through dual VET, students improve their skills and job placement	0.632	0.467	−0.061	0.640
With dual training companies being given too much prominence in VET	0.537	0.036	0.615	0.397
The company uses dual VET to train its specialists and not professionals in the sector	0.392	0.332	0.526	0.070
Lack of didactic qualification on the part of the company tutor	0.395	0.140	0.593	0.154
The stay in the company is too short	0.323	−0.090	0.246	0.504
Self-value		7.01	2.60	1.88
% Variance		36.92	13.68	9.90
% Accumulated		36.92	50.60	60.50
Sum of loads to square after rotation (% variance)		33.57	46.01	53.17
Sum of loads to square after rotation (% accumulated)		22.51	41.92	53.17

Extraction method: maximum likelihood. Rotation method: Varimax with Kaiser normalization. ^a The rotation has converged in five iterations.

In this case, this scale is grouped into three well-differentiated factors.

- Factor 1. Model of governance in the dual VET (GM-S2). This factor is defined by six items that show, from the respondents' perspectives, the current situation of dual VET in relation to its management and governance.
- Factor 2. Curricular model in dual VET (CM-S2). This is defined by eight items that show, from the perspective of the participants, how dual VET is implemented at a curricular level, and the role of the different agents involved in the process.
- Factor 3. Results and impact of dual VET (RI-S2). There are five items that are grouped into this factor that highlight the perception of the respondents regarding the results and impacts of the dual VET model since its implementation in Spain.

Regarding the analyses, descriptive statistical analyses (percentages, sum, mean, and standard deviation) have been carried out to identify the aspects that, according to the surveyed teachers, hinder or help in the development of dual VET as well as the perception these respondents have with regard to the implementation of this model, and non-parametric contrast tests (U of Mann-Whitney and Kruskal Wallis test) based on the three factors identified in each scale to see the loads and correlation of each one of these factors with the most outstanding descriptive variables in the questionnaire: type of educational centre (public-private), discipline knowledge (science-technology-services), management position (yes-no), gender (male-female), and knowledge of dual VET (in-depth-basic).

3.4.2. Qualitative Analysis: SWOT Technique

The process followed for the analysis of the qualitative information collected using the SWOT technique has followed the system proposed by Miles, Huberman, and Saldaña [70] who maintain the three tasks proposed by Miles and Huberman in 1994 [71] (and reproduced in the majority of studies that work with qualitative data), even though we have modified the names of some activities. This analysis methodology favours compliance with the quality criteria established for qualitative information: credibility (internal validity), transferability (external validity), dependence (reliability), and confirmability (objectivity) [72].

Likewise, we have taken into account the contributions of authors such as Bernard and Ryan [73] and Spencer, Ritchie, Ormston, O'Connor, and Barnard [74] who insist on the need to clarify and make explicit the process followed as a strategy in order to ensure its quality. Although this article focuses exclusively on the internal factors that pose weaknesses for dual VET below, we explain the process followed for the analysis of all the qualitative contributions of the respondents using the SWOT technique.

The analysis has been carried out from a dual approach and through two phases. Thus, from an interpretive approach, the analysis process begun with a detailed reading of all the information, which has allowed us to clean up the texts, eliminate unnecessary and repetitive terms, and, above all, take a global perspective of meaning and scope from the contributions to these large dimensions. This first reading has allowed us to identify four overall categories of analysis around which all contributions revolved: (1) training model, (2) educational centre, (3) company, and (4) agents involved.

The second reading of the contributions has allowed us to identify some possible subcategories of analysis within these categories, whose consolidation has been achieved after the open coding of the information.

The inductive construction of this category system has not been without obstacles. Managing to include all the relevant contributions in the categorisation has been the most complex. In this case, the system itself is a product of the analysis. Figure 5, by following the logic proposed by Martínez García, Padilla Carmona, and Suárez Ortega [75], shows the content of the categories that make up this system.

