

# Dual Vocational Training in Andalusian educational institutions from the teachers' perspective

## La Formación Profesional Dual en los centros educativos andaluces desde la perspectiva del profesorado

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**María Teresa Pozo Llorente**

<https://orcid.org/0000-0002-8120-1474>

*Universidad de Granada*

**María de Fátima Poza Vilches**

<https://orcid.org/0000-0001-6186-9306>

*Universidad de Granada*

**José Manuel Aguayo Moral**

<https://orcid.org/0000-0002-7304-961X>

*Universidad de Granada*

### **Abstract**

Despite the increasing presence of dual vocational education and training in the Spanish education system and the great efforts made by different bodies to promote this training pathway, many concerns have been raised that perhaps its launch is not being conducted correctly, which may hinder its success. The support of the different levels of government, funding and regulations, the pertinence of the training offered, the role of the companies, the recognition of teachers, and company-school coordination are some of the issues around which controversies have arisen since this training model was first implemented. The purpose of this study is to characterize how this debate is playing out in the Andalusian education system, based on the opinion of its day-to-day protagonists –the teachers involved– and on the practices taking place in Andalusian schools. The paper explores to what extent the teachers' gender, their experience in dual training and their degree

of involvement in administrative coordination activities may be conditioning these opinions. A total of 1,445 teachers took part in the study, out of the 2,164 teachers involved in dual training programmes in the 2019-20 academic year. The questionnaire was designed *ad hoc* and the questions were structured around five dimensions related to issues present in national debates. The analyses performed indicate that the practices most contribute to the successful implementation of this training model in Andalusian educational institutions are those related to the administrative coordination of dual training programmes and those related to teachers and guidance services. The practices related to the governance model, academic organisation and the role of the company are those that show the most room for improvement. Female teachers, teaching staff who are involved in management and teaching staff with greater experience in the dual system are those that rate the system most highly.

**Keywords:** Dual Vocational Education and Training, teachers, evaluative study, best practices, areas to improve.

### Resumen

A pesar de la creciente presencia de la Formación Profesional Dual (FPD) en el sistema educativo español y de los esfuerzos realizados desde distintos organismos por impulsarla, son muchas las voces que alertan de que el proceso de puesta en marcha de esta modalidad formativa no se está haciendo como debiera, lo que dificulta su éxito. El apoyo de las administraciones, su financiación y normativa, la pertinencia de la oferta, el papel de las empresas, el reconocimiento al profesorado o la coordinación centro-empresa son algunos de los aspectos que están detrás de las controversias que desde el principio han acompañado a esta modalidad formativa. El propósito de este estudio es caracterizar este debate en el escenario educativo andaluz a partir de la opinión de sus protagonistas diarios, el profesorado implicado, y de las prácticas que se desarrollan en los centros andaluces. Se explora en qué medida el género, la experiencia en formación dual y la participación en gestión pueden estar condicionando esta opinión. Los docentes encuestados han sido 1.445, de los 2.164 implicados en FPD en el curso 2019-20. El cuestionario utilizado ha sido diseñado *ad hoc* y la opinión recogida se ha estructurado en torno a cinco dimensiones relacionadas con los tópicos de los debates nacionales. Los análisis realizados destacan que las prácticas desarrolladas en los centros andaluces relacionadas con la gestión administrativa de la dual y con el profesorado y la acción tutorial son las que más favorecen la implantación de la FPD en Andalucía y las relacionadas con el modelo de gobernanza, la organización académica y el papel de la empresa son las que presentan margen de mejora. Las profesoras, el profesorado implicado en gestión y el que tiene gran experiencia en el sistema dual son los que mejor valoran este sistema.

*Palabras clave:* Formación Profesional Dual, Profesorado, estudio evaluativo, buenas prácticas, aspectos de mejora.

## Introduction

In recent years in Spain, vocational education and training (hereinafter VET) in both educational and workplace settings has become one of the government's strategic pillars and the reform of the current system is now a national priority. The aim of such reform is to better adapt VET to the changing demands of the new economic and entrepreneurial context, thus heightening competitiveness and improving employability in Spain. Evidence of this governmental commitment to strengthen the country's VET system can be found in the national plans that have been adopted (MEFP, 2020a and 2020b) and also in Organic Law 3/2022, of 31 March, on the regulation and integration of VET (publication in Official State Gazette, B.O.E., 2022) all of which seek to improve the system and ensure it meets European standards.

Recognition by Spanish society and businesses of the importance of VET has also grown, with two factors being primarily responsible for this shift. One, the prospecting carried out by the European Centre for the Development of Vocational Training (CEDEFOP, 2020), which found that approximately 65% of jobs generated in Spain between 2018 and 2030 will require workers with intermediate qualifications (intermediate-level VET training) and 35% will require workers with high qualifications (high-level VET training or a university degree), and that more profiles of a technical nature and with STEAM (Science, Technology, Engineering, Art and Maths) training will be needed. The other is the implementation in 2012 of the dual training scheme, that is, alternance training in which students learn at both a school and a workplace. However, as suggested by Echeverría and Martínez-Clares (2021), a great deal still needs to be done; according to the OECD (MEFP, 2020c), Spain currently has the highest rate of early school leaving (17.9%) in the EU, where the average is 10.6%.

If the Spanish government has made a priority of the alternance model of vocational training, it has done so with the conviction that the dual type of VET programme represents a very effective tool with which to combat some of the main problems affecting the country's traditional VET system. Dual VET has been incorporated into the existing system to help achieve

a series of objectives, such as raising the number of young people who obtain a certificate of post-compulsory education, thus increasing their job opportunities and reducing the rate of youth unemployment (about 50% in 2012). A further objective is to adapt the training the learners receive to the requirements of a changing socioeconomic and labour context, one that is more and more demanding in terms of the profiles of its future professionals and is characterised by behavioural patterns that are highly technological, as dictated by the Industry 4.0. context (Barrientos et al., 2019; Igartua, 2017; Ishar, Derahman & Kamin, 2020; Vaganova et al., 2020; among others). Royal Decree 1529/2012 (publication in Official State Gazette 2012) is now the regulatory framework for both apprenticeship contracts, which have a long tradition in Spain, and dual vocational education and training, specifically within the initial stage of vocational training.

At the national level, Dual VET, understood as “a formal education and training programme in which learning takes place through periods at the workplace alternating with periods at the educational institution, leading to a recognized qualification” (Pineda et al., 2018, p.35), is increasingly present, as shown by the growing number of projects, participating institutions, collaborating companies and enrolled students.

