Higher Vocational Education and Training: Examining an unexpected upskilling and reskilling pathway for STEM and non-STEM university graduates in Spain

Formación Profesional de Grado Superior: Examinando una vía inesperada de upskilling y reskilling para titulados universitarios STEM y no STEM en España

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Abstract

This article analyses the type of learning strategies of university graduates who subsequently choose to study a higher vocational qualification in Spain. The aim is to show whether this decision responds to an upskilling or reskilling strategy. The methodology used is quantitative, and taps on official survey data of the learning pathways and VET-to-labor market transitions of Higher VET Graduates in Spain (ETEFIL-19). First, the magnitude of University-to-Higher-VET transfer is determined and the profile of the university graduates involved in this transition is characterised. Second, the "relatedness" between the field of study of origin and the Higher VET area of destination is analysed. Thirdly, the perceived usefulness in terms of employability is studied. The results reveal that University-to-VET transfer is mainly chosen by women and that the decision is taken years after completing their university studies. The positive and statistically significant association between the Higher VET area and their previous university degree reveals that this transition is best interpreted as an upskilling strategy, rather than a career change. University graduates also perceive that their VET qualification has been useful in finding a job. Finally, policy and practice implications are considered, while the limitations of this study and the need for future lines of research are raised.

Keywords: Vocational Education and Training, university graduates, VET-University pathways, Post-Baccalaureate, Reverse Transfer, employability, STEM, contingency analysis, reskilling, upskilling, ETEFIL-19

Resumen

Este artículo analiza el tipo de estrategias de aprendizaje de aquellos jóvenes que tras lograr una titulación uni-

versitaria optan por estudiar un ciclo formativo de Grado Superior de Formación Profesional en España. El objetivo es mostrar si esta decisión responde a una estrategia de actualización (upskilling) o de recapacitación (reskilling). La metodología utilizada es de carácter cuantitativo, fundamentada en la encuesta oficial española que estudia la inserción laboral de los jóvenes españoles con relación a los itinerarios seguidos dentro del sistema educativo y las transiciones entre el estudio y el trabajo (ETEFIL-19). Primero, se determina la magnitud de este fenómeno y se caracteriza el perfil de las personas que protagonizan esta transición. Segundo, se analiza la relación entre la rama de estudio de procedencia y la familia profesional de destino. Tercero, se estudia la utilidad percibida en clave de empleabilidad. Los resultados revelan que esta trayectoria se desarrolla mayoritariamente por mujeres y que la decisión se toma años después de finalizar sus estudios universitarios. La relación entre la rama de estudios previos y la familia del ciclo cursado es positiva y estadísticamente significativa, por lo que su decisión se toma principalmente en función a una estrategia de upskilling, más que de un cambio de carrera. Asimismo, perciben que su titulación de FP les ha resultado útil para encontrar empleo. Finalmente, se consideran las implicaciones en el ámbito de la política y de la práctica, a la vez que se plantean las limitaciones de este estudio y la necesidad de futuras líneas de investigación.

Palabras clave: Formación profesional superior, egresados universitarios, pasarelas FP-Universidad, itinerarios educativos, empleabilidad, STEM, análisis de contingencia, reskilling, upskilling, ETEFIL-19

Introduction

Vocational Education and Training (henceforth VET) attracts different profiles of adults who, at different points in their life course, decide to return to education/training (Cournoyer et al., 2017).. In Europe, this trend has been accentuated in recent years and more and more schools are admitting adults to IVET courses (Markowitsch & Hefler, 2019).. The return of adults to the education system is a phenomenon that shows large variations across occupations and countries (Lerman 2017, cited by Markowitsch & Hefler, 2019).

These flows are an example of the increasing de-standardisation, individualisation and fragmentation of young people's transitions to adulthood (Montes Ruiz, 2019) and challenge the excessively rigid and linear configuration of educational pathways and routes to employment, which have long since become much more ambiguous, protracted and indirect (e.g. Golding, 1999; Moodie, 2004; Taylor & Jain, 2017; Townsend & Dever, 1999).”edition”:”C. Selby-Smith (Ed..

The presence of university graduates in VET classrooms is not a new phenomenon, nor is it exclusive to Spain. Research undertaken in countries such as Australia and the United States aimed at determining the volume of this flow, the context in which it occurs and the reasons behind this decision. The counter-intuitive nature of University-to-VET transfer is perhaps one of the reasons why this phenomenon has received little attention in Europe (Montes Ruiz, 2019).

In the United States, Townsend & Dever (1999) coined the concept of “Post Baccalaureate Reverse Transfer” to characterise the movement of university graduates to Community Colleges (2-year VET). Two years earlier, Gose (1997) estimated that between 10% and 20% of students entering this type of training had a previous university degree. Subsequently, several authors (e.g. Friedel & Friesleben, 2017; Leigh, 2009) have continued this line of research but the scope has often been limited to specific educational institutions or states, so that no clear picture is available at the country level.