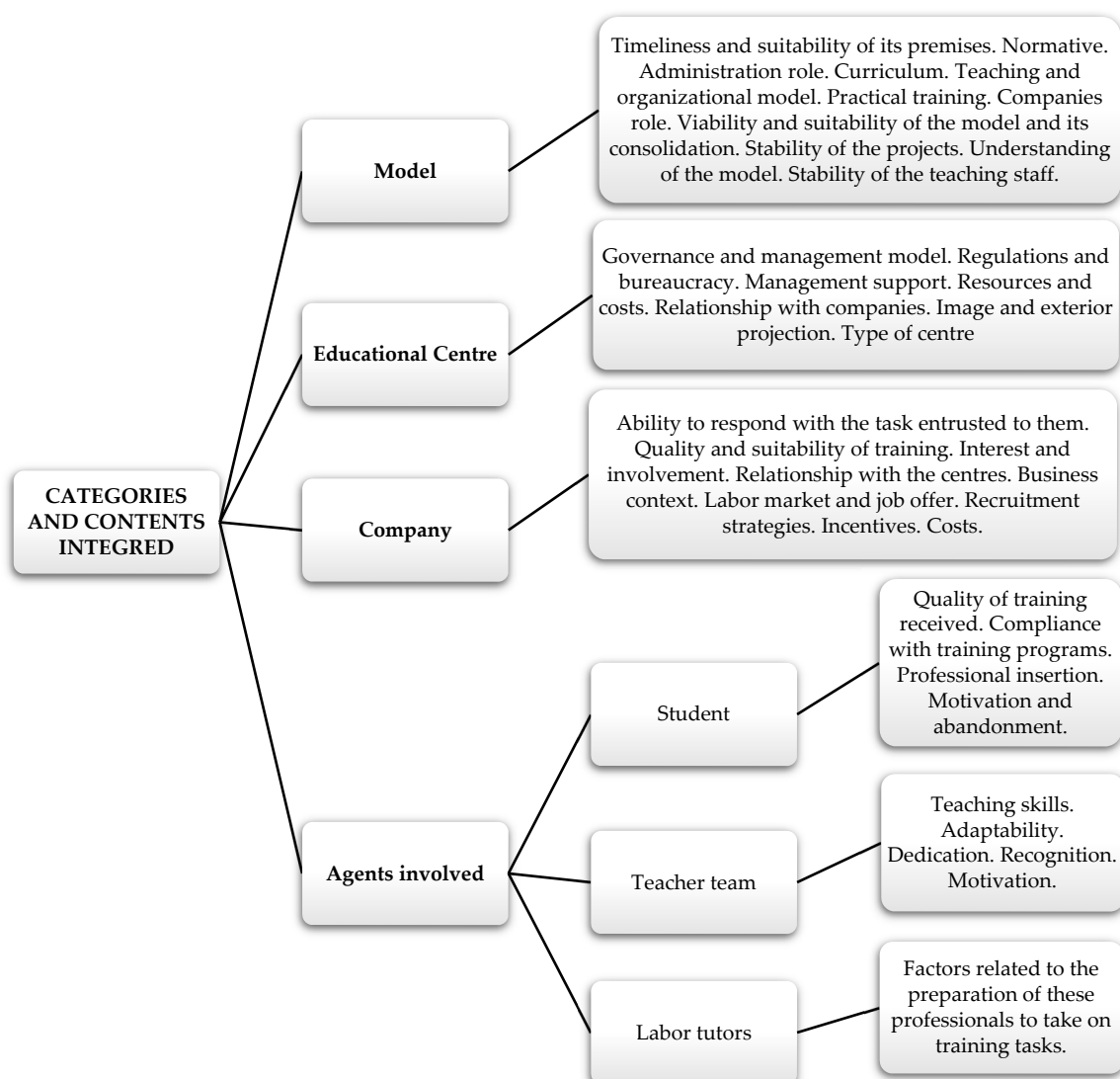


Figure 5. Categories and contents integrated in the content analysis system used for this study.

4. Results

As previously indicated, this article focuses on the information collected through the first scales of the CAEI Questionnaire with regard to the qualitative information collected through the SWOT technique in relation to those areas identified as weaknesses of dual VET. For this, we have taken into account the factors identified in the factor analysis carried out on them and explained previously.

Table 16 shows the opinions provided by the respondents in the first scale of the CAEI Questionnaire in which they indicate, taking as a reference the current situation of dual VET at their respective educational centres, the extent to which they consider that the aspects shown help or hinder the implementation and success of the dual VET through the following scale: −1: hinders implementation, 0: does not influence implementation, and +1: helps implementation. The items on this scale have been grouped in accordance with the three factors identified.

