The impact of individual, educational, and workplace factors on the transfer of school-based learning into the workplace

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Abstract

The aim of this study was to investigate the transfer of learning of professional competences from vocational colleges to the workplace context in vocational education. Concretely, the study examined the relations between the professional competences learned at school and the use and further development of those competences at the workplace during the *practice module* in vocational education programmes in Spain. The study analysed individual, educational design and work environment factors that facilitate or hinder transfer of learning. The study took a multidimensional approach to professional competences by observing four dimensions: hard-specific, hard-generic, interpersonal and intrapersonal. The data collection drew from a questionnaire administered to students of vocational education programmes (N = 379) after they had completed the practice module scheme. A moderation analysis was applied to observe the effect of individual, educational design and workplace factors on the relation between the competences learned at school and those used at the workplace. The findings showed that compulsory placement, school-work alignment, work-based supervisor, access to resources and task complexity are significant moderators between the competences learned at school and those used at the workplace. The study highlights the coherence between the school and workplaces and work environment characteristics as factors conducive to transfer of learning.

Keywords: professional competence, work learning-conducive features, school-work alignment, transfer of learning, moderation analysis, vocational education

The Impact of Individual, Educational, and Workplace Factors on the Transfer of School-based Learning into the Workplace

Introduction

Transfer of learning lies at the heart of modern educational systems (Schwartz, Bransford, & Sears, 2005). A majority of the financial and human investment in education is based on the belief that formal education contributes to the acquisition of knowledge and skills that may be used beyond the educational context, which thus helps students become productive members of society (Barnett & Ceci, 2002). Consideration of the transfer of learning is particularly important in vocational education because learning occurs across different contexts, such as vocational colleges and workplaces (Mulder, Messmann, & König, 2015). Consequently, teachers and trainers in vocational education expect that the professional competences developed through various learning activities will have an effect that lasts beyond college. To respond to this need, various pedagogical innovations, such as simulations, visits to companies and internships, have been developed to diversify learning situations with the aim of combining school-based lectures and work experiences and, therefore, complementing learning experiences in different settings.

Nevertheless, regarding educational matters, the relationship between training colleges and work organizations is not without tensions and constraints. These two different settings often have specific work dynamics and rely upon the use of diverse types of knowledge (Eraut, 2004). Moreover, educational and work organizations have dissimilar interests and ideas concerning the goals of the education process (Kilbrink & Bjurulf, 2012). In this situation, learners are expected to be able to integrate diverse educational and workplace learning experiences when building professional competences and subsequently transfer them to the workplace. Numerous research studies have demonstrated that the transfer of what is learned at training colleges to the workplace is neither automatic nor unproblematic (Kilbrink & Bjurulf, 2012; Sappa & Aprea, 2014). As a result, the knowledge and skills learned in the educational context are often underutilized in the workplace (Poortman, Reenalda, Nijhof, & Nieuwenhuis, 2014; Veillard, 2012). Against this backdrop, schools

as well as workplaces should provide students with the necessary aid to integrate the knowledge and skills gain in both settings.

In the case of Spain, where a school-based vocational education scheme is traditionally established, it is crucial to maximize the school learning experience and improve its connection with workplace requirements, as well as engaged companies in offering students an enriching learning environment. To do so, the traditional vocational education scheme includes a practice module that includes a compulsory period of work experience at an enterprise or organization. Under this scheme, students are expected to use and further develop the competences they developed in their classes in a real work context. However, little is known regarding this process or the individual and contextual factors that may influence it.

The study reported here addresses the issue of the transfer of professional competences learned at school and their usage in the workplace during the practice module in vocational educational programmes (EQF level 3-5) in Spain. Our goal is to examine the individual, educational and workplace factors that may interact with the process of transfer in this specific setting. Four dimensions of professional competence are analysed: intrapersonal, interpersonal, hard-generic, and hard-specific (Balçar et al., 2011). The results will contribute to increasing understanding of the crucial factors that influence the process of the transfer of learning between vocational colleges and workplace contexts. Therefore, they will illuminate particular aspects that may require improvements in the provision of vocational educational programmes and their connections with the workplace.

In the following section, we present the theoretical and conceptual framework that we used to investigate the factors associated with the transfer of learning. Then, the methodological approach is described in detail. The subsequent section presents the results, and in the conclusion, we discuss the contribution of our work and its practical implications for vocational educational programmes.

Theoretical and Conceptual Frameworks

Different approaches to the transfer of learning

In the twentieth century, transfer of learning became an issue of interest in educational research through the experimental studies of Thorndike (1924) and Judd (1908). Currently, researchers are engaged in understanding this process, explaining its underlying mechanisms and

finding ways to improve it (Barnett & Ceci, 2002; Eraut, 2004; Schwartz et al., 2005). The topic has attracted substantial attention for theoretical and practical reasons. From a theoretical perspective, nearly all learning theories assume that as individuals learn, they continuously utilize prior knowledge (Lobato, 2006). From a practical perspective, a central goal of education is to provide learning experiences that are useful beyond the specific conditions of initial learning (Barnett & Ceci, 2002). Despite its relevance, the progress of researchers in understanding the transfer of learning has been limited because of methodological and theoretical problems associated with the construct, which have contributed to increased acknowledgement that there is little agreement in the scientific community regarding the nature of transfer of learning (Barnett & Ceci, 2002; Lobato, 2006).

Originally, the study of the transfer of learning was based on the theory of identical elements and the theory of generalization. The theory of identical elements posits that people must identify identical or similar elements between different situations to be able to transfer their knowledge or ability (Thorndike, 1924). In contrast, the generalization theory states that transfer depends on the identification of core and abstract features of a particular situation and its applicability to a novel situation (Judd, 1908). However, these approaches have been criticized for several reasons, particularly due to the limited scope of their definition of transfer itself as the application of knowledge in controlled settings (Lobato, 2006) and the underlying assumption that knowledge is a portable substance that can be carried from one context to another (Hager & Hodkinson, 2009).

In response to this situation, several alternative approaches to the transfer of learning have emerged. For instance, from *the situated learning perspective* in which knowledge is viewed as being context-related and weaved into social practices, transfer depends on people's participation in communities of practice and the identification of different situations in which these practices are relevant (Greeno, Smith, & Moore, 1993). In the situated learning perspective, the content of the transfer is not knowledge or skills but patterns of participation across situations. The contribution of this perspective is the recognition that social and environmental factors have a strong influence on the transfer of learning.

The *actor-oriented perspective* of transfer focuses on the influence of prior learning activities on novel situations and examines different instances in which people generalize their prior learning

experience in understanding similar situations (Lobato, 2006). Contrary to the classical account, which defines transfer as the application of predetermined knowledge from the researchers' point of view, the actor-oriented perspective is designed to capture traces of previous learning experiences in the individual's reasoning while solving new problems. Similarly, other researchers define transfer as new learning, preparation for future learning or a productive use of prior knowledge in a novel situation (De Corte, 2003; Eraut, 2004; Schwartz et al., 2005). Under this framework, the focus of the transfer is on assessing the subject's ability to use prior knowledge in an innovative way or to gain new insight to solve a particular problem. This expanded definition allows researchers to pay attention to the design of powerful learning environments that enhance students' learning (De Corte, 2003) and encourage them to use their knowledge and abilities beyond the original context of learning.

