

Exploring the Vocational Identity of Slovak In-Company Trainers: Validation of a New Concept

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Received: 06 December 2024, Accepted: 01 August 2025

Abstract

Purpose: In-company trainers are company employees who are responsible for planning and teaching vocational skills to young people. They also teach them about the company's values, thus fostering a sense of belonging and alignment with company goals. However, there is limited understanding of what constitutes their vocational identity. Therefore, the purpose of this study is to a) theoretically and empirically develop a concept of the vocational identity of in-company trainers, (b) transpose this concept to a newly developed tool, The Vocational Trainer Identity Questionnaire, and (c) assess its construct validity. Beyond the focus on the validity, the study provides descriptive data on how in-company trainers rate the vocational identity components and how their ratings relate to demographic factors.

Methods: The Vocational Trainer Identity Questionnaire was developed and validated through a multi-stage process. This included workplace visits, interviews with trainers, a literature review, and analyses of existing vocational education and training questionnaires. To ensure validity, three rounds of factor analysis were conducted. The study involved 300 in-company trainers from a wide range of companies across Slovakia, who participated as respondents.

Results: A four-components model of vocational identity resulted from the data, comprised of self-efficacy, company values, professional improvement, and task perception. They correlate positively, which indicates that they create a consistent unit, albeit with components that

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are still conceptually independent. Self-efficacy, accounting for 19.4% of the total variance, emerges as the strongest component in the vocational identity model for in-company trainers. The other three components contribute to a lesser extent: Company values account for 11.3%, professional improvement for 11%, and task perception for 8.5%. Combined, these four components explain 50.2% of the total variance. With regard to the descriptive data, on average, in-company trainers scored above the midpoint of the five-point scale across all four identity components. The relatively high mean scores suggest that self-efficacy, company values, professional improvement, and task perception are strong elements of their vocational identity.

Conclusion: Data were collected from in-company trainers across a wide range of vocational fields, making the resulting model an empirically validated step towards clarifying the construct of the trainers' vocational identity. The Vocational Trainer Identity Questionnaire addresses a gap in the literature and provides opportunities for conducting longitudinal studies and exploring the reciprocal effects between perceived vocational identity and related concepts. The questionnaire is available for validation and use in other countries.

Keywords: In-Company Trainer, Vocational Education and Training, VET, Vocational Identity, Dual Professionalism

1 Introduction

The goal of dual vocational education and training (VET) is to prepare young people for specific jobs. The dual VET system, which combines classroom instruction with hands-on workplace experience, has attracted significant attention as an effective model for workforce development (Deissinger, 2019; Eiríksdóttir, 2020; Martínez-Izquierdo & Torres Sánchez, 2024; Organization for Economic Co-operation and Development [OECD], 2022). A special aspect of VET in companies is the close association between the training content and labour market needs. The key personnel who are responsible for the VET programme delivery in companies are in-company trainers. They are company employees who are responsible for planning and teaching practical and theoretical knowledge to young people. They also focus on motivating them vocationally and teaching them about the company's culture and values, thus fostering a sense of belonging and alignment with company goals. Other responsibilities include the trainer's cooperation with secondary vocational schools, attended by their trainees, in order to harmonize the school curricula and the workplace training focus.

Despite the in-company trainers' significant role in educating the generation of future workers, the scientific knowledge of them is limited. In contrast to VET teachers, little is known about how in-company trainers perceive their role as both professionals and educators. The literature concentrates mostly on legislature about in-company trainers, their

qualifications, experience and skill requirements (Heusinger & Jonda, 2018; OECD, 2022). Other materials provide guidance on how to initiate, develop, organize and assess effective VET programmes with in-company trainers (CEDEFOP, n.d; Dernbach et al., 2017; Euler, 2018; Nielsen & Oldroyd, 2005).

This study adopts a different perspective. It explores how Slovak in-company trainers make sense of their vocation and what self-knowledge they hold. We looked at these characteristics through the concept of vocational identity. This concept is of great theoretical potentials and provides a fruitful avenue for empirical analyses. In addition to theoretical importance, empirical findings on in-company trainers' vocational identity may be of interest for their company managers, VET programme designers, in-company trainers' development providers, policy makers, and in-company trainers themselves. This study introduces a newly developed instrument for assessing the identity components of in-company trainers. It offers a valuable tool for cross-national studies, facilitating comparisons across diverse cultural and economic contexts.

2 Dual VET in Slovakia

Dual VET is a relatively new phenomenon in Slovakia. After the passing of Act No. 61/2015 on vocational education and training, companies began to establish dual VET in their premises to provide instruction on practical knowledge and skills to young trainees. Companies initiated partnerships with vocational schools, which provide in-class theoretical instruction that serves as the foundation for in-company training. By definition, dual VET in Slovakia is implemented as initial VET (IVET). It corresponds to the upper-secondary level of schooling, which generally covers the final part of secondary education (OECD, 2000).

The individuals who are responsible for the VET training in companies are in-company trainers. They are skilled workers who assumed VET training functions either as full-time trainers (typically in large companies with many trainees) or as part of their regular job. These trainers are recruited from among the company staff based on their employment reputation, professional qualifications and interest in performing in-company training of trainees. Large companies establish training centres that provide technology, devices and materials for training purposes. Part of the training can be implemented in the company's work process. Small companies usually do not establish training centres; they provide training in their own premises or use premises of other companies. There is no specific rule regarding the minimum size of a company staff implementing in-company training, as long as the company holds a training certificate issued by professional or vocational organizations.