Table 16. Scale 1. CAEI questionnaire. Relevant aspects that hinder or help the implementation and success of dual VET.

Factor		Aspects	-1 %	0 %	1 %	Sum
Factor 1 (GM-S1)	GOVERNANCE MODEL of the DT in Andalusia	Dual-VET's ability to cover the official curriculum	31.9	17	51.1	18
		The consensus of the contents with the company	23.2	26.3	50.5	26
		Work in coordination with the company	15.8	17.9	66.3	48
		The training and didactic and pedagogical capacity of the company tutor	22.6	24.7	52.7	28
		The available socio-economic and business environment	31.3	19.8	49	17
		The network of contacts that the centre maintains with the surrounding companies	5.2	17.5	77.3	70
		The information that companies have about dual VET	41.5	25.5	33	-8
		The duration of the stay in the company	12.4	24.7	62.9	49
		The current system for selecting students for this training modality	18.1	28.7	53.2	33
		Student motivation	8.8	23.1	68.1	54
Factor 2 (EF-S1)	EXTERNAL FACTORS that condition implantation	The current regulations governing dual VET	28.3	33.7	38	9
		The role played by the administration	35.2	36.3	28.6	-6
		The resources assigned by the administration to the centre for the implementation of this VET modality	44.2	37.2	18.6	-22
		The role played by macro-business organizations (chambers of commerce, confederations, business associations)	22.6	48.4	29	6
		The tax advantages of companies for participating in dual VET	45.6	23.3	31.1	-13
		The lack of homogeneity regarding the financing or economic compensation to alternate students	51.5	24.7	23.7	-27
Factor 3 (RA-S1)	RECOGNITION agents	The administrative recognition of the coordinator of the centre	24.4	31.1	44.4	18
		The administrative recognition of the tutor of the centre	31.9	24.2	44	11

From a general perspective, and as indicated by the percentages and the total sum shown in the previous table, the aspects that determine the dual VET governance model (Factor 1 GM-S1) at the participating educational centres are those that are facilitating its implementation at these centres. This does not happen with external factors (Factor 2 EF-S1: regulations, administration, resources, etc.). It seems that, at these institutions, these aspects are conditioning the implementation of this training modality. Finally, recognition (Factor 3 RA-S1) is not an aspect that greatly conditions the success of dual VET at these centres.

Moving into a more detailed analysis, we note that there are four aspects related to dual VET governance model (Factor 1 GM-S1) at their respective educational centres that are helping the success rates of dual VET. The network of contacts that the centre maintains with the companies in their area (77.3%/70), student motivation (68.1%/54), length of stay at the company (62.9%/49), and work in coordination with the company (66.3%/48).

The information that companies have on the dual VET (41.5%/8) and, to a lesser extent, the socioeconomic and business environments are all aspects that are making it difficult for these centres to implement this modality of VET.

Those external aspects (Factor 2 EF-S1) that, according to the participants, make it difficult to implement dual VET at their respective educational centres are related to financing, thus, the lack of homogeneity regarding financial compensation for dual training scheme students (51.5%/-27), the resources assigned by the administration to the educational centre for the implementation of this VET modality (44.2%/-22), and the lack of compensation or advantages for companies for their participation (45.6%/-13). Despite the leading role that is currently being given to macro-business organizations (chambers of commerce, confederations, business associations, etc.) in the process and implementation of dual VET in Spain and Andalusia, for 48.4% of those surveyed, this role is not significant nor does it condition implementation.

Finally, recognition of the coordination and tutoring activities undertaken by the teaching staff (Factor 3 RA-S1) does not stand out as a conditioning aspect of the development of the dual training schemes at these three educational centres.

Table 17 shows the degree to which the respondents agree with the statements in the second scale, grouped into the three factors identified in the factor analysis undertaken: the first factor relates to the governance model, the second relates to the curricular model, and the third factor refers to the results and impact of dual VET. In this case, the values on the Likert scale range from 1 to 4 (where 1 is totally agree, while 4 is totally disagree).

Table 17. Scale 2. CAEI questionnaire. Degree of agreement.