Researchers also have approached transfer from a *transitional or boundary-crossing perspective.* From this point of view, transfer is not viewed as the application of 'something' that has been acquired 'elsewhere' but as a transition across different social organizations involving some type of transformation of knowledge, skills and identity (Beach, 2003; Särljö, 2003). Based on this perspective, some authors (e.g., Beach, 2003) have provided a reconceptualization of transfer as a developmental concept to account for the continuity and transformation of knowledge across various forms of social organization. In a similar vein, other researchers have accounted for the developmental transition at a collective level (Tuomi-Grohn & Engestrom, 2003) and have approached transfer as an expansion of and change in collective practices over time.

There is a strong tendency to reformulate and broaden the concept of transfer of learning by emphasizing aspects, such as the socially embedded nature of knowledge, the subjects' perspective of the reconstruction of the novel situation in light of their prior knowledge and the transformation of knowledge, skills and identity in the transition and participation across social organizations. This reconceptualization of transfer has important implications from an educational perspective, especially in the context of vocational education studies in which learning occurs across different settings, such as schools and workplaces, and involves the acquisition and integration of different types of knowledge, skills and professional identity development.

In professional training programmes, the separation between learning contexts and spaces may hinder the transfer of learning and the integration of components of theory and practice (Veillard, 2012). Moreover, researchers have argued that the transfer process requires additional learning to convert theoretical knowledge into practical knowledge that is ready to use in a range of possible situations (Eraut, 2004). Learning how to apply theoretical knowledge to solve practical problems requires substantial effort from students, and they typically find themselves alone in this process (Kilbrink & Bjurulf, 2012; Sappa & Aprea, 2014; Veillard, 2012). This problem was described by Schön (1983), who argued that professional education focuses on technical knowledge and, consequently, that professionals lack the ability to utilize this knowledge to solve problems in practical situations. As a result, students often find this process to be difficult and either consider their training to be inadequate or reject the theory as being irrelevant to their practice. Therefore, appropriate support is necessary to help students to facilitate the use of what they learned in their classes to address new situations in the workplace and combine the knowledge and skills acquired through different learning experiences. Thus, vocational colleges and workplaces should identify the factors that are most important in the transfer process to maximize the use of relevant knowledge and skills in the workplace and ensure the establishment of a solid foundation upon which further learning can be built.

Factors associated with the transfer of learning

In the present research, we draw on Baldwin and Ford's (1988) transfer process, which is described in terms of input factors that are organized into three categories (individual factors, educational design factors and work environment factors), outcomes of training (learning) and transfer (generalization and use of the learned material on the job) (Baldwin & Ford, 1988). The model assumes that the learning and workplace contexts are different spaces and that trainees have acquired knowledge, skills or attitudes in the learning context that may help them to solve problems and complete assignments in the workplace context. Baldwin and Ford's (1988) transfer model offers an interesting framework that enables the simultaneous assessment of different factors that interact with the transfer process; thus, the most important factors involved in facilitating or obstructing it may be identified. In the following section, we describe this conceptual framework.

Individual characteristics. Among the various individual characteristics, motivation has been widely analysed in the research on transfer of learning (Gegenfurtner, 2011). Researchers have developed conceptual models of transfer effectiveness in which motivational aspects are significant prerequisites of the occurrence of transfer (Tai, 2006). In the research context, characterized by a high level of unemployment among youth, the practice module generates a high expectation of finding a job position among students after they complete their studies. Thus, students with a high level of motivation to find a job in the same company where they are doing the practice module may be prone to display better professional performance than those who do not expect to find a job. At the same time, in the face of a work placement shortage, while some schools allocate students using their own criteria (students' grades, personal profile, availability), others tend to allow the students to choose where they want to do the practice module. Consequently, students who are allowed to choose the location of their practice may be more motivated than those who do their practice at a compulsory work placement. For these reasons, we analyse two individual factors that are related to motivation, 'expectations to continue at the same organization' and 'compulsory placement', which might have an effect on the transfer of learning.

'Expectations to continue at the same organization' derives from the more general concept of organizational commitment, which refers to the degree to which workers feel engaged with their work organization, has been investigated as a motivational factor that is relevant to the transfer of learning (Pilati & Borges, 2012). One component of organizational commitment is continuance commitment, that is, the intention of workers to stay at the organization in the future (Menezes & Bastos, 2010). Students in vocational educational programmes are not full-time workers; however, the practice module is an opportunity for them to demonstrate their competence to potential future employers (Pineda-Herrero, Quesada-Pallarès, Espona-Barcons, & Mas-Torelló, 2015) if they hope to stay. It is widely believed that after completing the practice module, students have a greater likelihood of finding a job within the same organization at which they completed their practice. Similarly, employers are more willing to offer a job to individuals when they are familiar with their practice. Therefore, students may exert more substantial effort towards making a good impression by demonstrating their best skills, knowledge and positive attitudes when performing assignments in the

workplace. This may lead students to take advantage of their previous learning and effectively use it to complete assignments in the workplace.

Compulsory placement is related with the studies of the impact of pre-training decisions on transfer effectiveness (Tai, 2006). Pre-training decisions involve whether participants have a specific degree of choice in the training programme, such as voluntary or compulsory attendance or content choice (Tai, 2006). In the context of vocational educational programmes, the practice module is compulsory to obtain the final qualification; however, students usually have the opportunity to choose the work organization at which they want to complete their practice. Work organizations with better job prospects and higher standings have the greatest demand among students who seek to do the practice module. Moreover, student allocation to an organization is conducted on the basis of student records; thus, the best students have more possibilities to complete their practice at the enterprises of their choice. It may be the case that students are more willing to exhibit their best competences when they complete the practice module at work placements of their choice. In contrast, students who complete their practice in work placements that they did not select may not exert substantial effort in their performance; thus, transfer may be hindered.

Educational design. Existing research has demonstrated that the transfer of learning is related to different factors in the educational design category, such as school-work alignment (Ballesteros-Rodríguez, 2008; Pineda-Herrero et al., 2015), content relevance (Renta-Davids, Jiménez-González, Fandos-Garrido, & González-Soto, 2014), teaching methods (Varghese et al., 2012), and teacher support (Kilbrink & Bjurulf, 2012; McNamara, 2011; Sappa & Aprea, 2014).

Researchers have argued that when a combination of on-the-job and off-the-job learning occurs, the proper alignment of all learning settings is pivotal to the quality of the vocational education system (Messmann & Mulder, 2015). Alignment indicates that the learning processes that occur in all learning settings must be consistent and build upon each other (Mulder et al., 2015). Therefore, school-work alignment may involve a critical enabler of the transfer of learning that helps students to perceive the competences that they gain in their classes as being relevant to their work during practice. If the competences learned at school are not or are not perceived as being relevant in the workplace, students are unlikely to use them in the workplace.

The teaching approach might be a key factor in the learning transfer process. It has been shown that a student-centred teaching approach is positively associated with student motivation and the transfer of learning (Gegenfurtner, 2011). One explanation for this outcome is that learner-centred instruction promotes trainee agency and self-reflectiveness, which promote an individual's abilities (Gegenfurtner, 2011). Thus, it may enhance the transfer of learning by helping students to make connections between what they have learned at school and what they are required to do in the workplace. In contrast, a teacher-centred teaching approach in which students remain in a passive role may hinder the transfer process.