Despite the long history and considerable recognition of this type of training in other countries (Emmenegger & Seitzl, 2020; Stephen, 2020; Vaganova et al., 2020) and even with the great efforts being made by different bodies (both national and international) to promote it, many voices have expressed concern that its launch in Spain is not being conducted correctly, a problem that may hinder its success. Even though it was incorporated into Spain’s education system not as an isolated response to a crisis situation, but rather as a firm proposal of a structural nature, since its launch more than one decade ago the dual system has been the object of numerous controversies and debates. Such discord, Sanz de Miguel (2017) points out, is evidence that the system has considerable room for improvement, especially in the sphere of its governance, mission and vision.

Real and effective support by the different levels of government, funding, the concretion of the regulatory framework, the adaptation of the training offered to the production system and the business fabric of the region, the role of the companies, recognition of the teachers involved, school-company coordination, the capacity of this type of training to cover all the official curriculum, the sufficiency of resources, and the suitability and heterogeneity of the governance models in the various

autonomous communities are some of the issues highlighted by different spheres (e.g. the scientific, technical, educational, entrepreneurial and union spheres...) as conditioning factors affecting the implementation and success of this model in the Spanish context (Aguilar, 2015; Bentolila & Jansen, 2019; Echeverría, 2016a and 2016b; Echeverría & Martínez-Clares, 2018; Igartua, 2017; Marhuenda et al., 2017; Martín-Artiles et al., 2020; Martínez-Morales & Marhuenda, 2020; Navarro, 2019; Pineda et al., 2019; Šćepanović y Martín-Artiles, 2020; Vila & Chisvert, 2018; Virgós & Burguera, 2020; Virgós, Burguera & Pérez, 2022; among others).

Since its experimental launch in Andalusia in the 2013-14 academic year, Dual VET has become increasingly present in the political, educational and entrepreneurial landscape of this autonomous community as a measure to reduce youth employment. As pointed out by the European Commission (2020) the economic crisis of 2007 resulted in unemployment rates of 55.5% for Spanish youth aged 15 to 24 and the even more alarming rate of 66% in Andalusia, in the year 2013.

The Dual VET programme in Andalusia, from the very beginning, has consisted of training projects that the educational institutions design jointly with the collaborating companies and then submit for approval or renewal in the annual call for projects issued by the Andalusian government, based on the provisions of RD1529/2012 (publication in Official State Gazette, B.O.E., 2012). Such projects are carried out at all three levels of VET –basic, intermediate and high–, with dual training slots for their students.

The successive administrations of the Andalusian government have placed a great deal of confidence in this alternance training model. Since its launch in academic year 2013/14, dual training in Andalusia has expanded annually, growing from 11 projects in 6 of the 26 vocational families specified in the National Catalogue of Vocational Qualifications, 227 students, 11 educational institutions and 56 agreements with companies to a very considerable 772 projects, 14,559 students, 332 educational institutions and 11,806 agreements with companies in the year 2022/23. The number of vocational families with dual programmes in Andalusia has also increased; in the 2022/23 academic year 24 of the 26 vocational families are present. The two families not yet represented in dual programmes in Andalusia are Glass and Ceramics and Art and Artisanry.

The research presented in this article is situated within the context described above and it forms part of a broader study whose ultimate purpose is to provide arguments for continued support of Dual VET in

Andalusia. An additional aim of the larger project is to develop guidelines for the strategic and sustainable planning of the dual system in this region, to facilitate evidence-based decision-making to improve the system.

The aim of this paper is two-fold. Firstly, it seeks to characterize, from the perspective of the teaching staff, since they are the facilitators of the success or failure of this training model, some of the practices taking place in Andalusian educational institutions. Secondly, it seeks to explore to what extent this opinion is conditioned by variables such as gender, experience in the dual system and/or the participation of the teachers in the administrative coordination activities the system entails.

## Method

To reach our objectives an evaluative methodology was used; information was gathered by means of an *ad hoc* questionnaire sent to all teachers involved in Dual VET in Andalusia during the academic year 2019-20. This effort required the collaboration of the Secretariat General of Education and Vocational Training of the Ministry of Education and Sports (now Ministry of Educational Development and Vocational Training) of the Autonomous Government of Andalusia, which, through the provincial coordinators of dual training programmes, and using the internal administrative platform (*Séneca*), contacted all the teachers involved, providing access to the questionnaire, encouraging them to participate in the study and ensuring that all responses would remain anonymous. The instrument itself also included a brief description of the research team, the purpose of the research, the promise of confidentiality and an informed consent form.

## Sample

According to the data provided by the aforementioned Ministry, the number of teachers involved in Dual VET in the academic year 2019-20 was 2,164. They are distributed among the provinces as shown in Table I<sup>1</sup>. To meet the sampling and representativity requirements of a 95%

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<sup>1</sup> The disparity between the number of responses and the number of teachers identified in some provinces is due to the time lapsed between the request for this data and the collection of data.

TABLE I. Participation of teachers by province

	<b>Almeria</b>	<b>Cadiz</b>	<b>Cordoba</b>	<b>Granada</b>	<b>Huelva</b>	<b>Jaen</b>	<b>Malaga</b>	<b>Seville</b>
Teachers	121	360	292	263	116	153	338	521
Sample	22	64	52	47	21	28	60	93
Responses (n°)	125	216	171	186	105	173	181	286
%	103.31%	60.00%	58.90%	70.72%	90.52%	113.07%	53.55%	55.09%

Source: Compiled by the authors

confidence interval and a 5% margin of error, it was necessary to obtain a sample of 387 teachers distributed among the provinces as shown in the “Sample” row of Table I. In all provinces the minimum size required for a representative sample was obtained, although the percentage of participation was disparate, oscillating between 53.55% in the province of Malaga and 100% in the provinces of Jaen and Almeria.

The number of teachers surveyed was 1,445; of them 56.5% were men (N=815) and 43% (N=620) women (0.5% of those surveyed did not indicate their gender). The majority are in the 36-55 age group and have a permanent employment contract.

Of the teachers surveyed 70% work at public schools, 27% at semi-private schools and 3% at private schools.

The teachers surveyed teach in training programmes belonging to all of the 23 vocational families<sup>2</sup> present in Andalusia in the 2019-20 academic year. Most teach in the families of Business and Marketing followed by the families of Administration and Management, Sociocultural and Community Services, and Electricity and Electronics.

Sociocultural and Community Services (19M/68W), Healthcare (17M/43W) and Personal Image (4M/10W) are the families with more female teachers than male teachers. The greatest presence of male teachers is found in families such as Installation and Maintenance (24M/4W), Electricity and Electronics (66M/9W), Physical Activity and Sports (12M/4W) and Mechanical Manufacturing (30M/5W).