Factor		Affirmations	1	2	3	4	X	TD
			%	%	%	%		
Factor 1 (GM-S2)	GOVERNANCE MODEL in DT	Implementing dual VET in the centre implies greater complexity in its organization and management	55.2	28.1	2.1	14.6	1.76	1.05
		It involves an added workload for teachers	52.1	26	5.2	16.7	1.86	1.11
		The management and supervision of dual VET takes more dedication than non-dual training	52.2	23.3	7.8	16.7	1.89	1.12
		The task as a dual VET coordinator or tutor is not recognized	35.8	29.6	8.6	25.9	2.25	1.19
		It is very difficult to have dual VET students and non-dual students in the same group	34.1	26.1	11.4	28.4	2.34	1.21
		There are training contents of the curriculum that are not worked on in the company	27.3	37.5	14.8	20.5	2.28	1.08
Factor 2 (CM-S2)	CURRICULAR MODEL in DT	It is difficult for me to adapt to the changes in the schedules implied by dual VET	11.5	20.7	20.7	47.1	3.03	1.07
		It is difficult for me to adapt to the changes in the training program that dual VET implies	9.6	24.1	26.5	39.8	2.96	1.01
		Dual VET is the same as non-dual training but with more hours of internships	4.4	13.3	25.6	56.7	3.34	0.87
		Dual VET does not cover the official curriculum	10	21.1	21.1	47.8	3.07	1.04
		Students lose training content necessary to complete their professional training	12.9	22.6	21.5	43.0	2.95	1.08

Factor 3 (RI-S2)	RESULTS AND IMPACT	With dual training, companies are being given too much prominence in VET	7.1	17.9	25.0	50	3.18	0.97
		The company uses dual VET to train its specialists and not professionals in the sector	13.3	32.5	14.5	39.8	2.81	1.10
		Lack of didactic qualification on the part of the company tutor	15.9	32.9	9.8	40.2	2.72	1.18
		With dual VET, the image and external projection of the educational centre is improved	51.6	36.8	11.6	-	1.72	0.95
		One of the benefits of dual VET is that it forces teachers to keep up to date with the latest technical and professional advances and innovations	37.5	33.3	9.4	19.8	2.11	1.12
		It implies the reduction of teaching hours, which can translate into a loss of teaching staff	2.2	16.7	30	51.1	3.30	0.82
		Through dual VET, students improve their skills and job placement	43.8	37.1	4.5	13.5	1.96	1.26
		The stay in the company is too short	2.4	23.5	25.9	48.2	3.20	0.88

As indicated in the previous table, a large majority of participants agree that the dual training management model comes with a complexity to manage this type of training scheme and a large workload (Factor 1 GM-S2).

With regard to the curricular model (Factor 2 CM-S2), we want to highlight that, for the vast majority of teachers (82.3%), dual VET only differs from non-dual training schemes in the duration of the practices. This statement will be the object of an in-depth analysis in subsequent studies as we are concerned that the teachers involved in dual VET do not recognize the other differentiating curricular descriptors.

For 68.9% of teachers, the dual training curricular model addresses the entire official curriculum established at the normative level in the different training cycles, so that students do not miss out on the training content necessary to complete their professional training. It is a curricular model, the organisation of which includes a costly adaptation process both in regard to the training program (67.8%) and the schedules (66.3%).

In relation to the participation of the company in dual VET curricular model, we highlight that a majority of the teachers surveyed noted the prominence being given to this participation is high (75%), even though their teaching capability is not very good (50%), and companies seem more interested in training specialists for their own use rather than versatile professionals within the sector (55.3%).

The impact of dual VET (Factor 3 RI-S2) falls on the educational centre itself, improving its external projection (88.4%), on students whose training and job placement improves (80.9%) and on teachers, especially since this training modality promotes continuous professional learning for those staff involved in the latest technical and professional advances and innovations (70.8%). Respondents seem to indicate that, to achieve this, it is necessary to review the length of stay at the company, which 74% of respondents find to be too short.

In order to look at the previous descriptive analyses in depth, and to understand the degree of association or independence between some variables, we have carried out inferential statistical analyses (non-parametric contrast tests) based on the three identified factors and the independent variables: type of centre (private or public), discipline of knowledge (science-technology-services), management position (yes-no), gender (man-woman), and knowledge of the dual scheme (deep-basic).

