

THE ECONOMIC VALUE OF WORLDSKILLS UK

23 NOVEMBER 2023



Contents

Executive summary	4
1 Introduction	9
1.1 Background	9
1.2 Motivation for this study	11
1.3 Project aims and objectives	11
1.4 Structure of the report	12
2 Modelling approach	13
3 Theoretical benefits	15
3.1.1 Empowering young people	15
3.1.2 Improving teaching standards	17
3.1.3 Championing future skills	18
4 Modelling findings	19
4.1 Headline findings	19
4.2 Detailed findings	21
4.2.1 Empowering young people	21
4.2.2 Raising standards	28
4.3 Benefits not captured in the RoI calculations	32
4.4 Comparison with previous findings	36
5 Recommendations for further research	37
6 Conclusion	40

EXECUTIVE SUMMARY

WorldSkills UK is an independent charity and a partnership between employers, education and governments. Its overarching mission is to accelerate the development of young people's skills, with the ultimate goal of achieving world-class standards.

WorldSkills UK activities reinforce each other to support skills development among young people in the UK

WorldSkills UK is a four nations partnership between education, industry and UK governments. It is a world-class skills network acting as a catalyst for:

- **Raising standards** through international benchmarking and professional development.
- **Championing future skills** through analysis of rapidly changing economic demand.
- **Empowering young people** from all backgrounds through competitions-based training and careers advocacy.

The driving vision behind WorldSkills UK is founded on the belief in the value and significance of technical education, recognising its potential to empower young people and fuel growth. Their overarching mission is to embed world-class training standards across the UK to improve the quality of apprenticeships and technical education for the benefit of all young people and businesses.

WorldSkills UK works to help the UK become a world class 'skills economy', boosting the prestige of technical and professional education across the UK to help drive investment, job creation and economic growth. WorldSkills UK is a key player in WorldSkills International, a global organization uniting 85 countries for biennial skills competitions. One of its key activities is organizing an annual national skills competitions programme, from which the UK selects and trains its international skills team. The organisation also offers customised career education and information tools to help young people develop their technical and employability skills and learn about career pathways, especially in technical and apprenticeship fields. Additionally, WorldSkills UK invests in research and innovation within the realm of international skills, aiming to influence best practices in skills development through diverse events and publications such as blogs and reports. It also helps Further Education (FE) staff develop their skills by sharing international best practices in training and assessment, supporting them to teach to higher standards.

WorldSkills UK's activities can be organised under three main themes, as shown in Figure 1.

Figure 1 WorldSkills UK activities 2021-23



Source: Frontier Economics and WorldSkills UK

WorldSkills UK and its funders wanted to gain a deeper understanding of the benefits and value of its activities both for those with whom the organisation interacts and for the wider UK economy. Frontier Economics was commissioned to conduct an economic review of WorldSkills UK’s activities and provide estimates of the value added by the organisation. The analysis focussed on the 2021-2023 period to align with the two-year cycle of international competitions.

Value is generated through several channels

Through the national and international competitions programme and associated training, WorldSkills UK **improves the skills and confidence of young people and stimulates a high performance mindset**. This affects not only those taking part in competitions themselves (competitors and trainers) but also their peers.

WorldSkills UK also **promotes a better understanding of technical and vocational routes** through careers education and advice resources, helping to inspire young people to consider a career or FE in a technical field.

By offering world-class teacher training based on international insights and best practices in technical education and skills development, WorldSkills UK contributes to **developing the FE workforce and improving the quality of teaching in FE**.

Through its research and development activities and convening work, it **spreads world-class standards to the UK** and informs training standards.

WorldSkills UK activities generate a high return on investment

The impact and value of WorldSkills UK activities are large. We estimate an RoI for the taxpayer of £3.50 for every pound invested in WorldSkills UK in our **central scenario**, and at least £2.10 in our **conservative scenario**. This demonstrates high value for money, aligning with the Department for Transport's Value for Money Supplementary Guidance¹ which categorises a benefit-to-cost of more than 2 as "High Value for Money" (and above 4 "Very High Value for Money").

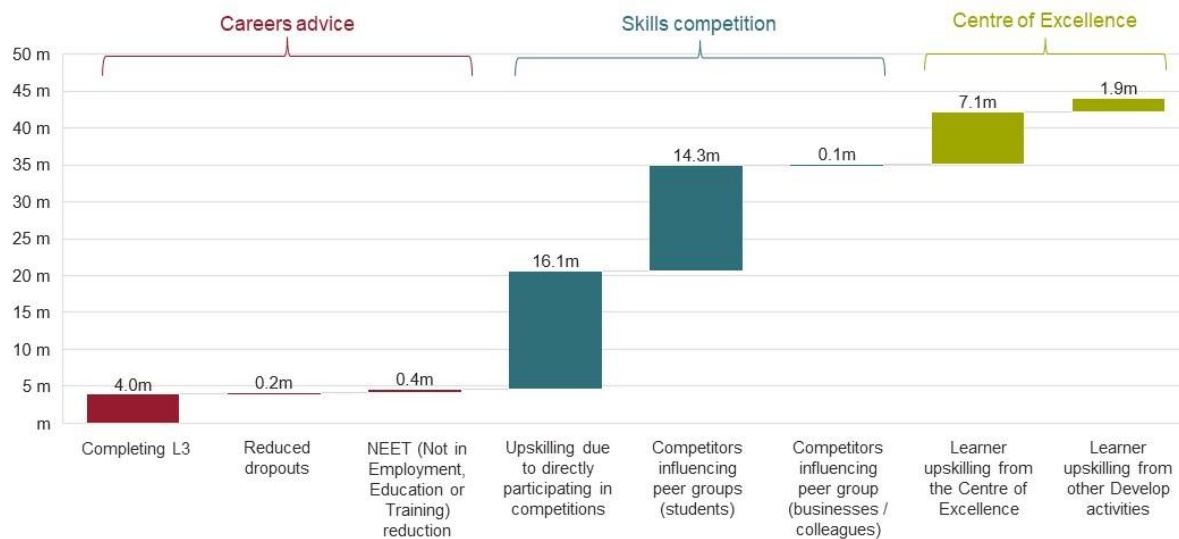
Additionally, the organization's extensive reach highlights its ability to engage not only the Technical and Vocational Education and Training (TVET) sector - including Independent Training Providers (ITPs), employers and other stakeholders - but also international partners and learners. Each year, WorldSkills UK engages around 150,000 young individuals through its activities.

The benefits to the taxpayer in our headline RoI calculations come from four main sources:

- The largest benefit is a **direct upskilling effect** of individuals participating in the skills competitions programme (national or international). This arises from the training and the competitive environment itself, leading to increased lifetime earnings due to improved skills and better signalling of their capabilities.
- In addition to direct upskilling, there are **spill-over benefits** within the skills competition programme, where participating learners share knowledge and inspire their peers, resulting in improved performance and earnings for the peers themselves.
- Furthermore, **increased information about career prospects and career guidance** translates to improved educational and job matching outcomes for students receiving careers education and advice, reducing dropout rates and enhancing employability and earnings over their lifetimes.
- Finally, **higher teaching standards** in FE and technical skills training improve learners' cognitive skills and educational outcomes, reducing the likelihood of them being not in education, employment, or training (NEET) and increasing their lifetime earnings.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918481/value-for-money-supplementary-guidance-on-categories.pdf

Figure 2 Key drivers of estimated benefits in central scenario



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

Other benefits could not be quantified but may be significant

In addition to these quantifiable benefits, there are a number of positive impacts from WorldSkills UK’s activities which were not captured in our analysis due to a lack of quantifiable evidence to support the assessment. Some of these benefits could be quantified through further research. They include:

- **Benefits from research and insights activities aiming to mainstream global excellence in skills** - These activities will help sharing international best practices, exploring global trends in skills development, and benchmarking the UK’s skills systems against those of other countries. These efforts ultimately contribute to the success of young people, employers, and the UK economy.
- **Potential reduction of skills gaps in the UK economy** – It is very likely that WorldSkills UK’s activities have an effect on reducing skills gaps and skills mismatch in the UK labour market (a number of WorldSkills UK competitions are in occupations with a considerable skills gap).
- **Productivity gains within firms and higher tax receipts for businesses** – Participation in WorldSkills UK activities enhances the skills and educational achievements of learners, leading to heightened productivity for the firms employing them in the future. This, in turn, leads to an increase in tax revenues from firms operating within the country and strengthens the UK’s competitiveness in the global market, positively impacting the nation’s productivity and contributing to an upswing in GDP.

- **Wider productivity spill-over effects** – The spill-over effects we value only apply within the employer firm, but productivity spill-overs between one firm which employs a competition participant and one that does not may also be present.
- **Reduced turnover of teachers and lower recruitment costs for colleges** – The training and professional development offered through the Centre of Excellence is likely to increase the retention of teachers, reduce recruitment costs for FE colleges and unlock a range of further benefits.
- **International influence** – By being a key member of the WorldSkills network, WorldSkills UK is able to raise the profile and prestige of UK skills, possibly enhancing the export potential of education products and encouraging investment into the UK.

Taken together, these additional benefits are likely to generate additional value for the UK over and above what was included in our assessment. All of this points to WorldSkills UK delivering high value for money for the UK taxpayer and as such, there is a strong case for continued support for the organisation by the Department for Education (DfE).

1 Introduction

1.1 Background

WorldSkills UK is an independent charity and a partnership between employers, education and governments. Its overarching mission is to accelerate the development of young people's skills, with the ultimate goal of achieving world-class standards. As a prominent member of the global movement known as WorldSkills International, WorldSkills UK actively supports and empowers young individuals through competition-based training, assessment, and benchmarking. These efforts culminate in national teams competing at the biennial 'skills Olympics', where they test their abilities against international standards. The insights gained from this global network contribute to raising skill standards in the United Kingdom.

WorldSkills UK is primarily dedicated to inspiring and nurturing the skills and talents of young people, equipping them with practical competencies essential for successful careers. Its primary focus lies in technical and vocational education and training, effectively bridging the skills gap within the UK.