Furthermore, the ability of teachers to guide and support students may contribute to closing the gap between the school and the workplace and promoting a school-centred integration approach (Sappa & Aprea, 2014). This may be achieved by supporting students in establishing learning goals and helping them to connect theoretical knowledge and practice and reflect on their workplace learning experience (Marhuenda-Fluixà, Cros-Castelló, & Giménez-Urraco, 2001; McNamara, 2011; Wesselink, de Jong, & Biemans, 2010). Therefore, strong school-based supervisor support during the practice module may foster the transfer of learning.

Work environment. Work environment characteristics have been widely examined in the literature on the transfer of training in organizational settings. For example, supervisor and peer support (Pineda-Herrero et al., 2015) and work learning-conducive features (Renta-Davids et al., 2014) reportedly are significant factors that are related to the transfer of learning.

Supervisors are particularly important to student learning in workplaces because they can provide students with enriching learning opportunities (McNamara, 2011), quality feedback (Gijbels et al., 2014) and guidance (Virtanen, Tynjälä, & Eteläpelto, 2012). Moreover, it is the supervisors' role to encourage and support the students' reflection on their own practice by creating a positive atmosphere and offering essential advice and instruction (Lähteenmäki & Uhlin, 2011). Research also indicates that work-based supervisor support is significantly and positively related to the transfer of learning in vocational educational contexts (Pineda-Herrero et al., 2015).

Access to information and feedback from colleagues has been highlighted as a learning-conducive feature of a workplace (Kira, 2007). Moreover, access to resources has been shown to be a

crucial enabler of human performance (Awoniyi, Griego, & Morgan, 2002). In the context of the transfer of learning, we expect that having access to a variety of resources, such as information, other workers' experiences, and colleagues' feedback, may encourage students to use the learned competences and possibly further develop them.

Task complexity involves aspects, such as planning, decision making, retrieving information, organizing, monitoring and evaluating work processes (Frieling, Bernard, Bigalk, & Müller, 2006). In the context of students' work experiences, researchers have argued that students who have an adequate amount of work complexity confront situations that require a high level of competence (Messmann & Mulder, 2015). This demanding situation may activate students' competences and encourage them to further develop those competences.

Researchers have argued that the perception of autonomy may empower students in the workplace by allowing them to decide how they want to approach their work tasks and goals (Messmann & Mulder, 2015). This work feature may encourage students to activate their previously learned competences and use them to respond to task requirements.

It has been shown that task variability is conducive to the transfer of learning (Renta-Davids et al., 2014). Handling different tasks, changing work positions and being engaged in non-routine activities may increase the possibility of activating different competences and therefore foster the transfer of learning.

Task challenge is defined in terms of the precision, quality and speed required to solve a particular work event (Eraut, 2004). Similar to task complexity, task challenge may cause students to confront demanding situations and may therefore trigger the use of learned competence.

Professional competences

The concept of competence is widely used in vocational education. However, the academic literature is full of different models and understandings of the term competence. Although it is a complex and polysemic concept, the present study adopts a broad definition of the term. Accordingly, for the purpose of this study, competences are defined as a set of acquired personal characteristics, attitudes, knowledge and skills that lead to high-quality performance (Balçar et al., 2011).

Scholars usually distinguish among different aspects of professional competence. Lester (2014) observed that most professional qualification frameworks include a distinction between generic aspects of being a professional (e.g., ethics, values, self-management, work processes, colleagues, communication and relations with others) and the technical or profession-specific domain. While technical competence is essential to being a professional in a particular field, stakeholders in the workplace also emphasize the importance of generic competences such as social and motivational competence, creativity, and decision making as key aspects of better career prospects (Urtasun & Núñez, 2012). Some authors argue that these competences need to be situated within the work context (Gijbels, 2011) but this does not exclude the fact that they can be relevant to a wide variety of workplaces (Kyndt et al., 2014).

In this respect, the study by Balçar et al. (2011) offers a theoretical and operational definition to identify transferable professional competences across different economic sectors and workplaces. It distinguishes between generic-specific and hard-soft dimensions of professional competences. The generic-specific dimension is defined by the scope of its applicability across different occupations and sectors. Generic competences are applicable to a large number of companies and across occupations and sectors, while specific competences are applicable to a small number of companies, occupations and sectors. The hard-soft dimension is defined by technical, job-specific knowledge, skills and attitudes. Hard competences are described as knowledge and skills that are easily observed or measured, easily developed through training and closely connected to technical knowledge, while soft competences are defined as non-job-specific competences that are related to attitudes and the ability to operate effectively in the workplace. Although it is not complete, as it excludes aspects such as beliefs and vocational identity, Balçar et al.'s (2011) framework offers a comprehensive approach to studying professional competences in different sectors.

In our study, we employed Balçar et al.'s (2001) framework. This allowed us to observe the transfer of professional competence between school and the workplace in different vocational study programmes and, therefore, in different work fields. We distinguished among four aspects of professional competences: hard-specific competences, hard-generic competences, and the soft-generic interpersonal and intrapersonal competences (Balçar et al., 2011).

Context of the study

In Spain, vocational education primarily is organized under a state-driven model in which schools have a monopoly in the granting of degrees (Valiente, Zancajo & Tarriño, 2014). However, traditional lessons are increasingly combined with training periods in an enterprise or other type of labour organization (Marhuenda-Fluixá, 2012). Since the 1990s, vocational colleges have been allowed to offer a practice period in their curriculum based on their own decisions. It was not until 2006, when additional reforms were introduced, that a compulsory practice module became included in the curriculum (Marhuenda-Fluixá, 2012). Similar to other European countries (Poortman et al., 2014; Virtanen et al., 2012), in Spain, this decision was grounded in the belief that work experience leads to more relevant, efficient and transferable learning (Marhuenda-Fluixá, 2012; Pineda-Herrero et al., 2015) and increases future employability (Passaretta & Triventi, 2015). Moreover, it is assumed that work placements ensure that students face complex and ill-defined problems in unique situations and may help them to transform their technical knowledge into a 'knowing-in-action' scheme that is ready to use in professional practice (Schön, 1983).

In 2012, in an effort to delve more deeply into vocational education reforms and with the intention to bring school and work closer, the dual-system scheme was implemented. Currently, two vocational schemes coexist: a traditional scheme that includes the practice module and a dual scheme that combines alternative school and work periods, although the coverage of the latter is marginal. Nevertheless, the belief persists that studies come first and work comes second. Thus, students must acquire a certain level of professional competence before accessing the workplace and applying what they learned in school.

In this context, vocational educational programmes that include the practice module, a compulsory period of work experience at an enterprise or work organization, are based on a sequence approach in which theory comes first, followed by a period of work experience at an enterprise or other organization at the end of the study programme. Students take the practice module only once they have completed all the theoretical modules of the educational programme. The outcome of the practice module does not impact the grades earned on the other modules, although it must be approved to obtain the degree. The assessment of the practice module is conducted jointly by the

school-based supervisor and the work-based supervisor, who must come to an agreement, and it is based on general observations of student performance in the workplace.

According to the Spanish Regulatory Framework of Vocational Education, the practice module scheme is complementary to college training and should offer students the potential to develop their professional competences more fully and acquire new ones (Pineda-Herrero et al., 2015). Currently, this period of practice in work placements accounts for 12% of the total amount of hours of study programmes and consists of developing a non-contractual and measureable professional activity in a company or labour organization. This means that students spend 350-450 hours in a work placement completing professional tasks that are defined in the official curricula by the Ministry of Education. The practice module often occurs at the end of the study programme, after students have approved the school-based training modules. Therefore, it is expected that students have already acquired a basic level of professional competence before moving on to the practice module to complement the theoretical training, further develop their professional competences and acquire context-related knowledge.