In the first scale, we have identified statistically significant differences ($p < 0.05$) in relation to the variables: management position, professional discipline, and knowledge of dual VET. According to the data shown in Table 18, these differences occur in the opinions regarding the external factors that condition the implementation and success of dual VET at the participating educational centres (Factor 2 EF-S1). Thus, conditioning these opinions are the following factors: having a management position (significance level of 0.31 points), the discipline within dual VET that staff belong to (significance level of 0.27 points), and the knowledge respondents have about this training modality (significance level of 0.001).

For the management position, the average range shows us that this weight of significance is held by the responses of those who do not have a management position (average range of 43.79 points) compared to those who do (29.66 points). Regarding knowledge of the discipline, the weight of this correlation with Factor 2 is in the Services discipline (average range 47.65 points) compared to the technologies discipline (38.08 points) and sciences discipline (32.31 points). Moreover, with regard to knowledge of dual VET, those answers linked to the participants who have a basic knowledge about this training modality (45.63 points of average range) are those that carry the weight of this correlation compared to those who have in-depth knowledge (25.89 points).

Table 18. Correlation between factors and independent variables for Scale 1 (U-Mann Whitney for type of centre, gender, management position, and knowledge of dual VET and Kruskal Wallis for Professional Family).

Factor	Independent Variables		Average Range	Statistical	<i>p</i>
GM-S1	Type of centre	Private	37.80	−1.836	0.066
		Public	52.50		
	Gender	Male	36.81	−0.745	0.457
		Female	40.85		
	Professional Family	Sciences	43.83	3.003	0.223
		Services	40.72		
		Technology	31.47		
	Management position	Si	40.85	−0.279	0.780
		No	39.12		
	Knowledge of dual VET	Basic	36.93	−1.711	0.087
		In-depth	46.95		
EF-S1	Type of centre	Private	42.93	−1.870	0.062
		Public	28.73		
	Gender	Male	36.75	−1.187	0.235
		Female	43.25		
	Professional Family	Sciences	32.31	7.218	0.027 *
		Services	47.65		
		Technology	38.08		
	Management position	Si	29.36	−2.163	0.031 *
		No	43.79		
	Knowledge of dual VET	Basic	45.63	−3.214	0.001 *
		In-Depth	25.89		
RA-S1	Type of centre	Private	45.26	−.237	0.812
		Public	43.50		
	Gender	Male	44.81	−0.054	0.957
		Female	45.11		
	Professional Family	Sciences	38.63	5.894	0.052
		Services	51.56		
		Technology	39.21		
	Management position	Si	39.33	−1.169	0.242
		No	46.64		
	Knowledge of dual VET	Basic	45.87	−.583	0.560
		In-Depth	42.34		

* Statistically significant differences at level $p < 0.05$.

In the case of the second scale (Table 19), these significant differences occur in the variables: type of educational centre (level of significance 0.023 in Factor 3 RI-S2), gender (level of significance 0.039 in Factor 2 CM-S2), knowledge of discipline (level of significance 0.034 Factor 2), and knowledge of dual VET (0.006 Factor 1 GM-S2). As the following tables show, belonging to a public or private educational institution conditions the opinions of the respondents in relation to the impact and results of dual VET (Factor 3 RI-S2) with the significance loading on the answers given by the teachers of the private institution (average range 43.07 points) compared to those from the public institution (27.23 points).

The opinion that these have about the curricular model of dual training (Factor 2 CM-S2) is conditioned by gender, with the strongest correlation loading on the responses of females (average range 40.09 points) when compared to responses given by males (29.31 points), and by the discipline within dual VET that staff teach with a strong correlation in the responses given by respondents from the Technology disciplines (49.11 points) versus Science disciplines (32.2 points) and Services disciplines (42.62 points). Finally, the opinions that have been contributed with regard to the governance model (Factor 1 GM-S2) are conditioned by the knowledge that the respondents have about dual VET schemes with the significance loading on those answers given by the respondents with a basic knowledge of this training modality (41.55 points of average range) versus those answers given by respondents with an in-depth knowledge (25.76 points).