There are two categories of in-company trainers in Slovakia: Trainers and chief trainers. While the former are responsible for carrying out the training activities, the latter, in addition to these activities, are responsible for management and administration of the dual VET

programme in a company. They are responsible for the organisation and conceptualisation of training programmes, evaluate the training outcomes, provide counselling and mentoring to trainers, and establish linkages with schools where theoretical instruction of young trainees takes place.¹

In-company trainers are required to have at least a certificate of apprenticeship in the respective vocational field. In contrast to teachers in VET schools, they are not obliged to have a professional graduate certificate or to have completed pedagogic studies. Instead, five years of practice as a fully qualified worker in the respective occupation is the starting qualification criterion. As stipulated by the Slovak Act No. 61/2015 on Vocational Education and Training, a certificate of apprenticeship or graduation from an upper secondary school is not required if the individual has served in a profession for at least eight years.

Most in-company trainers in Slovakia begin vocational training with no or low training expertise. At the onset, they are obliged to complete 56 hours of education covering areas like legislature of dual vocational preparation, foundations of psychology and education, management of on-site training, learning assessment, communication with trainees, etc. This preparation takes place in the form of lectures and workshops and is managed by experts from professional bodies. After seven years, trainers must complete another round of education to maintain their training license. The detailed curricula for dual VET trainers' preparation is based on requirements from professional chambers and employers' representatives (CEDEFOP, 2016; Wiegerová et al., 2024).

3 The Concept of Vocational Identity

Vocational identity is comprised of occupational ties and characteristics associated with a particular vocation. Vocational identity determines how individuals characterize themselves as workers (Skorikov & Vondracek, 2011). It reflects how a person perceives their fit within a particular occupation, their commitment to a profession, and their sense of purpose in their career path.

Vocational identities are group-based identities in that they are "shared with a group of others who have (or are believed to have) some characteristic(s) in common" (Ashmore et al., 2004, p. 81). At the same time, vocational identity is a part of individuals' social identity and is based on identification with individuals holding a particular profession (Kirchknopf & Kögler, 2022; Trede et al., 2012). Thus, this identity involves interaction and negotiation with other individuals with whom they share a professional role. Through this role, they establish and stabilise a group-based identity. This stabilisation is important for having beliefs, values, motives, and experiences by which they define themselves in a professional role (Ibarra, 1999).

¹ To avoid repeating the terms "trainers and chief trainers" throughout the text, we collectively refer to them as "trainers". However, when necessary, we shall distinguish between these two vocational roles.

Vocational identity is a multi-layered compound consisting of several components. Van Dick (2001) and van Dick et al. (2005) proposed a four-component identity model, applied to the organisational context. These are (a) a cognitive component, which is the knowledge of being a member of a certain work group, (b) an affective component, which is the emotional attachment to that group, (c) an evaluative component that describes the value connotation assigned to that group from outside, and (d) a behavioural component, or group-related behaviour (van Dick et al., 2005). In addition to these components, van Dick et al. (2005) suggested different foci of an individual's identification with a group and differentiation from other groups: Career, work team, organisation, and occupation. Thus, membership in a professional group requires both intragroup and intergroup behaviour.

While the approach of van Dick et al. (2005) relates identity chiefly to an organisational context and demonstrates how an individual feels and behaves as a member of a vocational group, other scholars extend the attributes of professionalism that efficiently influence the performance of an individual in a vocation. Some identify vocational knowledge and skills as core components of vocational identity (Van Oeffelt et al., 2018; Worthington et al., 2013). Similarly, Fitzgerald (2020) identified both theoretical and practical professional knowledge and skills as important components of vocation. These are acquired through vocational education and training and are performed as a shared behaviour in the professional community.

In addition to cognitive characteristics, such as knowledge and skills, performing a profession also requires affective attributes. These include emotional attachment and a favourable attitude toward the professional group (van Dick et al., 2005), as well as shared values, norms, and beliefs among group members (Ibarra, 1999; Van Oeffelt et al., 2018). Research in organizational psychology has shown that individuals who feel emotionally attached to their organizations experience greater job satisfaction, higher motivation, improved job performance, and report fewer intentions to leave the organization compared to those lacking these qualities (Van Dick & Wagner, 2002).

4 Vocational Identity of In-Company Trainers

By taking on training functions in a company, individuals attain a distinct status and recognition as 'trainers'. This status is reinforced by national regulations, professional associations, and company policies. In addition to the occupational competence and technical skills required for their role as skilled company workers, they also possess pedagogical knowledge and instructional skills essential for training young people. The scope and focus of this knowledge are shaped by sectoral and company-specific guidelines (European Commission, 2008).

Despite the widespread recognition of in-company trainers' role in producing the next generation of the vocational workforce, their professional characteristics have been scarcely investigated empirically. Rather, most of the empirical investigations focused on VET teachers.

In-company trainers share many characteristics with VET teachers in that they promote the vocational education of young people. The difference is that the former are workplace-based personnel while the latter work in school-based systems, with periods of workplace learning (CEDEFOP, 2018). They enter the VET training job as a second career without any prior teacher training but have expertise in a particular vocational area (Bükki & Fehérvári, 2024). Another difference is that they usually do not possess a formal teacher certificate but have professional knowledge in a particular section of industry or commerce. They acquired the trainer's certification shortly before they started their job of an in-company trainer. The certification of trainers involves varying requirements depending on the country and the vocational field (Brockmann et al., 2008; OECD, 2022). There are also differences within national systems, as companies who organize VET workplace training can establish their own profiles of competences to be required by recruited trainers (Brockmann et al., 2008). In-company trainers play a crucial role in preparing the workforce, particularly for their own organization. As role models, they not only impart special skills but also embody professional behaviours and attitudes. This is probably the largest difference between them and VET teachers.

Due to the limited number of empirical studies on the vocational identity of in-company trainers, we shall instead focus on studies examining the professional identity of VET teachers. We will provide a brief review of these studies, highlighting both their relevance and their limitations in capturing the professionalism of VET teachers. This will lay the basis for explaining our approach to identifying the vocational identity of in-company trainers.

