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**Developing Vocational Excellence:
Learning Environments within Work Environments**

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Editor's Foreword

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Abstract

Vocational education and training (VET) in the UK has received much bad press domestically and internationally and the criticism is long standing. Yet, there is evidence pointing to positive aspects of VET. This paper, rather than focussing on a deficit model, draws on a study of skills competitions to begin to understand better what vocational excellence looks like and how it is developed, focussing particularly on the learning environment at work. The study surveyed 124 young people, vying for selection into the WorldSkills Team UK in 2009 and 2011, about their workplace learning environments. The findings show that the more 'expansive' the workplace environment, the more likely the competitor is going to have the necessary and sufficient skill base to begin working towards meeting WorldSkills international standards in that skill.

Introduction

Vocational educational and training (VET) in the UK has received much bad press both internationally and domestically. Internationally, UK VET appeared in league tables showing that it lags in overall achievement (e.g. OECD 2010, Field *et al.* 2009), has fewer young people entering and participating in VET compared to the vocational route in other countries (Steedman 2010) and comparatively lower levels of vocational qualifications to other countries (Brockmann 2010). Domestically, it has been criticised in terms of the relationship between employers, the State, the employee and the unions within the VET system (Stanton 2008, Fuller and Unwin 2009), whether the vocational qualifications are valid for their purposes (Stasz 2012), low employer participation and completion rates, weak funding arrangements (Keep 2007, Wolf 2011) and lower rates of return to vocational qualifications compared to equivalent academic qualifications such as A-levels and bachelor degrees (Machin and Vignoles 2001, Vignoles and Powdthavee 2006).

This criticism of UK VET is a long-standing problem (Keep and Mayhew 1988). More recently, the Wolf Review of 14-19 vocational education (2011) highlighted many issues that need attention in the English VET system and made 27 recommendations for improvement, although Wolf (2011: 7) does acknowledge,

Vocational education today includes, as it always has, courses and programmes which teach important and valuable skills to a very high standard. It offers a direct route into higher education which has been followed by hundreds of thousands of young people; and prestigious apprenticeships which are massively over-subscribed. Conventional academic study encompasses only part of what the labour market values and demands: vocational education can offer different content, different skills, different forms of teaching. Good vocational programmes are, therefore, respected, valuable and an important part of our, and any other country's, educational provision.

Even so, Fuller and Unwin (2011) point out, 'the review has surprisingly little to say about how we might build on the good-quality vocational education that does exist'. Keep and James (2011: 56) highlight that competition for apprenticeship places with companies such as BT and Rolls Royce outstrips competition for places to Oxford and Cambridge. Michael Gove (2010), Minister for Education and John Hayes (2011), Minister for Further Education, Skills and Lifelong Learning, have both spoken of the need and importance of vocational education, practical skills and craftsmanship (although see Fuller and Unwin 2011 for a critique of what they are

espousing) for individuals, the economy and society. This paper, rather than being based on a deficit model, draws on a study of skills competitions to begin to understand better what vocational excellence looks like and how it is developed, focussing particularly on the learning environment at work in the context of skills competitions. These competitions provide both a benchmark for high-performance and an objective way to assess vocational excellence. They also provide an opportunity to understand better the factors that contribute to the development of vocational skills to a high standard. This study was carried out in collaboration with WorldSkills UK as it prepared competitors for the 2009 WorldSkills Competition (WSC) in Calgary and the 2011 WSC in London.

The next section asks the question what does vocational excellence look like. The third section presents the example: the UK Team competing at WSCs. The findings from the research conducted with the young people vying first for selection into the squad and then for selection into Team UK in 2009 and 2011 are presented in the fourth section. Conclusions and recommendations are then made in the last section of this paper.

What Does Vocational Excellence Look Like in Skill Competitions?

It would be very easy to answer this question by saying, ‘Visit a WorldSkills Competition’. The reviews from WorldSkills London were glowing (Murray 2011). However, the answer is far more complex and nuanced. Given that the UK has participated in WorldSkills Competitions for nearly 60 years there is a surprising dearth of research on the topic (Berry-Lound *et al.* 2012). This situation is all the more surprising given the level of financial investment. In 1995 approximately £4 million was spent on national competitions and preparing for the Skills Olympics in Lyon (Cassels 1996: 3 cited by Wilson 2000). For WorldSkills London (WSC 2011) the Department of Business, Innovation and Skills (BIS) and the Skills Funding Agency (SFA) funded approximately 35 per cent of the costs, with a further 15 per cent contributed by the Edge Foundation and CITB-Construction Skills (a UK Sector Skills Council). The other 50 per cent was provided through smaller cash donations, discounts and donated goods and services from well over 100 companies, colleges, universities, agencies and individuals (James *et al.* 2012: 8) although the total amount spent is not clear.

There is research on the role of competitions in education (for example, Verhoeff 1997) with regard to why competition may discourage student learning (Wang and Yang 2003), and on how competition is used to good effect in specific subjects such as engineering in middle school classrooms (Sadler *et al.* 2000), engineering in university (Sirianni *et al.* 2003), computing (Cormack *et al.* 2006) and music (Burnsed and Sochinski 1983); however, little has been written about competitions in VET. Two papers from the United States were written in the 1980s and 1990s: one on the challenges, responses and issues of vocational education and excellence (Worthington 1982); the second on the institutional factors underlying excellence in vocational education (Migler *et al.* 1990). This latter paper stated:

Attention to excellence in vocational education is most frequently focused towards programs, classrooms and individual student performance. For example, research questions are usually framed to study the composition of course content, methods of instruction and elements of delivery... This research project was based on the premise that the study of institutions in which exemplary vocational education is found might provide insights regarding the nature and importance of this environment. Specifically, a study of exemplary institutions may provide better conceptions of quality instruction and learning environments, a sounder foundation from which to support significant change and improvement, and an avenue of improvement by linking the research in vocational education with other efforts to understand and improve institutional improvement (1990: 2).

Participation in skills competitions is limited to a small number of young people already excelling in their work. Reaching a level of competence that is sufficiently high to merit being considered for entry into a skills competition is dependent on a much longer history of the individual's skill development. This may take place in a number of arenas, including schools and colleges, as well as through learning in the workplace.

Some research has focused on how the vocational training in schools and colleges is able to deliver workers that reach the required standard. The final report of the National Skills Task Force underlined 'the lack of a high quality vocational education and training system, as part of a coherent foundation learning system, [which] has held back participation and attainment for many years' (NSTF 2000: 61). Many of the messages in this report aligned with conclusions being drawn by research from UK Skills, in conjunction with the Learning and Skills Council (LSC). UK Skills 'had found, from its organization of national and international competitions, that the development of vocational skills in the UK is not of sufficient depth or quality

to enable our young people to compete successfully with the best of our international competitors' (Smeaton *et al.* 2002: 4). Their research, conducted in three Further Education Colleges, explored how to develop mastery and excellence in vocational learning through examining possible models of curriculum design, and teaching, learning and assessment strategies, which might lead to improved results among young people engaged in international competitions. The report pinpointed that, '[p]erforming to a standard of excellence, whether in competitions or in the workplace, requires well-developed personal and key skills as well as technical competence' (ibid: 6). One of the lessons to be learnt was that,

Opportunities to perform and to participate in competitions strongly motivated the students to achieve high standards and encouraged them to demonstrate what they were capable of. Previously, the colleges had regarded competitions as a 'bolt-on' addition to their curriculum, rather than a mainstream curriculum tool (Smeaton *et al.* 2002: X).