Table 19. Correlation between factors and independent variables for Scale 2 (U-Mann Whitney for type of centre, gender, management position and knowledge of dual VET and Kruskal Wallis for Professional Family).

Factor	Independent Variables	Average Range	Statistical	<i>p</i>	
GM-S2	Type of centre	Private Public	38.01 34.25	−0.516 0.606	
	Gender	Male Female	32.21 40.36	−1.562 0.118	
	Professional Family	Sciences Services Technology	37.35 38.43 35.36	0.209 0.901	
	Management position	Si No	30.06 39.72	−1.631 0.103	
	Knowledge of dual VET	Basic In-Depth	41.55 25.76	−2.769 0.006 *	
	CM-S2	Type of centre	Private Public	35.43 42.45	−1.028 0.304
		Gender	Male Female	29.31 40.09	−2.066 0.039 *
		Professional Family	Sciences Services Technology	46.70 33.27 30.50	6.784 0.034 *
Management position		Yes No	34.91 36.99	−0.359 0.720	
Knowledge of dual VET		Basic In-Depth	36.33 39.95	−0.113 0.910	
RI-S2		Type of centre	Private Public	43.07 27.23	−2.267 0.023 *
		Gender	Male Female	38.70 41.42	−0.497 0.619
		Professional Family	Sciences Services Technology	32.20 42.62 49.11	5.535 0.063
	Management position	Yes No	42.00 40.18	−0.268 0.789	
	Knowledge of dual VET	Basic In-Depth	42.90 33.30	−1.612 0.107	

* Statistically significant differences at level $p < 0.05$.

Regarding the analysis of the qualitative information collected using the SWOT technique, it has been focused on the contributions of a single dimension of the SWOT: Weaknesses.

In the following table (Table 20), we show the internal factors that are, according to the respondents, weaknesses of this VET modality in relation to the training model, the educational centre, the company, and the agents involved.

Table 20. Internal aspects that suppose a weakness for dual VET.

Weaknesses		
Model	Frequency	%
- Normative	52	53.6
- Curriculum	19	22.2
- Teaching skills	3	3.2
- Practical training	3	3.2
- Coordination	19	20.2
- Monitoring	1	1.1
- Project stability	17	18.1
- Teacher stability	16	16.5
Centre	Frequency	%
- Governance model	64	66
- Workload	15	16
- Support	3	3.2
- Resources	3	3.2
- Training/Information	6	6.4
Company	Frequency	%
- Interest and involvement	6	6.2
- Feasibility/availability	7	7.0
- Training/information	17	18.1
- Coordination with the centres	21	22.3
Agents	Frequency	%
- Student	18	19.1
- Teacher team	3	3.2
- Labour tutor	9	9.3

The complexity of the management, the excess of work, the need to specify aspects related to the organization of the teachings in regulations, the difficulty of monitoring dual students with the same criteria used for non-dual students, and the stability of the projects are, among others, some of the most noted weaknesses.

Additionally, 26.6% of the contributions refer to the regulations that regulate dual VET, its rigidity, and lack of definition as a weakness of the model, with arguments including:

‘The regulations are very rigid and complicate management for the dual VET centres’ (C1.S22).

‘The regulations should regulate much more than it does now, since it does not address situations that occur daily (students who repeat years/subjects, students who drop out), where the solution is left to the schools’ (C1.S42).

In addition, 22% of the contributions state that the curriculum is a weakness of the model itself including its inability to ensure its complete development, as established in the teachings, and the coordination between the curriculums addressed in the theoretical training and in practice.

‘The problem is that we cannot ensure that students complete a dual cycle having been taught the entire curriculum’ (C2. S79).

‘There is a lack of actual alignment between the curriculum of the modules and what is learned at companies’ (C1.S2).

The lack of coordination is highlighted as a weakness of this system. Greater communication between the institution and the company is necessary to ensure success.

A key element for the development of dual VET at all three educational institutions is the stability of the projects. Stability is essential to acquiring the experience and knowledge necessary to

make adjustments and changes aimed at improving the training offered in this modality. The permanent mobility of the teaching staff involved is seen as a weakness by a large part of the respondents working at the public institution participating in this study (59.2% of the teaching staff).

For 66% of those surveyed, the governance model represents a great weakness for dual VET.