While the theoretical literature highlights that VET teachers possess two distinct identities — the vocational and the educational — there is no consensus on the specific components that constitute these identities (Beauchamp & Thomas, 2009; Beijjaard et al., 2004). This lack of agreement stems from the fact that professional identity is a complex, broad, and somewhat loosely defined concept that can be operationalized in various ways. Historically, VET research has primarily focused on teacher competence, which has occasionally been equated with professional identity. For example, in a Swedish study based on interviews with VET teachers, Antera (2023) identified four attributes of VET teachers. The most extensive of these is teaching competence, which encompasses didactic knowledge, curriculum knowledge, the ability to plan the teaching process, student assessment skills, and expertise in addressing the needs of special needs students and those from diverse cultural backgrounds. Additional elements include developmental aspects of the VET teaching profession, such as teacher training and teaching experience. The remaining two attributes identified by Antera are occupational competence and school life competence.

In contrast to the study of Antera (2023), Bükki and Fehérvári (2024) identified only two attributes in Hungarian research on VET teachers based on interviews and a questionnaire: Teacher's self-image and task perception. The former concerns identification with teaching and/or vocation, while the latter consists of knowledge of teaching goals, knowledge

of curricula, teaching competence, management of student behaviour, student assessment, and continuous professional self-reflection. Out-of-classroom components include collaboration with colleagues and communication with students' parents or guardians. In a study conducted in Australia, Smith and Tuck (2023) suggested five complex teacher attributes. The first one is a teacher's knowledge of students, their context and learning styles. The second attribute concerns the knowledge of the curricula and teaching methods. The third attribute is associated with planning and delivering effective teaching experiences. The fourth attribute is assessment and provision of feedback to students. Finally, the fifth attribute relates to engagement with industry, colleagues, community, regulatory and professional bodies. In Slovakia, Lukáčová et al. (2020) administered a 50-item questionnaire to VET teachers and trainers. They did not categorize the components resulting from their questionnaire. Nor were reliability and validity information of the questionnaire published.

Regardless of the national context, the representation of teacher attributes in these studies is quite limited. They reduce professionalism to the teacher's competence and they overlook other professional domains essential to the role of a VET teacher. Specifically, they disregard the perceived teachers' self-efficacy, though it plays a prominent role in the teaching profession. Teacher's self-efficacy shapes how they apply their skills, knowledge, and abilities in teaching situations. The concept of self-efficacy, originally developed by Bandura (1986, 1997) in his social cognitive theory, explains how self-beliefs determine an individual's intentional and purposive behaviour. Applied to the work of in-company trainers, self-efficacy affects their ability to successfully perform teaching and learning tasks in their training centres. Self-efficacy is an important attribute of in-company trainers when considering the challenges in the process of transfer from their vocational job to the training position (Gagnon & Dubeau, 2023).

VET teacher professional identity studies also disregard the importance of attitudes, values, and emotions associated with the teaching profession. As Beijaard et al. (2004) contend, the teaching profession is deeply connected to personal beliefs, values, interests, and goals. These qualities are equally needed for in-company trainers. As indicated, they differ from VET teachers in that they are company employees and train young people to become members of the company workforce. Therefore, it is essential for them to visibly align with their workplace, instil an understanding of the company culture in their trainees, and inspire them to commit to the organization for which they are training. Thus, attitudes toward the company and its values are integral aspects of in-company trainers' professionalism (van Dick, 2001; van Dick et al., 2005).

This study broadens the competence-based concept of VET educators' professional identity by incorporating attitudinal and self-belief components. In doing so, it contributes to the discourse on the identity of in-company trainers.

5 Study Aims

While the work of in-company trainers is appreciated for preparing the young generation for the demands of the modern workforce and becoming valuable and contributing members of the professional community, little is known about in-company trainers' values and beliefs relating to their training roles. The legislature concentrates mostly on their qualification, experience and skill requirements (cf. OECD, 2022) and neglects the subjective aspects of their position, in particular how they perceive their role and commitment as vocational trainers of young people. This study approaches the subjective aspects of an in-company trainer's role through the concept of vocational identity, which the trainer develops and uses during the training processes.

Specifically, the aim of this study is to theoretically develop the concept of the vocational identity of in-company trainers as well as to assess it empirically. This is done through a multi-stage process including workplace visits, interviews with trainers, and a literature review. The concept of an in-company trainer's identity is transposed then to a newly developed instrument, the VET Trainer Identity Questionnaire (VETTQ), and the construct validity of this instrument is assessed in a series of factor analyses with two subsamples of in-company trainers. Further, the study evaluates how the individual components of the trainers' vocational identity relate to form a cohesive whole. Beyond the focus on ty of this concept, the study provides descriptive data on how in-company trainers rate the vocational identity components and how their ratings relate to demographic factors.

6 Methods

In the following chapters the participants of the study, the data collection and the analysis of the data are described.

6.1 Study Samples

The sample used to determine the identity composition of in-company trainers consisted of 300 Slovak trainers. To validate the VETTQ, the sample was divided into two subsamples. Subsample 1 provided data for both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Subsample 2, composed of participants from different vocational areas than those in subsample 1, was used to cross-validate the findings from subsample 1 using CFA. The demographic characteristics of participants in each subsample are detailed in Table 1.