In Australia, the movement of graduates from university to VET was virtually unknown until Golding (1999) uncovered the magnitude of this flow in the State of Victoria. In the period 1991-1997, he estimated that about 40,000 VET students had a prior university qualification each year, although the accuracy of these figures was questioned years later by Moodie (2004). More recent statistics show that in the last five years the percentage of VET graduates with a prior university degree in Australia is between 12% and 15% (National Centre for Vocational Education Research, 2022)..

Generally speaking, university graduates decide to enrol in a VET programme years after ob-

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taining their degree. In Europe, tertiary education attracts a significant number of students aged 25+ as an *upskilling* or *reskilling* strategy (European Commission, Directorate-General for Employment, Social Affairs and Inclusion et al., 2016). In Finland, analysis of a group of short-cycle higher education programmes showed that the average age of students was around 40 years and at least 12% had a university degree (Aittola & Ursin, 2019).

Golding (1999) and Townsend and Dever (1999) highlight the unforeseen nature of this movement both for the individuals involved, as it was not part of their career plans, and for the VET providers, designed to take in students entering from conventional entry routes such as Compulsory Secondary Education or Upper Secondary Education. In the USA, Friedel & Friesleben (2017) criticise the fact that educational authorities still do not have the relevant mechanisms in place to collect data on the volume and characteristics of VET students with previous university degrees and to analyse the impact of their presence on the quality of training or at a budgetary level.

Periods of economic downturn and the resulting increase in unemployment and job insecurity lead to a return to the education system of people with work experience (e.g. Harris et al., 2006; Lehmann et al., 2014; Molgat et al., 2011). For instance, in Australia, the movement of university graduates into VET took place in the early 1990s during an episode of economic recession that led to high unemployment rates among university graduates (Golding, 1999). In any case, several authors point to the multi-causal character of this phenomenon (e.g. Chen et al., 2020; Hagedorn & Castro, 1999; Harris et al., 2006; Quinley & Quinley, 1999).we examine the lived experiences of international reverse transfers to understand the reasons for reverse-transfer and to understand the students' learning experiences. Methods: Using a phenomenological approach, we recruited 10 international reverse transfer students attending one four-year university or one of the two community colleges. We conducted individual interviews with all participants and analyzed transcript data through Bourdieu's sociological theory of field, habitus, and social and cultural capital. Results: We identified three types of international reverse transfer students: undergraduate reverse transfers, temporary reverse transfers, and postbaccalaureate reverse transfers. Each type reported different reasons for reverse transfer but shared similar influential factors of the reverse transfer process as well as the learning experiences while enrolled at the community colleges. Contributions: This study helps to fill an information and research gap regarding international reverse transfer students. We present the academic, social, and cultural challenges faced by international students and offer practical implications for higher education practitioners for improved understandings and better processes to serve international students from diverse cultural backgrounds.","container-title":"Community College Review","DOI":"10.1177/00 91552120932223","ISSN":"0091-5521, 1940-2325","issue":"4","journalAbbreviation":"Community College Review","language":"en","page":"376-399","source":"DOI.org (Crossref. For example, Harris et al. (2006) identified 19 factors including, among others, improved employment prospects, cost of study, location, school reputation, flexibility of study mode, recommendation from social or work environment, or purely personal interest. These decisions take place in contexts of uncertainty and not always voluntarily (Fouad & Bynner, 2008) and are reactive or proactive depending on a combination of individual, social and contextual factors (Cournoyer et al., 2017)..

Retraining or upgrading of professional skills as main motivators

Reskilling is the process by which a person acquires a new set of skills that will enable them to perform a different occupation and involves a career change, while *upskilling* is the process by which a person acquires an additional set of skills that enhance their ability to perform the job for which they were trained (Evans, 2022). The presence of university graduates in US community colleges has been explained in terms of both an *upskilling* and *reskilling* strategy (Chen et al., 2020; Friedel

& Friesleben, 2017; Quinley & Quinley, 1999).we examine the lived experiences of international reverse transfers to understand the reasons for reverse-transfer and to understand the students' learning experiences. Methods: Using a phenomenological approach, we recruited 10 international reverse transfer students attending one four-year university or one of the two community colleges. We conducted individual interviews with all participants and analyzed transcript data through Bourdieu's sociological theory of field, habitus, and social and cultural capital. Results: We identified three types of international reverse transfer students: undergraduate reverse transfers, temporary reverse transfers, and postbaccalaureate reverse transfers. Each type reported different reasons for reverse transfer but shared similar influential factors of the reverse transfer process as well as the learning experiences while enrolled at the community colleges. Contributions: This study helps to fill an information and research gap regarding international reverse transfer students. We present the academic, social, and cultural challenges faced by international students and offer practical implications for higher education practitioners for improved understandings and better processes to serve international students from diverse cultural backgrounds.",”container-title”:”Community College Review”,”DOI”:”10.1177/0091552120932223”,”ISSN”:”0091-5521, 1940-2325”,”issue”:”4”,”journalAbbreviation”:”Community College Review”,”language”:”en”,”page”:”376-399”,”source”:”DOI.org (Crossref.