The second project, *A Cut Above: Customising a Curriculum for Excellence in Skills Development* (Hughes *et al.* 2004) expanded to include seven colleges to understand how teaching and learning methods can help learners develop their technical and personal skills and support the development of excellence in the vocational curriculum. A number of principles for achieving vocational excellence were suggested in the conclusions (ibid: 41-50). These principles will be returned to later but for now some of the points for helping to develop vocational excellence are highlighted below:

- Good teachers make a difference! Their skills, knowledge, commitment and expertise are the most important resource in a curriculum for excellence;
- Learners need to have opportunities to experience excellence, to look beyond the standards they experience in their everyday lives and to develop their skills through example, practice and constructive feedback;
- Using experts from the world of work adds credibility and authenticity to the learning experience and provides examples of what constitutes excellence;
- Competitions provide experience of working under pressure and within set constraints. Maximising this experience depends on effective feedback and debriefing on performance; and
- A mature relationship between teacher and learner, more akin to that of expert and novice, often underpins the development of excellence.

There is, however, little research to understand better how workplace learning and training fit into this story. This paper investigates the role of the workplace in the development of vocational excellence drawing on research commissioned by WorldSkills UK. The next section provides the context of TeamUK and outlines the training programme, and the findings of the research follow.

Team UK

Team UK competes in WorldSkills¹ Competitions (WSC), which have been held biennially for 64 years. The first national competition of the International Vocational Training Organisation (IVTO) took place in Spain in 1947. In 1950 Portugal joined and in 1953 five other European countries participated in the event.² These competitions were formerly called Skill Olympics and mirrored the Olympic Games with the main purpose to:

create a youth festival in which competitors would recognise their role in helping to construct the future. Individual excellence is recognised in sports and the arts, and for this reason it was felt that achievements in vocational education and training were deserving of the same (Wilson 2000: 201).

Young people compete in different vocational fields and are judged against high international standards.

The UK first entered a team in the WSC in 1953 (WSI 2010: 31) but it was not until 1989 that the State became involved. The 1989 Skills Olympics were held in Birmingham. Margaret Thatcher, the then Conservative Prime Minister, was an awards presenter and was ‘dismayed the UK won only one gold medal – in hairdressing’ (Wilson 2000: 204) and subsequently asked the Department for Education to set up UK Skills. UK Skills was founded in 1990 and renamed WorldSkills UK in 2011. UK Skills was set up as an independent charity with the aim ‘to help industry by promoting world-class standards of vocational skills through competitions’ (ibid: 204).

¹ For more information on WorldSkills International and WSC see www.worldskills.org

² For a more detailed history of WSC see http://www.worldskills.org/index.php?option=com_content&task=view&id=17&Itemid=453

Figure 1: The Team UK skills clusters

Building Services Engineering	Automotive and Metal Skills
Electrical Installations	Autobody Repair
Landscape Gardening	Automobile Technology
Plastering and Dry Wall Systems	Car Painting
Plumbing and Heating	Hospitality Skills
Refrigeration	Confectioner Pastry
Wall and Floor Tiling	Cooking
Welding	Restaurant Service
Construction Skills	Engineering and Information Services
Bricklaying	Aircraft Maintenance
Cabinet Making	CNC Milling
Carpentry	CNC Turning
Joinery	Electronics
Painting & Decorating	Graphic Design Technology
Stonemasonry	IT PC Network Support
Creative Skills	Manufacturing Team Challenge
Beauty Therapy	Mechanical Engineering
Caring	Mechatronics
Fashion Technology	Mobile Robotics
Floristry	Web Design
Hairdressing	
Jewellery	
Visual Merchandising	

WorldSkills UK is now housed within the National Apprenticeship Service (NAS) and champions skills and learning for work through partnering with industry and education organisations to identify, develop and train, and support vocational talent through skills competitions. Young people mostly aged 18-22³ compete in regional and national skills competitions (these competitions are managed by

³ The upper age limit to compete at a WSC is 22; the exception to this rule is for the skills areas of Information Network Cabling, Manufacturing Team Challenge, Mechatronics and Aircraft Maintenance where the age limit is 25 years in the year of competition.

WorldSkills UK in conjunction with Further Education (FE) Colleges). The competitors undergo intensive skill development and training⁴ to build their skills to world-class standard in order to be selected, first as part of the UK squad, and then for Team UK. Figure 1 presents the skill areas in which the UK competes, organised into skills clusters.

Prior to trying out for TeamUK some of the competitors are full-time college or university students, but many of them are, or have been, apprentices. So, while some of their skill development would have taken place within educational institutions, the vast majority of the training would have occurred in the workplace. However, as Brockmann *et al.* (2010) point out,

One of the key problems in providing work-based learning and an important reason for ‘employer reluctance’ is the changes in the labour process. The workplace is an increasingly capital-intensive and sometimes physically dangerous place, a risky environment in which to place young people with little or no experience. It can be extremely specialised, only providing work-based learning for a restricted set of activities, especially if an apprentice is dependent on a single employer. It may lack the necessary experience and infrastructure, including personnel to train, to support work-based learning. And the costs of good quality apprentice training may be too high for the individual company to plan for a rate of return.

The competitors’ skills and knowledge developed in their workplaces are built upon in the WorldSkills UK training (see James *et al.* 2012 for a fuller description of the WorldSkills programme in the UK); however, often employers can ill-afford the intensive training the competitors need to undergo to ensure their skills, knowledge and ability are raised to meet the WSC standards of vocational excellence. Due to the potentially different starting points for each squad member in terms of knowledge and skill, WorldSkills UK takes a number of factors into consideration to ensure the most suitable training profile for each potential Team UK member is developed. These factors are:

- The training matches each squad members’ requirements at that precise point;
- The trainer has the understanding and skills to train to world standards with the appropriate briefing;
- The environment enables, and requires, world standards to be practised – training location is key;

⁴ Some members of Team UK also compete in EuroSkills as part of their training: <http://www.euroskills.org>

- The training incorporates formative assessment and feedback to the squad member and Training Manager Expert (TME⁵); and
- The training is varied and transparent in its settings, trainers and material resources.

The final team competes against other countries, with the best performers receiving medals. At the 2009 competition in Calgary, the UK team ranked seventh of 50 countries winning three gold, four bronze and 14 Medallions of Excellence⁶ and at WorldSkills London 2011, 51 countries competed in 49 skills and the UK ranked fifth with five gold, two silver, six bronze medals and 13 Medallions of Excellence.

The next section discusses the development of the survey conducted with TeamUK squad members to investigate the learning and working environments of these young people. The results of this survey are analysed to see how differences in these environments affects two measures of vocational excellence: selection into the team and medal performance.

Learning Environments within Work Environments

Earlier research, particularly by Eraut (2000 2004 and 2007) and by Fuller and Unwin (2003a), identified a number of factors that promote learning in the workplace. Eraut and his colleagues have extensively researched the development of knowledge and skills in professional work and the significance of workplace learning for individuals, groups and organisations. While their work concentrated on learning in the professions, elements of it are transferable for use in other workplace settings. Fuller and Unwin's research found that an expansive work environment, as opposed to a restrictive work environment, is one that is characterised by a number of features that will create more, stronger and richer learning opportunities for a worker to develop a greater breadth and depth of knowledge and skills.⁷ Following on from Eraut and Fuller and Unwin's leading edge research, a two-part survey was developed to begin to identify factors in the workplace that helped the development of world-class skills. Broadly, Eraut's work helps to frame Part 1 of the survey and Fuller/Unwin's work

⁵ A Training Manager Expert is the expert in that particular skill who trains the young person for the Team UK.

⁶ Medallions of Excellence are awarded to competitors who achieve 500 points or more.

⁷ Further details of how employers can develop expansive apprenticeships can be found in The NAS Toolkit: Expansive Apprenticeships: A Guide for Employers, Training Providers and Colleges of Further Education (Fuller and Unwin 2010).

helps to frame Part 2. Only findings from Part 2 of the employee survey are presented in this paper.