‘There is a missing line that delineates the management and administration aspects of physical and human resources. It is very important to have a clear governance model that ensures that the dual VET is a system that is maintainable and sustainable’ (C1. S68).

Of the three large groups involved in the development of dual VET, the majority of respondents identify a number of weaknesses with the student body. Associated factors include the student’s maturity levels, the lack of previous training, the lack of remuneration/scholarship, and the highly company-specific training the student receives while on a placement.

‘The student receives specialized training related to a specific role rather than industry-based training’ (C 3.S.90).

‘The training that students receive is so specialized that it means we cannot ensure their versatility, which is currently the most sought-after professional quality’ (C3. S.34).

The lack of training and experience in dual stands out as a weakness of the model in relation to teachers. The excessive workload that this implies for teachers and the lack of recognition of it are, among others, the weaknesses highlighted that, according to the respondents, determine the success of this modality.

Finally, we want to highlight that a lack of educational training of the workplace tutor is the most repeated weakness in relation to this agent with repeated arguments including little we can do at the institution since the problem lies in the lack of educational training on the part of the workplace tutor (C1. S26).

5. Discussion of Results

Based on the contributions outlined in various scientific papers (cited in the first part of this article) about the teaching staff and management teams participating in this study and, taking the objectives of this work as a reference, it is worth highlighting dual VET regulations as a key aspect to the success of the implementation of this training modality. It is necessary to approach its revision taking into account both the new structural framework of dual VET and the requirements of the collaborating companies. It is necessary to move toward a single, national regulatory framework, which has greater flexibility in the model used that are based on the principles that govern the associated SDGs (SDG 4, 8, 10, 11, and 17).

Another key aspect is the relationship between the training offerings and industry sectors. In this sense, it requires training programs to address the competences required by the different professional sectors, and for sustainability and entrepreneurship initiatives to be included in these programs under the framework of Education for Sustainability, and that the training offered are directly related to industry demands, which is an aspect that acquires great prominence in the current economic situation triggered by the health crisis caused by COVID-19. This would translate, on the one hand, into a greater number of companies participating in dual VET and, on the other hand, into more employment opportunities for students after completing their dual training, in turn, consolidating a much more sustainable training model.

Recognition is another factor of special importance. Acknowledgment of the work being carried out by educational institutions, teachers, and companies for the consolidation of dual VET. For an educational institution, participating in dual VET schemes means taking on a significant bureaucratic management task. In this sense, having greater support from the administration is necessary for this management philosophy to be much more sustainable. For teachers, getting involved in this training modality means assuming responsibilities not considered until now. It is possible that recognition of these tasks by administrations would motivate teaching staff and ensure their permanence in dual training projects. Achieving the loyalty of companies and their permanence in dual training projects is a constant concern for the management teams at educational institutions. In this sense, it is essential that the administration is aware of these issues and establishes incentives and recognitions that

motivate companies to participate. This participation should not be limited to only serving students for a set period of time.

The implication that the dual VET system demands a great deal of a company is very real with activities including: participation in the design of the regional training strategy, in prospective analyses and in the meta-evaluation of the model, maintaining permanent coordination processes with the educational institutions for the design and implementation of a specific training program and of any complementary training, devising processes for monitoring and evaluating student learning, their job placement, and entrepreneurial capacities, etc.

In the opinion of the teaching group participating in this study, the key aspects mentioned above are the foundation of the weaknesses that the Andalusian dual system has. Therefore, the rigidity and lack of specificity of the regulations, the lack of continuity for both the teaching staff and the companies in the dual training projects, the difficulties relating to central coordination of the institution and the company, the suitability of the educational model used to ensure students develop the abilities, skills, attitudes, and knowledge outlined in the official curriculum and required by industry, and the relevance of the training offerings and its potential to increase employability factors are some of the weaknesses of the Andalusian dual system.

There were a number of actions highlighted to improve and modernise the dual training offering including, but not limited to, increased investment in dual VET (which implies greater financing and budgets), simplifying bureaucracy, defining a network of educational centres, companies, public administrations, macro-business organizations, and foundations involved in dual VET, provide greater flexibility, dynamism and agility to training, both in regard to its curriculum as well as its structure and duration, redefine the dual offering by realigning it with the industry across different territories, reimagine the training content ensuring the development of entrepreneurial capacity among young people, and the development of skills in sustainability and entrepreneurship, facilitate the exchange of good practices, and encourage the participation of companies, especially SMEs.