Table 1: The Demographic Characteristics of the Subsamples

	Subsample 1	Subsample 2
Size	169	131
Males	138 (82.4 %)	91 (68.9 %)
Females	26 (15.5 %)	40 (30.3 %)
Not provided	4 (2.3 %)	1 (.8 %)
Age	44.3 (SD = 9.5)	44.6 (SD = 10.1)
Age range	23-65	23-68
Years of VET trainer experience	4.3 (SD = 2.8)	3.4 (SD = 2.1)
Range	1 – 9	1 – 9
Years of chief VET trainer experience	4.9 (SD = 3.5)	14.7 (SD = 10.8)
Range	1 – 5	1 – 9
Education completed		
Secondary voc. school	18 (10.7 %)	19 (14.6 %)
Secondary voc. school with <i>maturita</i> (graduation) exam	72 (42.9 %)	71 (54.6 %)
High school	7 (4.2 %)	2 (1.5 %)
University	68 (40.5 %)	38 (29.2 %)
Missing	3 (1.8 %)	1 (.4 %)
Vocational areas	Railway transportation, automobile manufacturing, vehicle parts production.	Electrical engineering, sales, textile manufacturing, restaurants and hotels, quality control, railway transport, vehicle parts production, public administration.

6.2 Instrument

The VET Trainer Identity Questionnaire (VETITQ) was developed as a tool for data collection. Its creation involved two main steps. First, four sources of information were analysed to identify potential dimensions of vocational identity. These sources included the following:

- a. Workplace Visits. The purpose of these visits was to gain insights into the workplaces that provide VET in Slovakia. Observations were carried out in three dual VET training facilities: Duálna akadémia (Bratislava), Deutsch-Slovakische Akademien (Nitra), and Dual ZF Slovakia (Levice). During these visits, training sessions were observed, and informal conversations were held with trainers to gather contextual knowledge.
- b. Interviews. Seventeen semi-structured interviews were conducted with trainers to explore their academic and career trajectories, perceptions of VET training, vocational and teaching skills, relationships with trainees and superiors in companies, and their professional development needs. These interviews provided detailed insights into the personal

and professional aspects shaping the trainers' identities. We obtained information about a wide range of areas: Communication with trainees, assessment of trainees, use of technologies, company culture, etc. Most of these areas were integrated in the VETTQ.

- c. Literature Review. Given the limited research on the vocational identity of in-company trainers specifically, literature on the professional identity of VET teachers was reviewed. This review helped identify relevant vocational and professional areas, which are outlined below.
- d. Analysis of VET Teacher Questionnaires. Questionnaires were analysed to inform upon how and to what extent they empirically assessed the teacher vocational identity. Key sources included studies by Antera et al. (2022b), Bükki and Fehérvári (2004), and Lukáčová et al. (2020). While these studies primarily assessed vocational competencies rather than broader aspects of professional identity, several items from them, indicated in Table 2, were adapted for the VETTQ.

Each of these four sources contributed unique perspectives and insights into the complex vocational identity of in-company trainers, forming a foundation for the proposed identity components.

Based on these findings, in the next stage we identified eleven areas that collectively describe the in-company trainers' vocational identity. Following this identification, questionnaire items for the VETTQ were developed. The names of these areas, along with the number of questionnaire items and item examples, are as follows (translation from Slovak):

- a. Knowledge of the vocational curriculum - 3 items. Example: "I have excellent knowledge of the subject matter I teach".
- b. Knowledge of trainees - 3 items. Example: "I understand trainees' behaviour in puberty".
- c. Teaching strategies - 5 items. Example: "I can effectively use information technologies in my teaching".
- d. Trainees assessment - 2 items. Example: "I can adequately assess trainees' knowledge and skills".
- e. Trainee guidance - 3 items. Example: "I advise trainees in seeking employment after completing their studies".
- f. Workplace training challenges - 6 items. Example: "When I have to deal with problems in my trainer's work, I usually find appropriate solutions".

- g. Professional improvement - 4 items. Example: "I continuously improve my teaching skills".
- h. Professional values - 3 items. Example: "I am proud to work as an in-company trainer".
- i. Identification with company values - 3 items. Example: "I identify with the values of the company for which I work".
- j. Appreciation of workplace culture - 2 items. Example: "I find this company climate favourable".
- k. Collaboration with the school attended by trainees - 2 items. Example: "I can efficiently cooperate with the school that is attended by my trainees".

Altogether, 40 items were proposed, which were used in a preliminary study with 25 participants attending a trainers' conference. After analysis, wording of some items was changed, and three items were eliminated. The version of the VETTQ prepared for final validation contained 37 items. Five-point scales were used from "strongly disagree" (1) to "strongly agree" (5). The higher the score, the more favourable perception of an item. In the preliminary study as well as in the main study, a paper-and-pencil format of answering was used.

6.3 Statistical Analyses

In the descriptive analysis, means and standard deviations were calculated along with skewness and kurtosis values. The Shapiro-Wilk test was used to assess data distribution, and the Mann-Whitney U test and Kruskal-Wallis H test were applied to examine statistical differences. To assess construct validity, an EFA and a CFA were performed on subsample 1. The CFA was then computed on subsample 2 to assess whether or not a predetermined model can be verified with participants from different vocational areas. In the EFA, the principal axis method of extraction with items loading set at .40 or higher was used. Oblique rotation, Oblimin, was employed due to a hypothesized correlation among factors. In the CFA, maximum likelihood estimation was performed, utilizing robust maximum likelihood estimation and full information maximum likelihood estimation for missing data, with factors assumed correlated. The model fit of the CFA was evaluated using the fit indexes: Chi-square divided by degrees of freedom (CNIN/df); Comparative Fit Index (CFI); Tucker-Lewis Index (TLI); Root Mean Square Error of Approximation (RMSEA); Standardized Root Mean Square Residual (SRMR). In general, CFI and TLI statistics greater than .90 are considered as an adequate model fit, whereas values greater than .95 are deemed as a good model fit. Fit indexes for RMSEA and SRMR values less than .08 and .06, respectively are considered good and

values between .08 and .10 mediocre (Hu & Bentler, 1999). Instead of Chi2 statistics, which are sensitive to sample size, CMIN/df is recommended (Kline, 2005), with a ratio of less than 2 suggesting a good fit (Byrne, 1991). Factor reliability was computed using McDonald's omegas and Cronbach's alphas. All calculations were performed in JASP version 0.19.1.