<sup>2</sup>. <https://sepe.es/HomeSepe/Personas/formacion/certificados-profesionalidad/familias-profesionales.html>

The teachers surveyed belong to one of the three following profiles:

- **Administrative coordination [39.93%]:** Teachers with experience in administrative coordination activities, either as a member of the school's administrative team or as a teacher that assists regularly in the coordination of dual projects.
- **Teaching [39.80%]:** Teachers who teach in dual training projects at the time of data collection and who do not have experience in administrative coordination.
- **Prospecting [20.27%]:** Teachers who have carried out the prospecting tasks specified in the Instructions document issued 10 October 2019 by the Andalusian Ministry of Education and Sports.

Of particular interest in this research is the professional development index. This variable, designed for this study, refers to training and

TABLE II. Definition of the professional development index of the teachers surveyed

Variables	Remark	Value
Year of teaching experience in Dual VET	1-2	0
	3-4	1
	5-6	2
Participation in business search	No	0
	Yes	1
Number of projects	0	0
	1	1
	More than 1	2
Training stays	No	0
	Yes	1
Participation in lifelong learning	No	0
	Yes	1
Knowledge about Dual VET	1 – very poor	0
	2	0
	3	0
	4	1
	5 – very good	3

Source: Compiled by the authors.



experience in Dual VET. The index for each teacher is calculated as the sum of the values shown in Table II.

This index was calculated only for the teachers who answered all the questionnaire items used to calculate the index (N=806). These teachers were classified into three groups of professional development: 32.1% were defined as Low Index<sup>3</sup> (N=259); 57.9% as Intermediate Index<sup>4</sup> (N=467); and 9.9% as High Index<sup>5</sup> (N=80).

## Instrument

The questionnaire used to collect the data was designed by the researchers. The information gathered in the first part of the instrument allowed us to characterize both the teaching staff surveyed and the situation, with respect to dual training, in which the teacher carries out his or her teaching activity. The second part, comprised of 5 blocks (the last one only for teachers who have engaged in prospecting), used a response scale to learn the surveyed teachers' opinion of certain practices taking place in the Andalusian schools that offer dual programmes.

This paper offers an analysis of Block I of the questionnaire (25 items), the section focused on the aspects that hinder or contribute to the consolidation of this VET model in Andalusian learning institutions. The aspects assessed in the study pertain to regulations, the support of the government, courses designed and offered, administrative and educational coordination, and the role of the agents involved.

The quality of the instrument was assured by careful examination of its reliability and validity (of content and construct). Content validity was based on a review of regulatory and scientific documentation on Dual VET, on the analysis of instruments used in previous studies by the present researchers (Pozo-Llorente & Poza-Vilches, 2020) and other research teams, and on inter-rater validity. Twelve people took part in this validation process (experts in the field, school administration teams, teachers, government-employed technicians and politicians from the Andalusian Ministry of Education with powers in Dual VET). After analyzing the opinions of the persons consulted about the pertinence, clarity and relevance of the pilot questionnaire, the decision was made to

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<sup>3</sup> Low Index = between 0 and 3

<sup>4</sup> Intermediate Index = between 4 and 7

<sup>5</sup> High Index = between 8 and 10

eliminate 4 items and to modify the distribution of some of the theoretical dimensions comprising each block. The final composition was 84 items distributed among five blocks. The theoretical dimensions and associated items resulting from the consultation are shown in Annex I.

The questionnaire's internal consistency reliability, as measured by Cronbach's Alpha, is high, with values close to 1 in all the questionnaire's blocks. For Block I (25 items), the object of this paper, the value is  $\alpha=0.928$ .

## Procedure

The questionnaire was initially designed to be used in face-to-face interviews but the special circumstances derived from the COVID19 pandemic complicated the process. The global health crisis made it necessary to adapt the questionnaire for use online and also to delay data collection until June and July of 2020, so as not to coincide with the process of adaptation of Andalusia's educational institutions to online teaching.

An exploratory factor analysis was performed using the principal component method with Varimax rotation and Kaiser normalization, to extract the factors within Block I (25 items), the object of this paper. Tables III, IV and V present information related to KMO and Bartlett test (which is very high, with a value close to 1), the explained variance with the 5 components that make up this factor analysis and the matrix of rotated components.

After the interpretation of the factors observed and based on the items comprising each one of them, the initially defined groupings (dimensions) were redefined within this block.

TABLE III. KMO and Bartlett's Test

<b>Kaiser-Meyer-Olkin measure of sampling adequacy</b>		<b>.92</b>
Bartlett's test of sphericity	Aprox. Chi-square	7796.56
	gl	300
	Sig.	.00
	5 – very good	3

Source: Compiled by the authors.

TABLE IV. Total explained variance

Component	Initial eigenvalues			Extraction sums of squared loads			Rotation sums of squared charges		
	Total	% variance	% Cumulative	Total	% variance	% Cumulative	Total	% variance	% Cumulative
1	9.63	38.53	38.53	9.63	38.53	38.53	3.58	14.32	14.32
2	1.76	7.03	45.57	1.76	7.03	45.57	3.50	13.99	28.31
3	1.46	5.86	51.43	1.46	5.86	51.43	3.07	12.30	40.61
4	1.13	4.54	55.97	1.13	4.54	55.97	2.74	10.97	51.58
5	1.04	4.16	60.12	1.04	4.16	60.12	2.14	8.55	60.12

Extraction method: principal component analysis.

Source: Compiled by the authors.

Using this analysis a confirmatory factor analysis was performed, as detailed in Figure I and Table VI.

This analysis confirms a strong correlation between dimensions (Table VII) and also an acceptable ( $R > 0.4$ ) and very acceptable ( $R > 0.7$ ) regression weight as shown in Table VIII, with a RMSEA value of 0.073 within normal range (values between 0.04 and 0.08 are considered acceptable) (Bollen, 1989).

The dimensional structure resulting from these analyses modified the theoretical grouping of some items. The structure has marked the analysis of the data presented in Table IX.

The collected data has been subject to descriptive and inferential statistical analyses using SPSS 27.0. The mean and the standard deviation have been calculated for all the dimensions integrating this block. To examine these primary results more closely, appropriate statistical contrasts have been performed (Student's t test, ANOVA and MSD-LSD).

Out of all the variables considered in this study, three of them –gender, professional profile (administrative coordinator, teacher, prospector) and professional development (low, intermediate or high) – are explored.