The activities of WorldSkills UK (2021-23) can be categorised into three main themes, as shown in Figure 3, with each team contributing to its mission:

- **Empowering young people.** WorldSkills UK carries out a range of activities to inspire young people to choose high-quality apprenticeships and technical education as a prestigious career route. These activities include:
 - *Skills Competitions* – WorldSkills UK organizes national competitions encompassing a wide array of trades and professions, offering young competitors under the age of 25 a platform to showcase their skills at a high level. Additionally, as part of the WorldSkills International network, WorldSkills UK takes part in the international WorldSkills Competitions, a biennial cycle of skills competitions where the winners of the national competitions programme compete with other countries (both European and global) as part of Team UK.
 - *Careers Advice toolkit* – This digital guide aimed at careers professional supports young individuals in enhancing employability skills and gaining career-related information, particularly within technical and apprenticeship career pathways. It provides inspiring, bite-sized content that can be flexibly used for independent online learning or incorporated into classroom and virtual career curricula.
 - *Spotlight on Careers* – This content series sheds light on current and future skills needs, aiding students in initial career planning and assisting educators in providing engaging career advice. It comprises industry overviews, insights from experts, apprentice role models' experiences, industry-related tasks, and technical pathways.
- **Raising standards.** WorldSkills UK undertakes various activities aimed at enhancing the expertise and performance of educators, by sharing international best practice, to deliver high-quality training and assessment. These activities include:

- *Centre of Excellence* – This programme endeavours to offer its members world-class teacher training based on international insights and best practice in technical education and skills development. It fosters industry-led networks for innovation, communities of practice exploring priority skill sectors, and a global community for thought leadership, which contributes to research and shapes future policy. Supported by partners from the education and industry sectors, the Centre supported over 4,000 educators and influenced more than 64,000 learners over the 2020-23 period. Looking ahead to the 2023-26 timeframe, the objective is to extend assistance 5,000 educators and influence the paths of 140,000 learners.
- *CPD Live* – These live sessions cater to those involved in delivering technical and vocational education and training, as well as quality leads and pastoral staff. They demonstrate how to integrate world-class teaching practices and enhance the skills of educators, students and apprentices to align with employer demands.
- *Learning Lab* – This resource repository contains tools and materials derived from WorldSkills UK's global insights into best practices in skills development. It aims to assist Further Education (FE) colleges and independent training providers in training more young individuals to meet world-class standards.
- **Championing future skills.** WorldSkills UK conducts research and insights activities with the aim of mainstreaming global excellence in skills. This involves sharing international best practices, exploring global trends in skills development, and benchmarking the UK's skills systems against those of other countries. These efforts ultimately contribute to the success of young people, employers, and the UK economy.

Figure 3 WorldSkills UK activities



Source: Frontier Economics and WorldSkills UK

1.2 Motivation for this study

WorldSkills UK receives annual funding from the Department for Education (DfE). The funding is intended to support the development of high-quality technical education programmes that will prepare learners for the jobs of the future. WorldSkills UK is committed to understanding and demonstrating the value it delivers to its funders and taxpayers. To this end, Frontier Economics was engaged to conduct an independent assessment of the Return on Investment (RoI) generated for taxpayers through WorldSkills UK's initiatives.

A first RoI study was carried out by Frontier Economics in 2021, focussing on the 2018-20 period to align with the two-year WorldSkills Kazan cycle of international competitions. However, the set of activities carried out by WorldSkills UK has changed significantly since this first study, with developments catalysed by the Covid-19 pandemic and pressures on public funding.

WorldSkills UK has moved many of its events online, and is no longer organising the UK LIVE annual event that used to take place at the NEC in Birmingham, attracting over 70,000 participants². Furthermore WorldSkills UK has also created a number of digital resources, such as online courses, webinar and toolkits. Overall, the pandemic has advanced WorldSkills UK to be more creative and flexible in its approach to carrying out its work. These changes have made WorldSkills UK's activities more accessible and resilient. Despite being challenging, the pandemic has presented the opportunity for WorldSkills UK to innovate and reach new audiences. In addition to this, the WorldSkills UK Centre of Excellence was launched in September 2020, and therefore its benefits had not been assessed in the previous RoI study. For these reasons, it is important to reassess the RoI generated for taxpayers through WorldSkills UK initiatives.

1.3 Project aims and objectives

This report examines the economic value of WorldSkills UK activities and provides estimates of their public Return on Investment. The evaluation approach can be summarised as follows:

- **Identify the channels through which the impact is expected to materialise.** This includes understanding how WorldSkills UK's activities are expected to lead to changes in skills, employment and productivity.
- **Gather data and literature to understand the strength of possible effects.** This includes collecting data on the impact of similar programmes, as well as academic research on the factors that affect skills development and economic growth.
- **Combine the evidence in a valuation model to estimate the size of future benefits.** This involves estimating the number of people who will participate in WorldSkills UK

² The WorldSkills UK LIVE event was the largest experiential skills, careers and apprenticeship event in the UK. The event featured competitions, demonstrations, and interactive exhibits from a wide range of industries, as well as opportunities for young people to meet with employers and learn about apprenticeships and technical education.

activities, the skills they will gain, and the impact these skills will have on their employment and productivity.

- **Discount the future benefits to the present day to get the Net Present Value (NPV).**
This takes into account the fact that money today is worth more than money in the future.
- **Compare the size of benefits with the public funding provided to WorldSkills UK.**
This will help to determine whether the programme is a good use of public money.

The analysis focusses on the 2021-2023 period to align with the two-year cycle of international competitions.

1.4 Structure of the report

The report is structured as follows: Section 2 explains the modelling approach, Section 3 discusses the theoretical benefits of WorldSkills UK activities, Section 4 presents the findings and Section 5 outlines the conclusions.

2 Modelling approach

We evaluated the costs and benefits of WorldSkills UK's activities across two financial years: 2021-22 and 2022-23. This covered the entire 2021-23 cycle of activities.

We calculated the NPV of future benefits to the Exchequer arising from WorldSkills UK's activities using these steps:

- **Estimating economy wide benefits:** we first assessed the present and future benefits that WorldSkills UK activities generate across the entire economy.
- **Discounting future benefits:** To bring these future benefits back to their present day value, we applied the government Green Book³ discount rate of 3.5%.
- **Converting to the Exchequer value:** We then transformed the discounted economy-wide benefits into Exchequer value, specifically focusing on the implications for tax value.

By comparing the NPV of these future benefits to the funding provided by DfE, we calculated the RoI for DfE funds. Additionally, we estimated the benefit-to-cost ratio concerning the government's perspective. Notably, we refrained from estimating the benefit-to-cost ratio from a societal viewpoint due to the inclusion of private costs and opportunity costs within the broader economy. These factors, beyond public funding, were challenging to robustly estimate.

Figure 4 Summary of approach



Source: Frontier Economics and WorldSkills UK

In assessing the value of WorldSkills UK activities, we drew upon a range of information sources, as outlined in Figure 5, each contributing varying degrees of reliability. Our preference, whenever feasible, was to base our assumptions on literature from peer-reviewed journals, recognized as the most dependable form of evidence (particularly when supported by comprehensive reviews or meta-analyses), or grey literature focusing on policy publications. Our literature review encompassed areas such as skills competitions, the

³ <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government/the-green-book-2020>

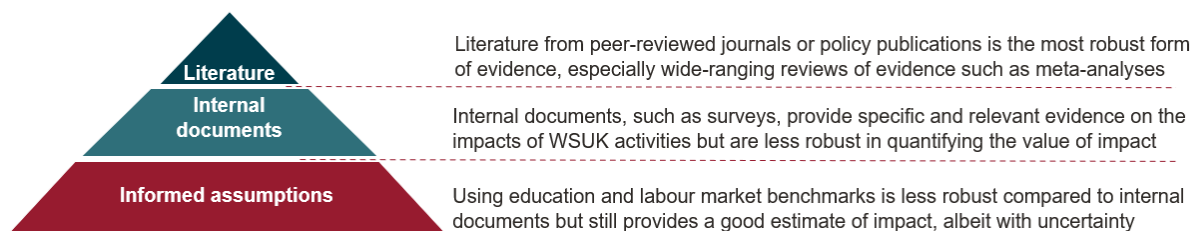
productivity spill-over effects associated with peer influence, careers advice and the value of higher teaching quality.

In cases where academic or grey literature was not available, we turned to WorldSkills UK's own resources, including case studies, surveys, interviews, and other forms of evidence. While these internal documents supplied specific and contextually relevant insights into the impacts of WorldSkills UK's activities, they are inherently less robust when it comes to quantifying the precise value of these impacts.

In situations where neither academic literature nor internal documents were at our disposal, we crafted our own assumptions to inform our analysis, considering two distinct scenarios: a conservative estimate (low) and a more optimistic projection (high). It's worth noting that our assumptions were intentionally designed to err on the side of caution and remained consistent with established benchmarks in education and the labour market. Although relying on informed assumptions and industry benchmarks may introduce some uncertainty, this approach still yields a reasonable estimate of impact, albeit with a degree of unpredictability.

Figure 5 Evidence ranked based on robustness

Evidence ranked based on robustness



Source: *Frontier Economics and WorldSkills UK*

3 Theoretical benefits

We estimated WorldSkills UK's benefits across their *Empowering Young People* and *Raising Standards* activities over the 2021-23 period:

- **Empowering Young People.** Our modelling is split into the two areas of WorldSkills UK's work in this area:
 - *Skills competitions* – WorldSkills UK organizes national competitions and takes part in the international WorldSkills Competitions, a biennial cycle of skills competitions where the winners of the national competitions programme compete with other countries (both European and global) as part of Team UK. These skills competitions provide upskilling opportunities for participants.
 - *Careers advice* - WorldSkills UK provides the Careers Advice toolkit and the Spotlight on Careers. These are digital resources for educators and young people to use to support development of employability skills and career-related information.
- **Raising Standards.** WorldSkills UK undertakes various activities aimed at enhancing the expertise and performance of educators, by sharing international best practice, to deliver high-quality training and assessment. These activities include the Centre of Excellence, CPD Live and Learning Lab.

There are additional WorldSkills UK activities in each of these buckets that we are not valuing: Skills Champions (*Empowering Young People*) and the Innovation Network (*Raising standards*). We have also been unable to quantitatively value WorldSkills UK's research and insights activities but instead discuss the value of this work qualitatively. Therefore, the RoI set out in this report is likely to be an under-estimate of the total benefits.