7 Results

Subsequent chapters detail factor analyses of the questionnaire data, performed on two subsamples and the overall sample. This is followed by a presentation of descriptive data, including their relationships with participants' demographic characteristics.

7.1 Factor Analyses for Subsample 1

An EFA with a subsample of 169 participants produced eight factors with eigenvalues above 1. Because this factor solution was difficult to interpret and the aim was to achieve a simple solution (Thurstone, 1947), parallel analysis (Hayton et al., 2004) and scree plot were inspected to determine a more appropriate number of factors. They both suggested four factors, which proved a meaningful solution. They were labelled self-efficacy (14 items), company values (6 items), professional improvement (2 items) and task perception (4 items). Because of the large size of the self-efficacy factor, we examined whether VETTQ items can be divided into more factors. We computed an EFA with forced 5 and 6 factors, but achieved factors with uniqueness values under .60. When such items were eliminated, we achieved an unreasonable solution. Thus, we returned to the four-factor model. Since the self-efficacy factor contained a disproportionately high number of items, eight items with the lowest loadings were excluded, resulting in a final set of six items for this factor. To ensure the four-factor model remained intact, we conducted an EFA without the excluded items, which yielded positive results.

In the following step, we inspected how the eleven professional areas, suggested in chapter 6.2, were represented in the VETTQ factors. In sum, nine areas were preserved, with a total of 18 items: Knowledge of trainees (1 item), teaching strategies (3 items), trainee guidance (2 items), workplace training challenges (3 items), professional improvement (3 items), professional values (2 items), identification with company values (2 items), appreciation of workplace culture (2 items), and collaboration with the school attended by trainees (1 item). Only two areas - knowledge of the vocational curriculum and trainee assessment - were not represented in the resulting VETTQ structure. Generally, this can be seen as an indication that the questionnaire effectively covers most of the vocational areas relevant to in-company trainers.

In addition to presenting the number of items extracted from eleven vocational areas and used in the questionnaire, it is valuable to describe which areas contribute to each factor.

- Self-efficacy was composed of items originally categorized under workplace training challenges (3 items), teaching strategies (2 items), and knowledge of trainees (1 item)
- Company values consisted of appreciation of workplace culture (2 items), identification with company values (2 items), and vocational values (2 items).
- Three vocational improvement items were derived entirely from the vocational improvement area.
- Task perception was formed from trainee guidance (2 items), training strategies (1 item), and collaboration with the school attended by trainees (1 item).

After the EFA, the VETTQ includes 19 items. The wording of the items is presented in Table 2. The reliabilities of the self-efficacy factor were .791 (McDonald's omega) and .799 (Cronbach's alpha). The reliabilities of the company values were .891 and .891, respectively. The professional improvement factor shows reliabilities of .804 and .800. Finally, the task perception factor provides reliabilities of .702 and .794. When considering the appropriateness of reliability indexes, McDonald's omega values of .7 or higher denote good reliability (Hair et al., 2009), and Cronbach's alphas of .7 – .8 are considered acceptable values (George & Mallery, 2003). In sum, the 19-item VETTQ proved good though not ideal factor reliabilities.

The initial CFA did not provide an optimal model fit, with a TLI index slightly lower than needed; TLI = .886. To improve the model fit, two modification indexes were consecutively evaluated and indicated that correlating the residuals for the following items would improve the model fit. These were as follows:

V24 "I provide guidance to trainees in finding a job after completing their studies" and V29 "I motivate trainees in their job search after finishing school". V1 "I am able to communicate effectively with young trainees" and V5 "I understand young trainees who are going through puberty".

After these changes, the following model fit statistics were determined: CMIN/df = 1.8; CFI = .925; TLI = .910; RMSEA = .062; SRMR = .061. Thus, the CFA results show an adequate to good model fit for the proposed model.

Table 2: Item Wording and Factor Loadings of the VETTQ

	Item wording	SE	COMP	IMPR	TASK
V1	I am able to communicate effectively with my trainees.	.742	-0.055	-0.053	-0.095
V11	I can typically handle any challenges that arise in my role as an in-company trainer.	.734	-0.085	.030	-0.040
V12	I can achieve the goals I set for myself as an in-company trainer.	.667	.046	-0.045	-0.047

V5	I understand young people who are going through puberty.	.641	.052	-0.153	.042
V25	Challenges in my work as an in-company trainer don't unsettle me, as I trust in my abilities.	.556	.143	-0.123	.108
V10	When I encounter problems in my role as an in-company trainer, I usually find appropriate solutions.	.499	.084	.068	.099
V37	I am proud to work for our company.	-0.121	.877	.067	-0.023
V9	The company I work for is like a second family to me.	.019	.818	-0.206	.022
V31	I am proud to be an in-company trainer in our company.	-0.028	.801	.271	-0.151
V26	I consider the climate in our company to be positive.	.050	.601	.004	.101
V17	I identify with the values of the company where I work. ¹	.113	.532	.102	.048
V30	I feel comfortable in the company for which I work.	-0.016	.904	.041	-0.208
V35	I continuously improve my practical teaching.	.044	-0.024	.671	.165
V28	I strive to refine my practical teaching.	-0.125	.160	.663	.118
V18	I regularly work on developing my training skills.	.053	.072	.595	.079
V24	I provide guidance to trainees in finding a job after completing their studies.	.013	-0.105	-0.185	.915
V29	I motivate trainees in their job search after finishing school.	-0.040	-0.093	.080	.784
V32	I collaborate with the school my trainees attend.	-0.216	.035	.285	.584
V34	I evaluate and reflect on my practical teaching. ^{1, 2}	-0.088	.018	.033	.578
	Cronbach's α	.799	.891	.800	.794
	McDonald's ω	.791	.891	.804	.702

Note. Names of the factors: SE = self-efficacy; COMP = company values; IMPR = professional improvement; TASK = task perception. Translation from Slovak. Items adapted from 1 Antera et al. (2022b) and 2 Bükki and Fehérvári (2004). Cronbach's α and McDonald's ω are reliability indexes.