The analyses have been performed from two perspectives; a general perspective that has enabled us to identify, thanks to the basic descriptive statistics, the best practices taking place in Andalusian schools with regard to Dual VET (these aspects are deemed facilitators) and also other practices that show some room for improvement (these aspects

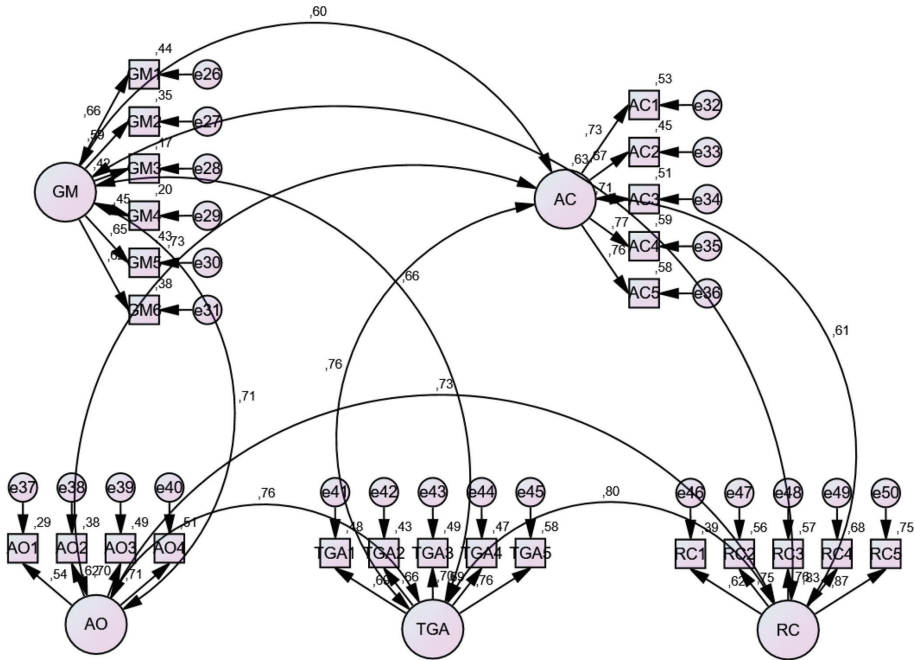
TABLE V. Matrix of rotated components

Matrix of rotated components (a)					
Item	Component				
	D1 (RC)	D2 (AC)	D3 (TGA)	D4 (GM)	D5 (AO)
Item1	0.07	0.11	0.09	0.58	0.50
Item2	0.09	0.09	-0.03	0.72	0.31
Item3	0.05	0.13	0.23	0.50	-0.01
Item4	0.20	0.67	0.23	0.15	0.20
Item5	0.08	0.30	0.08	0.33	0.31
Item6	0.11	0.64	0.14	0.20	0.29
Item7	0.24	0.74	0.23	0.13	-0.06
Item8	0.19	0.78	0.18	0.17	0.02
Item9	0.18	0.73	0.30	0.02	0.21
Item10	0.28	0.31	-0.11	0.37	0.38
Item11	0.17	0.41	0.42	-0.03	0.48
Item12	0.22	0.09	0.40	0.00	0.66
Item13	0.30	0.15	0.12	0.19	0.68
Item14	0.18	0.28	0.66	0.15	0.13
Item15	0.20	0.19	0.72	0.12	0.10
Item16	0.34	0.23	0.54	0.30	0.10
Item17	0.62	0.22	0.28	0.09	0.14
Item18	0.73	0.17	0.19	0.24	0.18
Item19	0.80	0.15	0.16	0.15	0.13
Item20	0.36	0.09	0.16	0.70	-0.07
Item21	0.20	0.10	0.26	0.63	0.01
Item22	0.32	0.20	0.58	0.27	0.18
Item23	0.33	0.29	0.64	0.15	0.16
Item24	0.67	0.28	0.33	0.13	0.16
Item25	0.76	0.19	0.24	0.19	0.20

Extraction method: Principal component analysis.  
 Rotation method: Varimax normalisation with Kaiser.  
 a. Rotation has converged in 8 iterations.

Source: Compiled by the authors.

FIGURE I. Confirmatory Factor Analysis (CFA)



Source: Compiled by the authors.

TABLE VI. CFA values

	Estimate	S.E.	C.R.	P	Label
SGM 1 <--- GM	1.00				
SGM 2 <--- GM	.98	.058	16.90	***	par_11
SGM 3 <--- GM	.66	.055	12.16	***	par_12
SGM 4 <--- GM	.84	.064	13.15	***	par_13
SGM 5 <--- GM	1.18	.069	17.16	***	par_14
SGM 6 <--- GM	1.09	.067	16.41	***	par_15
SAC 1 <--- AC	1.00				
SAC 2 <--- AC	1.05	.046	23.06	***	par_16
SAC 3 <--- AC	.86	.035	24.79	***	par_17

(continued)

TABLE VI. CFA values (continued)

	<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>	<b>Label</b>
SAC 4 <--- AC	1.11	.042	26.47	***	par_18
SAC 5 <--- AC	1.14	.043	26.16	***	par_19
SAO 1 <--- AO	1.00				
SAO 2 <--- AO	.80	.050	16.08	***	par_20
SAO 3 <--- AO	.91	.052	17.48	***	par_21
SAO 4 <--- AO	1.09	.062	17.59	***	par_22
STGA 1 <--- TGA	1.00				
STGA 2 <--- TGA	1.00	.046	21.93	***	par_23
STGA 3 <--- TGA	1.20	.051	23.44	***	par_24
STGA 4 <--- TGA	1.09	.048	22.69	***	par_25
STGA 5 <--- TGA	1.05	.042	25.00	***	par_26
SRC 1 <--- RC	1.00				
SRC 2 <--- RC	1.54	.068	22.65	***	par_27
SRC 3 <--- RC	1.32	.058	22.90	***	par_28
SRC 4 <--- RC	1.38	.057	24.31	***	par_29
SRC 5 <--- RC	1.60	.064	25.01	***	par_30

Source: Compiled by the authors.

are deemed obstructers). A second perspective of analysis, focused on the dimensions in which these practices are grouped, has allowed us to assess to what extent the three variables mentioned above condition the opinion of the teachers surveyed.

## Results

From a general perspective, in Andalusian schools the practices related to teachers and guidance activities and those related to the administrative coordination of Dual VET are the ones most highly valued and that most contribute to the consolidation of this training model in this autonomous community, in the opinion of the teaching staff. The practices related to the governance model, to academic organization and to the role of the company are those that show room for improvement (Graphic I).

TABLE VII. Correlations between CFA dimensions

CORRELATIONS			ESTIMATE
SGM	<-->	SAC	.60
SGM	<-->	SAO	.70
SGM	<-->	STGA	.66
SRC	<-->	SGM	.63
SAC	<-->	SAO	.73
SAO	<-->	STGA	.76
SRC	<-->	SAO	.73
SAC	<-->	STGA	.76
SRC	<-->	STGA	.80
SRC	<-->	SAC	.61

Source: Compiled by the authors.

