Skills Competitions for Promoting Vocational Excellence

Nokelainen, P., Pylvas, L., & Rintala, H. (in press). Skills Competitions for Promoting Vocational Excellence. To appear in International Handbook of Education for the Changing World of Work. Cham: Springer.

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Petri Nokelainen
Tampere University of Technology
Tampere, Finland
petri.nokelainen@tut.fi

Laura Pylväs
University of Tampere
Tampere, Finland
laura.pylvas@uta.fi

Heta Rintala
Tampere University of Technology
Tampere, Finland
heta.rintala@tut.fi

Abstract

Over the last decade, skills competitions in vocational education and training (VET) have increased in popularity and visibility. The most well-known global event is the biennial WorldSkills Competition (WSC), which is organized by WorldSkills International (WSI) and involves competitors from 77 member countries covering 50 skill areas (e.g., plumbing, hair dressing, robotics). Academic research on international vocational skills competitions provide an excellent opportunity to investigate the micro- and meso-level factors related to vocational excellence. This chapter focuses on the role of skills competitions in promoting vocational excellence, introducing relevant research and discussing the seminal findings on individual vocational development and the attractiveness of VET.

Keywords

skills competitions, WorldSkills, vocational excellence, vocational talent development, attractiveness of VET

Introduction

Rapidly changing labor market requirements in non-academic sectors have created worldwide challenges for both vocational education and training (VET) students and the workforce, preventing them from developing and maintaining the relevant skills. Research has shown a positive relation between participation in VET programs and smooth transitions from school to work (Caroleo et al. 2017). To better understand the mechanisms of different VET systems, research has focused on investigating the interplay between institutions and work life, with regards to curriculum (e.g., Biemans et al. 2009; Bohne et al. 2017), attractiveness (e.g., Chankseliani et al. 2016), and excellence (e.g., Acquah and Malpass 2017). Studying stakeholder values, objectives, and preferences also offers insights into the structures that enable or restrict the development of quality VET programs (van der Sluis et al. 2014). In a broader context, a globalized labor market allows skillful workers to gain employment abroad but, at the same time, calls for comparative studies of the VET systems in different countries with the aim to remove

any barriers to such development (for a discussion of the European Qualifications Framework, see Brockmann et al. 2008).

In addition to studies concentrating on the structural, economic, and policy barriers to VET participation and completion, as well as the subsequent transition into the workforce, it is also important to understand the individual characteristics of each VET system. By identifying the factors hindering vocational talent development in the preliminary stages of VET, the future workforce has a better chance at fulfilling their potential. According to Tyson (forthcoming), two major research themes can be identified in the current research on vocational excellence: investigations of the individual characteristics related to the development of vocational competence (e.g., Nokelainen et al. 2013) and a focus on the neo-Aristotelian perspective of developing practical wisdom and virtues relevant to the vocation (e.g., for a discussion of 'vocational identity', see Klotz et al. 2014; for discussion of 'Bildung and practical wisdom', see Tyson 2015, 2017).

The interplay between these two themes is essential, as successful vocational performances require various competencies (i.e., unified sets of knowledge, skills, and views that one can employ in real contexts; see Mulder 2014) that can be mapped onto a holistic competence model (LeDeist and Winterton 2005). In this model, *cognitive competence* includes knowledge and understanding, *functional competence* includes practical know-how, and *social competence* includes behavior and attitudes. The fourth component of the model, *meta-competence*, supports the acquisition of cognitive, functional, and social competence (i.e., "learning how to learn"). Following Klotz et al. (2014) argumentation, all these competencies are required for successful vocational performances, as vocational identity and excellence are developed through voluntary and engaging (meta-competence), inclusive (social competence), and practical experiences in work processes (cognitive and functional competence).

Recent research indicates that one viable strategy for promoting VET is to increase its attractiveness through vocational skills competitions (Virolainen and Stenström 2014). It has also been suggested that skills competitions may have multiple benefits on the national, organizational, and individual levels (Wilson 2000). Acknowledgement of such competitions in higher education policies (e.g., EC 2010) indicates that they are no longer "the best kept secret" in the field of VET. Building an understanding of micro- and meso-level operations, such as the individual factors related to the development of vocational excellence in different learning environments, also contributes to the knowledge of macro-level issues (e.g., the "excellence" of VET).