7.2 Factor Analyses for Subsample 2

The CFA was conducted to evaluate whether or not the model represented by the VETTQ adequately fits the data from another subsample, consisting of 131 study participants from different professional areas. The initial CFA did not prove an optimal model fit on two indexes – TLI was .888 and RMSEA was .087. One modification was made to improve the model fit: V31 "I am proud to be an in-company trainer in my company" and V30 "I feel comfortable with the company for which I work". After this adjustment, the following fit indices were obtained: CMIN/df = 1.7, CFI = .922, TLI = .908, RMSEA = .079, and SRMR = .063. These results indicate that the factorial model of the VETTQ is adequate for subsample 2, demonstrating that the VETTQ model structure remains robust even when assessed with an independent sample of participants.

The results of the EFA and CFA of the VETTQ with two independent subsamples indicated a four-factor solution, comprised of the factors of self-efficacy, company values, professional improvement, and task perception. This means that the eleven vocational identity areas previously outlined, which served as the initial framework to develop the VETTQ, were consolidated into a shorter yet robust model of vocational identity.

7.3 Results of the Full Sample

We computed the CFA with 300 participants and confirmed the four-factor model, consisting of self-efficacy, company values, professional improvement, and task perception. The model has $CMIN/df = 2.3$ and fit indexes as follows: $CFI = .936$; $TLI = .925$, $RMSEA = .066$, and $SRMR = .056$. One modification index was applied, linking V24 "I provide guidance to trainees in finding a job after completing their studies" and V29 "I motivate trainees in their job search after finishing school". To sum up, the four-factor model is supported, with acceptable to good model fit. Thus, the VETTQ was approved as a valid and reliable instrument for assessing the vocational identity of Slovak in-company trainers. The path diagram of the CFA model for the VETTQ is in Figure 1.

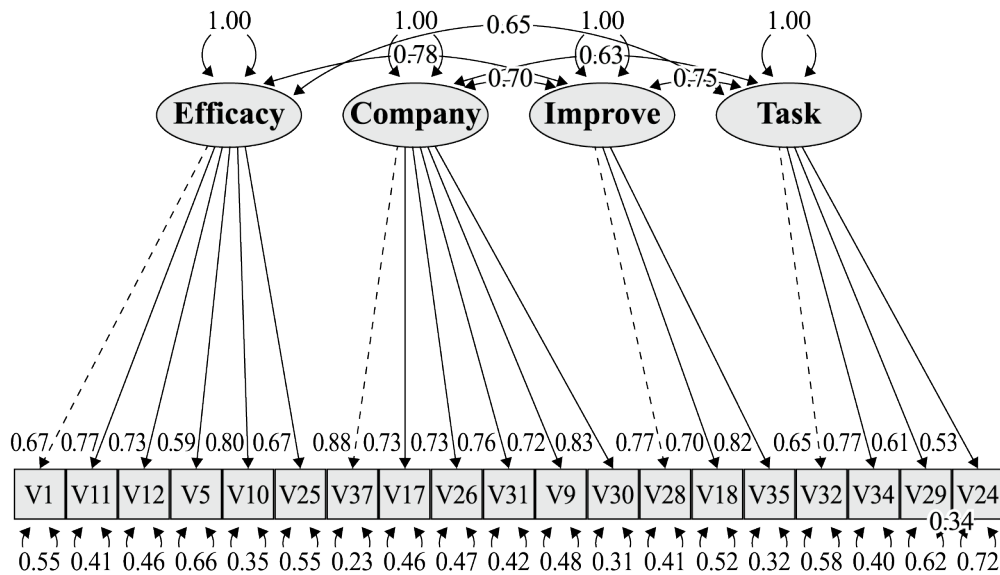


Figure 1: Path Diagram of the Confirmatory Factor Analysis (CFA) Model of In-Company Trainers' Vocational Identity

Calculations were conducted to provide further data for the full sample of 300 VET trainers. The explained variance for each of the four VETTQ factors was assessed to determine the relative strength of the vocational identity components. The self-efficacy component, accounting for 19.4% of the total variance, emerges as the strongest component in the vocational identity model for VET trainers. The other three components contribute to a lesser extent: company values account for 11.3%, professional improvement

for 11%, and task perception for 8.5%. Combined, these four components explain 50.2% of the total variance, reaching the 50% threshold, which suggests that the model effectively captures the underlying data structure (Kline, 2005).

7.4 Descriptive Analysis

In this part of the study, we present respondents' assessments of the four components of the VETTQ. We calculated the overall averages for the full sample, as well as differences in averages based on gender, educational background, and in length of practice of in-company instructors.

The scores of the sample of 300 Slovak in-company trainers are shown in Table 3. On average, in-company trainers scored above the midpoint of the five-point scale across all four VETTQ components. The relatively high mean scores suggest that self-efficacy, company values, professional improvement, and task perception are strong elements of their vocational identity. The differences between the component averages are small, with professional improvement receiving the highest score ($M = 4.16$, $SD = .61$). This indicates that in-company trainers recognize the importance of continuously enhancing their knowledge and skills in practical teaching for young trainees. Similarly, the high score for self-efficacy ($M = 4.08$, $SD = .58$) reflects trainers' confidence in their vocational competencies. The third highest score, company values ($M = 3.94$, $SD = .80$), suggests that trainers generally appreciate the work environment and culture of their company. Finally, the task perception score ($M = 3.74$, $SD = 0.75$) indicates that trainers feel competent in implementing vocational curricula and guiding young trainees.