TABLE VIII. Regression. CFA

REGRESSION			ESTIMATE
GM1	<---	GM	.66
GM2	<---	GM	.59
GM3	<---	GM	.42
GM4	<---	GM	.44
GM5	<---	GM	.65
GM6	<---	GM	.62
AC1	<---	AC	.73
AC2	<---	AC	.67
GA3	<---	AC	.71
AC4	<---	AC	.77
AC5	<---	AC	.76
AO1	<---	AO	.54
AO2	<---	AO	.62
AO3	<---	AO	.70
AO4	<---	AO	.71
TGA1	<---	TGA	.69
TGA2	<---	TGA	.66

(continued)

TABLE VIII. Regression. CFA (continued)

TGA3	<---	TGA	.70
TGA4	<---	TGA	.68
TGA5	<---	TGA	.76
RC1	<---	RC	.62
RC2	<---	RC	.74
RC3	<---	RC	.76
RC4	<---	RC	.83
RC5	<---	RC	.86

Source: Compiled by the authors.

TABLE IX. Distribution of items by dimension

Dimension	Items
[D1.RC] Role of the company in Dual VET	RC1. The motivation of dual students RC2. The familiarity of participating companies with the content of the training courses taught at the schools RC3. The commitment of participating companies to the training of dual students RC4.courses RC5.The companies' fulfilment of the dual training programme objectives
[D2.AC] Administrative coordination at the school	AC1. The process followed at the school for the planning of dual projects AC2. Administrative coordination of Dual VET at the school AC3. The network of contacts that the school maintains with companies in the area AC4. The system implemented by the school for recruiting companies AC5. The procedure followed by the school for assigning the teacher-guidance counsellor in dual projects
[D3.TGA] Teachers and guidance activities	TGA1.The degree of involvement of the teachers in Dual VET TGA2. The continuity of teachers in the dual projects TGA3. The training received by the school's teachers about Dual VET TGA4. The guidance students receive concerning the choice of a dual programme TGA5. The system that offers guidance and counselling to dual students

(continued)



TABLE IX. Distribution of items by dimension (continued)

Dimension	Items
[D4.GM] Governance model	GM1. The terms and conditions of the annual call for projects by the Andalusian education authorities GM2. The resources allocated by the Andalusian education authorities to the school for Dual VET GM3. The usefulness of the work done by the prospector during the first quarter of the 2019/20 academic year GM4. The existence within a single programme of both dual and non-dual students GM5. The role played by the Chambers of Commerce, Business Confederations, Associations of Entrepreneurs... GM6. The role played by organizations such as foundations (Bertelsman, Dualiza,...) and other institutions that contribute to the consolidation of Dual VET
[D5.AO] Academic organization at the school	AO1. Amount of time allocated to the school counsellor for monitoring dual students AO2. The procedure followed at the school for the selection of dual students AO3. The length of the training in the company AO4. The compatibility of school and company schedules

Source: Compiled by the authors.

As shown in the Table X, among the aspects and practices that most contribute to the consolidation of this training model in Andalusian schools, the ones that stand out from the rest are: the involvement of the teachers, their continuity in the dual projects and the network of contacts the schools maintain with nearby companies (these were given a score of 5/5 by over 50% of teachers surveyed); these are followed by the guidance and counselling system for dual students, the procedures followed in the school for the selection of dual students and for the planning of the dual projects and also the length of the company-based training (these were given an average score of 4/5 and 5/5 by over 75% of teachers surveyed). In the minds of teachers, student motivation is an aspect that facilitates the implementation of this training model (4.14).

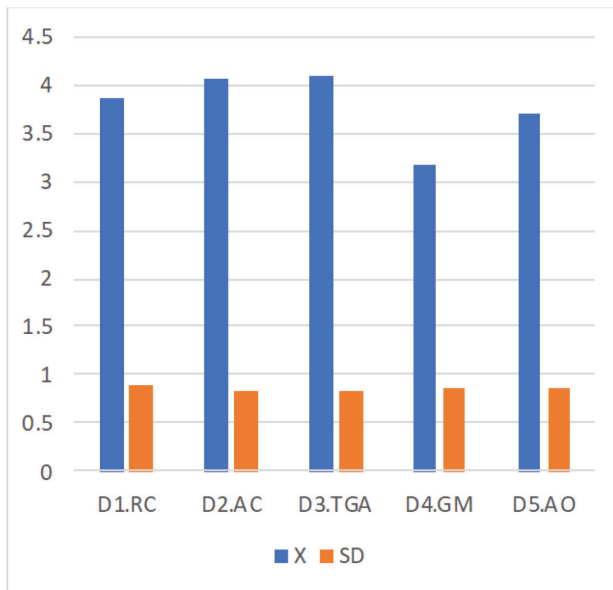
Among the practices with the most room for improvement (with average scores in the 2-3/5 interval and with deviations greater than 1) the most salient are: the resources allocated by the government to the school, the existence in a single programme of dual and non-dual students, the role played by Chambers of Commerce, Business Confederations and

Associations of Entrepreneurs, and the time allocated to the school's guidance counsellor for monitoring dual students. Also belonging to this group are other practices that have room for improvement but not as much (average scores between 3-4/5 and deviations greater than 1).

Other analyses were performed to find out the extent to which gender, teacher experience in and knowledge about the dual training model (professional development) and professional profile (administrative coordinator – teacher – prospector) condition the opinion that the surveyed teachers have of these practices. The results of these analyses and a discussion appear below.

These variables do not appear to condition the general assessment made by the survey respondents of the practices taking place in their schools. The most highly valued practices are the ones related to administrative coordination of dual programmes at the school and the

GRAPHIC I. Practices contributing to or hindering the consolidation of Dual VET in Andalusian schools, by dimension



\*1 is "Does not contribute to the consolidation of Dual VET at my school" and 5 is "Contributes a great deal to it"  
 Source: authors.

TABLE X. Aspects and practices that facilitate/obstruct the implementation of Dual VET in Andalusia's schools