3.1.1 Empowering young people

Skills competitions

The participation in skills competitions and the preparatory training leading up to them yield several significant benefits:

- **Upskilling Effect:** Individuals engaged in the skills competitions programme, whether at the national or international level, experience a direct upskilling effect. This effect results from the training they receive and their active participation in these competitions, leading to an enhancement of their skills. Ultimately, this upskilling translates into increased lifetime earnings for participants. This phenomenon aligns with established economic theory, encompassing both signalling and human capital effects. Human capital, which encompasses an individual's skills, knowledge, capacity, mindset and attributes, plays a pivotal role in determining productivity. Education and skill enhancement contribute to improved human capital, leading to increased productivity and, consequently, higher lifetime earnings. Moreover, competitions serve as signals of an individual's higher existing productivity to potential employers, resulting in elevated wage returns. This

signalling effect becomes particularly crucial in labour markets characterized by information asymmetry, where employers rely on indicators such as qualifications and work history to assess human capital. Achieving specific benchmarks in WorldSkills UK competitions, whether as a national finalist, Team UK member, or medal winner, can signal to employers a high level of human capital in a particular technical or vocational skill, potentially leading to higher wages. The extent of this benefit may vary based on the specific benchmark achieved, with medal winners expected to experience a greater upskilling effect than Team UK members, who, in turn, might experience a greater effect than national finalists.

- **Classroom/Workshop Peer Effects:** Learners participating in skills competitions bring about spill-over benefits for their peers within the classroom/workshop. These advantages include knowledge sharing and inspiring fellow students or colleagues to excel, resulting in improved overall performance. Peer effects occur when one learner's achievements positively impact the performance of others. Awards and recognition of outstanding accomplishments can influence subsequent behaviour by altering beliefs, norms, or interests. While it is challenging to conclusively prove the existence of peer effects, empirical research, such as Moreira (2017)⁴, demonstrates that public recognition of students' accomplishments can indeed affect both their own and their peers' subsequent academic performance. Attaining specific benchmarks in the WorldSkills UK competitions programme may foster a positive effect on the motivation and aspirations of peers, thereby enhancing their academic and technical performance, and ultimately, their lifetime earnings.
- **Colleague Peer Effects:** Competitors experience peer effects in their workplaces, where their enhanced skills contribute to heightened productivity that spills over to their colleagues. This phenomenon results in improved overall team performance and, consequently, higher earnings for the entire group.
- **Educator Benefits:** Educators actively involved in the skills competitions programme serve as sources of spill-over benefits that benefit both their learners and colleagues, ultimately leading to enhanced performance. Trainers and teachers participating in international competitions gain exposure to international best practices. When they return to their teaching roles or workplaces, their learners benefit from their improved skills, similar to those discussed in Section 3.2.2. Furthermore, for trainers not employed in FE and Higher Education (HE), their colleagues also benefit from their increased motivation, enhanced skills, and knowledge sharing. The positive impact on their own human capital can cascade to those they work with, thus positively influencing their performance and lifetime earnings.

Careers advice

WorldSkills UK's careers advice provides increased information about career prospects and subsequent better job matching for students receiving career advice, once again leading to improved earnings and employability over their lifetime. The key potential benefit of careers

⁴ Moreira, D., *How Awards Affect Winners' and Peers' Performance in Brazil*, 2017, Job Market Paper

advice is to improve information about what training and career options are available to young people, equipping them with the information they need to make more efficient decisions about their education and career. In the absence of such information (i.e. when there are informational failures), the economy is operating below its potential output, as labour is not efficiently utilised – and individuals are worse off than they would be in a world with perfect information. By giving young people improved information on the options available to them, the potential returns of those options and what suits their skillset, the WorldSkills UK careers events are likely to mitigate this information failure, with economic benefits for the individual and society.

3.1.2 Improving teaching standards

Enhancing teaching standards holds the potential for a direct and positive impact on learners' educational outcomes. This improvement is expected to manifest in several ways, including:

- **Enhanced Cognitive Skills:** Learners are likely to experience an increase in their cognitive skills (e.g. problem-solving, critical thinking, technical skills), which can be quantified through improved test scores.
- **Improved Non-Cognitive Skills:** Higher teaching standards can also positively affect non-cognitive skills (e.g. self-discipline, teamwork skills, leadership skills), leading to reduced absenteeism and suspensions, as well as an increased likelihood of learners continuing their education.

In the long term, these improved learner outcomes have far-reaching benefits, both for individual learners and the broader economy. Learners can anticipate:

- **Higher Earnings:** Improved teaching quality can translate into higher earnings and better employment prospects over the course of their lifetimes.
- **Reduced Likelihood of NEET Status:** Learners are less likely to fall into the category of 'not employed, in education or training' (NEET), contributing to their long-term career stability.

These learner-centric advantages also ripple out to benefit the broader economy. Anticipated outcomes include:

- **Higher GDP and Tax Revenues:** The economy may experience an upswing in GDP and tax revenues, primarily driven by increased lifetime earnings and a reduced likelihood of individuals becoming NEET.
- **Levelling Up and Reduced Inequality:** Enhanced teaching quality can have a levelling up effect, reducing disparities in educational outcomes. Less advantaged learners are particularly responsive to non-test score dimensions of teaching quality, such as reduced absenteeism, and are likely to benefit from lower long-term crime rates. Moreover, individuals from lower socioeconomic backgrounds are often taught by less experienced teachers. Strengthening the expertise of these educators means improving the career and life prospects of disadvantaged learners. It's important to note that our analysis has not

ventured into estimating the precise financial contributions of these factors. However, the potential for substantial economic and societal gains from enhancing teaching standards is evident.

3.1.3 Championing future skills

WorldSkills UK's research and insights initiatives have the potential to instigate favourable shifts in both attitudes and the practical implementation of policies. These activities constitute a vital component of WorldSkills UK's endeavours and hold the promise of yielding significant economic benefits. Through investments in research and a robust media presence, WorldSkills UK actively engages with the sector, thereby fostering alterations in attitudes, operational practices, and the development of policies. This engagement contributes to an overall enhancement of the quality of technical and vocational education policy in the UK.

4 Modelling findings

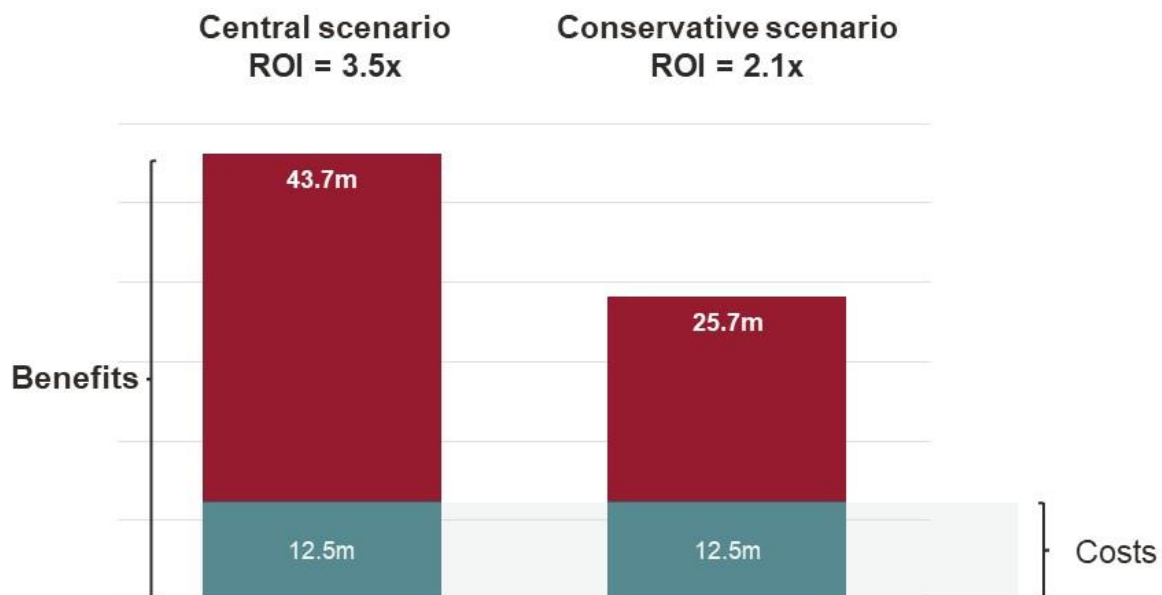
4.1 Headline findings

We estimate two scenarios to assess WorldSkills UK’s RoI to capture some of the uncertainty that is inherent in the evidence base:

- **“Central” scenario:** expected RoI (e.g. most likely projection in a set of scenarios). This scenario is the one that is deemed most probable or representative of the expected conditions. It helps provide a balanced and realistic perspective in the face of uncertainty around some of the modelling parameters.
- **“Conservative” scenario:** most likely conservative RoI (e.g. likely at least). This scenario represents the most cautious approach to estimating RoI. It is based on a less optimistic or lower set of modelling parameters compared to the “central” scenario, and reflects a more prudent and conservative outlook.

Our assessment shows an RoI for the taxpayer of £3.50 for every pound invested in WorldSkills UK in our **central scenario**, and at least £2.10 in our **conservative scenario**.

Figure 6 Present RoI calculations to DfE funding (2021-23)



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

We evaluate benefits and costs over a two-year period to align with the international competition cycle. The benefits primarily stem from increased tax revenue resulting from wage impacts, with every additional £1 in wages contributing 32p in tax and National insurance. On

the other hand, our cost assessment only considers the direct funding provided by DfE to WorldSkills UK.

Our RoI calculations deliberately exclude factors such as thought leadership, potential secondary impacts on policy, addressing the skills gap, productivity enhancements, and global influence. We will delve deeper into these aspects in subsequent sections.

Key quantifiable present benefits arise from WorldSkills UK’s in delivering careers advice, skills competitions and in raising teaching standards in FE through the Centre of Excellence.