Table 3: Average Scores on the Four Vocational Identity Components

	M (SD)	Min	Max	Skewness	Kurtosis	Shapiro-Wilk	<i>p</i> -value
Self-efficacy	4.08 (.58)	2.00	5.00	-0.82	1.32	.95	.001
Company values	3.94 (.80)	1.00	5.00	-0.79	.37	.94	.001
Improvement	4.16 (.61)	1.50	5.00	-1.25	3.03	.90	.001
Task percept.	3.74 (.75)	1.80	5.00	-0.43	-0.18	.97	.001

Note: $N = 300$

Next, we present the average scores for the four VETTQ components in the male and female subsamples. Since the component scores did not follow a normal distribution, the Mann-Whitney U test was used to assess statistical differences. The results indicated no significant differences between genders across any of the components.

Specifically, the male subsample ($M = 4.08$) and the female subsample ($M = 4.06$) did not differ significantly in the self-efficacy component, $U = 7896$, $p = .58$. Similarly, no significant difference was found in the company values component between males ($M = 3.92$) and females ($M = 4.00$), $U = 8241$, $p = .19$. Likewise, the professional improvement component showed no significant difference, with males scoring $M = 4.19$ and females $M = 4.07$, $U = 6819.5$, $p = .22$. Finally, for the task perception component, males had an average score of $M = 3.75$, while females scored $M = 3.68$, $U = 7314.5$, $p = .69$. These findings suggest that gender is not a key factor in differentiating the vocational identity of in-company trainers. However, the results may be influenced by the small size of the female subsample ($N = 66$), compared to the male subsample ($N = 229$).

Respondents in this sample had diverse educational backgrounds. Since educational attainment may significantly influence how they perceive their vocational identity, we examined this assumption. Some respondents completed vocational school with a graduation exam (*maturita*), while others did not. Additionally, some attended grammar school, while others obtained a university degree. As shown in Table 4, although there were differences in average scores, the Kruskal-Wallis H test for multiple samples indicated that these differences were not statistically significant. True, the subsamples of respondents with vocational school and grammar school completion were relatively small. However, when statistical differences between the larger subsamples — vocational school graduates with *maturita* and university graduates — were analysed, the results still appear statistically non-significant.

Table 4: Scores on the Four Vocational Identity Components by In-Company Trainers' Education Level

	Vocational school ($N = 37$)	Vocational school with <i>maturita</i> ($N = 140$)	Grammar school ($N = 9$)	University ($N = 106$)	Kruskal-Valis H df. = 3	p -value
	M (SD)	M (SD)	M (SD)	M (SD)		
Self-efficacy	4.17 (.51)	4.05 (.65)	3.94 (.51)	4.10 (.50)	1.291	.731
Company values	4.09 (.60)	3.90 (.84)	3.76 (.64)	3.95 (.81)	1.757	.624
Improvement	4.12 (.53)	4.12 (.72)	4.08 (.43)	4.24 (.49)	1.852	.604
Task percept.	3.61 (.73)	3.65 (.79)	4.09 (.55)	3.86 (.70)	6.067	.106

The length of practice was assumed to be a factor potentially associated with in-company trainers' scores on at least some vocational identity components. Since the range of practice was relatively small (only eight years), we compared beginning in-company trainers (1–2 years of practice, $N = 111$) with more experienced trainers (3–9 years of practice, $N = 54$).

The only vocational identity component that showed a statistically significant difference between the two groups was professional improvement ($H(1) = 4.28, p = .04$), with higher scores in the more experienced group. This finding is somewhat unexpected, as it was anticipated that trainers with less experience would have a greater need for professional improvement. The small sample size may have influenced these results.

8 Discussion

The aim of this study was to gain insights into how Slovak in-company trainers perceive their vocational identity. Using the VETTQ – developed through workplace visits, interviews with in-company trainers, a literature review and an analysis of VET teacher questionnaires – we identified a four-component model of in-company trainers' vocational identity, comprised of self-efficacy, company values, professional improvement, and task perception. The four components correlate positively, which indicates that they create an integrated entity, albeit with components that are still conceptually independent. Data were gathered from in-company trainers across a broad range of vocational fields. Thus, this model represents an empirically validated step toward clarifying the construct of in-company trainers' vocational identity.

The self-efficacy component indicates that in-company trainers are confident in their ability to effectively train young trainees in a workplace setting. They are prepared to face challenges with persistence and resilience, qualities that are essential for maintaining a high-quality training process. The literature provides no empirical data on in-company trainers' self-efficacy, but there is an abundance of evidence on how this factor affects thinking, decision making and the behaviour of teachers in various academic fields (Holzberger et al., 2013; Küsting et al., 2016; Zee et al., 2016). Studies also show that high self-efficacy prevents teacher burnout (Hultell et al., 2013), and that efficacious teachers tend to be more open to new ideas (Cousins & Walker, 2000; Evers et al., 2002). These findings can be with some caution extrapolated to effects of in-company trainers' self-efficacy. Self-efficacy is an important component of the vocational identity of in-company trainers as they are going through identity transition, shifting from being experts in their profession to novices in pedagogy (Deever et al., 2020; Fejes & Köpsén, 2014; Sarastuen, 2020).

Company values appeared as another component of in-company trainers' vocational identity. Identification with company values refers to the extent to which in-company trainers align themselves with the beliefs, principles, and culture of their organization. Since they prepare trainees to meet company needs, it is important that there is alignment between the trainers and the company. The literature shows that company values are positively linked to employees' job satisfaction and perceptions of career success and are negatively associated with turnover intentions (Bunderson, 2001; Ford, 2012; Vogel & Feldman, 2009). By demonstrating company values, in-company trainers can foster positive attitudes in their trainees toward the company, thereby influencing their commitment to future employment within it.