<b>Well-valued Practices</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>X</b>	<b>σ</b>
1°	AC3	1.36%	3.29%	8.30%	28.92%	58.12%	4.39	0.88
2°	TGA2	2.96%	4.81%	10.30%	22.96%	58.96%	4.30	1.03
3°	TGA1	2.32%	4.06%	11.52%	25.94%	56.16%	4.30	0.98
4°	TGA5	1.76%	4.33%	13.35%	36.24%	44.31%	4.17	0.94
5°	RC1	1.52%	5.42%	15.31%	33.07%	44.69%	4.14	0.97
6°	AC5	3.13%	2.97%	15.17%	36.67%	42.06%	4.12	0.98
7°	AC1	2.41%	5.18%	16.27%	35.81%	40.34%	4.06	0.99
8°	AO3	2.91%	4.52%	15.80%	39.84%	36.93%	4.03	0.98
9°	AC4	3.27%	5.65%	17.41%	34.00%	39.66%	4.01	1.05
10°	AC5	3.82%	5.65%	16.96%	32.85%	40.72%	4.01	1.07
11°	RC3	2.86%	6.29%	18.53%	31.62%	40.70%	4.01	1.05
12°	RC4	2.12%	6.42%	18.18%	35.55%	37.74%	4.00	1.00
13°	TGA4	4.10%	5.97%	17.54%	34.33%	38.06%	3.96	1.08
14°	GM3	5.97%	5.97%	16.16%	30.65%	41.26%	3.95	1.16
<b>Practices that could be improved</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>X</b>	<b>σ</b>
1°	GM2	24.75%	27.65%	26.28%	14.06%	7.26%	2.51	1.21
2°	GM4	21.19%	17.35%	24.41%	20.09%	16.95%	2.94	1.38
3°	GM5	19.04%	20.41%	26.17%	19.43%	14.94%	2.91	1.32
4°	AO1	19.31%	20.36%	19.02%	21.33%	19.99%	3.02	1.41
5°	GM6	12.18%	16.86%	25.73%	24.66%	20.57%	3.25	1.29
6°	GM1	6.55%	14.23%	32.90%	30.96%	15.36%	3.34	1.10
7°	RC2	8.31%	14.97%	23.71%	28.30%	24.71%	3.46	1.24
8°	AO4	5.77%	10.66%	23.21%	31.31%	29.05%	3.67	1.17
9°	RC5	4.36%	9.62%	20.34%	35.13%	30.55%	3.78	1.11
10°	TGA3	4.70%	10.53%	19.29%	31.17%	34.31%	3.80	1.16
11°	AC2	4.98%	8.30%	21.04%	31.83%	33.86%	3.81	1.14
*1 is "Does not contribute to the consolidation of Dual VET at my school" and 5 is "Contributes a great deal to it"								

Source: Compiled by the authors.

ones related to teachers and guidance activities, while those with the most room for improvement have to do with the governance model; however, the analyses have made it possible to identify some significant differences in the levels of concretion of these variables (Table XI).

Student's t test reveals that significant differences ( $p < 0.05$ ) exist between the opinions of male and female teachers in four of the five dimensions studied; the dimension of administrative coordination of Dual VET at the school is the only one that does not show differences by gender.

The ANOVA performed shows there are significant differences in the assessment of the five dimensions analyzed depending on the teacher's professional profile: administrative coordination, teaching and prospecting ( $p < 0.05$ ).

As the following table shows (Table XII), teachers with an administrative coordination profile give the highest assessments, in contrast with teachers engaged in prospecting, who give the lowest assessments.

After calculating the minimum significant difference (MSD analysis) between the different variables, it was found that these differences are present in the aspects comprising the dimensions "Administrative coordination of Dual VET at the school" (AC) and "Teachers and guidance activities" (TGA) for all three profiles ( $p$  between 0.00 and 0.02). The differences in the aspects comprising the dimension "Governance

TABLE XI. Average scores of each dimension by analysis variable

Dimensions		RC		AC		TGA		GM		AO	
Variables		X	$\sigma$	X	$\sigma$	X	$\sigma$	X	$\sigma$	X	$\sigma$
Gender	M	3.80	0.91	4.04	0.82	4.01	0.85	3.10	0.86	3.65	0.88
	W	3.97	0.85	4.06	0.82	4.18	0.78	3.23	0.88	3.78	0.85
Professional Profile	T	3.75	0.95	4.03	0.86	4.09	0.86	3.07	0.94	3.68	0.94
	P	3.83	0.92	3.85	0.91	3.85	0.92	3.33	0.81	3.56	0.94
	AC	4.02	0.78	4.17	0.71	4.20	0.71	3.15	0.82	3.80	0.73
Professional Development	L	3.59	1.03	3.89	0.90	3.86	0.97	3.00	0.94	3.58	1.01
	I	3.88	0.85	4.11	0.75	4.18	0.72	3.18	0.86	3.75	0.83
	H	4.06	0.76	4.33	0.78	4.37	0.68	3.18	0.92	3.89	0.68

Source: Compiled by the authors.

model” (GM) are present in the opinions of the surveyed teachers with a teaching profile and those with a prospecting profile ( $p=0.00$ ), and also between the prospecting profile and the administrative coordination profile ( $p=0.01$ ); the differences in the assessments of the various aspects comprising the dimensions “Academic organization” (AO) and “Role of the company” (RC) are marked by the administrative coordinators, whose opinions differ from those of teachers and prospectors ( $p$  between 0.00 and 0.02).

Although all surveyed teachers deemed the time allocated by the school to the guidance counsellor for monitoring dual students to be insufficient, the score is significantly lower in the case of teachers who are familiar with and perform this task (2.87/5;  $p=.008$ ).

In the case of teachers involved in the coordination of dual projects, the aspects explored (because of the characteristics of their tasks) are related to administrative and academic coordination of Dual VET at the school and to the support of the Andalusian educational authorities. In eight of the ten aspects explored (Governance model, items 1 and 4; Administrative coordination, items 1, 2 and 3; Academic organization, items 2, 3 and 4), the average scores of coordinators are higher than the scores of teachers lacking that experience; according to the ANOVA data these differences are significant (with a value of  $p=.000$ ) in opinions about the process followed at the school for the planning of dual projects (AC1) and for the selection of dual students (AO2) and

TABLE XII. Average score by professional profile

DIMENSIONS	Professional Profile					
	Teaching		Prospecting		Administrative coordination	
	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation
RC	3.75	0.95	3.83	0.92	4.02	0.78
AC	4.03	0.86	3.85	0.91	4.17	0.71
TGA	4.09	0.86	3.85	0.92	4.20	0.71
GM	3.07	0.94	3.33	0.81	3.15	0.82
AO	3.68	0.94	3.56	0.94	3.80	0.73

Source: Compiled by the authors.

the length of the work-based training (AO3). Also standing out in a significant manner (with a value of  $p \leq 0,05$ ) is the positive assessment this group of teachers has of the network of contacts the school maintains with companies (AC3), of the existence within the same training programme of both dual and non-dual students (GM4) and the compatibility of schedules between the school and the workplace (AO4). Among the practices deemed by this group to be improvable (with average scores below those of respondents who have never taken part in project coordination) especially noteworthy is the amount of time allocated to the school's guidance counsellor for monitoring dual students (AO1) with statistically significant differences ( $p=.004$ ).

In relation to the professional development index, it is important to note that significant differences exist in all the dimensions, using as reference the value  $p \leq 0,05$ : Role of the company:  $p=0,000$ ; Administrative coordination:  $p=0,000$ ; Teachers and guidance activities:  $p=0,000$ ; Governance model:  $p=0,035$ ; Academic organization:  $p=0,006$ .