Although it has been implemented for more than ten years, there is sparse knowledge regarding the efficiency, value, results and need for improvement of the practice module. Little is known about what elements could enhance the relationship between the training that students obtain in school and the work experience that they gain in the workplace. Thus, the present research focuses only the traditional scheme of vocational education and analyses study programmes that include the practice module in their curriculum.

Purpose of the study

Based on these assumptions, in the present study, we analysed the following factors that may interact with the transfer of learning of professional competence in the practice module scheme:

- In the individual characteristics category, we observed the expectation to continue (Menezes & Bastos, 2010) and compulsory placement (Tai, 2006).
- In the educational design category, we observed school-work alignment (Ballesteros-Rodríguez, 2008; Messmann & Mulder, 2015), student-centred teaching approach

and teacher-centred teaching approach (Trigwell & Prosser, 2004), and school-based supervision support (Marhuenda-Fluixà et al., 2001).

- In the work environment category, we observed work-based supervision support (Marhuenda-Fluixà et al., 2001), access to resources (Kira, 2007) and work learning-conducive features, such as task complexity, task autonomy, task variability, and task challenge (Frieling et al., 2006).

Figure 1 shows the proposed relationships. Furthermore, the study analysed the interaction of these factors on four dimensions of professional competence: hard-specific, hard-generic, intrapersonal and interpersonal (Balçar et al., 2011).

[Fig 1]

Methodology

Sample and data collection

To address our research questions, a study was conducted with vocational education students in Spain. A convenience sample procedure was applied to collect the data. The study was conducted in 2014 and involved students from eight vocational colleges. A self-administered paper-and-pencil questionnaire was distributed among the students of sixteen study programmes of four professional families. The questionnaire was administered following the completion of the practice module to 480 students registered in the selected study programmes. Four hundred twenty-five questionnaires were returned, and 46 questionnaires were excluded because of incomplete data (more than two-thirds of the items in the questionnaire were missing), which yielded a sample size of N = 379 valid registers. An analysis of the missing values indicated that no variable had more than 8% of missing values, and only 4.09% of the overall values were missing. The expectation-maximization method (EM) was applied to address the missing data because a pattern analysis indicated the presence of missing data at random (Little's MCAR test $\chi 2 = 9592.48$, df = 8812, $p < 0.000$). Further analysis indicated that most values were missing according to professional family, in which the category 'Health' had the greatest number of them.

The participating students had an average age of 22.69 years, an average total work experience of 2.83 years and an average work experience in the study field of 0.96 years. Fifty-eight

percent of the sample was female, and 31% was employed. Concerning the professional families, 27.4% were in the Social Services, 38% were in Health, 11.9% were in Accountancy and Administration and 22.7% were in Industry and Mechanics. Regarding the educational level of the study programs, 37.2% of the students followed a non-compulsory secondary education programme [EQF 3-4], and 62.8% of the students followed a non-university tertiary education programme [EQF 5]. Regarding the educational attainment of the participants, 24.3% had attained the compulsory education [10 years duration, 6 years for primary school and 4 years for secondary school – EQF 1], 38.6% had attained high school [2 years duration – EQF 3], 21.3% had not completed compulsory school but they had approved the access exam for applying for a vocational qualification [entry level EQF 3-4], 13.9% had attained a previous vocational qualification [EQF 3-4 or 5] and 1.9% had attained a university degree [EQF 6]. Moreover, all study programmes had a duration of 2 to 2.5 years and comprised between 340-450 hours of practice within a workplace, referred to as the practice module. Regarding experience in vocational education, all students were in their second year. Finally, 45.9% of the students completed their practice module in a large enterprise [more than 251 employees], 36.1% in a medium-sized enterprise [between 250 and 50 employees], and 18% in a small-sized enterprise [fewer than 50 employees]. These enterprises belonged to different economic and social sectors, such as education, the chemistry industry, the automobile industry, pharmacy, healthcare, the commercial sector and ICT services.

Instruments

A self-report questionnaire was developed for the purpose of this research. Research has demonstrated that, if properly designed, self-report instruments may comprise adequate tools in measuring student competences (Kyndt et al., 2014). The questionnaire was founded on previous research following Baldwin and Ford's (1988) model of the transfer of learning. It consisted of three main parts: 1) transfer of learning factors, 2) competence learned at school and used at work, and 3) biographical information. The construction process of the instrument was as follows: 1) a literature review of previous research and scales, 2) the selection and adaptation of the items of previous scales to be included in the first version of the questionnaire (112 items), 3) a reduction of the number of items based on expert evaluations and the development of a second version of the questionnaire (80

items), 4) a pilot test with vocational education students (N = 46) to confirm understanding of the questions, and 5) the design of the final version of the questionnaire (80 items remained; however, the words of some items and questions were changed without changing the meaning).

The first component of the questionnaire included the transfer of learning factors. In the final version of the questionnaire, 58 items were included. The items were adapted from previous research that measured different factors of the three categories of the transfer of learning of Baldwin and Ford's (1988) conceptual model: individual characteristics, educational design and work environment. The items were based on a four-point scale in which 1 = 'not at all' and 4 = 'to a great extent'.

The second part of the questionnaire included student competence learned at school and used at work. Four aspects of professional competence were defined: hard-specific, hard-generic intrapersonal and interpersonal competences. For the hard-specific competence, the items were drawn from the competences listed in the National Institute of Qualification (Instituto Nacional de Cualificaciones [INCUAL], 2015) of each of the study programmes included in the research. The complete list of competences published in the INCUAL was taken into account; thus, 22-42 items were incorporated in the questionnaire, depending on the corresponding study programme. For the hard-generic, intrapersonal and interpersonal competences, the items were adapted from a previous study regarding the conceptualization of the transferability of skills between sectors (Balçar et al., 2011). In the final version of the questionnaire, 22 items were included for this set of competences. The items represented statements regarding knowledge, abilities, procedures and performances that students should develop along with their vocational studies. To establish the extent to which these competences were learned at school and used at work, we asked the students to indicate them by using a double column. Therefore, the participants had to state the degree to which they had learned each competence during college lectures and the degree to which they had used these competences during the practice module. The item scores were based on a four-point scale that ranged from 1 = 'not at all' to 4 = 'to a great extent'.

The third component of the questionnaire collected participants' background information. It collected data regarding personal aspects, such as age (years), gender (male or female), labour status (employed or unemployed), total work experience (years), field study work experience (years), study

programme (name of the study program), professional family (name of the professional family), study level (secondary, tertiary), educational attainment (primary education, secondary education, vocational secondary education, vocational tertiary education, university, or exam entry), and the size (big, medium, or small) and sector of the enterprise where the practice module occurred (name of the economic sector).

A confirmatory factor analysis (CFA) was conducted to assess the internal validity of the questionnaire and determine whether the data fit with the proposed model. This analysis was conducted separately for the first and second components of the questionnaire. Statistical R Software (R Team Core, 2013) with the Lavaan package (Rosseel, 2012) was used for the CFA. The CFA results are subsequently described.