In this article two hypotheses are put forward to explain the movement of Spanish university graduates (ISCED 5) into Higher VET, the *reskilling* hypothesis and the *upskilling* hypothesis. Therefore, this study pursues three objectives: 1) to quantify and characterise the flow of university graduates towards Higher VET in Spain; 2) to contrast whether this flow is mainly due to an *upskilling* or *reskilling* strategy and; 3) to assess the usefulness of the Higher VET qualification obtained in order to find employment.

Reskilling hypothesis

This hypothesis suggests that University graduates (ISCED 6) enrol in Higher VET programmes (ISCED 5) that are not related to their previous degree on the lookout for a career change. The reskilling strategy may be motivated by unemployment or job insecurity, but also by personal or family reasons. In Spain, Rujas Martínez-Novillo (2015) points to the Intermediate VET programmes as a re-entry door or a way of "recycling" for people who left the school system without the compulsory education qualification but the aim of this article is to check whether the Higher VET programmes constitute a reskilling route for people with a university degree.

Upskilling hypothesis

VET has been identified as a way for university graduates to expand the repertoire of professional skills that they have not obtained at the end of their academic training (Temmerman, 2019). In Spain, García-Brosa (2019) points to the Higher VET programmes as an incipient re-entry route into the education system for university graduates seeking to specialise in certain areas or to complement their training. Thus, the *upskilling* hypothesis assumes that university graduates enrol in Higher VET programmes to further enrich their competence profile in which technical, academic and generic skills complement each other (Markowitsch & Hefler, 2019).

In general terms, the approach to test these hypotheses is to verify whether or not there is a relationship between prior university education and subsequent VET studies, as will be seen in the following section.

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Method

Instruments

In order to determine the magnitude of the flow of university graduates into Higher VET, it is essential to identify a robust, reliable and accessible data source (Teese & Watson, 2001). In Spain, the latest edition of the Survey on the Transition from Education/Training to Labour Market Insertion (hereafter ETEFIL-19) (INE, 2020) fits the needs of this study to a large extent due to the size of the sample analysed, its accessibility and the type of data collected that allow us to establish the degree of relationship between the chosen VET programme and the previous university degree.

The main objective of ETEFIL-19 is "to *study the subsequent educational trajectory and the process of labour market insertion in relation to the studies undertaken by each of the 5 groups of interest for the survey* (including Higher VET graduates), as *well as the transitions between study and work*" (INE, 2020, p.5). The territorial scope of ETEFIL-19 covered the whole of Spain. The data collection method combined direct web-based (CAWI) and telephone (CATI) interviews and the consultation of administrative data. The surveys were conducted between August 2019 and January 2020. ETEFIL-19 provided access to information on the educational background and previous training of higher technicians who had completed their studies in a Spanish educational institution five years earlier.

Sample

ETEFIL-19 surveyed in 2019 an effective sample of 7,802 Higher VET graduates out of a theoretical sample of 11,031 persons from a total population of 113,910 persons who had successfully completed a Higher VET qualification in the academic year 2013-2014. It should be noted that ETEFIL-19 provides estimates with a relative error of no more than 5% for the most important characteristics, using the Jackknife method (INE, 2020).

In order to achieve the objectives of the present study, a subsample of the total effective sample (n=7,802) was selected, consisting of Higher VET graduates who had a university degree before enrolling in a Higher VET programme (through the variable EST_B19_1 of ETEFIL-19). This subset is made up of 767 persons representing 9.8% of the sample.