Generally speaking, the average opinions of teachers with long experience in Dual VET (high index) are higher than those of other teachers, in all dimensions except Governance model (with an average between 3.19 and 4.37). For Governance model, their assessments are the same as those given by teachers with an intermediate professional index (average 3.18).

It is worth pointing out that the average opinions of teachers with less experience (low index) are lower than those of the rest of teachers (average ranging from 3 to 3.89), in all dimensions. The MSD analysis shows that the minimum significant differences in the various aspects of the dimensions "Administrative coordination of Dual VET at the school (AC)" and "Teachers and guidance activities (TGA)" are found between all the groups ( $p < 0.05$ ). The differences in the aspects of the dimension "Governance model (GM)" are found between the opinions of teachers with a low and intermediate level of experience in Dual VET. The differences in the assessments of the aspects of the dimension "Academic organization (AO)" are found between teachers with low and intermediate levels, low and high levels and high and low levels ( $p$  between 0.00 and 0.05). As for the dimension "Role of the company in dual training", it is the opinions of teachers with low professional development that differ from those of other teachers (intermediate and high levels).

## Discussion

As indicated by the analyses presented above, the involvement and continuity of teachers in dual projects constitutes one of the aspects most favourable to the consolidation of this training model in Andalusian educational institutions. However, it appears that teachers do not feel fully prepared (3.5/5 and SD 1.2) to take on this task in the dual model of VET, which informs us of a change from the disciplined and obedient response shown by this collective when this type of VET was first implemented (Marhuenda et al., 2017). The recent demands of teachers in this regard suggest they are now in a much more proactive position.

The efforts made by schools in terms of academic and administrative organization in order to offer alternance training are very considerable and their efficacy is highly rated by teachers; standing out in this respect are the network of contacts that schools maintain with local companies and the procedures followed by schools in the selection of students, the planning of dual projects and the assignment of teacher-counsellors.

As regards the role of the company –without losing sight of the high degree of motivation with which students go to the assigned company and which itself is a guarantee of the success of the training process taking place there– of particular relevance is the company's commitment to the training process and its coordination with the school. However, as has been highlighted in previous studies (Pozo-Llorente & Poza-Vilches, 2020; Pozo-Llorente et al., 2021; Barrientos et al., 2019; among others), in the opinion of teachers the knowledge of the companies regarding the content of these training programmes should improve, as should their degree of fulfilment of the programme's objectives.

The complexity of Dual VET systems, due to the variety of agents involved (governmental bodies, schools, companies, social partners, etc), means that their governance is of key importance. As pointed out by Oliver (2010) in relation to VET, its success and efficacy depend to a large degree on the development of structures of governance that enhance the coordination and integration of the different agents that take part. In line with the findings of Sanz de Miguel (2017), in the dual training system in place in Andalusia the practices with the most room for improvement are those related to the governance model that is imposed by government regulations and conditions how organization occurs at the schools. In this regard, the time allocated for teachers-counsellors

to monitor dual students and schedule compatibility between school and company are both considered insufficient. This aspect constitutes a handicap for collaborating companies whose schedule cannot be modified to match the school schedule because the companies respond to exceptional situations that require a special schedule; situations that in fact would provide valuable training opportunities for the students. It should be noted that this aspect has recently been made more flexible, with modifications to the latest guidelines included in the annual call for Dual VET projects in Andalusia<sup>6</sup>.

The only governance-related practice that received a positive assessment by teachers is the one referring to the tasks performed by the prospector. This figure was introduced into the dual system in 2019 by the Andalusian government as a response to the demand, put forward by various spheres, for greater leadership power and resource allocation for the purpose of organizing and fomenting prospecting activities by public schools, to recruit companies and make more training opportunities available to dual students.

It must be noted that in the opinion of teachers, in Andalusia the existence within the same programme, and thus within the same group, of both dual and non-dual students constitutes a conditioning factor of the successful implementation of such programmes. This opinion does not coincide with the one pointed out by Pineda et al. (2019) in a multiregional study, which stated that “combining dual and non-dual training simultaneously does not generally affect the factors favourable to consolidation” (p. 35). It may be the high student/teacher ratio in vocational training programmes in Andalusia that makes it difficult to teach both dual and non-dual students in the same classroom.

Gender, experience in administrative coordination and knowledge about the dual system are variables that condition the teachers' opinions about the process of implementation of this type of training in the educational institutions of Andalusia. In general terms, female professors and professors of any gender with experience in administrative coordination (especially of dual projects) express the highest opinions. The surveyed teachers who have carried out prospecting activities and

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<sup>6</sup> <https://www.juntadeandalucia.es/educacion/portals/web/inspeccion-educativa/normativa/-/normativas/detalle/orden-de-20-de-enero-de-2023-por-la-que-se-convocan-proyectos-de-formacion-profesional-dual-para-el-curso-academico>



those having a low professional development index are the ones with the lowest opinions. In the case of prospectors, this may have something to do with the great effort that must be made before they reach agreements for ongoing collaboration projects with collaborating companies; in the case of teachers having a low professional development index, their lack of knowledge regarding the dual system may be the conditioning factor of their opinion (Pozo-Llorente et al., 2021).

## Conclusions

Thus study was undertaken based on the premise that the specific analysis of local (regional) singularity will make it possible to move towards a more effective, efficient and sustainable dual training system at the global level. Many voices (from political, technical and academic spheres) insist that the success of this training model lies, along with political initiative and the productive fabric, in its teachers and in the companies that choose to become involved. Among these voices are Ramasamy et al. (2021) when he underlines that the teaching staff plays a key role in the quality of this training. As pointed out by Pineda et al. (2018), to achieve greater teacher engagement, it is necessary that the teaching staff understand this training model. It is equally necessary that the dual project proposals take into account the motivations and needs of the companies, without losing sight of the ultimate goal of this training, which is student learning. These observations reflect the importance of coordinated efforts by schools and companies, plus the prominent role that government must play.

This research has allowed us to better understand Dual VET based on the opinion that participating teachers have of its implementation in the region's schools. It has also enabled us to examine the state of the debate that this training model has generated in the Andalusian educational community, a debate that is also reflected in the annual governmental guidelines.

This study has limitations related to the possible biases resulting from the situation of stress experienced during the most intense stage of the pandemic, when the study took place. A series of measures were put in place to minimize the impact of the exceptional situation on the opinions gathered. These measures included modifying the fieldwork to better suit the new situation, adapting it to the pace of activity at the schools, the

type of information sought and the triangulation processes used. Another limitation of this study is that it does not explore the opinion of teachers with regard to the vocational family in which they teach.

Subjects of special interest for future research include the changes brought about by the new VET legislation in the practices of Andalusia's dual training classrooms and the analysis of the potential of the dual system described in the legislation to respond to the professional situation in Andalusia.