The survey was piloted with the help of a trainer from UK Skills who had worked closely with the employers and young people vying for selection for the 2009 WorldSkills UK Team over the 18-month period before the competition. The purpose of this pilot was to test the language and descriptions used to help ensure clear understanding in the workplace context. From this meeting, some of the questions were re-worded and slight amendments were made to ensure the survey’s user-friendliness.

The data set consisted of the squad for the WorldSkills teams in 2009 and 2011. The majority of the squad completed the survey at the beginning of their team selection week in June 2009 during a seminar-style session on the first evening and the same process occurred for the 2011 squad. Table 1 shows the breakdown of the 124 respondents. The data was broken down further to medal winners and non-medal winners once the results of WSC 2009 and WSC 2011 were available.

Table 1: Breakdown of respondents by main place of work

Squad	Team	Non-team	Squad total
2009	21	36	57
2011	31	36	67

The answers for Part 2 of the survey were on a Likert scale, scored from one to five where five is the most positive. The survey was designed specifically for assessing the workplace or college environment and does not incorporate any data gathering or analysis of individuals’ attributes, such as their psychological suitability for competition or reactions under pressure (see Nokelainen *et al.* 2012a for research on individual attributes and characteristics of the 2011 Team UK).

Findings

The survey was designed for the purpose of identifying aspects of the workplace that contribute to offering more expansive working environments. The underlying premise is that the more aspects of the workplace the employee was given access to – the elements identified as constituting an expansive work environment – the better the

opportunities for developing skills and knowledge, leading to vocational excellence.

Seven areas were focussed upon:

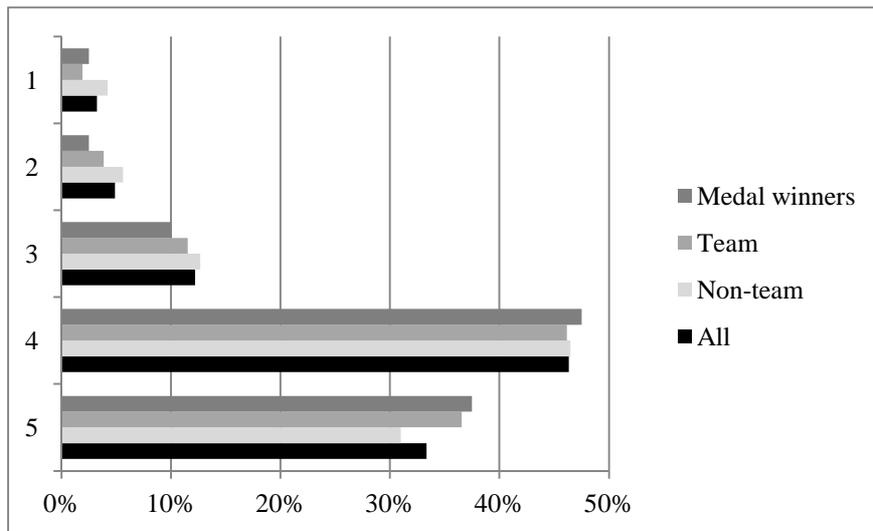
1. Participation and understanding of the workplace;
2. Task performance;
3. Access to resources to help learning;
4. Judgement, decision-making, problem-solving and reflection;
5. Experience, task transition and career progression;
6. Status as a worker and a learner; and
7. Organisational development.

1. Participation and understanding of the workplace

Lave and Wenger (1991) explained the journey of moving from being a newcomer in the workplace to an 'old-timer' as a process of legitimate peripheral participation. The newcomer worked his or her way through a series of tasks moving from being a novice to an expert, while developing a broad and deep range of skills and knowledge through participation and understanding of the work processes. Fuller and Unwin (2003b) identified that this process happens in a variety of different ways and at a variety of different paces depending on the organisation and individuals involved. The exact nature of the task that will face the competitors in the WSC is unknown to them, and although most competitors will have trained on tasks set in previous WSC, participation, or at least knowledge of the broader workplace, would be expected in order to gain the skills and knowledge necessary for vocational excellence.

79 per cent of all respondents reported having access to all or many situations and processes in the workplace. Figure 2 shows that more medal winners worked on and understood a variety of situations of processes than other respondents. Non-team members reported having less access, as would be expected. The overwhelming majority of team and non-team members (91 per cent) knew what work their colleagues did and understood the goals and aims (90 per cent) of the workplace.

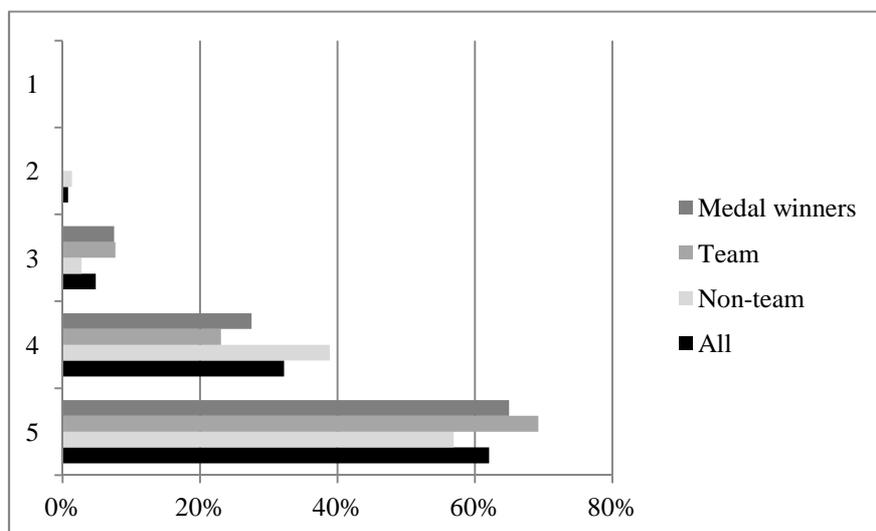
Figure 2: A variety of situations and processes



2. Task performance

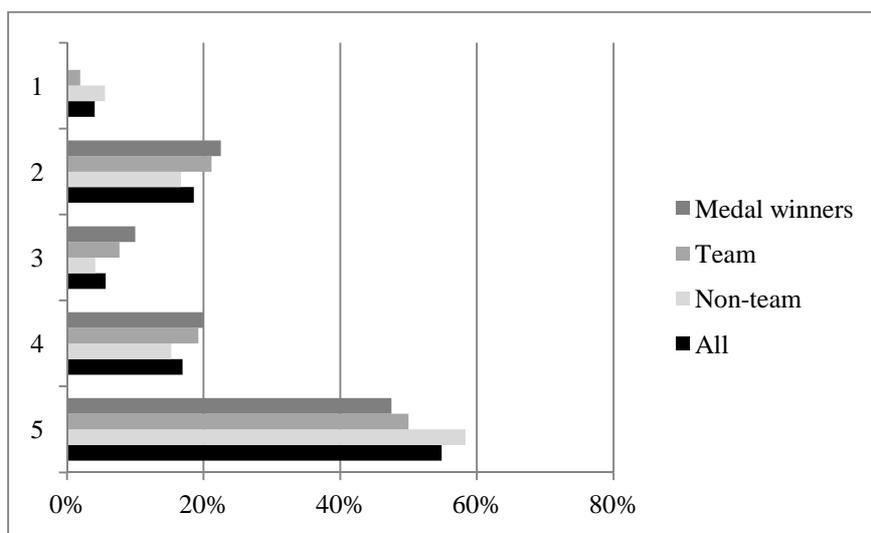
In order to develop a breadth and depth of knowledge and skill to meet the demands of the WSC task it would be expected that employees would perform a variety of tasks to develop their skills and knowledge. The participants were generally, but not exclusively, positive about aspects of the way they carried out their work. Only 15 per cent of all respondents felt they did not complete many very complex tasks and problems. In performing tasks in their work, the medal winners and team members reported using more of a large range of skills to complete a variety of tasks (see Figure 3), although non-team members did report that they used a good range of skills.