Approach to hypothesis testing

Once the study sample had been selected, dichotomous variables were created to classify the previous university degree and the Higher VET programme according to whether or not they belonged to the scientific-technological field (STEM/NOT STEM). STEM university degrees were categorised as those included in two branches of knowledge: Engineering and Architecture and Science. In the case of VET, nine programme areas were included in the STEM category according to the classification proposed by the National Institute for Educational Assessment (INEE, 2017)

TABLE I. Branches of study and professional families in the scientific-technological field (STEM)

STEM BRANCHES (university)	STEM PROGRAMME AREAS (VET)
Science Engineering and Architecture	Building and Civil Works Electricity and Electronics Energy and Water Mechanical Manufacturing Food Industries Extractive Industries[1] IT and Communications Installations and Maintenance Chemistry Transport and maintenance of vehicles

Source: Compiled by the authors

It should be noted that Health-related studies are left out of this categorisation following the proposal of the US National Science Foundation (n.d.), considering that a good part of Health and Health Sciences graduates end up working in the care field and not so much in sectors linked to research or innovation[2] . Therefore, including health science graduates could distort the results and make it difficult to understand the real opportunities and trends in the STEM field. Thus, this analysis has chosen to limit the focus to fields more closely related to traditional science, technology, engineering and mathematics (STEM).

From this categorisation it is determined that there is a relationship between the VET qualification and the previous university degree both when both belong to the field of science, technology, engineering or mathematics (STEM→STEM) or when both are outside (NON STEM→NON STEM). Both scenarios support the *upskilling* hypothesis. Conversely, the *reskilling* hypothesis is supported when field of origin and destination do not match (STEM→NO STEM / NO STEM→STEM).

Data analysis

Data analysis was carried out with JAMOVI v2.3.21.0, an open source statistical analysis software. The analyses include the calculation of descriptive statistics (analysis of the flow of university students to VET) and descriptive-correlational analyses to test the *reskilling* and *upskilling* hypotheses, namely contingency analysis and Chi-square tests (χ^2). In the latter case, the analysis complies with three assumptions: the two variables are nominal, each variable comprises two independent categorical groups (STEM, NOT STEM), and none of the cells has an expected value of less than 5.

The chi-square test ($\chi 2$) of independence allows us to determine whether there is a relationship between the type of Higher VET qualification obtained in 2014 and the previous university degree considering two large categories (STEM and NO STEM). In this case, the sample corresponds to a single population, Higher VET graduates with previous university degree. The individuals have been classified according to two qualitative variables of a binomial nature: STEM Higher VET (Yes/No) and previous STEM university degree (Yes/No).

1 The Extractive Industries vocational family has no Higher Level training cycles.
2 The US National Science Foundation only considers Health Sciences as a STEM degree at the doctoral level.

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Results

Socio-demographic profile

The number of people with a previous university degree who obtained a Higher VET qualification in the 2013-2014 academic year was 767, which represents 9.8 % of the sample at national level (n=7802). In addition, 17.1% of Higher VET graduates with a university degree (n=131) had at least a Master's degree.
The average age at the time of obtaining the Higher VET diploma in 2014 was 32 years and 50% were 30 years old or older (min=23, max=45, SD=6.5 years).

TABLE II. Higher technicians graduating in the 2013-2014 academic year by age group in 2014

	TOTAL HIGHER VET GRADUATES		**HIGHER VET GRADUATES WITH A PREVIOUS UNIVERSITY DEGREE**	
AGE GROUP	N	Percentage	N	Percentage
Under 25	4.462	57,2%	73	9,5%
25-34 years	2.428	31,1%	454	59,2%
35-44 years	648	8,3%	181	23,6%
45 years and over	264	3,4%	59	7,7%
All ages	**7.802**	**100%**	**767**	**100%**

Source: Compiled by the authors based on ETEFIL-19 data.

The percentage of Higher VET graduates with a previous university degree doubles the average (9,8%) in the 25-34 age group (18.7%) and almost triples among graduates aged 35-44 (27.9%).

TABLE III. Higher VET graduates with previous university degree by age group in 2014 with respect to the total number of graduates.

	TOTAL HIGHER VET GRADUATES	**HIGHER VET GRADUATES WITH PREVIOUS UNIVERSITY DEGREE**	
AGE GROUP	N	N	Percentage
Under 25	4.462	73	1,6%
25-34 years	2.428	454	18,7%
35-44 years	648	181	27,9%
45 years and over	264	59	22,3 %
All ages	**7.802**	**767**	**9,8%**

Source: Compiled by the authors based on ETEFIL-19 data.

The results in Tables II and III indicate that the decision to pursue VET studies does not take place immediately after completing university studies. In terms of gender, 67.5% are women, although the gender gap decreases with age, as shown in Table IV.
TABLE IV. Higher VET graduates with a previous university degree by sex and age group in 2014
2013-2014 academic year with

AGE GROUP	SEX				
	Male		Female		Total
	N	% of row	N	% of row	N
Under 25	15	20,5%	58	79,5%	73
25-34 years	140	30,8%	314	69,2%	454
35-44 years	70	38,7%	111	61,3%	181
45 and older	24	40,7%	35	59,3%	59
All ages	**249**	**32,5%**	**518**	**67,5%**	**767**

Source: Compiled by the authors based on ETEFIL-19 data.