As previously indicated, the new economic situation caused by the COVID-19 health crisis has forced governments to realign the VET and also dual VET.

6. Conclusions

The purpose of this study is not generalization, but rather to reflect on the findings reached and their possible application to other settings as Wood & Smith (2017) [67] suggest in reference to case studies. Even though it is true that this type of research emphasizes particularization, it allows us to understand what happens in other, similar contexts. In general terms, this case study presented is the exploratory phase of a more ambitious study that aims to analyse the impact of dual VET in Andalusia and, from this logic, an analysis of the situation will be carried out from the perspective of all the agents involved (students, graduates, companies, and chambers of commerce).

On the other hand, we highlight the exploratory and diagnostic nature of this study and its interest in justifying the suitability of the dual training model in a regional context that has only recently been incorporated into this experience, and its contribution to providing empirical evidence that enable the identifying aspects of improvement and, thus, guaranteeing the sustainability of the model.

A government's commitment and support is not enough to ensure the success of this training modality. It is necessary to carry out diagnostic studies that provide reliable information on the status of the key elements of the dual VET system in different regions through the opinion of all those involved so that informed decisions can be made to improve weaknesses, consolidate strengths, and disseminate the good practices identified.

The sociodemographic, economic, and educational differences between the different autonomous communities of Spain make it necessary for these studies to be carried out at a regional level. Domestic studies of the dual VET schemes provide a general perspective that is unable to detect the singularity that the implementation of the dual VET scheme poses for different regions and those aspects could be subject to improvement.

Although the commitments made by the Spanish government in relation to VET, and set out in the documents mentioned throughout this article, highlight its growing place and prominence in the political agenda of Spain, there are numerous challenges ahead to achieve Europeanization. The dualisation of VET (in the sense outlined in this study), undoubtedly constitutes the best strategy for this modernization and Europeanization.

The implementation and development of dual VET in Andalusia does not greatly differ from those in the other autonomous communities. It is true though that—even if some regions such as the Basque Country have a much more consolidated and advanced dual system—there are still many ‘bottlenecks’ that will slow down the consolidation of the dual VET scheme in the national context and in various regional contexts [10,32,53].

The type of obstacles encountered by the dual VET schemes in the Andalusian Autonomous Community are the same as across the other Spanish regions: cultural obstacles related to the sociocultural consideration of VET and dual VET in the Spanish educational system, legislative obstacles related both to the disparity of guidelines and rules across the different autonomous communities, and to the lack of coordination across the different administrative levels on which education depends, structural obstacles related to the characteristics of the production and business fabric of the different autonomous regions, which in the case of Andalusia, because of a high presence of small companies, means that the training involvement of these companies and the rapid implementation of the dual VET scheme is especially difficult, bureaucratic obstacles, especially for educational centres that have to respond to the inflexibility of administrative regulations, academic-administrative obstacles that prevent the necessary flexibility to modify academic curricula, and teachings in a changing world such as that of industry [76].

Finally, we cannot ignore the ideological obstacles [54]. In this case, it is the trade union organisations that, even though they recognise the relevance of this type of training, are very critical of it, as it could imply a level of discrimination for workers, a lack of equal opportunities, and increased industry power.

The Andalusian region must continue to support this training modality, but it must incorporate improvements both in its conception and in its design and implementation. Therefore, it is necessary to move toward a much more sustainable and quality dual model, a model concerned with curricular greening, which transversally incorporates aspects such as sustainable development, inclusion, equality, social responsibility, internationalization, entrepreneurship, and digitisation in its *educational corpus* and ensuring that sustainable regional development and industry sectors with great entrepreneurial capacity are taken into account in the design of these programs.

For this, coordination of both educational and employment administrations are essential, that is, the joint work between educational centres and regional business organizations are consolidated as partnership alliances. We must take into account that there are two factors that determine the sustainability of this dual system: the adequacy between the training offer and the demand of the business environment and the adjustment of this offer to the strategic regional and national productive sectors.

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