Factors associated with the transfer of learning

A CFA was conducted to determine whether the structure of the data fit the proposed conceptual model including the factors associated with the transfer of learning. The ratio of the sample size (N = 379) to the number of items was fairly suitable to conduct this analysis using the 5:1 recommended ratio (Bryant & Yarnold, 2000). An initial model with all 58 items in this section was tested, and the CFA results confirmed a twelve-factor solution ($\chi 2/df = 1.68$, RMSEA 0.049 [0.046; 0.053] $p = 0.637$, SRMR 0.063, CFI 0.82, and TLI 0.81); however, four items were eliminated because of their low coefficients (less than 0.45). A second model with 54 items was tested, and the CFA also confirmed a twelve-factor solution. The fit indices results demonstrated that the proposed model had a fair fit with the data ($\chi 2/df = 1.74$, RMSEA 0.051 [0.047; 0.054] $p = 0.392$, SRMR 0.060, CFI 0.85, and TLI 0.84). Following the cut-off criteria combinational rules suggested by Hu and Bentler (1999) (RMSEA ≤ 0.06; SRMR ≤ 0.08), the model was accepted. A summary of the factors obtained and sample items are shown in Table 1.

Individual characteristics. In this category, we measured students' *expectations to continue* (Menezes & Bastos, 2010) in the same organization at which they completed their practice module. Three items from previous studies (Menezes & Bastos, 2010) were adapted to measure this concept. Moreover, *compulsory placement* was measured by three items that were adapted from previous studies (Tai, 2006). *Expectation to continue* measured whether students felt comfortable at the

organization and whether they had specific expectations to find a position within the company. *Compulsory placement* measured whether students felt obliged to complete their practice module at a specific organization because either it was not their choice or they did it only to fulfil the study programme requirements.

For the *expectation to continue* items, the estimates ranged from 0.69 to 1. For the *compulsory placement* items, the estimates ranged from 0.97 to 1.

Educational design. We measured three aspects of the educational design category: school-work alignment, teaching approach and school-based supervisor support. *School-work alignment* was measured via six items that were adapted from a previous study (Ballesteros-Rodríguez, 2008). Information was obtained with respect to student perceptions regarding the degree to which teaching at the vocational college was in line with work assignments. The items on this scale referred to whether students believed that they had learned procedures, used tools or developed abilities during their classes that were useful to them in performing different tasks in the workplace. Teaching approach was measured via ten items adapted from the Approaches to Teaching Inventory by Trigwell and Prosser (2004). The items on this scale referred to student perceptions of the teaching approaches of their teachers, including whether they perceived that their teachers encouraged them to adopt an active role in learning (i.e., a *student-centred teaching approach*) or a passive role in learning (i.e., a *teacher-centred teaching approach*). Finally, *school-based supervisor support* was measured via eight items developed from previous studies regarding the role of the school-based supervisor in vocational education studies (Marhuenda-Fluixà et al., 2001). The items on this scale referred to the ways in which supervisors help students to conduct their work through conversations, examples and guidance or by providing them with other resources to fulfil the practice module's goals.

For the *school-work alignment* subset of items, the estimates ranged from 0.80 to 1. For the *student-centred teaching approach* subset of items, the estimates ranged from 0.77 to 1.08. For the *teacher-centred teaching approach* subset of items, the estimates ranged from 1 to 1.33. Finally, for the *school-based supervisor support* subset of items, the estimates ranged from 0.95 to 1.31.

Work environment. In this dimension, we measured work-based supervisor support and work learning-conducive features. *Work-based supervisor support* was measured via eight items that were similar to those used to measure school-based supervisor support. The work learning-conducive features were measured via twenty items adapted from previous research on the learning dimensions of workplaces by Frieling et al. (2006). Four dimensions from the Learning Dimension Inventory (Frieling et al., 2006) were selected: *task complexity*, *task autonomy*, *task variability* and *task challenge*. One additional dimension was included in the learning-conducive features of the work environment, *access to resources*, to measure the extent to which organizations offer students a variety of resources to achieve the practice module's goals (time, material resources, access to information, and other advice from other colleagues), which enables students to have substantially enriched learning experiences (Awoniyi et al., 2002).

The CFA yielded the following estimates: 0.88 to 1.20 for *work-based supervisor support*, 0.77 to 1.23 for *access to resources*, 0.52 to 1.02 for *task complexity*, 0.66 to 1 for *task autonomy*, 1 to 1.29 for *task variability*, and 0.48 to 1 for *task challenge*.

Internal validity. Internal consistency coefficients were obtained for each set of items that loaded on the specific factors (Table 1). Most of the internal consistency coefficients ranged from 0.65 to 0.90. Although the broadest accepted cut-off is 0.70, an alpha coefficient of 0.60 could also be acceptable (Loewenthal, 2004). Nevertheless, two factors (task autonomy and task challenge) fell below that threshold, as their coefficients were less than 0.60. A low alpha value could be due to a low number of items, poor inter-correlation between items, multidimensional construct or heterogeneous sample (Streiner, 2003). After evaluating all these possibilities, we came to the conclusion that a low number of items and a heterogeneous sample could have been the causes for such results. Nonetheless, we decided to retain these scales for further analysis because they were confirmed to be significant factors in the CFA and the inter-correlation between the items were satisfactory ($r = .345$ to $r = .541$); however, we interpreted these results with caution. Composite variables were obtained by averaging the item scores of each factor (for descriptive results, see Table 2).

Professional competence

Two CFAs were conducted with the items on the hard-generic, intrapersonal and interpersonal competences to test the structure of the data. CFAs were independently conducted for each set of items that loaded to the competences learned at school and the competences used at work. The items from the hard-specific competence set were not included in the CFA because they were drawn from sixteen different vocational study programmes; therefore, they differed across the sample. Regarding the suitability of the data to conduct the CFA, the ratio of the sample size (N = 379) to the number of items was greater than the recommended ratio of 5:1 (Bryant & Yarnold, 2000).

Competences learned at school and used at work. For the set of items relating to 'competence learned at school', the fit indices indicated a good fit of the proposed model to the data ($\chi 2/df = 2.23$, RMSEA 0.061 [0.050; 0.073], SRMR 0.040, CFI 0.95, and TLI 0.94), according to the recommended cut-off criteria ($\chi 2/df \leq 3$, RMSEA ≤ 0.06, SRMR ≤ 0.08, CFI $\geq$ 90-0.95, TLI $\geq$ 0.90-0.95) in the literature (Bryant & Yarnold, 2000; Hu & Bentler, 1999). The analysis confirmed the structure of a three-factor solution. For the items loading on the *hard-generic competence* factor, the estimates ranged from 1 to 1.54. For the items loading on the *intrapersonal competence* factor, the estimates ranged from 0.91 to 1.12. Finally, for the items loading on the *interpersonal competence* factor, the estimates ranged from 0.91 to 1.02.

For the set of items relating to 'competence used at work', the analysis also indicated a good fit of the proposed model to the data ($\chi 2/df = 2.09$, RMSEA 0.060 [0.049; 0.071] p = 0.074, CFI 0.91, and TLI 0.90), according to the recommended cut-off criteria (Bryant & Yarnold, 2000; Hu & Bentler, 1999). The analysis confirmed the same structure of a three-factor solution. The estimates for the items loading on the *hard-generic competence* factor ranged from 1 to 2.77. The estimates for the items loading on the *intrapersonal competence* factor ranged from 0.93 to 1.31. Finally, the estimates for the items loading on the *interpersonal competence* factor ranged from 0.97 to 1.35.