Reasons to enrol in Higher VET

The main reason for university graduates to enrol in Higher VET programmes is to improve their future career prospects (67.8%). Personal interest comes next in the list. The expansion of knowledge for personal satisfaction is a reason cited more frequently by university graduates (24.8%) than by the sample as a whole (17.7%). In third place are "other reasons" (6.9%), which are not further detailed in the ETEFIL-19 micro-data[3] .

TABLE V. Reasons for taking Higher Vocational Training studies

	TOTAL HIGHER VET GRADUATES		HIGHER VET GRADUATES WITH PREVIOUS UNIVERSITY DEGREE	
REASONS	N	Percentage	N	Percentage
Training with your future career in mind	5.607	71,9%	520	67,8%
Expanding knowledge for personal satisfaction	1.380	17,7%	190	24,8%
Other reasons	796	10,2%	53	6,9%
NS/NC	19	0,2%	4	0,5%
Total	**7.802**	**100%**	**767**	**100%**

Source: Own elaboration based on ETEFIL-19 data.

With the ETEFIL-19 data is not possible to determine whether University graduates were unemployed when they decided to enrol in a Higher VET programme. However, 18.9% of the sample who was employed in 2019 indicated they stayed at the same job they had before earning their Higher VET qualification in 2014. This suggests that, in these cases, unemployment was not the reason to study VET.

Level of satisfaction with the decision taken

In 2019, five years after completing the Higher VET qualification, and regardless of their employment situation, 85% of university graduates indicate that they would enrol in Higher VET again,

3 Question B5 of block B for the CFGS group only allows you to select one of these two options or "Other".

compared with 85.4% of the total sample. Likewise, 83.1% of university graduates would choose the same Higher VET programme again, which attests to a higher degree of satisfaction with the training studied than the sample as a whole (74.1%).

TABLE VI. Satisfaction with the decision to study Higher VET

Question	TOTAL HIGHER VET GRADUATES		HIGHER VET GRADUATES WITH PREVIOUS UNIVERSITY DEGREE	
	N	Percentage	N	Percentage
I would study Higher VET again	6.663	85,4%	652	85,0%
I would choose the same Higher VET programme	4.936	74,1%	190	83,1%

Source: Compiled by the authors based on ETEFIL-19 data.

Geographical distribution

At regional level, the percentages of Higher VET graduates with a previous university degree, vary substantially ranging from 4.9% in Catalonia to 13.3% in the Valencian Community which tops the list of eight regions with percentages above the national average of 9.8%. The other regions that exceed the national average are Asturias (12.8%), the Canary Islands (12.7%), Galicia (12.7%), Castile and Leon (11.9%), Andalusia (11.8%), Murcia (10.5%) and Cantabria (10.3%). The autonomous cities of Ceuta (21%) and Melilla (4.6%) mark the maximum and minimum, respectively.

University field of study of origin

Almost half of the Higher VET graduates with previous university degree (49.9%) come from the "Social and Legal Sciences" branch. They are followed in order of importance by holders of degrees in "Engineering and Architecture" branch (16.8%) and "Sciences" (13.3%), which together represent 30% of university graduates who had completed a STEM degree before enroling in Higher VET. Health Sciences and Arts and Humanities contribute a similar percentage of graduates that is slightly above 9% (Table VII).

TABLE VII. Higher VET graduates in the 2013-2014 academic year, by university field of study of origin

UNIVERSITY FIELD OF STUDY	Frequency	Percentage
Social and legal sciences	383	49,9%
Engineering and Architecture	129	16,8%
Science	102	13,3%
Health sciences	72	9,4%
Arts and Humanities	70	9,1%
Indeterminable	11	1,4%
Total	**767**	**100%**

Source: Compiled by the authors based on ETEFIL-19 data.

A slightly more fine-grained analysis reveals that one out of every five university graduates who completed a Higher VET programme had a degree in the field of Education Sciences and Teacher Training (20.7%), Architecture and Construction[4] (9.3%) and Management and Administration (8.2%).

Higher VET destination

Although the presence of Higher VET graduates with a previous university degree has been detected in each and every one of the 25 Higher VET programme areas [5] , 60% chose to earn a Higher VET qualification in seven areas: Socio-cultural and community services (16.9%), Health (12.6%), Hospitality and tourism (8.7%), IT and communications (6.8%), Administration and management (5.6%), Commerce and marketing (5.1%) and Image and sound (5%) (Table VIII).

TABLE VIII. VET Programme Areas that account for 60% of VET graduates in the 2013-2014 academic year

VET PROGRAMME AREA	Frequency	Percentage
Socio-cultural and community services	130	16,9%
Health	97	12,6%
Hospitality and tourism	67	8,7%
IT and communications	52	6,8%
Administration and management	43	5,6%
Trade and marketing	39	5,1%
Image and sound	38	5,0%
Subtotal	*466*	*60,7%*
Total	**767**	**100%**

Source: Compiled by the authors based on ETEFIL-19 data.