Figure 3: Use of a range of skills to complete a variety of tasks



Interestingly, the perceptions of the respondents on team working were quite widely dispersed, with non-team members reporting higher scores for this question (Figure 4). Overall, 23 per cent of TeamUK members and 22 per cent of non-TeamUK members reported working predominantly on their own in their workplace with the occasional, or no, opportunity to learn from others.

Figure 4: Working with others

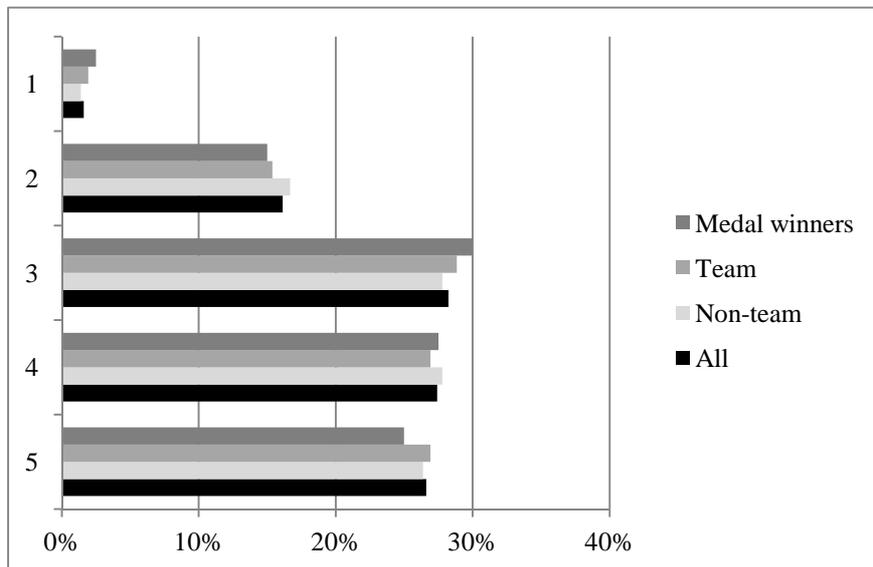


Given that 77 per cent of all participants reported working as part of a team, the responses to receiving communication and feedback on their work were far more dispersed than one would expect: Twenty-seven per cent reported receiving constant constructive communication and feedback (none of these were gold and silver medal winners); 27 per cent reported much constructive communication and feedback; and 28 per cent reported some constructive communication and feedback. 18 per cent reported receiving little or no communication and feedback on their work. There was little difference between team members and non-team members for this question (Figure 5).

These findings, in particular the reporting from gold and silver medal winners, are in line with Nokelainen *et al.* (2012) who show that as vocational excellence develops, intrinsic motivation to do well on tasks rather than extrinsic motivation from teachers and trainers becomes more important. So, it could be that at this stage the gold and silver medal winners simply did not need as much feedback as other

participants or were relying on feedback from WSC trainers rather than colleagues in the workplace.

Figure 5: Receiving communication and feedback



3. Access to resources

Individuals develop vocational skill and knowledge in the social milieu of a workplace, school and/or college through the direct and indirect guidance of more experienced others (Billet 2002, James 2006). Consequently, having access to a variety of resources in the workplace – a mentor/coach, other workers, materials, customers, competitors, suppliers, qualifications and training – would seem an imperative for developing vocational excellence. Interestingly employees were less positive about the access to resources provided to help learning. Fifty-two per cent of respondents reported having a named individual as a mentor at work and 26 per cent reported that while there was no one person, support was available from other colleagues. Alongside having a mentor as a resource to aid learning, 67 per cent of the young people had access to other resources such as other workers, materials, customers, suppliers and professional networks. Medal winners and team members were also more likely to be encouraged to gain a qualification (see Figure 6).

On access to training, 64 per cent reported access to some form of on and/or off-the-job training. Seventeen per cent reported having little or no access to training in the workplace and a surprising number of these were team or medal winners,

although this lack of training may be compensated for with the WSC training the young person is receiving.

Figure 6: Encouraged to gain a qualification

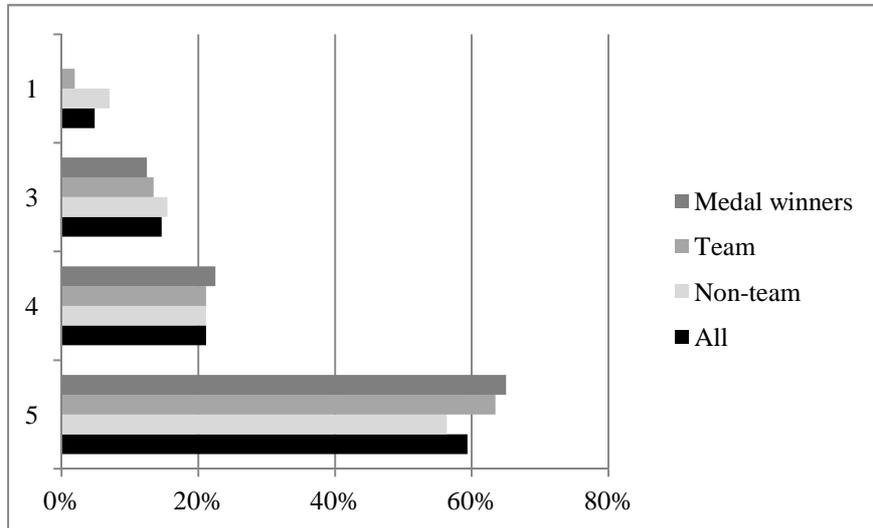
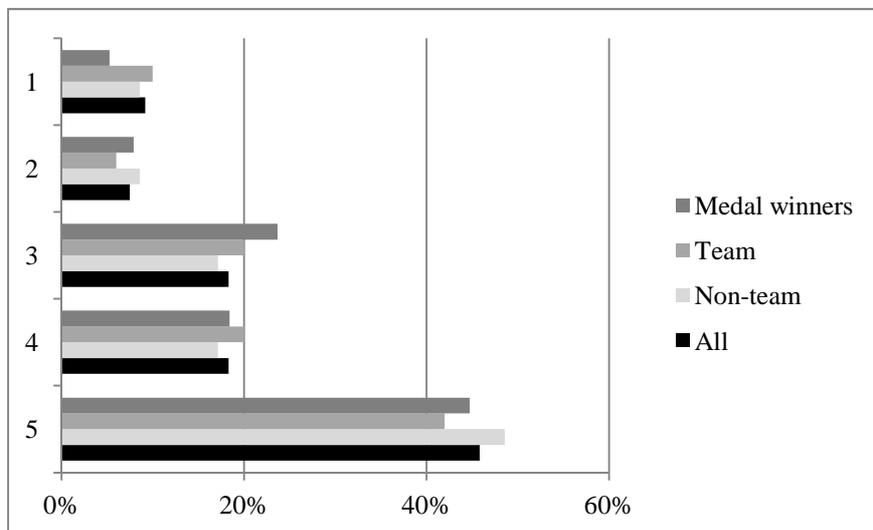


Figure 7: Receive training in the workplace



4. Judgement, decision-making, problem-solving and reflection

Given the pressurised competition environment the smallest decision can impact greatly on outcomes. Eraut and Hirsch (2007) highlight that, '[E]xperts are distinguished from novices mainly by their situation assessment abilities, not their general reasoning skills'. As workplaces are fraught with their own tensions, the opportunity to assess own performance, make decisions, solve problems and reflect on

the work would seem a fertile ground for helping to develop expertise in these areas for vocational excellence. Although Felstead *et al.* (2007) showed that task discretion has in general decreased over the last three decades, 85 per cent of the young people covered by this research reported they were able to assess their own performance in their job and make changes (Figure 8) while 87 per cent said they solved problems in their jobs (Figure 9).