Over the past decade, starting from the 2005 WorldSkills Competition (WSC) in Helsinki, there has been a massive increase in the popularity of international skills competitions, which is based on the rising popularity of national skills competitions. For example, in Finland, the vocational career path was "the second choice" for most young people from the seventies to the nineties (Tasala and Alhojärvi 2017); traditional vocations, such as cook or plumber, did not hold a high status compared to academic professions. The VET quality was also deemed low. In the early nineties, Finland's Ministry of Education decided that various stakeholders, such as professional-sector representatives, social partners, relevant civil organizations, and education and training providers, should collaborate more closely to increase the quality and attractiveness of VET (Tasala and Alhojärvi 2017). To address these issues, the Ministry began supporting Skills Finland in organizing national "Taitaja" skills competitions for upper secondary students of vocational education. Over the following years, the concept was gradually developed and

marketed to vocational education institutions. Its breakthrough is represented by the 2001 Taitaja skills competition in Lahti, in which over 20,000 spectators, primarily young people, observed 200 competitors compete for several days in 28 skill areas. Up to the time of this writing, approximately half a million young students from schools all over Finland have visited Taitaja skills competitions with their study counselors to gain a better understanding of the nature of different professions and to spectate the top performances of young, skillful workers in various trades (Skills Finland 2017).

As the second major theme of research on vocational excellence is discussed in detail elsewhere in this book, the present chapter will focus on the first theme (i.e., the processes related to individual development of vocational excellence), particularly the role of skills competitions in promoting vocational excellence. The essential questions of this research area include how VET teachers develop their expertise and update their professional knowledge (e.g., Andersson and Köpsén 2017; Kunst et al. 2017), as well as how both institution- and apprenticeship-based VET students gain competencies that are relevant to their careers (e.g., Behle 2017; Motta et al. 2017). It is also essential to investigate, from multiple perspectives, how in-service professionals in different fields retrospectively assess the value of VET for their skills and career development (e.g., Pylväs et al. 2015). The following sections introduce relevant research in the field and discuss the seminal findings related to individual vocational development and the attractiveness of VET.

Competitions in education

Stanne et al. (1999) suggested that competitions have a variety of purposes in different fields; social comparison theorists posit that the purpose of competition is to evaluate the level of competence, whereas behavioral-oriented cognitive evaluation theorists suggest that the purpose of competition is to win extrinsic rewards. According to social comparison theory, individuals are driven to improve their performances and minimize the differences between their and others' performances (Festinger 1954; Garcia et al. 2013). Garcia et al. (2013) pointed out the theory's proposal that individual and situational factors can increasing competitiveness, especially by raising those related to social comparison. They noted that there are individual differences in competitiveness, presuming individuals compete on dimensions that are relevant or important to the self. Relational factors, such as similarity and closeness, are also important because individuals are inclined to compare themselves to those who are similar, whether in terms of performance or characteristics, and close relationships intensify this comparison. Situational factors, such as zero-sum competitions in which the winner takes it all, further increase competitiveness (Garcia et al. 2013).

Cognitive evaluation theory (CET) aims to explain the effects of extrinsic motivators (e.g., competition rewards) on intrinsic motivation (Gagné and Deci 2005). The theory assumes that social and environmental factors promoting feelings of autonomy and competence enhance intrinsic motivation, whereas rewards that are perceived as controlling an individual's behavior may undermine intrinsic motivation. The theory also proposes that individuals need social relatedness via secure and satisfying connections with others (Gagné and Deci 2005; Ryan and Deci 2000). Deci et al.'s (1999) meta-analytic review concluded that positive feedback enhances intrinsic motivation but, interestingly, concrete rewards tend to have a negative effect on intrinsic motivation. An intrinsically motivated person engages in action if it is interesting, pleasing, or challenging, not for external rewards or pressures (Ryan and Deci 2000). Furthermore,

individuals can be intrinsically motivated to engage in some activities but not others (Deci et al. 1999). It has been assumed that the nature of the competition, the duration of preparation for the final event, and the age or maturity of the participants all affect how a competition elicits intrinsic and extrinsic motivation (Ozturk and Debelak 2008).

Skills competitions in VET

The history of international skills competitions dates to 1950, when the first Skills Olympics were organized between Portugal and Spain with the participation of 12 young, skilled workers from both countries (Wilson 2000). Originally, the purposes of the competition were to raise the status and standards of vocational careers and to reward individual excellence in various trades (WorldSkills International [WSI] 2017). Currently, the goals of the WorldSkills program have remained the same, but also stress how important vocational skills are in achieving economic growth and improving our world (Messenger et al. 2017).