4 ETEFIL-19 data do not allow disaggregation by degree in this category.
5 The Extractive Industries vocational family has no Higher Level training cycles.

Higher VET graduates with a previous university degree with respect to the total number of Higher Technicians, by VET programme area

University graduates are unevenly represented across VET programme areas ranging from a barely 3.8% of Higher VET graduates in Physical Activities and Sports programmes to values over 15% in Food industries (17.1%) and Chemistry (16.9%)[6] . It is interesting to note that these are the only two STEM VET programme areas where female graduates outnumbered male graduates in the 2020-2021 academic year (Moso-Díez et al, 2024).

Testing the upskilling or reskilling hypothesis

As mentioned above, testing the *upskilling* or *reskilling hypothesis in University-to-VET transfer* requires determining the degree of relationship between the branch of knowledge of the previous university education and the Higher VET qualification obtained in 2014. This analysis was carried out in two steps: (1) identification of the branch of university studies according to the VET programme of destination and (2) contingency analysis to determine the relationship between academic branch of origin and VET programme of destination.

Identification of the branch of university studies according to the VET programme of destination

Table IX shows that graduates from STEM branches (Science and Engineering and Architecture) are in the majority in six VET programme areas clearly ascribed to the STEM field (INEE, 2017).

TABLE IX. Percentage of STEM university degree holders in STEM VET Programme areas

STEM HIGHER VET PROGRAMME AREA	Higher VET graduates with previous university degree	STEM university graduates	% of STEM university graduates
Chemistry	36	32	88,9%
Energy and water	11	9	81,8%
Building and civil works	20	16	80,0%
Installation and maintenance	16	10	62,5%
Electricity and electronics	30	18	60,0%
Mechanical manufacturing	30	16	53,3%

Source: Compiled by the authors based on ETEFIL-19 data.

Similarly, non-STEM university graduates (Social and Legal Sciences and Arts and Humanities) represent a majority in non-STEM Higher VET Programmes (Table X).

6 The percentage rises to 19.4% in Glass and Ceramics/Wood, Furniture and Cork/Textiles, Clothing and Leather/Arts and Crafts, which ETEFIL-19 considers on an aggregate basis.

TABLE X. Percentage of NON-STEM university degree holders in NON-STEM VET Programme areas

NON-STEM HIGHER VET PROGRAMME AREA	Higher VET graduates with previous university degree	NON-STEM university graduates	% of NON-STEM university graduates
Socio-cultural and community services	130	122	93,8%
Graphic arts	14	13	92,9%
Trade and marketing	39	36	92,3%
Image and sound	38	34	89,5%
Administration and management	43	35	81,4%
Hospitality and tourism	67	54	80,6%
Physical and sporting activities (including intermediate level sporting education)	9	7	77,8%
Transport and maintenance of vehicles	7	5	71,4%
Personal image	12	8	66,7%

Source: Compiled by the authors based on ETEFIL-19 data.

Tables IX and X show, therefore, that there is a certain relationship between the branch of university studies of origin and the area of Higher VET programme completed in 2014 in a high percentage of cases, supporting the *upskilling* hypothesis.

However, Information Technologies (IT) and Food Industries are two VET programme areas in the STEM field that do not fit this pattern. In the IT area, 55.8% of Higher VET graduates with previous university degree come from Non-STEM disciplines outnumbering STEM university graduates (40.4%) by 15 percentage points. A similar pattern is observed in the Food Industries programme area although the differences are smaller (Table XI).

TABLE XI. STEM professional families with a majority of graduates from NON STEM branches (Social and Legal Sciences and Arts and Humanities)

VET PROGRAMME AREA	Higher VET graduates with previous university degree	STEM university graduates (a)	Non- STEM university graduates (b)	Difference (b-a) in percentage points
Food industries	24	41,7%	45,8%	4,2
IT and communications	52	40,4%	55,8%	15,4

Source: Compiled by the authors based on ETEFIL-19 data.

On the other hand, the presence of STEM university graduates in non-STEM VET programme areas is much lower, exceeding 10% only in the following areas: Administration and management (16.3%), Hotel and catering and tourism (12%), Image and Sound (10.5%).

Correlation between the branches of origin and VET programmes of destination.

Table XII shows that 65% of STEM university graduates opted for a STEM VET programme. This pattern is even more pronounced among non-STEM university graduates who opted in the majority (79.8%) for professional families outside the scientific-technological field. The contingency analysis, ($\chi 2 = 122.7$, df=1, $p < .001$), indicates that there is a positive and significant association between the university branch of origin and the VET programme of destination. The Phi coefficient shows that the magnitude of the relationship between the variables has a moderate to large effect size (0.407).