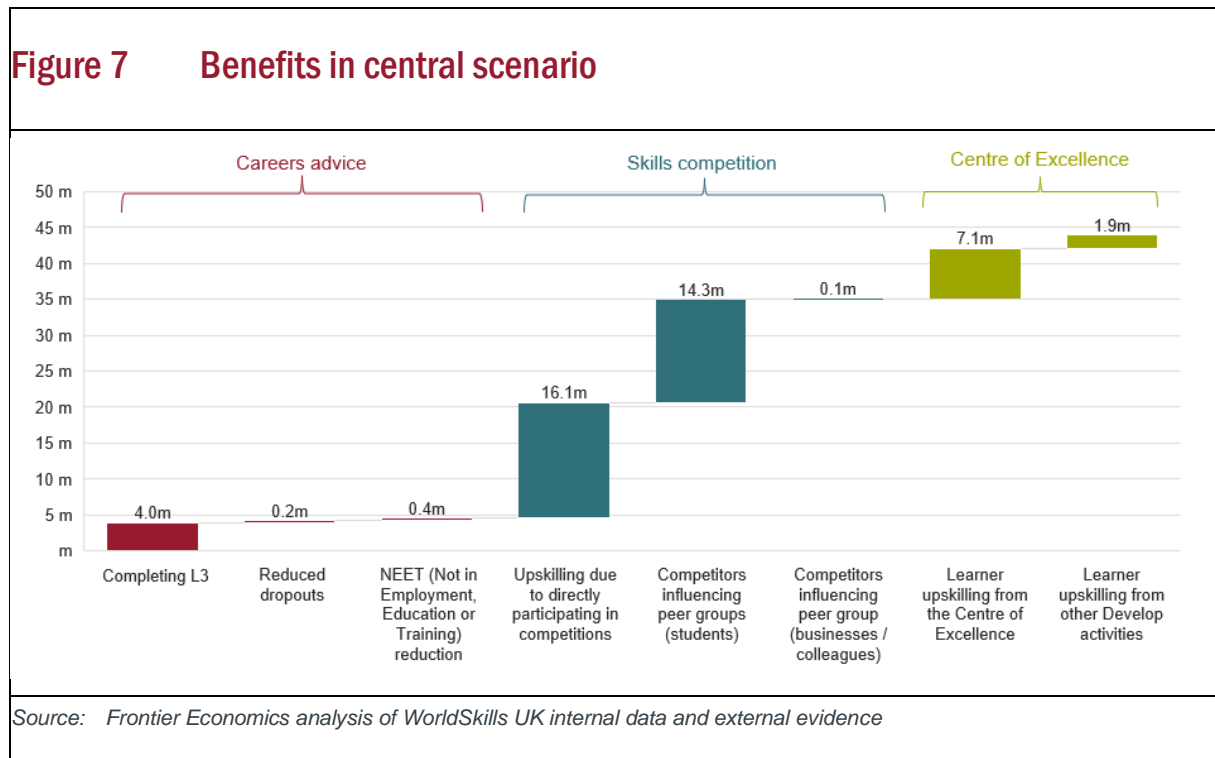
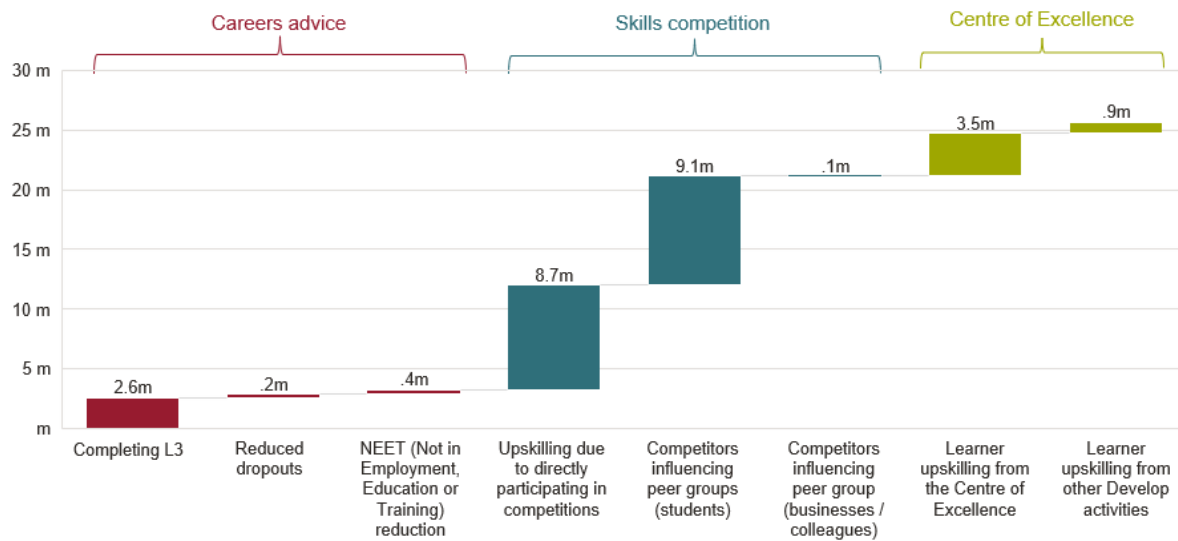


Figure 8 Benefits in conservative scenario



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

4.2 Detailed findings

4.2.1 Empowering young people

Skills Competitions

WorldSkills UK organises a national skills competitions programme across various fields - including engineering, digital, health and construction - and collaborates with WorldSkills International to organise the international competition programme. These competitions serve as platforms for UK apprentices and students to showcase their skills and vie for the title of the best in the nation within their respective disciplines. The international competitions programme involves the winners of the national competitions competing with other countries (both European and global) as part of Team UK after intensive upskilling and preparation.

The national competition programme commences with young participants registering for competitions in the spring of each year. Competition Organising Partners (COPs) are entrusted with the responsibility of delivering this programme, which includes an initial set of “passive” competitions, often online, followed by a series of heats taking place during the spring and summer months at various locations across the UK, occasionally including remote settings. The highest-scoring individuals from these heats advance to the national finals held in the autumn. These finals offer participants the chance to exhibit their exceptional talents.

The test projects for the finals are thoughtfully designed by COPs in collaboration with industry partners to ensure alignment with the standards sought after by employers. Participants in the national finals, who meet the age criteria and achieve the prescribed performance benchmark, may receive an invitation to join Squad UK, embarking on a rigorous training and development programme aimed at potential selection to represent the UK on the international stage.

Over the subsequent 14 to 18 months, Squad UK members undergo intensive training to attain world-class levels of excellence, undergoing scrutiny and refining their skills through competitive experiences and international exchanges. Before each international competition, the progression and potential of Squad UK members are carefully assessed, leading to the selection of the most promising candidates who form Team UK and participate in these prestigious international competitions. These international competitions occur on a biennial basis, involving approximately 70 countries, while in alternating years, a European competition known as EuroSkills takes place, attracting participation from around 35 countries.

Recognising the presence of distinct stages within WorldSkills UK's skills competitions, we have made the assumption that the direct benefits arising from upskilling and better signalling in the job market are not the same for each competitor but depend on how far they progress in the competition. To illustrate, it is a reasonable presumption that the benefits per learner differ for those who partake in the national finals but are not subsequently chosen for Squad UK (hereafter referred to as "national competitors"). This difference arises from the fact that national competitors do not undergo the intensive training leading up to international competitions. Therefore, we have calculated the benefits by categorising competitors into three exclusive and comprehensive groups, reflecting their progress in the competition work:

- 4,659 national competitors – all those who attend national heats but either fail to qualify for national finals or qualify for national finals but do not make it into Squad UK;
- 98 non-medal winning international competitors – all those who make it into Squad UK but do not receive a medal at the international competitions; and
- 17 medal winning international competitors – all those who make it into Squad UK and win a medal at the international competition.

We calculate three main benefits from participating or being close to those who participate in competitions:

- **Direct benefits** – The three groups of participants (e.g. medal winners, Squad UK non-medal winners and national competitors) experience a direct increase in their lifetime earnings as a result of upskilling and better signalling due to participation in the competition.
- **Peer benefits** – Each group affects its peers through increased upskilling either in the workplace or in the classroom.
- **Trainer benefit** – The trainers who attend international competitions are exposed to international best practice and benefit the classrooms and workplaces they return to through upskilling and sharing knowledge.

To estimate the **direct benefits**, we drew upon findings from our prior study on the earnings and employment impacts of WorldSkills UK competitions⁵. In that study, we discovered that, after controlling for factors such as gender, ethnicity, GCSE score, highest qualification level, years since obtaining the highest qualification, apprenticeship status, and subject of study, the average earnings of WorldSkills UK competitors were approximately 60% higher than the general UK population. Table 1 illustrates the estimated increase in earnings for WorldSkills UK competitors, segmented by gender and highest qualification level.

Table 1 Uplift in earnings for WorldSkills UK competitors by gender and highest qualification level

Level of highest qualification	Sex	% earning uplift	WSUK sample size	LEO sample size
Level 2	Male	68%	12	1916
Level 3	Female	66%	13	981
Level 3	Male	64%	247	34933

Source: Frontier Economics analysis of WorldSkills UK survey data and LEO data

Note: Figures in red if WorldSkills UK survey sample size smaller than 10

While we observed substantial variations in earning uplifts between competitors and similar peer groups at lower education levels, with earnings increases ranging from 60% to 70% for respondents at level 2 and level 3, small sample sizes did not allow us to estimate an earnings uplift for competitors whose highest qualification level is 4 or higher. Additionally, these estimates come with the following limitations:

- **Survey response bias** – The estimated uplift could be upwardly biased if survey respondents from the WorldSkills UK survey had higher earnings than non-respondents among competitors.
- **Selection on unobservable characteristics** – While the observed earnings difference may be attributed to the competition's impact on skills, it might also be explained by differences in unobserved factors. For instance, more motivated and ambitious learners might be more likely to participate in competitions, potentially accounting for some of the observed earnings increase.

Furthermore, it is unlikely that the annual wage premium is uniform across the three identified competitor groups. In fact, two factors must be considered:

- **Different degrees of upskilling** – Each group undergoes varying levels of training, leading to different degrees of upskilling. National finalists, who do not advance to Squad

⁵ <https://www.worldskillsuk.org/wp-content/uploads/2022/12/Earnings-and-employment-effects-of-WorldSkills-UK-competition-based-training-final-v2.pdf>

UK, miss out on the intensive preparatory training for international competitions, and consequently, they do not experience the same skill-enhancing effects. This suggests that the wage premium from skills competitions may be higher for Squad UK members and medal winners compared to national finalists.

- **Different degrees of selection** – It is reasonable to assume that individuals qualifying for international competitions, especially medal winners, already possess higher levels of talent, skill, and motivation. Consequently, their lifetime earnings may be elevated even if they had not participated in competitions. This implies that the wage premium from skills competitions might be potentially lower for Squad UK members and medal winners compared to national finalists.