The global, biennial WSC is organized by WSI, involving contestants from 77-member countries and regions and covering 50 skills (Messenger et al. 2017). Each country may enter one competitor per skill area. The upper age limit to compete is usually 22, except in the areas of Information Network Cabling, Manufacturing Team Challenge, Mechatronics, and Aircraft Maintenance, in which the competitors must not be older than 25. An international panel of judges assigns a score (0–600 points) to each competitor after four competition days. The best competitors in each skill area are awarded with gold, silver, and bronze medals. Competitors who score 500 points or more in their skill area are awarded with the Medallion for Excellence. The skill areas are grouped into six sectors: 1) Construction and Building Technology, 2) Creative Arts and Fashion, 3) Information and Communication Technology, 4) Manufacturing and Engineering Technology, 5) Social and Personal Services, and 6) Transportation and Logistics (WSI 2017). In 2008, a similar biennial skills competition, EuroSkills, was established in Europe. EuroSkills currently has 28 member countries, and the 2016 competition featured 500 competitors in 44 skill areas.

From a research perspective, the WSC provides an objective way to assess vocational excellence and represents an opportunity to better understand the factors contributing to the development of high-level vocational skills (Nokelainen et al. 2013). In Finland, only the winners in each skill area of the regional competitions are permitted to participate in the national skill competition, and only the gold and silver medalists in each skill area of the national skill competition are eligible to represent Finland in the WSC. The initial team selection is conducted through interviews with the team leaders, as well as both manual- and mental-skill trainers. Each competitor has a manual-skill trainer, usually a vocational instructor, who is an expert in the field. The Finnish WSC team has one or two mental-skill trainers who have degrees in education, religion, or psychology. Team members are monitored during the one-year training period, which differs significantly from Finland's traditional, institution-based VET model, as it is primarily based on workplace learning. The final composition of the team is announced about three months prior to the international competition, and each member is selected based on their performance during the training program.

Research on skills competitions and vocational excellence

International academic competitions were thoroughly investigated during the last decade (e.g., Campbell and Walberg 2011; Nokelainen et al. 2007), but only recently has there been research on international vocational skills competitions (e.g., Chankseliani and Relly 2016; Nokelainen 2010; Nokelainen and Ruohotie 2009; Wilde and Relly 2015). Instead of focusing solely on the competitions, such research has emphasized the wider training experience that includes individualized programs in training organizations, such as vocational institutions, and workplaces (Pylväs and Nokelainen 2017). Both qualitative and quantitative data was collected on vocational excellence and WorldSkills competitors. Besides conducting surveys and interviewing participants, data collection included a wider community of stakeholders, such as employers, family members, friends, college tutors, university lecturers, training managers (Chankseliani et al. 2016), and employers and colleagues in past workplaces (Pylväs and Nokelainen 2017). In addition, data from the WSC (e.g., the final competition scores) were used in the analyses (e.g., Nokelainen 2017).

Modeling of Vocational Excellence (MoVE)

Academic research on the WSC started in a 2007 Finnish project titled "Modeling of Vocational Excellence" (MoVE). The study was conducted in the Research Centre for Vocational Education at the University of Tampere. MoVE was the first research project to address the individual attributes that characterize the development of vocational excellence through skills competitions (Messenger et al. 2017). Based on a similar approach to the development of expertise (Chi 2006), MoVE focused on investigating both the characteristics and developmental processes of individuals who were determined to have achieved vocational excellence (Nokelainen et al. 2008; Nokelainen and Ruohotie 2009; Nokelainen et al. 2009). By focusing on the quality of vocational performances in skill competitions, MoVE departed from mainstream vocational research, which has followed a deficit pathway in that it primarily concentrates on the structural, economic, and policy barriers to vocational participation and completion (Messenger et al. 2017).