Although it was not included in the CFA, it is worth noting that the *hard-specific competence* scale refers to students' technical-professional knowledge, skills and abilities. The *hard-generic competence* scale refers to students' observance of professional, health and workplace safety norms and awareness of the environmental impact of their professional activity. The *intrapersonal competence* scale refers to students' self-control during stressful situations, confidence in their own

abilities and flexibility to adapt to new situations. The *interpersonal competence* scale refers to students' orientations towards collaboration with other individuals, ability to listen and accept the ideas of other individuals and ability to adequately communicate their own ideas. *Table 1* provides a summary of the factors obtained and examples of the items that loaded on the factors.

Internal validity. Similar to the first component of the questionnaire, internal consistency coefficients were calculated for each set of items that loaded on each factor (Table 1). For the items of hard-specific competence, internal consistency coefficients were obtained for each of the sixteen different vocational study programmes included in the research. Overall, the internal consistency coefficients ranged from 0.69 to 0.94 for this set of factors. Scale values for both competence learned at school and competence used at work were calculated by averaging the individual item scores; therefore, four pairs of latent variables were obtained (for the descriptive results, see Table 2).

[Table 1]

[Table 2]

Data analysis techniques

A diagnostic analysis was performed to ensure the data were suitable for moderation analysis. First, we examined the univariate extreme values by observing box-plots and identified the multivariate outliers using Mahalanobis Distance (Pérez & Medrano, 2010). The examination process identified fourteen extreme values (D2 $p < 0.001$), which were deleted from the data set and resulted in a final sample of $N = 365$.

Second, we followed the diagnostic process described by Tabachnick & Fidell (2007) to check the assumptions of normality, linearity and multicollinearity. The normality was checked by examining the asymmetry and kurtosis indexes and considering a threshold of ± 1.5 as an indication of slight variation from the normal distribution. The linearity assumption was evaluated by plotting the matrices scatterplots and determining whether the data were organized along the regression line. Multicollinearity was assessed by observing the presence of highly strong correlations ($r > 0.7$) in the correlation matrix (Table 2). We determined that only one correlation coefficient surpassed the recommended threshold (Tabachnick & Fidell, 2007); however, we considered that this did not affect

the moderation analysis because these two highly correlated variables would not be entered together in the same regression model. Moreover, we examined the multicollinearity and determined that none of the variables exceeded the recommended tolerance index (TI < 0.10) and the variation-inflation factor (VIF > 10) (Pérez & Medrano, 2010).

Third, a moderation analysis was conducted to identify the specific factors that enhanced or diminished the association between each aspect of competence learned at school and its pair competence used in the workplace. A moderation analysis consists of several regression analyses; the first analysis includes the predictor variable and the main effect variable, and the second analysis includes the predictor variable, the main effect variable and the moderator term, which is the product of the predictor variable and the main effect variable (Hayes, 2013). If the percentage of variance explained by the second regression model significantly increases as a result of the introduction of the product term and the coefficient of the product terms is also significant, then the effect of the moderator variable is considered significant.

To conduct the moderation analysis, we specified and tested four regression models for each pair of competences learned at school and used at work (Table 3), in which the predictor variables were the competence learned at school and the outcome variables were the competence used at work. A multiple regression analysis was conducted using the lm function from the base package of R Software (R Team Core, 2013). To obtain more meaningful and easier to understand results, we centred the predictors (Hayes, 2013). Because the background information variables correlated with some of the variables features in the analysis, we introduced them in the first model as control variables: professional family (dummy code, reference = Social Service), enterprise size (dummy code, reference = medium-size enterprise), gender (0 = male, 1 = female), labour situation (0 = unemployed, 1 = employed), and study level (0 = tertiary education, 1 = secondary education). In the second model, the predictor variable was introduced, that is, the correspondent competence learned at school. In the third model, the main effects were introduced; these effects refer to the factors of the transfer of learning. In the fourth model, we added the moderator terms, that is, the product between the predictor and the main effect variables. The determination of the moderation effect consisted of comparing the models by observing the R^2 coefficients, the changes in R^2 for each model, and

inspecting the regression coefficients of each interaction term. Significant moderation interactions were plotted using ggplot2 function (Wickman, 2009) in R Software.

Limitations

This study is not without limitations. First, it relied on self-reported measures of professional competences. In the future, performance observations could be used to obtain more reliable data on the acquisition and development of professional competences. Moreover, the fact that a unique source of information was used both for the outcome variable and for the predictor variables is a potential source of common method bias (Podsakoff, MacKenzie, & Podsakoff, 2003). Therefore, research regarding professional competence development should be performed using either multiple sources of information, such as the views of teachers and supervisors, to triangulate the results or different instruments applied at different points in time. In addition, a qualitative approach (e.g., interviews) would help to enrich our understanding of other relevant aspects that might affect the transfer of learning to the workplace. Second, the study included a cross-sectional approach and convenience sample; therefore, no causal relations could be examined. Future research could explore the transfer of learning with multiple measures at different points in time to identify causal relationships and use probabilistic samples. Furthermore, other research designs might be employed (e.g., pre-/post-test) to estimate the impact of school learning on performance during the practice module or the impact of the practice module on overall professional competence acquisition at the end of study programmes. Third, the present research investigated a limited number of factors that affected the transfer of learning. Other factors could be observed, such as motivation to transfer, personality traits, ability, workplace climate, and learning activities at the workplace. In a similar vein, the conceptualization of professional competence used in this study neglected other aspects, such as professional identity, beliefs and attitudes. Future studies could address these issues. Fourth, the research investigated the transfer of learning in one direction (i.e., from school to the workplace). It would be interesting to determine the impact of workplace experiences on performance on school assignments, although such an approach would only be possible in an integrated model of vocational education in which there are alternative periods of theory and practice.

Results

The regression coefficients for the moderation analysis are displayed in Table 3. First, we examined *hard-specific competence*. The examination of the moderation effects in the fourth model indicated that only *school-work alignment* had a significant regression coefficient (β = 0.141, p = 0.026). The change in R^2 was significant in this model (F = 2.28, p = 0.010), which provides evidence of a significant moderation effect. *Figure 2* shows the moderation effect of *school-work alignment* on the association between the *hard-specific competences* learned at school and those used at work. The difference in the slope of the regression line indicates that the association is stronger for higher values of *school-work alignment*. That is, students who indicated high *school-work alignment* reported greater use of competence at work compared with students who indicated low *school-work alignment*.

[Fig 2]

[Table 3]

Second, we investigated *hard-generic competence* (Table 3). The results demonstrated that in the fourth model, similar to the previous analysis, *school-work alignment* was a significant moderator (β = 0.112, p = 0.049). Moreover, *work-based supervisor support* and *task complexity* emerged as significant moderators (β = -.100, p = 0.048 and β = -.107, p = 0.032, respectively). The significant change in R^2 (F = 2.17, p = 0.014) provided evidence of significant moderation effects. *Figure* 3 illustrates an example of these moderation effects (in this case, the effect of work-based supervisor support). It is interesting to note that at the low end *of hard-generic competence* learned at school, student perceptions of a higher level of *work-based supervisor support* were related to higher scores on student perceptions of competence used at work.