TABLE XII. Contingency table of studies of origin and destination.

STEM NON STEM			VET PROGRAMME AREA		
			Total		
BRANCH OF UNIVERSITY STUDIES OF ORIGIN	**STEM**	Observed	134	71	205
		Expected	72,1	133	205
		% row	65,4 %	34,6 %	100 %
	NON STEM	Observed	83	329	412
		Expected	144,9	267	412
		% row	20,1 %	79,9 %	100 %
	Total	Observed	217	400	617
		Expected	217,0	400	617
		% row	35,2 %	64,8 %	100 %

	Value	**gl**	**p**	**Contingency ratio**
χ^2	122,7	1	< .001	0.407
N	617			

Source: Compiled by the authors based on ETEFIL-19 data.

Usefulness of the higher technical qualification for finding employment.

Having a Higher VET qualification has proved useful to find a job for 57,4% of Higher VET graduates with a previous university degree employed in 2019. This perception changes depending on the time when they found the job. Among those who kept the same job they had before graduation in Higher VET, only 37.4% considered that the Higher VET qualification had been useful. In contrast, the perception of usefulness rises to 62% among those university graduates who found or changed jobs after completing the Higher VET qualification in 2014.

The correlation analysis (χ^2= 24.7, df=1, p < .001), indicates that there is a positive and significant correlation between the time of finding employment and the perceived usefulness of the Higher VET qualification. On the other hand, the Phi coefficient (0.19) shows a moderate effect size. It should be noted that no differences are observed when comparing the perceived usefulness of Higher VET qualification of STEM university graduates (62.5 %) with that of graduates from NON STEM university graduates (62.3 %) employed in their current job from 2014 onwards..

TABLE XIII. Perceived usefulness of the Higher VET Programme for finding employment by university graduates employed in current job before or after Higher VET graduation in 2014.

EMPLOYED IN CURRENT JOB		USEFULNESS OF HIGHER VET PROGRAMME IN FINDING EMPLOYMENT		
		Yes	**No**	**Total**
Before 2014	Observed	46	77	123
	Expected	70,6	52,4	123
	% of row	37,4 %	62,6 %	100 %
From 2014 onwards	Observed	328	201	529
	Expected	303,4	225,6	529
	% of row	62,0 %	38,0 %	100 %
Total	Observed	374	278	652
	Expected	374,0	278,0	652
	% of row	57,4 %	42,6 %	100 %

	Value	**gl**	**p**	**Contingency ratio**
χ^2	24,7	1	< .001	0.191
N	652			

Source: Compiled by the authors based on ETEFIL-19 data.

Perceived usefulness of the Higher VET qualification among university graduates who opted for the *reskilling* strategy.

Table XIV shows that STEM university graduates who transferred to a Non-STEM Higher VET programme are more sceptical about the usefulness of VET studies for finding employment (66%) than non-STEM university graduates in STEM Higher VET programmes (79.7%). However, these differences are not statistically significant ($\chi^2 = 2.6$, df=1, p =.104)

TABLE XIV. Perceived usefulness of the Higher VET Programme for finding employment by university graduates who adopted a reskilling strategy and found their current job after completing Higher VET in 2014.

RESKILLING STRATEGY		USEFULNESS OF CFGS IN FINDING EMPLOYMENT		
		Yes	No	Total
STEM to NON STEM	Observed	35	18	53
	Expected	38,8	14,2	53,0
	% of row	66,0 %	34,0 %	100 %
NON STEM to STEM	Observed	47	12	59
	Expected	43,2	15,8	59,0
	% of row	79,7 %	20,3 %	100 %
Total	Observed	82	30	112
	Expected	82,0	30,0	112,0
	% of row	73,2 %	26,8 %	100 %

	Value	gl	p
χ^2	2,64	1	0.104
N	112		

Source: Compiled by the authors based on ETEFIL-19 data.

Discussion and conclusions

Firstly, and given the scarcity of research in the field of unexpected educational trajectories (Markowitsch & Hefler, 2019; Friedel & Friesleben, 2017; Leigh, 2009)this study shows novel research results in University-to-VET transfer in Spain. The scope and weight of this flow of young people and adults shows that it is a relevant line of research, since one in ten graduates in Higher VET had already completed university studies in the years analysed. This work reveals the existence of a profile of Higher VET students whose specific needs, reasons and causes leading to these somewhat counterintuitive trajectories have not been considered in the design of conventional educational itineraries.