The theoretical framework of MoVE was based on an adaptation of Gagné's (2004) Differentiated Model of Giftedness and Talent (DMGT), which differentiates innate gifts from systematically developed talents. The DMGT comprises six components: 1) chance (i.e., genes), 2) gifts (i.e., intellectual, creative, socio-affective, sensory-motor, and other natural abilities), 3) intrapersonal characteristics (i.e., physicality, motivation, volition, self-management, personality), 4) environmental conditions (i.e., the milieu, important persons, provisions, events), 5) developmental processes (i.e., informal and formal learning and practicing), and 6) talents (i.e., systematically developed skills). Apart from the DMGT, the Developmental Model of Vocational Excellence (DMVE) used in several Finnish studies (Nokelainen 2010, 2017; Pylväs et al. 2015) applied Multiple Intelligences theory (Gardner 1983, 1993) to operationalize "natural abilities" (i.e., chance and gifts), the socio-cognitive theory of self-regulation to operationalize "intrinsic characteristics" (Zimmerman 2000, 2006), and the role of domain- and non-domain-specific factors to operationalize "extrinsic conditions" (Greenspan et al. 2004). The developmental components of vocational excellence (i.e., the individual's initial interest in learning a vocational skill, perseverance during the learning process, and mastery of the skill) was operationalized through Bloom's (1985) model of talent development and Ericsson's (2006) concept of deliberate practice.

The first phase of the research (2007–2008) investigated the characteristics of Finnish WorldSkills competitors with the aim to predict vocational excellence. The results, which were extracted from interviews with the competitors, their personal trainers, their vocational representatives, and their parents (N=30), showed that the most important characteristics related to vocational excellence are self-reflection, volition, cognitive skills, and social skills (Nokelainen and Ruohotie 2009; Nokelainen et al. 2009). Volition was considered the most important for all three stages of skill development (i.e., initial interest, perseverance, and mastery). The roles played by domain-specific stakeholders (e.g., vocational instructors and WSC trainers) were also important throughout all three stages, but having encouraging instructors was found to be especially vital in the early stages of skill development.

The second phase of the research (2009–2011), "Actualizing Vocational Excellence" (AVE), continued to work toward a comprehensive understanding of factors influencing the development of exceptional vocational talent. Both qualitative (structured theme interview) and quantitative (survey) instruments were developed for AVE to collect new data. The results, which included data from interviews with 26 past WSC medalists, were congruent with earlier findings, indicating that volition, self-reflection, and cognitive skills play an important role in all three stages of developing vocational talent (Nokelainen 2010, 2012). The results from surveys with 64 Finnish WSC training participants showed that the most successful competitors (i.e., the medalists) are characterized by their linguistic and interpersonal abilities, alongside a belief that effort was more important to their success than ability (Nokelainen 2010, 2012). Their goals for participating in the competition were also more performance-approach and less performance-avoidance than their less successful peers (see Midgley et al. 2000). A concluding remark in both the qualitative and quantitative studies was that supportive home and school atmospheres had positive effects on the development of vocational talent.

The third phase of the research (2012–2014), "Pathways to Vocational Excellence" (PaVE), included a long-term investigation of the effects of vocational skills competitions on career development via retrospective interviews of past Finnish WSC medalists who had entered the workforce. The results, which were extracted from 51 semi-structured interviews with Finnish WSC medalists or diploma winners (N=18), their employers (N=16), and their colleagues (N=17), showed that, in addition to vocation-specific knowledge and skills, the development of vocational excellence requires problem-solving, creative, social, and self-regulatory skills (Pylväs and Nokelainen 2017). Further, the findings revealed that formal vocational education, combined with deliberate practice and training and based on expert mentoring, improves the long-term career development and vocational expertise of past WSC winners.

MoVE International

In 2009, the WSC research entered the international arena with the addition of the University of Oxford, WorldSkills UK, RMIT University, and WorldSkills Australia (WSA), thereafter called the "MoVE International" research project (Messenger et al. 2017). In 2010, based on Finnish research instruments, researchers from RMIT University, WSA, and the Dusseldorf Skills Forum conducted a survey of 254 competitors and 122 judges and trainers participating in the WorldSkills Australia National Competition (Smith and Rahimi 2011). In this study, both participant groups were asked about their WorldSkills journeys and how their experiences had influenced, and may influence, their careers. The results showed that most

competitors enhanced their skills and enjoyed measuring their skills against other competitors and an accredited set of standards.

In 2011, 76 members of the WorldSkills UK London team completed an adapted version of the Finnish survey on the characteristics of vocational excellence (Nokelainen et al. 2013). The most notable pattern in the results indicated that motivational factors (an aspect of intrinsic characteristics) are most important for WSC medalists, who reported the lowest levels of competitiveness and had concerns about appearing incompetent to others.

The MoVE International research team administered a survey during WSC London 2011, yielding 413 valid responses from competitors of 38 countries (Nokelainen et al. 2012). The results showed that the medalists rated their bodily/kinesthetic (practical) and interpersonal (social) capabilities higher than did other competitors. They also reported higher self-ratings in ethical sensitivity, entrepreneurial abilities, mastery goal orientation, and self-regulation.