Figure 8: Assess own performance at work

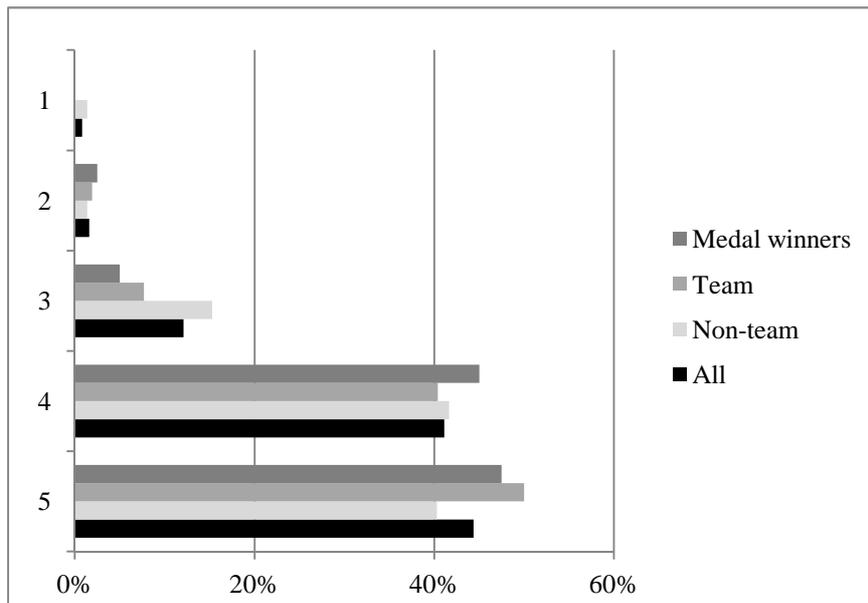
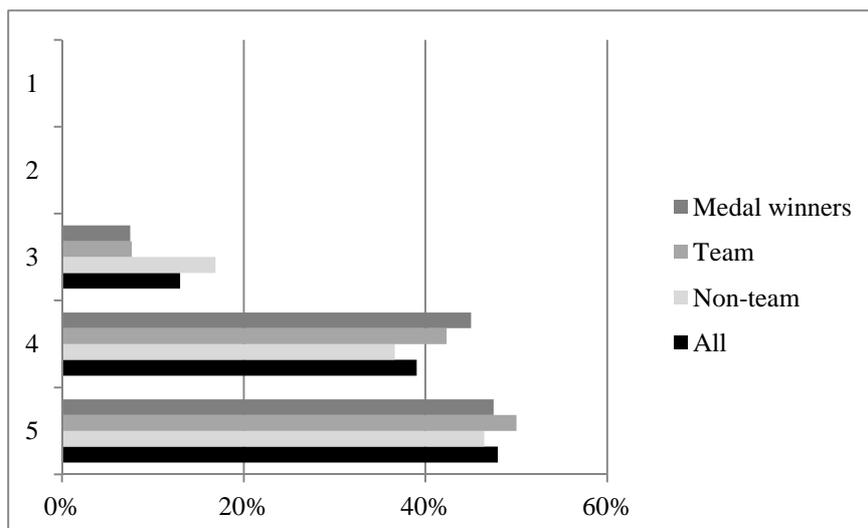
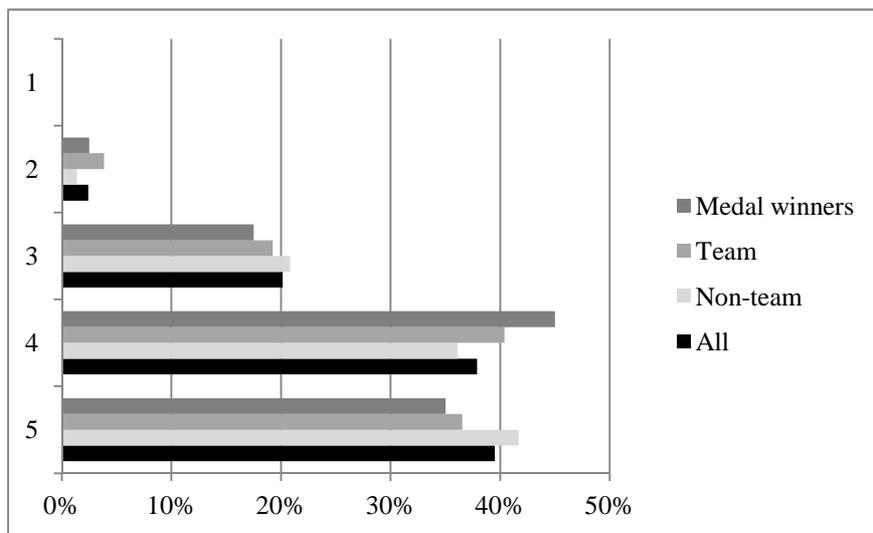


Figure 9: Solving problems in the job



Less, but still a high proportion (77 per cent), believed they were involved in decision-making, formulating and evaluating in their job (Figure 10). Interestingly, less medal winners reported being able to make decisions than they did being able to assess their performance and engage in solving problems (compare figures 8, 9 and 10). However, medal winners reported being able to make decisions in their job more than team and non-team members (answered 4 or 5 in Figure 10).

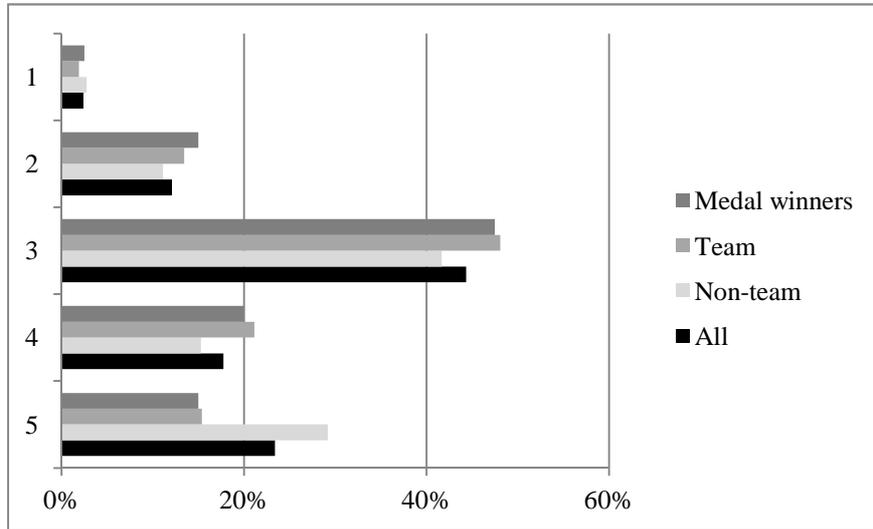
Figure 10: Making decisions in the job



This finding is somewhat in line with Felstead *et al.* (2007: 125) in that the work is complex but ‘personal discretion in jobs over the last two decades has been partly matched by rises in external sources of control’, although the sample here likely reflects the top end of practice. Responses to reflecting on their work were more dispersed: 23 per cent felt they had planned time to reflect on performance and time to make adjustments; 18 per cent felt they had planned time for reflection but not also time for adjustments; 44 per cent reported some time to reflect while 12 per cent said there was limited time to reflect on their performance (3 per cent reported no opportunity to reflect) (Figure 11). With workplaces existing to produce goods and services and not necessarily for the express purpose of reproducing vocational knowledge, it is unsurprising that time to reflect on performance is more limited and it may be that the better someone becomes at their work the need for reflection diminishes, as could be the case with the medal winners. Also, as Eraut and Hirsh’s (2007) research shows, ‘[E]xperts frequently generate and evaluate a single option

rather than analyse multiple options concurrently'. So it may be that the young people are reflecting and making more decisions but it is tacit in their work.