These two effects operate in opposite directions and it is challenging to determine which effect predominates. For these reasons, we adopted a highly conservative approach to estimate the effects of skills competitions under two scenarios, through the following steps:

- We estimated the percentage of participants holding level 2, level 3, and level 4 qualifications based on survey data from previous competitors, assuming that the distribution of participants across these levels would remain constant over time.
- We then applied the estimated uplift for level 2, level 3 to the respective subgroup of competitors. To ensure our approach was conservative we applied no uplift to those holding a level 4 or higher qualification.
- To maintain a conservative stance and account for varying upskilling levels and potential strong selection effects, we only considered 5% to 10% of the annual wage premium as attributable to the causal impact of taking part in the competition.

To calculate **peer effects**, we had to set the following assumptions based on economic literature:

- 20% peer effect of medal winners on workshop/classmates' test scores;⁶
- 10% to 55% peer effect of participants on workshop/classmates' test scores (we used the conservative lower bound);⁷
- 3% increase in earnings after college/provider attendance following a one standard deviation increase in FE college value added;⁸ and
- 3% business peer effects of peer quality on college wages (repetitive occupations).⁹

As per **trainer benefits**, trainers improve their skills during the competition, increasing their productivity and positively influencing students and colleagues. Survey evidence and interviews suggest that trainers improve a wide set of skills during the competition. Below some trainer interview extracts:

⁶ Moreira, D., *How Awards Affect Winners' and Peers' Performance in Brazil*, 2017, Job Market Paper

⁷ Hoxby C., *Peer Effects in the Classroom: Learning from Gender and Race Variation*, 2000, NBER Working Paper No. 7867

⁸ Aucejo, E. et al, *Where vs What: College Value-Added and Returns to Field of Study in Further Education*, 2020, Centre for Vocational Education Research, LSE

⁹ Cornellissen, T. et al, *Peer Effects in the Workplace*, 2009, American Economic Review, Vol. 107, N.2

“I have learned a huge amount during my time at the competition, my first as the UK expert. I have spent time since returning to build a network of contacts within our industry to enable me to use their knowledge and infrastructure to improve the quality of training we provide if I am given the opportunity to train a squad for Lyon.”

“Having encountered many challenges during this past year, this made me more ambitious and committed to develop this new skill and lead the way in setting the standards and good practice at international level.”

We posit that trainer benefits emerge through the following channels:

- **Spill-overs to employees** – we conservatively assume that each trainer affects their colleagues in the same way that non-medal winning competitors affect their classmates.
- **Spill-overs to FE students/apprentices** – we assume the effect of trainers on each student is half what we estimate for educators trained through the Centre of Excellence (see Section 4.2.2).

We also assume that teachers/trainers benefit each class they teach in the future with a yearly decay rate of benefits by 25% – the benefit after five years is 0.42x the estimated benefit.

Overall, the NPV economic benefits generated by the WorldSkills UK’s skills competitions programme in the 2021-23 cycle of activities is estimated to be £30.2m in the central scenario and at least £17.9m in the conservative scenario. See Figure 9 and Figure 10 for a detailed breakdown of the benefits and Annexes A and B for an outline of the assumptions underlying these calculations.

Figure 8 Estimation of benefits of skills competitions programme in the central scenario

Benefit	Central scenario calculation	Evidence
Direct benefits = £8.7m	<ul style="list-style-type: none"> 17 medal winners with a benefit of £5k each 98 Squad UK non medal winners with a benefit of £4k each ~4.7k national competitors with a benefit of ~£2k each 	DfE/WSUK analysis of LEO data to estimate competition impact + conservative assumptions on selection bias of competitors based on internal WSUK competitor data
Classroom peer effects = £7.8m	<ul style="list-style-type: none"> 244 medal winners peers @ £4,330 each 1,406 Squad UK non-medallist peers @ £2,165 each ~34k national competitor peers with a benefit of ~£1,082 each 	Peer-reviewed economic literature on classroom peer effects + DfE data on classroom size + Internal WSUK data
Colleague peer effects = £2.7m	<ul style="list-style-type: none"> 54 medal winners colleagues @ £143 each 311 Squad UK non-medallist colleagues @ £143 each ~15k national competitor colleagues with a benefit of ~£71 each 	Peer-reviewed economic literature on business peer effects + ONS data on average workforce + Internal WSUK data
Trainer benefit = £0.08m	<ul style="list-style-type: none"> 205 colleagues in a company a trainer returns to after a competition @ £310 each 394 students affected by trainer returning to FE colleges at @ £210 each 	Internal WSUK data on trainers and survey evidence on upskilling after international competitions + DfE data on class size and teacher tenure + peer-reviewed economic literature on teacher effects

Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

Figure 10 Estimation of benefits from skills competitions programme in the conservative scenario

Benefit	Conservative scenario calculation	Evidence
Direct benefits = £8.7m	<ul style="list-style-type: none"> 17 medal winners with a benefit of £3k each 98 Squad UK non medal winners with a benefit of £3k each ~4.7k national competitors with a benefit of £3k each 	DfE/WSUK analysis of LEO data to estimate competition impact + conservative assumptions on selection bias of competitors based on internal WSUK competitor data
Classroom peer effects = £7.8m	<ul style="list-style-type: none"> 244 medal winners peers @ £3,831 each 1,406 Squad UK non-medallist peers @ £1,197 each ~33k national competitor peers with a benefit of ~£718 each 	Peer-reviewed economic literature on classroom peer effects + DfE data on classroom size + Internal WSUK data
Colleague peer effects = £2.7m	<ul style="list-style-type: none"> 54 medal winners colleagues @ £202 each 331 Squad UK non-medallist colleagues @ £126 each ~15k national competitor colleagues with a benefit of £37.93 each 	Peer-reviewed economic literature on business peer effects + ONS data on average workforce + Internal WSUK data
Trainer benefit = £0.08m	<ul style="list-style-type: none"> 205 colleagues in a company a trainer returns to after a competition @ £310 each 394 students affected by trainer returning to FE colleges at @ £105 each 	Internal WSUK data on trainers and survey evidence on upskilling after international competitions + DfE data on class size and teacher tenure + peer-reviewed economic literature on teacher effects

Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

Careers Advice

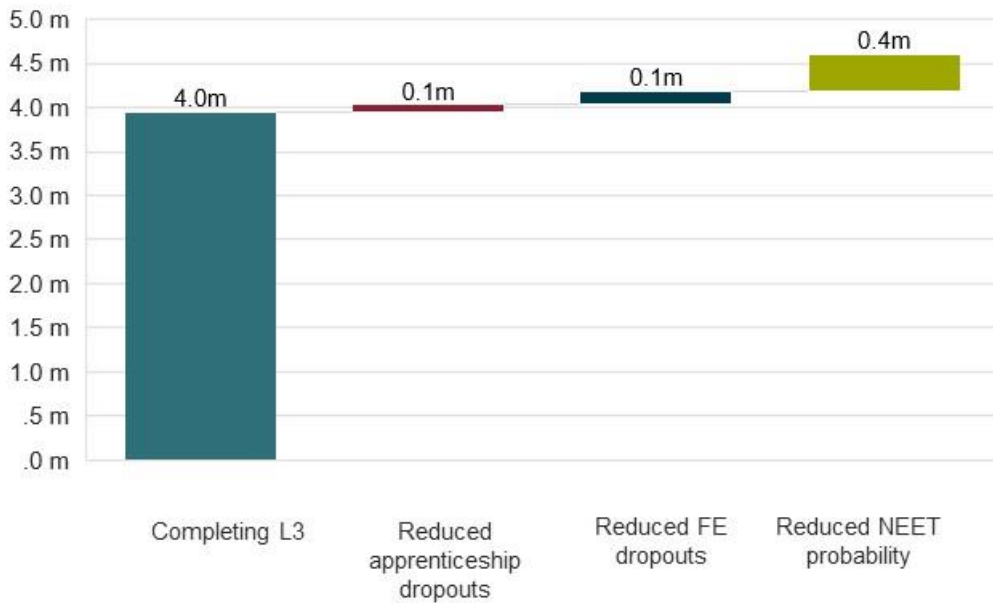
Receiving career guidance through the digital toolkit theoretically enhances young people’s understanding of the available FE and career opportunities. This empowerment enables students to make more informed decisions, facilitates better job matching and contributes to a more efficient allocation of resources in the job market. This abstract concept of reducing information gaps in the job market translates into several tangible, long-term outcomes. Among the immediate outcomes we were able to quantify with the available data, we identified:

- A decreased likelihood of students becoming NEET (not in employment, education or training).
- An increased probability of students successfully completing a Level 3 education.
- Reduced dropout rates from apprenticeships and FE programmes.

It’s important to note that in theory, careers advice could lead to additional outcomes, such as the reduction of skills gap, although we were unable to estimate these effects due to data limitations. These potential impacts are further explored in Section 5 of the report.

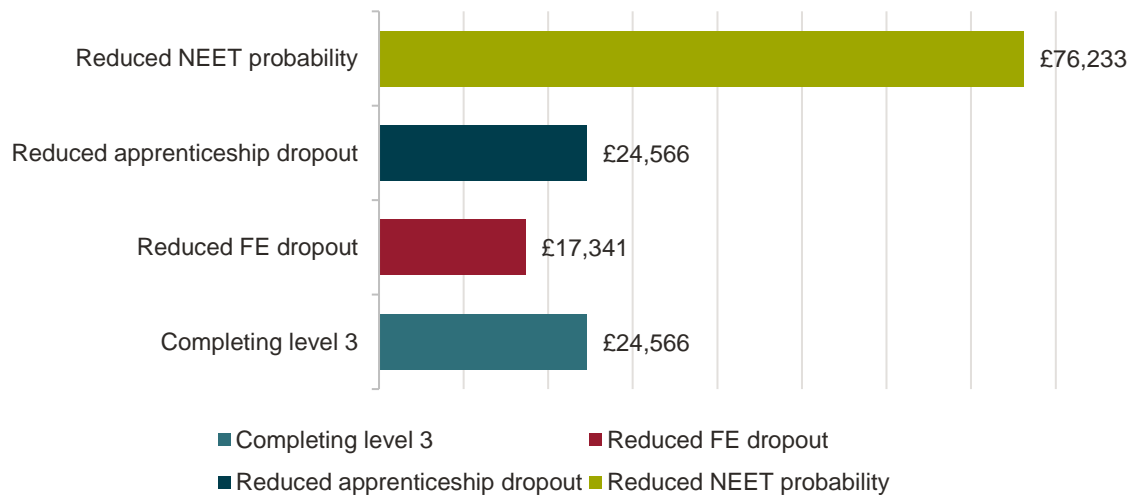
Figures 11 and 12 show the cumulative and per-student benefits of the Digital Toolkit in the central scenario, broken down by outcome category.