Developing and Understanding Vocational Excellence (DuVE)

The UK "Developing and Understanding Vocational Excellence" (DuVE) project suite was established in 2012, intending to use evidence-based research to further develop and ground high-quality WSC skills and practices (James 2016). The project suite focused on 1) modelling the characteristics of vocational excellence, 2) the best learning environments for developing vocational excellence, 3) the benefits of developing vocational excellence, 4) further education college participation in skills competitions, 5) WSC contestants and entrepreneurship, and 6) the benefits and barriers to WSC UK participation.

In 2009, the UK Economic and Social Research Council's (ESRC) Centre on Skills, Knowledge, and Organizational Performance (SKOPE) at the University of Oxford conducted a survey study on the workplaces of the 2009 and 2011 WorldSkills UK teams (N=124), investigating the role of the learning environment within the workplace in the formation of high-level vocational expertise (James and Holmes 2012). The results showed that "expansive workplaces" (Fuller and Unwin 2003, 2010) provided several key elements in the development of vocational excellence (e.g., acknowledgement as a worker and learner, mentoring, career progression, and time to work through tasks).

In 2014, Chankseliani and Relly interviewed 30 entrepreneurial and 10 non-entrepreneurial WorldSkills competitors to determine whether the competition experience contributed to enhancements in social, psychological, and human capital (Chankseliani and Relly 2016). The findings indicated that participation in the WSC supported entrepreneurship by providing opportunities for competitors to develop their social networks, psychological characteristics, and technical and business-interaction skills.

Wilde and Relly (2015) interviewed 36 UK training managers responsible for preparing young people to compete in the WSC. The results showed that the training managers' professional growth was supported by the opportunities to network with domestic and international colleagues, their enjoyment of the training process and competition, and the enhancement of their skills and knowledge. Although some negative aspects emerged (e.g., the intense time commitment), their main conclusion was that the benefits of the role outweighed the difficulties.

In a departure from previous studies, which focused on the individual aspects of developing vocational excellence, Chankseliani, Relly, and Laczik (2016) interviewed 39 past WorldSkills competitors and 71 of their associates (e.g., employers, family members, friends, and training managers) to determine the role of skills competitions in improving the attractiveness of VET. Three potential factors emerged from the findings: 1) raising awareness of outstanding performances in various vocational occupations, 2) demonstrating the success and financial benefits of vocational careers, and 3) creating a positive image of young people who choose vocational careers.

Conclusion

After considering all this evidence, can we conclude whether skills competitions promote vocational excellence? Large-scale international assessments (e.g., PISA, TIMMS) in compulsory schooling have proven the potential of both research and educational policy development in modelling and measuring competencies (Schleicher 2017, see also Carnoy et al. 2016 for more critical view). Although similar studies have been proposed in the context of VET (e.g., Achtenhagen and Winther 2014), their implications have not yet been actualized. Meanwhile, international vocational skills competitions provide an excellent opportunity for academic research to investigate the micro- and meso-level factors related to vocational talent development. The research indicates, quite unanimously, that WSCs and training have a positive effect on young peoples' vocational competencies and career success (Chankseliani and Relly 2016; Chankseliani et al. 2016; Pylväs and Nokelainen 2017; Smith and Rahimi 2011). The findings also demonstrate benefits for the experts and training managers who are involved in the process (Wilde and Relly 2015).

The WSC and its related training programs contain specific components that are not present in the VET curricula of many countries. International research on the WSC (e.g., Wilde and Relly 2015; Pylväs and Nokelainen 2017) shows that VET students need opportunities to strengthen their learning and self-regulatory skills within the sphere of vocational education, with the help of their instructors, and to recognize the potential advantages of collaborating with professional experts.

Perhaps most difficult to prove is the connection between skills competitions and an increased attractiveness of VET. The underlying premise of the WSC is that developing vocational excellence may raise the attractiveness and standards of the whole VET system. According to Wilde and Relly (2015, p. 95), "there is a significant tension between the concept of so-called elite skills competitions and the concept of raising standards and skill levels across the board." They mentioned several serious problems in the UK VET system, claiming that the winning of gold medals in the WSC should not be used to conceal these problems. Regardless, Chankseliani et al. (2016, p. 596) argued that "by establishing a positive societal image of young people, [skills] competitions may contribute to raising the attractiveness of VET to the degree that it becomes a respected, high-status learning pathway in its own right."

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