To close, we would underline that it is important to continue advancing in the dual training model and that to do so the system must be analyzed from the prism of its day-to-day protagonists.

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**Contact address:** María Teresa Pozo Llorente. Universidad de Granada, Campus Universitario de Cartuja, Facultad de Ciencias de la Educación. 18071. Granada. E-mail: [mtpozo@ugr.es](mailto:mtpozo@ugr.es)

## Annex I

### Theoretical dimensions and associated items resulting from consultation with experts on Dual VET in Andalusia

#### BLOCK I. ASPECTS CONTRIBUTING TO THE CONSOLIDATION OF DUAL VET IN ANDALUSIA

<b>REGULATIONS</b>
The terms and conditions of the annual call for projects by the Andalusian education authorities
<b>SUPPORT PROVIDED BY THE GOVERNMENT</b>
The resources allocated by the Andalusian education authorities to the school for the consolidation of Dual VI 1
The usefulness of the work done by the prospector during the first quarter of 2019 20
<b>COURSES DESIGNED AND OFFERED</b>
The process followed at the school for the planning of dual projects
The existence within a single programme of both dual and non-dual students
<b>ADMINISTRATIVE AND EDUCATIONAL COORDINATION</b>
Administrative coordination of Dual VET at the school
The network of contacts that the school maintains with companies in the area
The system implemented by the school for recruiting companies
The procedure followed at the school for assigning the teacher-counsellor in dual projects
Amount of time allocated to the teacher-counsellor for monitoring dual students
The procedure followed at the school for the selection of dual students
The duration of the training in the company
The compatibility of schedules between the school and the company
<b>ACTORS INVOLVED</b>
The degree of involvement of the teachers in Dual VET
The continuity of teachers in the dual projects
The training received by the school's teachers about t>ual VET
The motivation of dual students
The familiarity of the participating companies with the content of the training courses taught at the educational institutions
The commitment of participating companies to the training of dual students
The role played by the Chambers of Commerce, Business Confederations, Associations of Entrepreneurs...
The role played by organizations such as <i>Bertelsmann Foundation. Andalusia Entrepreneurship. Bankia Foundation, Alliance for the Dual VET...</i>

<b>QUALITY OF THE TRAINING</b>
The guidance students receive before deciding whether to choose a dual programme
The system that offers guidance and counselling to dual students
The coordination of schools and companies regarding the content of the training courses
The companies' fulfilment of the dual training programme's objective

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## BLOCK II. ASPECTS OF DUAL VET THAT SHOULD BE REVISED IN ORDER TO IMPROVE THE QUALITY OF DUAL VET IN ANDALUSIA

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<b>REGULATIONS</b>
The regulatory framework applicable to Dual VET
The (unctions and responsibilities of all the agents involved in Dual VET as established in the regulations
<b>SUPPORT PROVIDED BY THE GOVERNMENT</b>
The dissemination by the government of information about Dual VET to schools
The dissemination in the government of information about Dual VI 1 to companies
The recognition by the government of the teachers involved
The financial assistance (stipend/remuneration) provided to dual students
The monitoring mechanisms put in place by the government to ensure the proper execution of the dual projects
<b>COURSES DESIGNED AND OFFERED</b>
The process established in Andalusian regulations for determining what courses will be offered in Dual VET
The adjustment of dual courses offered, so as to meet the demands of Andalusia's productive fabric
The criteria applied by the government to evaluate the projects
The organization of the alternance (hours of training at the school and at the company)
The strategies put in place to ensure parity in the number of male and female students in all dual courses
<b>ADMINISTRATIVE AND ACADEMIC COORDINATION</b>
The administrative coordination model used to set up Dual VET in a school
The system established for students to access Dual VET without differentiation from regular VET (enrolment process in VET and specifically in Dual VET)
School-company coordination
The mechanisms put in place to ensure that the most vulnerable students are admitted to this type of VET

<b>INFRASTRUCTURE AND RESOURCES</b>
The infrastructure and equipment available to schools for the execution of dual projects
The infrastructure and equipment available to participating companies for the execution of dual projects
<b>QUALITY OF TRAINING</b>
The curriculum, competences (knowledge, abilities, skills, values) and learning outcomes established for Dual VET
The MOODLE platform that allows collaborative work between the teachers and coordinators of Dual VET
Mechanisms put in place for communication with the companies
The teaching methodologies linked to Dual VET
Didactic and pedagogical qualification of the company tutor
The system used for evaluating the learning of dual students
The rotation of students in different companies
The real level of professional qualification acquired by dual students

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### BLOCK III. SITUATIONS THAT MAY POSE REAL THREATS TO THE SUCCESS OF DUAL VET IN ANDALUSIA

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That the complexity of the administrative coordination of Dual VET is such that schools lose interest in this type of training
The level of participation in Dual VET by teachers, considering the effort it entails
The degree of interest companies have in the profile of graduates of Dual VET
The suitability of students who complete Dual VET to the jobs offered by the companies.
That the reduction in face-to-face teaching hours that Dual VET involves will result, in some cases, in the reduction of the teaching staff at some schools
The stability of the school-company relationship
The degree of specialization of the training received at the company may mean reduced possibilities of future job insertion for dual students
The degree of stability of the teachers involved
The rate at which dual students drop out of school
OTHER:



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## BLOCK IV. DEGREE OF GENERAL SATISFACTION WITH DUAL VET IN ANDALUSIA

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The consolidation of the Dual VET projects in which 1 participate
The overall consolidation of Dual VET in this autonomous community
The quality of the dual professional training offered in this autonomous community

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## BLOCK V. PROSPECTION

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The regulation of the figure of prospector is a demand expressed by the schools that offer VET
The scope and extension of Dual VET, in other words, its capacity to reach all territories, is adequate
The functions assigned to the prospector by the government are clearly defined
The pay established by the government for the prospector is adequate
The activity of prospectors is fundamental for ensuring the participation of nearby companies in Dual VET
For companies tire prospector is the point of contact with the schools
The number of prospectors in my area has been sufficient for reaching our objective
The amount of time established by the government for the prospection of companies has been sufficient
The function of the prospector is understood by all the VET teaching staff
I feel very motivated by the recognition 1 receive from my colleagues for my work as prospector
I have carried out my tasks as prospector in ongoing coordination with my school
On most occasions 1 have felt sure about my activity as prospector
The work I have done as prospector has improved the network of contacts between schools and nearby companies
The number of student slots made available by the companies for Dual VET thanks to my activity as prospector lias been sufficient to improve the execution of the same.
In general terms the companies seem willing to remunerate dual students
In general terms the companies are familiar with the procedures to be followed for the remuneration of dual students
I have met the objectives I set for myself in my role as prospector
I would like to be a prospector again in coming years
I am very satisfied with the work I have done as prospector