Figure 9 Cumulative benefit of careers advice in the central scenario



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

Figure 10 Per-student benefit of careers advice in central scenario



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

Overall, the NPV of economic benefits generated by WSUK’s careers advice activities in the 2021-23 cycle is estimated to be £4.6m in the central scenario and at least £3.3m in the

conservative scenario. See Figure 13 and Figure 14 for a detailed breakdown of the benefits and the Annexes A and B for an outline of the assumptions underlying the calculations.

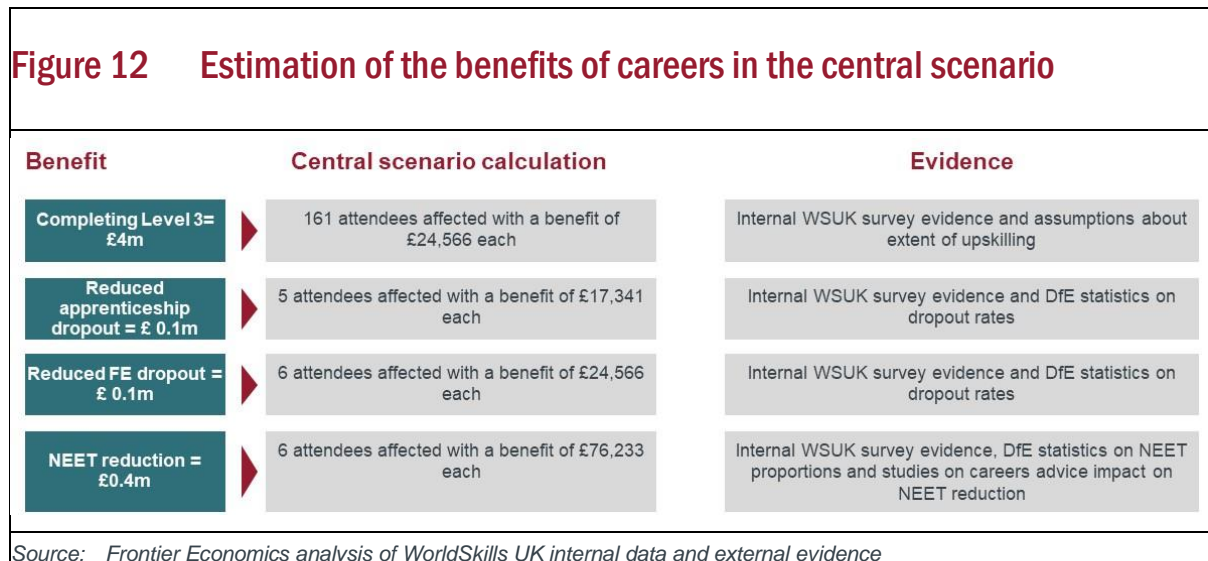
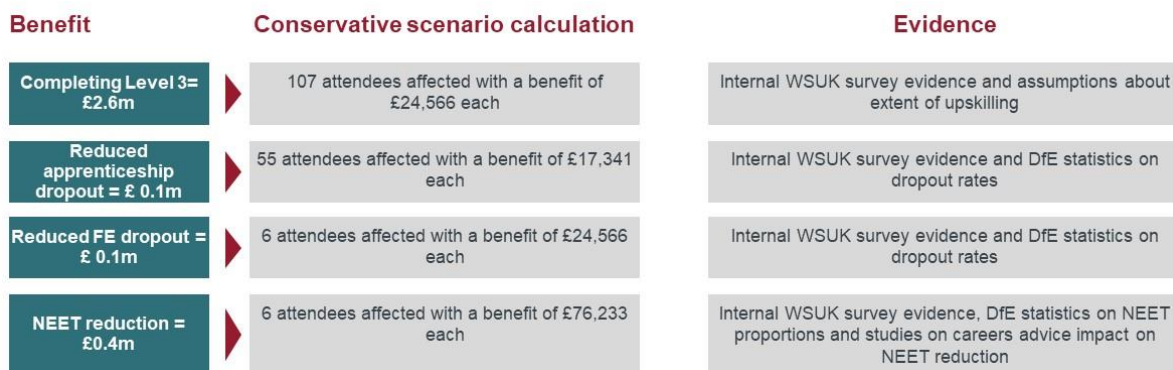


Figure 13 Estimation of benefits of careers advice in the conservative scenario



Source: Frontier Economics analysis of WorldSkills UK internal data and external evidence

4.2.2 Raising standards

Centre of Excellence

The WorldSkills UK Centre of Excellence is a workforce development programme that aims to equip educators across technical and vocational education and training (TVET) with the knowledge and skills to embed international best practice to advance technical teaching, training, and assessment into curriculum planning and delivery.

The Centre of Excellence is delivered through a three-pronged approach:

- **World-class teacher training:** This provides educators with the knowledge and skills to deliver world-class technical education.
- **A global community for thought leadership:** This brings together educators from across the world to share ideas and best practices.
- **An Innovation Network:** This supports educators to develop and implement innovative teaching practices, and embedding excellence in teaching and learning.

The Centre of Excellence is open to all educators who are involved in TVET, regardless of their experience or level of expertise. The programme is free to attend and is delivered online and in person. The Centre of Excellence has been running as a pilot during the 2020-2023 period (run over academic years September to August rather than financial years) and has already benefited over 4,000 educators and 64,000 learners (2,000 and 37,500 respectively during the two financial years covered by this RoI assessment). The programme has been highly successful and has been praised by educators, employers, and government officials. As of September 2023, it enters its next phase as Centre of Excellence 2.0, building upon the accomplishments of the pilot programme.

According to a recent evaluation of the Centre of Excellence, the programme continues to have a substantial impact on educator knowledge. The evaluation highlights that the programme is having a positive impact on all levels of the FE system, from individual educators to entire organisations. Educators are reporting a major substantial change in their knowledge of the topic, as well as an increase in their confidence and motivation to try new methods and approaches. This is leading to a significant improvement in the quality of teaching, learning and assessments, as well as learner outcomes. The programme is also having a positive impact at an organisational level, with many providers reporting changes to their course content and the way they operate.

We estimate the value of the Centre of Excellence primarily by studying the impact of enhanced teaching performance on learners' increased lifetime earnings. While we acknowledge that the Centre of Excellence can potentially yield various other benefits, we have chosen to concentrate on earnings due to its prominence in the existing academic literature on the value of higher teaching quality, which provides a wealth of high-quality evidence in this domain.

The economic benefit from higher teaching quality unlocked by the Centre of Excellence can be decomposed in two separate effect:

- **Direct benefit** – this is the benefit for learners who receive improved teaching input by attending the classes of educators who received the professional development delivered through the Centre of Excellence.
- **Cascade benefit** – this is the benefit for learners who benefit from higher teaching quality, despite attending classes of educators who did not receive the professional development delivered through the Centre of Excellence. These learners are still expected to receive better teaching inputs due to a knowledge spill-over between their educators and those who received professional development through the Centre of Excellence.

A number of academic papers value the impact of teaching quality on pupils' lifetime earnings. We set the parameters of our model referring to the methodology used by Hanushek (2011) to calculate the effect on lifetime earnings of a one standard deviation increase – as measured through value-added measures¹⁰ - in teaching quality.

While Hanushek (2011) studies the impact of a one standard deviation increase in teaching quality, there is no specific evidence to quantify the improvement in teaching quality in FE attributable to the Centre of Excellence. According to research by the Education Endowment Foundation (EEF)¹¹, the most effective professional development programmes for teachers can yield a one standard deviation enhancement in teaching quality, equivalent to 2 to 3 extra months of learning progress¹². However, since this research does not centre on professional development for FE educators and does not clarify the extent of professional development necessary for such improvement, we conservatively assumed that professional development provided to FE educators through the Centre of Excellence leads to a 0.2 standard deviation improvement in teaching quality. This conservative estimate helps address the uncertainty surrounding the measure of improvement and allows us to maintain confidence that our results represent the lower end of the potential earning benefits associated with higher teaching standards in FE. Importantly, this assumption does not imply that the improvement in teaching quality for FE educators trained through the Centre of Excellence cannot exceed this amount. Hanushek estimates the variation in lifetime earnings attributable to an increase in teaching quality as a function of the following parameters:

$$\Delta \textit{lifetime earnings} = \textit{baseline lifetime earnings} * \sigma * \phi * (1 - \theta)$$

where

- **σ is the learning gain** (i.e. the improvement in learners' attainment) determined by a one standard deviation increase in teaching quality expressed in standard deviation terms;
- **ϕ is the labour market return** (i.e. the percentage increase in earnings) of a one standard deviation improvement in achievement;
- **θ is the depreciation rate on prior learning** (this indicates how much of the learning attributable to a teacher carries over after the student leaves the classroom).

¹⁰ Value-added measures are statistical techniques used to assess the impact of teachers on the academic progress of students. These measures attempt to isolate the contribution of a specific teacher, taking into account the student's prior performance and other relevant factors. Whether differences in test-score gains across teachers measured by value-added capture causal impacts of teachers or they are primarily driven by student sorting is still object of debate. However, a number of recent papers concluded that value-added is an unbiased measure of teacher performance. Value-added measures are statistical techniques used to assess the impact of teachers on the academic progress of students. These measures attempt to isolate the contribution of a specific teacher, taking into account the student's prior performance and other relevant factors. Whether differences in test-score gains across teachers measured by value-added capture causal impacts of teachers or they are primarily driven by student sorting is still object of debate. However, a number of recent papers concluded that value-added is an unbiased measure of teacher performance.

¹¹ Sims et al. (2021). *What are the Characteristics of Effective Teacher Professional Development? A Systematic Review and Meta-analysis*.