[Fig 3]

Third, we assessed the *intrapersonal competence* (Table 3). In the fourth model, *access to resources* and *task complexity* emerged as significant moderators (β = 0.238, p = 0.002 and β = -.216, p = 001, respectively). This model added significant explanatory power compared with the previous models (change in R^2 = 0.069; F = 2.11, p = 0.017), which provides further evidence of a significant moderation effect. *Figure* 4 illustrates the moderation effect of access to resources on the association

between *intrapersonal competence* learned at school and that used at work. The greater difference between a higher level and a lower level of *access to resources* was on the high end of competence learned at school, as students who indicated a higher level of *access to resources* also reported greater use of intrapersonal competence at work than students who indicated lower levels of *access to resources*.

[Fig 4]

Finally, we examined the *interpersonal competence* (Table 3). The results demonstrated that *compulsory placement* (β = -.171, p = 0.022), *school-work alignment* (β = 0.191, p = 0.007), *work-based supervisor support* (β = -0.122, p = 0.046), *access to resources* (β = 0.183, p = 0.016) and *task complexity* (β = -.137, p = 0.024) were significant moderators. Additional evidence of significant moderation effects was associated with a significant change in R^2 (F = 2.65, p = 0.002). *Figure 5* shows the moderation effect of *compulsory placement* on the association between *interpersonal competence* learned at school and that used at work. At the low end of *interpersonal competence* learned at school, a difference was identified. Specifically, students who reported a low level of *compulsory placement* indicated greater use of competence at work than students who reported a higher level of *compulsory placement*.

[Fig 5]

Discussion

The aim of this research was to investigate the transfer of learning of professional competences acquired during school-based lectures and the use of these competences during the practice module in the context of vocational educational programmes in Spain. Drawing from Baldwin and Ford's transfer of learning model, the research identified interaction effects among individual characteristics (*compulsory placement*), educational design (*school-work alignment*) and work environment (*work-based supervisor support*, *access to resources*, and *task complexity*) on this association. The study examined four aspects of professional competence: hard-specific, hard-generic, intrapersonal and interpersonal (Balçar et al., 2011).

First, in the individual category, the results demonstrated that the perception of *compulsory placement* moderated the association between *interpersonal competence* learned at school and that used at work. We determined that among the students who perceived they had learned *interpersonal competence* at school, there was no difference between those who did and those who did not feel obliged to complete the practice module at a specific work placement. In contrast, when students reported a low level of learning, the difference appeared to be significant. That is, students who were free to choose a particular work placement at which to complete the practice module exhibited greater use of this competence than students who did not choose it. This finding has a practical implication. vocational education teachers may counterbalance the effect of compulsory placement by promoting the learning of interpersonal competence at school to maximize the use of this competence in the workplace, regardless of whether students complete the practice module in a placement of their choice. This is important because it is not always possible to allocate students according to their choice. Based on this findings, we therefore encourage researchers to analyse the effect of choice of work placement and student performance more fully and find alternatives to motivate all students to display their best learned competence.

Second, in the educational design category, we demonstrated that *school-work alignment* was a significant moderator of the association between competences learned at school and that used during the practice module. A higher level of *school-work alignment* strengthened this association for *hard-specific*, *hard-generic* and *interpersonal competences*. These findings indicate that *school-work alignment* contributes to the transfer of learning; however, it is necessary to rely on previous learning. This result is consistent with Kilbrink and Bjurulf's (2012) findings regarding the importance of students' learning basic knowledge at school to be able to deliver the work performance that is expected in the workplace. Moreover, it is also consistent with Messmann and Mulder's (2015) recommendations, who argued that *school-work alignment* enables students to make use of prior learning more easily, as they are aware that what they learned at school may be used at work to manage assignments.

In this respect, it would be important for vocational colleges to ensure that students initially develop competences at school to prepare them to further develop competences at work.

Simultaneously, vocational colleges should provide learning experiences that are aligned with workplace activities to boost the competence-development process in the workplace. For example, to improve *school-work alignment*, college teachers could spend short periods of time within companies or organizations to understand their work procedures, use of a specific technology or work climate more effectively. Thus, they will have more resources and experience to teach students about what it is like to work in a specific work placement. Similarly, workers from enterprises could be invited to provide short lectures regarding their work or explain a specific technique that they use at their company. These arrangements may increase collaboration between colleges and companies and improve *school-work alignment* to facilitate the transfer of learning

Third, we identified several factors from the work environment category that interact with the *hard-generic*, *interpersonal* and *intrapersonal competences* learned at school and used at work.

We found that *work-based supervisor support* may compensate for a previous poor learning experience of *hard-generic competence*. The findings indicated that *work-based supervisor support* added additional input to the perception of the hard-generic competence used at work among students who reported a lower level of learning in that competence at school. This may indicate a scaffolding effect of the work-based supervisor on students who reported a lower level of the competence learned at school. One explanation for this finding may be that supervisors offered more noticeable support to students who did not have sufficient previous knowledge of professional norms or were not aware of professional regulations. Thus, students who reported a lower level of this competence learned at school would use it (or learn it) in the workplace anyway. In this respect, Wesselink et al. (2010) noted that work-based supervisors should act as role models. Helping students to learn professional regulations or becoming aware of the impact on professional practice may represent good examples of the ways in which supervisors can serve such a function.

Moreover, *work-based supervisor support* positively moderated the association between *interpersonal competence* learned at school and that used at work. This finding may be explained by the fact that students who reported a higher level of perceived *interpersonal competence* learned at school may be prone to collaborate with other individuals, listen to other individuals' ideas and communicate their own ideas when they perceive a higher level of supervisor support. In this respect,

enterprises and labour organizations that host vocational education students should ensure that supervisors encourage students to become integrated into the work group and foster collaborative relationships between other workers and students.

These findings highlight the importance of the role of supervisors and their need to be fairly recognized as significant. One step towards achieving this goal is for workers who assume this responsibility to receive training on how to perform this task, as occurs in other European countries (Valiente et al., 2014). Offering special training to work-based supervisors could improve the outcomes of the practice module and enhance the quality of vocational studies.

We found that *access to resources* positively moderated the association between the *intrapersonal* and *interpersonal competences* learned at school and those used at work. This finding supports the assumption that an open workplace environment may provide students with more opportunities to use these competences; thus, they could take advantage of them, provided that they learned the competences at school. One practical implication of this finding is that companies and organizations should offer enriched working experiences by enabling students to have access to different materials, tools, technology, information and contact with other work colleagues.

Task complexity weakened the association between the *hard-generic*, *interpersonal* and *intrapersonal* competences learned at school and that used at work. When students' perceptions of *task complexity* were high, the competences learned at school did not predict the competences used at work. That is, despite the fact that students reported a lower level of learning of the competence at school, they reported greater perceived use. In this respect, students may rely on other sources of learning to use this competence at work and thus be able to handle the requirements of a task. This was especially noticeable for students who reported a lower level of the competences learned at school. Related to this finding, Messmann and Mulder (2015) demonstrated that students enquired more if they perceived that their task was complex. Thus, students' learning may be triggered when they are exposed to complex tasks in the workplace. Nevertheless, it has also been reported by previous researchers (Messman & Mulder, 2015) that the level of complexity should be adequate to produce a positive effect. In this respect, host enterprises and labour organizations should allow students to participate in challenging working situations to encourage the further development of their

professional competences, although these challenging situations must be aligned with their knowledge and abilities.