Figure 11: Time to reflect on work



5. *Experience, task transition and career progression*

In Fuller and Unwin's (2003: 8) expansive-restrictive continuum three key elements are identified as imperative for developing knowledge and skill in the workplace.

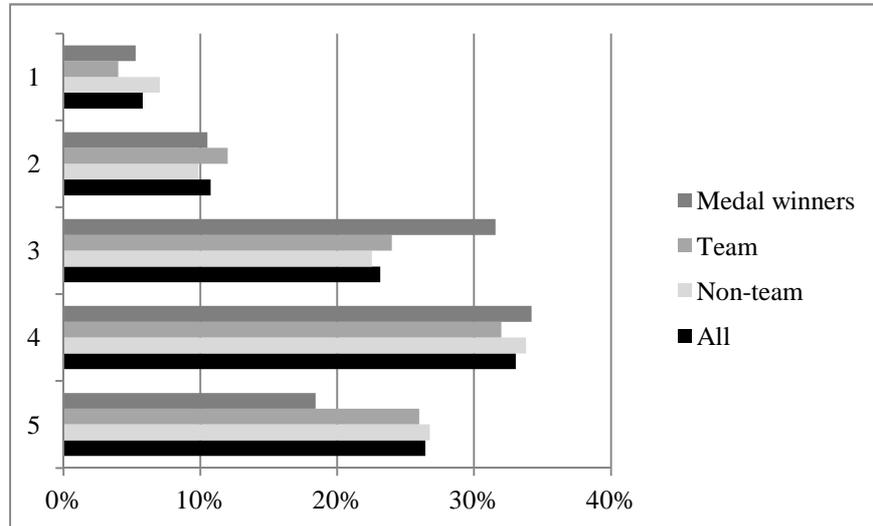
These are:

- Breadth: access to learning fostered by cross-company experiences built into programme;
- Gradual transition to full participation; and
- Post-apprenticeship vision: progression for career.

The more expansive these elements are in a workplace, the more opportunity there will be for developing vocational knowledge. Twenty-six per cent reported planned time for, and access to, experiences across the company. A further 33 per cent felt there was opportunity to gain experience in most parts of the company and 23 per cent some opportunity for experiences in some parts of the company. Two silver medallists reported having no opportunity for experiences across the company alongside two bronze medallists, two MoE winners and 14 non-medal winners who felt they had limited opportunity for experiences across the company (Figure 12). Given this reporting of limited opportunities, it may be that the extensive, individually tailored WorldSkills training may work in conjunction here for these young people.

Alternatively, these young people may have benefitted from other elements of an expansive working environment.

Figure 12: Opportunity to gain experience across the company



Alongside gaining experience across the company, 58 per cent of respondents reported a gradual transition with time allocated for gaining an understanding of most areas. Further to the point about learning opportunities being contingent on the structure and scheduling of production, 33 per cent of the young people reported some time allowed to gain an understanding but this time was dependent on work processes. The remaining 9 per cent reported a fast transition based on limited time to gain a full understanding of work tasks.

With 77 per cent of respondents reporting they worked in a team or with others, it is perhaps surprising that just 47 per cent knew about opportunities for progression with a clear career pathway mapped out. Twenty-four per cent knew of horizontal and vertical career progression but also knew this offer was subject to availability and a further 20 per cent knew some horizontal and vertical career progression but that these opportunities were heavily reliant on production processes and were not an inherent aspect to that workplace. Again, and in line with the research reported above, the production processes are key to any opportunities. Further research is currently being conducted to understand the career opportunities available to participants post-WSC; however, given the findings in the next section it is not unreasonable to assume that pre-WSC, these young people are employed to help with

the bottom line of the company first and foremost, and any other opportunities, learning or career, are subsidiary benefits.

6. *Status as a worker and a learner*

This section looks at the importance of learners and their achievement in the workplace. Employees were asked about the acknowledgement of their work in terms of development, achievement and excellence. A third reported little or no opportunities for acknowledgement of their work. Thirty-four per cent felt that achievement was routinely recognised and 32 per cent believed achievement was celebrated (Figure 13). These findings are in sync with the previous section whereby employees are in the workplace to do a specific job and, while there is some recognition of their performance in the job, working and performing in your job is rewarded with a pay cheque not necessarily verbal congratulations or the identification of task transition and career progression. However, since these young people are employees in the workplace who are given time away for training it is noteworthy that 38 per cent reported that all workers are expected to be learners in the workplace, which feeds neatly into the lifelong learning agenda, and 41 per cent believed that learning is encouraged. Only 10 per cent reported little or no workplace recognition of learners and a third of these were medal winners (Figure 14).

Figure 13: Work acknowledged

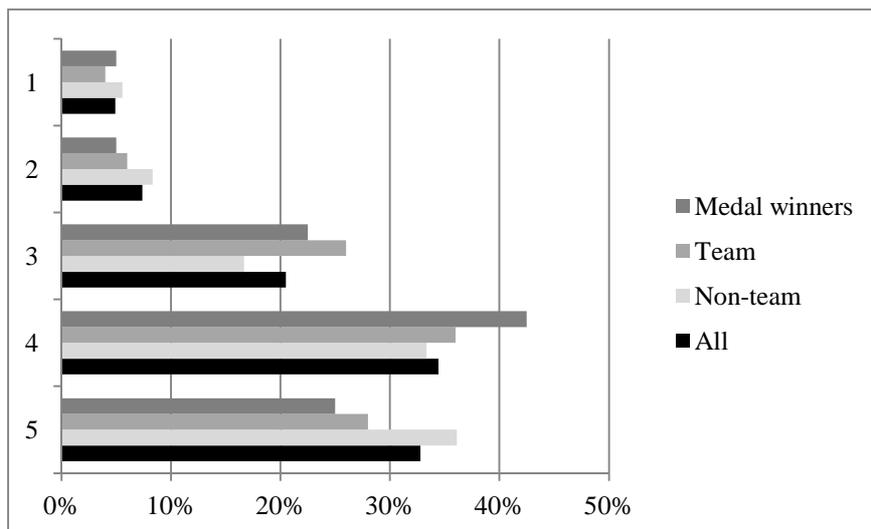
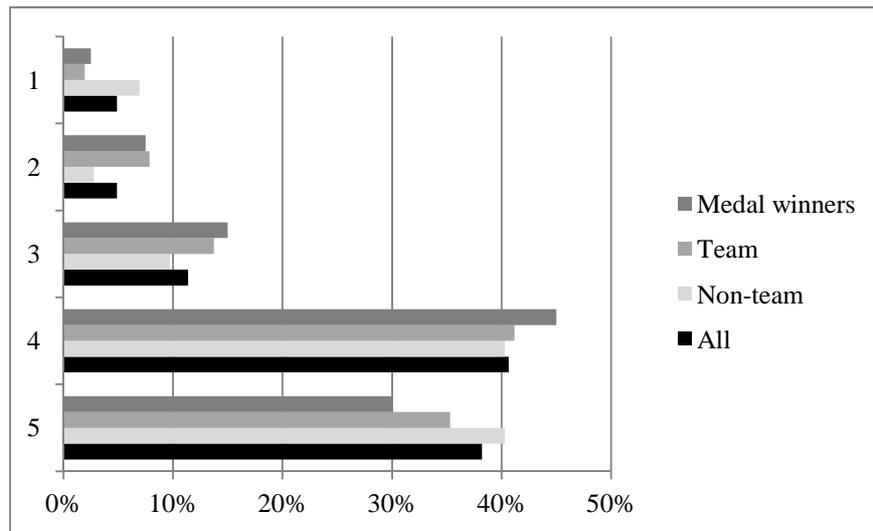