¹² According to academic literature a one standard deviation increase in teaching quality is generally associated with an increase in pupil achievement ranging from 0.1 to 0.2 standard deviations. According to the Education Endowment Foundation (EEF), this corresponds to 2 to 3 extra months of learning progress.

Hanushek (2011) sets the values of these parameters at $\sigma = 0.2$, $\phi = 13\%$, and $\theta = 30\%$ in his central scenario. To ensure our approach is conservative we set the labour market return at $\phi = 13\%$ and the depreciation equal to Hanushek's upper depreciation scenario $\theta = 60\%$. A higher depreciation rate means a lower impact of teaching quality on lifetime earnings. Furthermore, we set $\sigma = 0.2$ in the central scenario and $\sigma = 0.1$ in the conservative scenario.

Using these parameters and the ONS estimate of the average lifetime earnings in the UK, and multiplying the overall increase in lifetime earnings by the Government NPV benefit ratio, we obtain a direct benefit of £4.6m in the central scenario and at least £2.3m in the conservative scenario.

To estimate the cascade benefits, we assume that the increase in teaching quality due to knowledge spill-overs is 0.04 standard deviations, or in other words, just 20% of the improvement of teachers directly exposed to professional development. Under this assumption, using the same parameters we used to estimate direct benefits, and applying them to the number of learners expected to experience cascade benefits, the estimated value of cascade benefits is £2.4m in the central scenario and at least £1.2m in the conservative scenario.

CPD Live and Learning Lab

CPD Live is a series of online professional development events that provide educators with the opportunity to learn about the latest trends and developments in technical education. The events are delivered by experts from industry and education, and cover a variety of topics, including teaching methods, assessment, and curriculum development. The CPD Live can create significant benefits to the UK economy by:

- **Improving teaching skills:** The events provide educators with the opportunity to learn about new teaching methods and techniques that they can use in their classrooms.
- **Increasing knowledge of industry standards:** The events provide educators with the opportunity to learn about the skills that are in demand by employers, which can help them to ensure that their students are equipped with the skills they need to succeed in the workplace.
- **Enhancing collaboration with other educators:** The events provide a platform for educators to collaborate and share ideas, which can help to improve the quality of teaching and learning.
- **Updating on latest trends and developments in technical education:** The events provide educators with the opportunity to stay up-to-date on the latest trends and developments in technical education, which can help them to ensure that their teaching is relevant and effective.

The WorldSkills UK Learning Lab is a free online platform that provides educators and learners with access to a wide range of resources to support skills development. The resources are aligned with international best practice and cover a variety of skills, including engineering,

technology, construction, and healthcare. The Learning Lab can create significant benefits to the UK economy by:

- **Improving skills development for learners:** The Hub provides learners with access to high-quality resources that can help them to develop their skills and knowledge.
- **Increasing teacher confidence and competence:** The Hub provides educators with resources to help them to improve their teaching skills and confidence.
- **Enhancing collaboration between educators and learners:** The Hub provides a platform for educators and learners to collaborate and share ideas.
- **Increasing awareness of international best practice:** The Hub provides access to resources that are aligned with international best practice, which can help to improve the quality of skills development in the UK.
- **Improving alignment of skills development with business needs:** The Hub provides resources that are aligned with the skills that are in demand by businesses, which can help to ensure that learners are equipped with the skills they need to succeed in the workplace.

It is not easy to quantitatively estimate the benefits of programmes aiming to raise teaching standards because there is no consensus on how to define and measure teacher quality, since teaching is a complex activity and student achievement is influenced by many factors. While for the Centre of Excellence we could rely on evidence from the literature on the impact of high-quality professional development for teachers, there is not much evidence available to quantitatively estimate the benefits of the CPD and the Learning Lab. The approach we took is based on conservative assumptions:

- We assume that CPD Live and the Learning Lab do not have any benefit over and above the Centre of Excellence. Therefore, any teacher or educator who received professional development through the Centre of Excellence does not experience any further benefit from CPD Live and the Learning Lab.
- We assume that only 50% of CPD Live users and 25% of Learning Lab users have not received training through the Centre of Excellence, and are going to benefit from CPD Live and the Learning Lab
- We assume that the per-teacher benefit of both CPD Live and the Learning Lab are only 5% of the direct per-teacher benefit of the Centre of Excellence.

4.3 Benefits not captured in the RoI calculations

Insights reports

WorldSkills UK plays an active role in disseminating research, both through its own publications and by commissioning studies. The organization also collaborates with government stakeholders, leveraging the evidence generated from its initiatives to influence policy decisions. Furthermore, WorldSkills UK has a significant presence across various media platforms, ensuring its outreach reaches diverse audiences. This investment in insights and research is expected to yield positive returns by providing valuable evidence that can

inform vocational policies and practices. Additionally, engaging with stakeholders has the potential to drive changes in attitudes, practices, and policy development. It's important to note that our assessment does not encompass the full scope of this impact.

Skills taskforce, skills gaps and productivity gains

The WorldSkills UK Skills Taskforce is an independent group of experts that was set up in May 2021 to provide recommendations on how the UK could get better at using high-quality technical skills to attract and retain more inward investment. The taskforce is expected to report its findings in early 2023. The Skills Taskforce can generate significant economic benefits to the UK economy by identifying the skills gaps that are preventing the UK from attracting and retaining more inward investment, developing recommendations on how to close these skills gaps, raising awareness of the importance of skills in the UK economy and influencing policy makers and businesses to invest in skills and ensuring that the UK has the skilled workforce it needs to thrive in the global economy.

In addition to this, WorldSkills UK activities are poised to deliver additional and potentially substantial impacts, including:

- **Addressing Skills Gaps:** One of their significant contributions lies in reducing skills gaps and mismatches within the UK job market. Many of the occupations featured in WorldSkills UK competitions align with areas where there exists a considerable disparity in required skills versus available workforce.
- **Boosting UK productivity:** The upskilling and the improvement in education outcomes for learners participating in WorldSkills UK activities will not only enhance labour market outcomes and increase lifetime earnings of learners. It will also contribute to increased productivity among firms employing these learners in the future. This, in turn, will bolster the UK's productivity and competitiveness in the global market, with a subsequent positive impact on the UK's GDP and therefore lead to augmented tax revenue from firms operating within the country.

The economic ramifications of skills gaps in the UK are profound. Data from the most recent release of Employer Skills Survey¹³ show that in 2019 the number of skill-shortage vacancies in the UK was 214,306, up 2.7% from 2017. A 2019 Learning and Work Institute¹⁴ report suggested that the lack of output caused by the UK skills shortage could cost the country £120bn by 2030.

It's worth highlighting that WorldSkills UK competitions target numerous hard-to-fill vacancies, encompassing 11 professions that are especially challenging to staff. The primary reason for these vacancies is the scarcity of requisite skills and skilled workers, which the competitions

¹³ <https://explore-education-statistics.service.gov.uk/find-statistics/employer-skills-survey>

¹⁴ <https://www.local.gov.uk/sites/default/files/documents/FINAL%20LGA%202019%20Skills%20Gaps%20report%20final%20December%202019.pdf>

aim to address by both promoting and enhancing the skills of young individuals in these demanding fields.

Table 2 Hard-to-fill vacancies covered by a WorldSkills UK competition

Hard-to-fill vacancies covered by a WorldSkills UK competition

Programmers and software development professionals
Engineers
IT business analysts, architects and systems designers
Web design and development professionals
Laboratory technicians
Graphic designers
Welding trades
Bricklayers and masons
Roofers, roof tilers and slaters
Carpenters and joiners
Plasterers
Care workers and home workers

Source: <https://www.gov.uk/government/publications/skilled-worker-visa-shortage-occupations/skilled-worker-visa-shortage-occupations>

Furthermore, the potential boost to UK productivity assumes particular relevance in light of the fact that the UK's productivity performance has been weak in recent years, especially compared with other G7 countries - according to the ONS, the growth of UK's output per hour between 2009 and 2019 was the second slowest of the G7 countries¹⁵.

Reduced turnover of teachers and lower recruitment costs for colleges

In addition to raising teaching standards and improving learners skills, the training and professional development offered through the Centre of Excellence is likely to increase the retention of teachers, reduce recruitment costs for FE colleges and unlock a range of further

¹⁵<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/ukproductivityintroduction/apriltojune2021>

benefits. According to a recent literature review by CooperGibson Research¹⁶, training and professional development can:

- Improve teachers' confidence, competence, motivation and satisfaction, which can lead to higher retention rates and lower turnover costs.
- Enhance teachers' career prospects, progression and mobility, which can increase their loyalty and commitment to the sector and institution.
- Help teachers cope with the challenges and demands of the FE sector, such as workload, diversity, quality and innovation, which can reduce stress and burnout and improve wellbeing and performance.
- Foster a positive organisation culture and climate, which can create a sense of belonging, recognition, and support among teachers and managers, which can improve retention and reduce recruitment costs.

International influence

Participation in international competitions holds the potential for several advantageous outcomes:

- **Elevating the Prestige of UK Skills Systems:** Engaging in international competitions has the capacity to elevate the reputation and prestige of the UK's skills systems. This enhancement can contribute to the increased export potential of educational products.
- **Enhancing Global Visibility for the UK:** The active involvement of the UK in international competitions can also serve to spotlight the nation on the global stage. This heightened visibility can foster greater cross-border collaboration and partnerships.
- **Attracting Investment to the UK:** By demonstrating high standards in skills and vocational education, the UK can become more appealing as an investment destination. This attraction can lead to an influx of foreign direct investment (FDI).
- **Facilitating Knowledge Exchange:** Participation in international competitions facilitates the transfer of best practices and knowledge in skills development. This exchange of expertise extends beyond borders, contributing to knowledge spill-overs and skill enhancement.

Notably, the endorsement and promotion of vocational education in the UK represent valuable contributions to the country's economy. The participation in international competitions opens up opportunities to showcase and promote UK vocational education globally. Therefore, there exists substantial potential for economic gains by promoting UK technical and vocational education abroad through international competition events, thereby fostering the export of educational services.