Second, the characterisation of these students shows a clear gender bias, as more than two thirds are female (67.5%). According to Duncan's dissimilarity ranking (Imdorf et al, 2015), this trajectory is very close to qualify as feminised (within 3 percentage points). The age at which this educational decision is made shows a different dynamic depending on gender, with female university graduates making this transition at an earlier age (under 35) than males, with a higher proportion after the age of 45.

Thirdly, the movement of University graduates into Higher VET is more oriented towards *upskilling* than towards *reskilling*. The upskilling strategy is more evident among non-STEM university degree holders, with 79.9% transferring to non-STEM Higher VET programmes, whereas 65.4% of STEM university graduates opt for a STEM Higher VET programme. This greater propensity of non-STEM students to *upskill* goes hand in hand with their greater weight in the total number of transfer students, with 60% coming from the Social and Legal Sciences and Arts and Humanities. This supports the *upskilling* hypothesis, which results in a profile with academic and vocational qualifications (Markowitsch & Hefler, 2019).

In fourth place, the main motivation for pursuing this path is career-related (67.8%), which is

largely in line with the final assessment of usefulness, since five years after graduating in Higher VET most of the university students considered that the VET qualification was useful for them to find or change jobs (57%). Although this depends on whether or not they previously had a job, with a more positive influence on those who did not have a job before 2014. Therefore, it can be inferred that this pathway is more useful for labour market insertion than for labour mobility. However, more research is needed in this respect. In any case satisfaction with the decision made is high in general terms as most of university graduates would transfer again to Higher VET (85%) and would choose the same Higher VET programme (83.1%)-

Fifthly, there is a clear need to adopt measures that make the bidirectionality of the VET-University pathways visible through the exchange of information and recognition mechanisms between the two systems, since the pathway from University to VET is not only important, but also represents a useful learning strategy for labour market insertion and improvement. Although, in Spain, the mutual recognition of credits in both directions has been in force since 2011 (RD 1618/2011, of 14 November, on the recognition of studies in the field of Higher Education), the path from university to VET provides new elements to consider in the configuration of the formulas for transfer, connection and new models of relationship between Higher Level VET and the University that are proposed by Organic Law 2/2023, of 22 March, on the University System and Organic Law 3/2022, of 31 March, on the organisation and integration of VET.

Finally, the present study identifies educational-occupational transitions that can facilitate the work of career guidance teams, a key agent for the integration of this type of students in VET classrooms (Fletcher & Tyson, 2021). To this end, it is necessary to have up-to-date sources of information on prior university or VET progression in both enrolment processes and graduate tracking protocols and to facilitate cross-referencing between the two systems (Fowler, 2017)..

Limitations and future research

One limitation of the study is that survey participants completed the Higher VET diploma in 2014, which indicates that they were holders of Bachelor's and Master's degrees not adjusted to the model of the European Higher Education Area (EHEA) that came into force in 2010. The Royal Decree 1393/2007 of 29 October 2007, establishing the organisation of official university education, predicted that the new organisation of Higher Education studies would increase the employability of graduates. If this prediction is fulfilled, it is possible that the movement of university graduates to Higher VET will decrease. This can only be corroborated when the results of a new edition of ETEFIL become available.

On the other hand, the categorisation of branches of study and VET programme areas as STEM/NON STEM is only a "proxy" to determine the relationship between qualifications at the origin and at destination. A higher level of disaggregation of the data would allow for a more precise analysis of this relationship between specific previous university degrees and VET programmes. Even so, it would still be difficult to establish the relationship between the two if this work is not accompanied by qualitative studies (e.g. interviews, discussion groups, etc.) that allow us to explore in more detail the reasons given by the people who make these non-traditional transitions.

In general, the transition from university to VET is useful for finding employment but in order to assess more accurately the success of these *upskilling* or *reskilling* strategies, it is necessary to contrast these perceptions with the analysis of labour market insertion and job quality indicators collected by ETEFIL-19. Similarly, it is necessary to identify whether studies that are initially unrelated to each other may end up revealing their complementarity in the medium or long term if both degrees

represent an advantage in a selection process.

Finally, university graduates make up only a part of the total volume of people moving from the university system to the VET system. Unfortunately, the ETEFIL-19 dataset does not quantify the volume of Higher VET graduates who previously dropped out from university. The drop-out rate for undergraduate studies in Spain stands at 13.5% (Fernández-Mellizo, 2022)but the destination of this group of students once they leave the university system is unknown. Recently, Tieben (2023) has found that VET absorbs a significant proportion of students leaving the German university system with 34.2% of university dropouts choosing VET only one year after leaving. Corroborating in the future whether this phenomenon is repeated in Spain would pave the way for the formulation of specific mechanisms for early drop-out detection and guidance in a coordinated manner between the university system and the VET system.

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