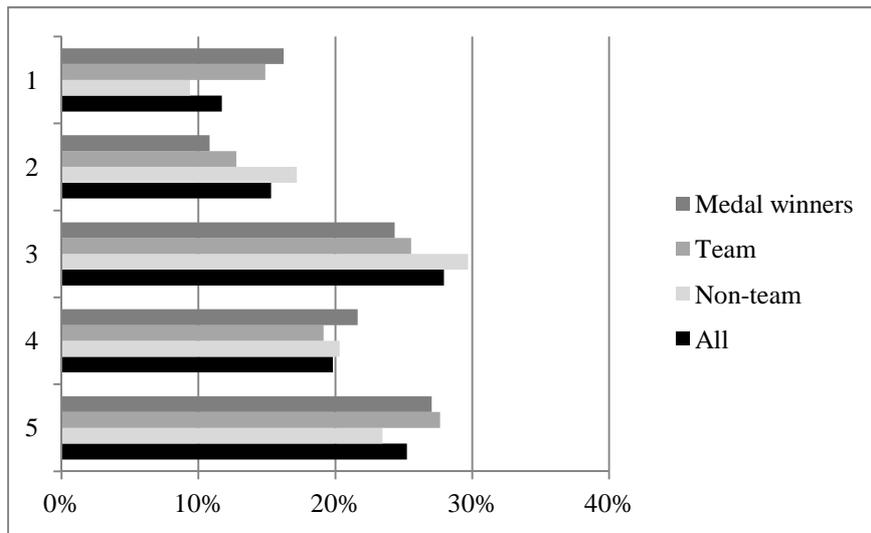
Figure 14: Recognised as a learner in the workplace



7. Organisational development

The literature on organisational development, organisational learning and a learning organisation is wide-ranging; Eraut and Hirsch (2007: 55-62) provide a good summary. But it is out of necessity that employing organisations are learning organisations in some shape or form as the reproduction of vocational knowledge is imperative for a business to survive. However, the degree to which the learning and training occurs depends very much on the company's product market strategy, the production processes within a company needed to deliver this strategy, and also on whether the training/learning is used 'as a vehicle for aligning the goals of developing the individual and organisational capability' (Fuller and Unwin 2003: 8). Given the findings in section five on experience, task transition and career progression it is not surprising that the responses to whether the business goals took account of employee goals were also more widely dispersed than in other sections (Figure 15). For 25 per cent of these young people their goals were embedded in the business goals. For nearly half (48 per cent) some account was taken of employees' goals in relation to the business goals while 15 per cent and 12 per cent respectively responded that little or no account was taken of their goals. More medal winners and team members reported that their goals were embedded in the business goals; however, these results are reasonably dispersed evenly across the medal winners, team and non-team members when the lower level answers are considered. All in all, approximately 75 per cent of the young people were having their goals taken into account within the organisation.

Figure 15: Business goals take into account the young person's goals



Summary

Given the high scores reported by most of the respondents, it is reasonable to assume that these features would be prominent in these organisations considering their involvement in WorldSkills in the first place. Although these are reported scores of interpretations, they do nonetheless give insight into the features of these workplaces. Interestingly, the difference between medal winners, team members and non-team members are not huge for most of the individual questions. With such a large number of elements to the expansive learning environment framework, it is likely that many of these dimensions appear together as a package, so that many survey responses are highly correlated. The next section shows that these elements can indeed be reduced down to a much smaller number of underlying factors which correlate with particular sets of questions. This analysis allows for the expansiveness of workplace learning environments to be more easily scored and distinguished, and how these scores relate to our measures of vocational excellence.

How do these areas relate to each other?

To explore the nature of these correlations, we conducted an exploratory common factor analysis on the questions in the seven areas to find out whether the responses to these 21 questions could be reduced down to a smaller number of underlying trends. Responses to many of these questions are correlated. This analysis identified two

common factors,⁸ which explained 76 per cent of variation in responses to the survey questionnaires. Table 2 shows the factor loadings of each of the questions in the survey on each of the two factors. The factor each question corresponds to is highlighted in bold (see Appendix A for the full set of questions).

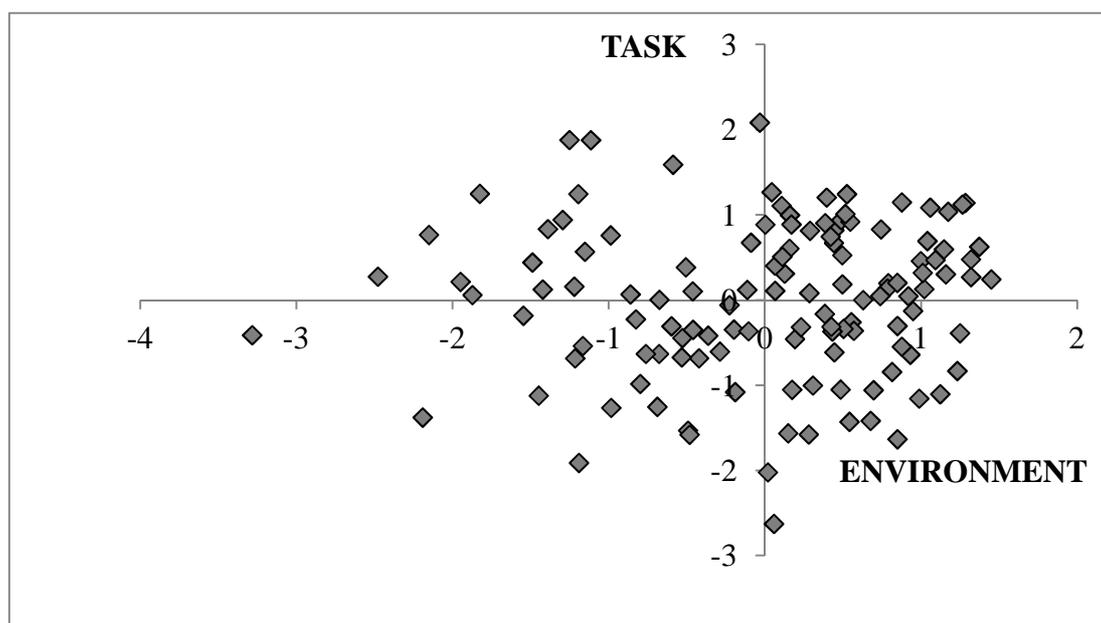
Table 2: Factor loadings

		Factor 1	Factor 2
1a	Variety of situations and processes	0.1921	0.4999
1b	Colleagues	0.4504	-0.1027
1c	Goals and aims	0.4443	0.401
2a	Complex problems	0.1163	0.4544
2b	Range of Skills	0.2129	0.5159
2c	Work with others	0.7281	-0.1024
2d	Communication and feedback	0.7592	0.1551
3a	Mentor/coach	0.6385	-0.1527
3b	Resources	0.6525	0.0444
3c	Qualifications	0.5276	0.1107
3d	Training	0.6342	0.0495
4a	Performance	0.2633	0.355
4b	Make decisions	-0.0692	0.7073
4c	Solve problems	-0.0722	0.6287
4d	Time to reflect	0.3988	0.4321
5a	Experience	0.5085	0.3306
5b	Work through tasks	0.6022	0.3757
5c	Career progression	0.5527	0.2835
6a	Acknowledgement	0.6804	0.1661
6b	Recognised as learner	0.5812	0.0082
7a	Business goals	0.3537	0.1886

Factor 1 correlates with questions to do with the learning environment in the work place. Factor 2 correlates to issues related to task complexity at work. Factor scores for ‘ENVIRONMENT’ and ‘TASK’ were projected for each survey participant. Figure 2 shows the raw scores:

⁸ Here we used the Kaiser criterion, which includes only factors that explain more variation in responses than an single question in the survey.