Professional improvement proved to be the third component of in-company trainers' vocational identity. This improvement involves both the development of teaching skills and mastering new technologies. The two aspects are important for the execution of vocational training of trainees in companies because VET educators have a central role in linking working life and school (Andersson & Köpsén, 2015, 2018, 2019; Fejes & Köpsén, 2014). Continuous pedagogical improvement of educators impacts the learning environment, trainee engagement, and training outcomes (Admiraal & Røberg, 2023). The development of in-company trainer occupational knowledge helps the understanding and adoption of rapidly evolving new technologies, practices, and tools. In-company trainers use continuous professional development to stay updated with the latest trends, such as AI, digital tools, and new manufacturing techniques. This ensures that they can teach relevant and up-to-date skills to trainees.

Task perception refers to how in-company trainers understand their role and performance in training tasks. The VETTQ items include the trainer's self-reflection on their training process, collaboration with the trainees' school, and fostering trainees' vocational motivation and orientation. Some tasks carried out by in-company trainers rely on self-efficacy, as confidence is a key prerequisite for successfully completing these tasks.

The identity components that emerged from the current data show some overlap with previous conceptualizations of VET educators' vocational identity. Several studies included as a key component of teacher professionalism their competence (e.g., Antera, 2023; Smith & Tuck, 2023). In this study, competence is encompassed in task perception and is implicit in the self-efficacy component because belief in one's potential must be grounded in existing vocational knowledge and skills. Task perception was identified as an identity component in the studies of Bükki and Fehérvári (2024) and Hanna et al. (2022). Obviously, company values were not identified in VET teacher identity literature because teachers are school-based rather than company-based employees. In summary, this study proposes a four-component model of VET professionals comprised of self-efficacy, company values, professional development, and task perception. This model offers a refined representation of the professionalism of VET educators, with a specific focus on in-company trainers.

With regard to the descriptive data, the findings show fairly high scores in all four components of vocational identity. This suggests that self-efficacy, company values, professional improvement, and task perception are strong elements of the vocational identity of the in-company trainers in this sample, and that the trainers are strongly identified with these aspects of their training roles in the company.

Second, the differences between the component averages are small, which indicates that vocational identity forms a cohesive and integrated construct rather than being fragmented across different components. In-company trainers perceive their self-efficacy, professional improvement, company values, and task perception as interconnected aspects of their vocational identity. Furthermore, the consistency across components implies that trainers see the-

se elements as mutually reinforcing. For example, a strong belief in professional improvement may enhance self-efficacy, while alignment with company values could strengthen task perception. This suggests that vocational identity is holistic, meaning that interventions aimed at improving one component (e.g., self-efficacy) might have positive spillover effects on other aspects of identity.

Third, the demographic variables, gender, education level and years of practice, did not show statistical differences in vocational identity (or showed reverse results, in the case professional improvement compared with years of practice). This can be attributed to several factors: (a) Vocational identity may be shaped more by professional roles than by demographic characteristics, (b) high average scores may limit the ability to detect differences, or (c) the sample distribution may not have been ideal for detecting differences. Future research could examine whether demographic variables remain consistent across different company sectors and cultural contexts, as well as how other personal factors influence the strength of vocational identity components.

9 Limitation and Future Directions

The study gathered data of in-company trainers across various vocational fields, ranging from automobile manufacturing to the restaurant and hotel industries. As an initial approach, this was a reasonable research strategy, providing a broad perspective on vocational identity across diverse sectors. However, given the large differences in workplace environments, job demands, and skill requirements among sectors, a more detailed exploration is needed. Future studies should focus on sector-specific analyses to capture the nuances of vocational identity within distinct professional domains. Examining how area-specific factors, such as technological advancements, customer interaction, regulatory requirements, and workplace culture, influence trainers' perceptions of their roles could offer valuable insights. A more nuanced perspective would not only enhance theoretical knowledge but also support the development of targeted policies and training programmes that align with the unique needs of in-company trainers across different sectors. In addition to cross-sectional studies, longitudinal examination could clarify how in-company trainers' identity evolves over time.

Acknowledgement

This research was made possible thanks to grant KEGA No. 049UK- 4/2025 from the Ministry of Education, Development and Youth in Slovakia. The authors extend their thanks to the Association of Industry and Transportation Unions (APZD) for their help in collecting questionnaires for this study.

Ethics Statement

Institutional ethical board approval was obtained from Faculty of Arts, Comenius University, certificate No. ER/38/2024. All responses were collected anonymously and reported as aggregate data. Informed consent was included in the first part of the VETTQ.

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Biographical Notes

Peter Gavora is a professor of education at Comenius University in Bratislava. His current research focuses on dual education, with particular emphasis on vocational teacher identity, the roles of in-company trainers, and the career development of vocational educators. He is also engaged in the development and validation of research instruments. His validation work includes the construction of questionnaires measuring beliefs about inquiry-based learning, perceptions of school organisational climate, students' metacognitive strategies, primary teachers' self-efficacy, and the self-efficacy of pre-service preschool teachers.

Adriana Wiegerová is a professor of education at Comenius University in Bratislava, where her primary professional focus lies in vocational education. She specializes in in-company training and the preparation of specialists for vocational instruction at the secondary school level. She currently directs a new framework for educating vocational training instructors in Slovakia. In addition to her work in vocational education, she is dedicated to promoting inquiry-based learning activities for primary school students and enhancing the didactics of vocational subjects. She also serves as the director of study programmes in education at Comenius University and is involved in training prospective primary and secondary school teachers, with a particular interest in their identity formation.