Although it was not a research questions in the present study, it is important to note at this point that work environment factors are linked with individual characteristics, and this relation might have impact the transfer of learning and needs further analysis. Extensive empirical research supports the assumption that congruence between individuals' skills and the specific demands of a job has an important effect on work attitudes and behaviours (Kristof-Brown, 2005). Moreover, researchers have shown that when workers have the necessary skills to fulfil job demands, they are more likely to perform at a higher level, meet the expectations of the supervisor and remain on the job (Vogel & Feldman, 2009). However, few studies accounted for the impact of this match on the transfer of learning. In this respect, consistent with our results, some researchers found that the perception of fit with sufficient resources is positively associated with the transfer of learning (Awoniyi et al., 2002), as access to resources is a major environmental support of performance. However, the same research found that, contrary to expectations, fit with supervisory encouragement is not associated with the transfer of learning (Awoniyi et al., 2002). Matching people's skills and abilities with the requirements of the job is not new to organizations, but this concept can be extended to promote an adequate fit between trainees' personal characteristics and the workplace characteristics that are capable of enhancing individual performance and thus facilitating the transfer of learning.

Control variables also deserve attention. The professional field had a significant impact on the application of *hard-specific competence* at the work placement, especially the health and industry branches. A plausible explanation for this outcome could be that those study programmes are based on more technical, standardized and job-specific knowledge; therefore, students are able to find more connections between what they learned in school and what they do in the workplace. In contrast, social services and administration programmes have a more general curriculum, so students might face more difficulties in using their previous learning in the workplaces, which sometimes demand more context-specific approaches to solve different tasks. Moreover, in the case of health programmes, students seem to apply *hard-generic competence* to a greater extent that their

counterparts, probably because schools emphasize the learning of this competence, and accordingly, students found it relevant in the workplace.

Gender had a significant impact on the application of *intrapersonal competence* in the work placement, revealing that women are more aware than men of showing self-control in stressful situations, being confident in their own abilities and being flexible to adapt to different situations. It is possible that women are more conscious of showing this competence in the workplace because they believe that they are more competent in doing so. In this respect, gender researchers have shown that women who are able to address negative emotions at work are perceived as being more competent than women who are not; therefore, they gain better status at work (Brescoll & Uhlmann, 2008). Moreover, in vocational research, some scholars have argued that professional identity combines personal traits with collective routines that are determined by gender, ethnicity and social class (Schaap, Baartman, & Bruijn, 2012). Therefore, gender might have an effect on professional competence performance, although this is a topic that has received little attention.

The overview of the results did not show a well-defined pattern of the interactions between the analysed factors and the different competences. However, an emergent trend could be identified. We observed that educational factors, such as *school-work alignment*, had a significant interaction effect on the *hard competences*, while individual and workplace factors, such as *compulsory placement*, *work-based supervisor support*, *access to resources* and *task complexity*, had a significant interaction effect on the soft competences (intrapersonal and interpersonal competences). An explanation of this result could be that hard competences are based on more job-specific, technical knowledge; consequently, the more the curriculum is adjusted to the technical knowledge needed in the workplace, the more the students would be able to find connections between the two settings and therefore apply in the workplace what they learned in school. Conversely, soft competences (intrapersonal and interpersonal competences) are based on social and personal abilities to address different context situations, and, as a result, their activation might be triggered by specific workplace characteristics, such as task complexity, access to resources and supervisor support.

Nevertheless, this pattern is not clear-cut, and some nuances must be recognized. *School-work alignment* also had an effect on the application of *interpersonal competence* in the workplace. An

explanation for this result might be that *interpersonal competence* has more relevance or is addressed with much more emphasis in the study programmes' curriculum than *intrapersonal competence*. Therefore, *school-work alignment* is perceived as a factor that might trigger the application of this soft competence in the workplace. Similarly, workplace factors also had an effect on *hard-generic competence*. In this respect, the fact that *hard-generic competence* is based on technical knowledge does not exclude the possibility that its application depends on contextual factors as well. Workplaces might have their own interpretation of professional norms as well as their own rules and security procedures; therefore, this competence also might be triggered by specific characteristics of the workplace environment (in this case, by the influence of supervisor support or task complexity).

These results lead us to raise the question regarding whether workplaces prefer one type of competence over another. Although we cannot answer this question with the present data, there are studies showing that both types of competence are equally valued in the labour market. For example, Van der Velden and Allen (2011) argued that higher education institutions should offer a mix of specialized and more general content programmes to allow students to cope simultaneously with the tension between a greater division of labour, which results in more fragmented disciplines, and with the notion of 'flexibility' associated with current professional life and introduce greater emphasis on generic transferable skills. In a different type of study but in a similar vein, other researchers (Urtasun & Núñez, 2012) observed that core work-based competence (explicit job-specific knowledge and social, motivational and creative competence) is related to better career prospects in the Spanish labour market, which shows that both hard and soft competences are valued.

Finally, a number of the factors tested in this study did not have a significant moderation effect on any of the competence dimensions analysed. *Expectation to continue* did not emerge as a significant moderator of the transfer of learning; however, the main effect on the use of *hard-generic*, *intrapersonal* and *interpersonal competences* remained significant after introducing the moderator term. This result is likely related to specific labour market dynamics, which compel students to obtain a job position through the practice module. It would be interesting for future researchers to tap into the effect of labour market conditions on students' motivation to perform during the practice module. Furthermore, *student-centred teaching* and *teacher-centred teaching* were not significant moderators.

However, an inspection of the partial correlation table revealed that *student-centred teaching* was strongly correlated with *school-work-alignment*; thus, there was likely a suppression effect (Tabachnick & Fidell, 2007). *School-based supervisor* was another factor that failed to emerge as a significant moderator. One potential explanation for this result is that their tasks are limited to the school context and do not have an effect on the way that students perform in the workplace. From the work environment category, *task autonomy*, *task variability* and *task challenge* did not significantly interact with the transfer of learning. It is unlikely that these factors are task characteristics that activate the use of previously learned competences in the context of the practice module, probably because students are not granted full autonomy yet and the tasks they are engaged with are not sufficiently diverse or require a certain level of precision and quality to be performed.

Conclusion

Overall, these findings indicate that transfer of learning is not a straightforward process, and there are factors that facilitate it and others that expand previous learning. We identified crucial factors that foster transfer of learning and activate the use of a previously learned competence in the workplace. Therefore, these findings support the assumption that work placement periods may complement and may compensate for a lack of learning in the vocational college context. In this respect, lessons may be learned from our results.

First, the use of the competence at work is related to the level of the competence learned at school. In this regard, it is important that vocational education colleges ensure a good quality of previous learning to provide students with a substantially broader base upon which they may apply and further develop their competences in the workplace.

Second, there are crucial factors that facilitate the use of competences at work regarding whether the students have learned the competence at school; these factors include school-work alignment, work-based supervisor support, task complexity or access to resources in the workplace. Moreover, in some cases, these factors may compensate for previously poor learning of aspects of the professional competence by encouraging the use of the competence at work. In this respect, it is important that vocational education colleges and host enterprises or labour organizations identify the

factors and attempt to improve them in order to provide students with a better learning environment and thus to further develop their professional competences.

To conclude, our research in general confirms findings from previous research. However, by incorporating simultaneously multiple variables and exploring the moderation effects of the relationships on the transfer of school-based learning to the workplace, we have attempted to strengthen and further refine our insights on the practice module scheme as an opportunity for students to gain work experience and further develop their professional competences. For practice, it is relevant to note the value of linking school-based learning with workplace requirements, while at the same time investing in a supportive work environment through work-based supervisor support and learning-conducive task features, as these factors affect not only the transfer of learning, but also help students to further develop their competence at work.

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