Figure 16: Raw scores for environment and task



There is no correlation between the two measures. Individuals are evenly distributed between the four quadrants representing above average and below average score for either variable. The mean scores for both factors were compared between different groups (shown in Table 3). No significant differences were found between team members or medal winners. However, potential competitors in 2011 scored significantly higher for TASK than those in the earlier competition.

Table 3: Comparison between groups

	Environment	Task	n
2011	-0.066	0.124	67
2009	0.078	-0.146	57
Difference	-0.144	0.271*	
Team member	0.003	0.043	52
Non team member	-0.002	-0.031	72
Difference	0.005	0.074	
Medal winner	-0.041	-0.042	39
Non medal winner	0.019	0.019	85
Difference	-0.060	-0.061	
Team member with medal	-0.041	-0.042	39
Team member without medal	0.136	0.297	13
Difference	-0.177	-0.339	

Note: *= significant at 10 per cent level

We tested whether the two scores jointly influenced the probability of success (both getting in the team and winning a medal) using a logit regression. As well as the two factor scores, a multiplicative interaction term was created to see whether workplaces that scored highly for both were particularly successful (e.g. those in the top right quadrant in figure 2). As the raw factor scores could be positive or negative (meaning a positive interaction term could arise for those in either the top right or the bottom left quadrants), these raw scores were standardised to fit on a scale between 0 and 1 before the interaction term was created. Table 4 shows the results of these regressions.

Table 4: Logit regression results

	Pr (team member)	Pr (medal winner)	Pr (medal winner if team member)
ENVIRONMENT	-5.305 (0.11)	-4.976 (0.15)	-0.022 (1.00)
TASK	-5.762 (0.14)	-5.871 (0.15)	-1.219 (0.87)
ENVIRONMENT* TASK	9.254* (0.10)	8.253 (0.16)	-1.394 (0.90)
CONSTANT	2.963 (0.19)	2.725 (0.25)	2.410 (0.58)

Note: *= significant at 10 per cent level. P-values in parentheses.

The individual factors did not significantly affect the probability of getting into the team. However, the interaction term is positive and significant, meaning that the chance of getting into the team was higher for those who scored higher for both learning environment and task complexity (i.e. those in the top right quadrant). Clearly, the more expansive the work environment *combined* with the opportunity to experience a variety of situations and work processes to solve complex problems and make decisions using a range of skills stands the young person in better stead for team selection; similar findings to that of Hughes *et al.* (2004) listed above. This relationship was weaker when predicting medal success for the whole sample. The

final column looks at the medal success only of those selected for the team. Pre-competition working environment does not matter at all for winning medals, which instead is dependent on the WorldSkills training received and the individual characteristics of the young person in the pressure of competition (see Nokelainen *et al.* 2012b).

Conclusions

Within the WSC context, developing vocational excellence involves a number of people: the young person, colleagues in the workplace and WorldSkills trainers to name a few. The young people competing at a WSC receive a substantial amount of training outside of the workplace to bring their skills levels up to WSC standards and the propensity of the young person to take up learning opportunities is obviously a key factor (Billett 2002). Yet, clearly the workplace plays a role, even within a group of relatively high achievers. This research focussed solely on the workplace to try and understand its significance in developing vocational excellence. Given the dispersion of responses, although in some areas more than others, the workplaces involved with WorldSkills are impacting in a variety of ways and through a variety of means. This varying level of involvement would be expected considering that, contrary to a lot of policy belief, workplaces are not homogenous. However, these workplaces are all offering an employee a chance to train and develop to world-class standards. What this research reinforces is that the more ‘expansive’ a workplace (Fuller and Unwin 2003a), with a number of key elements such as acknowledgement as a worker and learner, having a named mentor, awareness of career progression and being given time to work through tasks – all of the key features of quality apprenticeship training (Fuller and Unwin 2010) – the more likely the employee is going to have the necessary and sufficient skill base to begin working towards meeting WorldSkills international standards in that skill and potentially winning a medal. The analysis shows that it is the combination of the environment and support for the young person by the firm with the particular tasks they are engaged in which is key to developing excellence.

The competitor’s workplace learning and experience, in conjunction with the intense WorldSkills training, is clearly an expensive model of skill development. The model of WorldSkills UK is not being proposed as a one-fit solution, in a similar way

that a system modelled from examples on the continent would not work in the UK (Turbin 2001). However, key concepts from the WorldSkills UK model offer a further point (see Dolphin and Lanning 2011 for a precursor) for government and employers to think about developing expansive environments for developing vocational excellence more broadly. In their study on identifying institutional factors underlying excellence in vocational education, Migler *et al.* (1990: 14) declared:

This may be among the most refreshing of all the findings of this study. The thing that separates the very best vocational education institutions from the good ones may be that the very best programs reach beyond their stated curricular outcomes and educate holistic individuals. They are much more interested in how people learn than in what they know. There seem to be no artificial boundaries between theory and practice.

It seems that this finding could be equally applied to these employers who by participation in WorldSkills are reaching beyond their stated aims. These workplaces and employers show that quality and content do not need to be sacrificed for quantity. Clearly there is something special about these workplaces but it is not necessarily as complicated as one would be lead to believe by policy (Keep 2006). The issue here is that policy places a high priority on formal training, such as apprenticeship, because it is more easily measured; there is little policy priority on building up the workplace and employing organisations as sites of learning. The easiest solution is believed to be subsidies to incentivise employers (and employees) (Keep 2009). Yet it would seem this group of employers are using strategies that do not necessarily require financial incentives and do not need to be based around a profit and loss statement but play to the strengths of the workplace raising the benchmark toward developing vocational excellence. Until more imaginative thinking by policymakers occurs on how to develop the learning environment within more work environments to develop vocational excellence, the UK VET system will remain open to criticism and these WorldSkills employers will be considered special rather than the norm.

Note:

This research is ongoing for the UK Team 2013 and is being linked to the MoVE research on the individual characteristics and experiences of competitors in WSC (Nokelainen *et al.* 2012b).

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Appendix A – survey questions

1. *Participating and understanding your workplace*

- 1a. Do you participate in and understand a **variety of situations and processes** in the workplace?
- 1b. Do you know what work your **colleagues** do?
- 1c. Do you understand the **goals and aims** of the workplace?

2. *Performing tasks in your work*

- 2a. Do you tackle **complex problems** in your work?
- 2b. Do you use a **range of skills** in your work?
- 2c. Do you work **with others**?
- 2d. Do you receive **communication and feedback**?

3. *Resources available to help you learn your work*

- 3a. Do you have a **mentor/coach** at work?
- 3b. Do you have access to **resources to help you learn** (for example other workers, materials, customers, competitors, suppliers and professional networks)?
- 3c. Are you encouraged to gain **qualification(s)**?
- 3d. Do you receive **training** in the workplace?

4. *Judgement, decision-making, problem solving and reflection*

- 4a. Do you assess **your performance** at work?
- 4b. Do you make **decisions** in your job?
- 4c. Do you solve **problems** in your job?
- 4d. Do you have time to **reflect** on your work?

5. *Experience, tasks & career progression*

- 5a. Do you gain **experience** across the company?
- 5b. Are you given time to **work through tasks** to develop your skill and knowledge?
- 5c. Are you aware of possible **career progression**?

6. *Status as a worker and a learner*

- 6a. Is your work **acknowledged** (for example in development, achievement and excellence)?
- 6b. Are you recognised as a **learner** in the workplace?

7. *Organisational development*

- 7a. Do the **business goals** take into account **your goals**?