¹⁶https://assets.publishing.service.gov.uk/media/5c092eac40f0b670700d1236/Incentive_Programmes_for_the_Recruitment_and_Retention_of_Teachers.pdf

4.4 Comparison with previous findings

In 2021, Frontier Economics conducted a first RoI study¹⁷ of WorldSkills UK activities, focusing on the 2018-2020 period to align with the two-year WorldSkills Kazan cycle of international competitions. It is important to note that our RoI estimates for WorldSkills UK activities during the 2021-23 period should not be directly compared with those for 2018-20. This lack of comparability arises for two main reasons:

- **The range of activities conducted by WorldSkills UK has undergone significant changes since the onset of the Covid-19 pandemic.** WorldSkills UK has transitioned many of its events to online platforms and discontinued the UK LIVE annual event, which traditionally took place at the NEC in Birmingham and attracted over 70,000 participants¹⁸. Additionally, WorldSkills UK has developed a variety of digital resources, including online courses, webinars, and toolkits. Overall, the pandemic has pushed WorldSkills UK to adopt a more innovative and adaptable approach in carrying out its work. These changes have made WorldSkills UK's activities more accessible and resilient. Despite the challenges, the pandemic has provided an opportunity for WorldSkills UK to innovate and expand its reach. Furthermore, the WorldSkills UK Centre of Excellence was launched after the onset of the pandemic, in September 2020.
- **RoI estimates for the 2021-23 cycle of activities are grounded in evidence that was not accessible when the study on the 2018-20 cycle was carried out.** For example, in this present study, we could leverage insights from our prior research conducted in 2022 on the earnings and employment impacts of WorldSkills UK competitions¹⁹. This additional information allowed us to more accurately estimate the direct increase in lifetime earnings for learners participating in skills competitions, due to the upskilling and enhanced signalling resulting from participation in skills competitions.

¹⁷ <https://www.worldskillsuk.org/wp-content/uploads/2021/06/WSUK-ROI-FINAL-REPORT-V3-STC-1.pdf>

¹⁸ The WorldSkills UK LIVE event was the largest experiential skills, careers and apprenticeship event in the UK. The event featured competitions, demonstrations, and interactive exhibits from a wide range of industries, as well as opportunities for young people to meet with employers and learn about apprenticeships and technical education.

¹⁹ <https://www.worldskillsuk.org/wp-content/uploads/2022/12/Earnings-and-employment-effects-of-WorldSkills-UK-competition-based-training-final-v2.pdf>

5 Recommendations for further research

While we express confidence in the validity of the results obtained from this study, we recognise the potential for further research to enhance the depth of insights and bolster the robustness of our findings. We recommend that WorldSkills UK persists in its commitment to gather both quantitative and qualitative information, continually tracking the impact of its activities.

In our judgement, the following initiatives would add value from a research perspective and could be explored further by WorldSkills UK:

- **Competitor surveys:** Maintain regular surveys of competitors to monitor earnings and employment outcomes. Consider expanding surveying efforts to encompass other devolved administrations in the UK to broaden the geographical scope of the research.
- **Linking with administrative data sets:** Collaborate closely with the ONS and relevant data owners, including DfE, to explore potential data linkages between competitor data and the LEO dataset. This collaborative effort would facilitate even more robust econometric research on competition impacts, mitigating data and methodology limitations.
- **Digital Toolkit follow-up:** Keep tracking usage of the tool and consider follow-up surveys of Digital Toolkit users one to two years after the event to track their career decisions and satisfaction with the tool.
- **Centre of Excellence impact measurement:** Establish mechanisms to monitor the impact of the Centre of Excellence going forward, including:
 - **Establish a robust system for tracking teacher participation and engagement:** WorldSkills UK should keep implementing a comprehensive system for tracking the number of teachers participating in Centre of Excellence programs, as well as their level of engagement and satisfaction with the training they receive. This could involve using online registration systems, conducting surveys, or holding focus groups. Regularly reviewing this data will provide valuable insights into the effectiveness of the Centre of Excellence's training programs and identify areas for improvement.
 - **Measure the impact of teacher training on learner outcomes:** To assess the true impact of the Centre of Excellence' teacher training, WorldSkills UK should track the performance of learners taught by teachers who have received Centre of Excellence training. This could involve comparing standardised test scores and employment outcomes of students taught by trained teachers to those taught by untrained teachers. Such data will provide concrete evidence of the effectiveness of the Centre of Excellence's training programs in enhancing student outcomes.
 - **Track teacher turnover rates and recruitment costs for FE colleges participating in the Centre of Excellence:** WorldSkills UK should collect data on teacher turnover rates and recruitment costs for FE colleges participating in the Centre of Excellence. This data can be compared to the same data for FE colleges that are not participating in the Centre of Excellence to assess the impact of the Centre of Excellence on these two key metrics.

- **Programme participation tracking for CPD Live and the Learning Lab:** Monitor participation rates in CPD Live and the Learning Lab, surveying participants to understand self-reported gains or benefits. Additionally, survey learners to measure satisfaction and outcomes.
- **Policy influence measurement:** Establish mechanisms to estimate the economic benefits of WorldSkills UK's policy influence, including:
 - **Recording outcomes of research:** Document the outcomes of research, including citations and references, as well as specific actions taken as a result of the research findings.
 - **Tracking senior leadership engagements:** Monitor and document senior leadership's interactions with key policy stakeholders, focusing on direct outcomes resulting from these engagements, such as informed skills strategy development.
 - **Annual "Brand Awareness" assessment:** Conduct yearly assessments of WorldSkills UK's "brand awareness" to gauge changes in brand recognition resulting from variations in outreach efforts.
 - **Identifying research gaps:** Compile a list of key gaps in evidence within the field of technical and vocational education research. Keep track of how WorldSkills UK's research initiatives contribute to filling these gaps.
- **Estimation of benefits from reduction of skills gaps:** explore avenues to estimate the economic benefits resulting from WorldSkills UK's efforts in narrowing skills gaps and fostering spill-over effects, including:
 - **Tracking shifts in career interests:** Assess changes in career interests before and after involvement in WorldSkills UK activities, enhancing survey methodologies.
 - **Sector deep dives:** Conduct in-depth studies into specific sectors or skills areas to assess the incremental impact competitors make on output and/or productivity.
- **International influence measurement:** Quantify the benefits resulting from WorldSkills UK's international influence through:
 - **Employer engagement survey:** Conduct a comprehensive survey of employer participants at WorldSkills events to ascertain whether they engaged with employers from other countries and potential investors, shedding light on the extent of international collaboration.
 - **Analysis of medal position impact:** Analyse the UK's medal positions in various skills categories and explore their correlation with associated increases in foreign investment pertaining to those specific skills.

For new activities, not currently in scope, we recommend that WSUK carry out work to understand their potential outcomes and impacts and put in place infrastructure to gather data and evidence on these outcomes and impacts.

6 Conclusion

The impact and value of WorldSkills UK activities are large. We conservatively estimate an RoI for the taxpayer of £3.50 for every pound in WorldSkills UK in our central scenario, and at least £2.10 in our conservative scenario. This demonstrates high value for money, aligning with the Department for Transport's Value for Money Supplementary Guidance²⁰ which categorises a benefit-to-cost ratio of more than 2 as "High Value for Money" (and above 4 "Very High Value for Money").

Additionally, the organization's extensive reach highlights its ability to engage not only the FE sector but also international partners and learners. Each year, WorldSkills UK engages over 200,000 young individuals through its activities.

The benefits to the taxpayer in our headline RoI calculations come for four main sources:

- The largest benefit is a **direct upskilling effect** of individuals participating in the skills competitions programme (national or international). This arises from the training and the competitive environment itself, leading to increased lifetime earnings due to improved skills and better signalling of their capabilities.
- In addition to direct upskilling, there are **spill-over benefits** within the skills competition programme, where participating students share knowledge and inspire their peers, resulting in improved performance and earnings for the peers themselves.
- Furthermore, **increased information about career prospects and career guidance** translates to improved educational and job matching outcomes for students receiving career advice at live events, reducing dropout rates and enhancing employability and earnings over their lifetimes.
- Finally, **higher teaching standards** in FE improve learners' cognitive skills and educational outcomes, reducing the likelihood of them being not in education, employment, or training (NEET) and increasing their lifetime earnings.

In addition to these quantifiable benefits, there are a number of positive impacts from WorldSkills UK's activities which were not captured in our assessment either because they are still in their early stages of development or there is a lack of data to support the assessment. Many of these benefits could be quantified through further research. They include:

- **Benefits from research and insights activities aiming to mainstream global excellence in skills** – These activities will help sharing international best practices, exploring global trends in skills development, and benchmarking the UK's skills systems against those of other countries. These efforts ultimately contribute to the success of young people, employers, and the UK economy.

²⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918481/value-for-money-supplementary-guidance-on-categories.pdf

- **Potential reduction of skills gaps in the UK economy** – It is very likely that WorldSkills UK's activities have an effect on reducing skills gaps and skills mismatch in the UK labour market (a number of WorldSkills UK competitions are in occupations with a considerable skills gap).
- **Productivity gains within firms and higher tax receipts for businesses** – Participation in WorldSkills UK activities enhances the skills and educational achievements of learners, leading to heightened productivity for the firms employing them in the future. This, in turn, leads to an increase in tax revenues from firms operating within the country and strengthens the UK's competitiveness in the global market, positively impacting the nation's productivity and contributing to an upswing in GDP.
- **Wider productivity spill-over effects** – The spill-over effects we value only apply within the employer firm, but productivity spill-overs between one firm which employs a competition participant and one that does not may also be present.
- **Reduced turnover of teachers and lower recruitment costs for colleges** – The training and professional development offered through the Centre of Excellence is likely to increase the retention of teachers, reduce recruitment costs for FE colleges and unlock a range of further benefits.
- **International influence** – By being a key member of the WorldSkills UK network, WorldSkills UK is able to raise the profile and prestige of UK skills, possibly enhancing the export potential of education products and encouraging investment into the UK.

Taken together, these additional benefits are likely to generate additional value for the UK over and above what was included in our assessment. All of this points to WorldSkills UK delivering high value for money for the UK taxpayer and as such, there is a strong case for continued support for the organisation by DfE.

Frontier Economics Ltd is a member of the Frontier Economics network, which consists of two separate companies based in Europe (Frontier Economics Ltd) and Australia (Frontier Economics Pty Ltd). Both companies are independently owned, and legal commitments entered into by one company do not impose any obligations on the other company in the network. All views expressed in this document are the views of Frontier Economics Ltd.

