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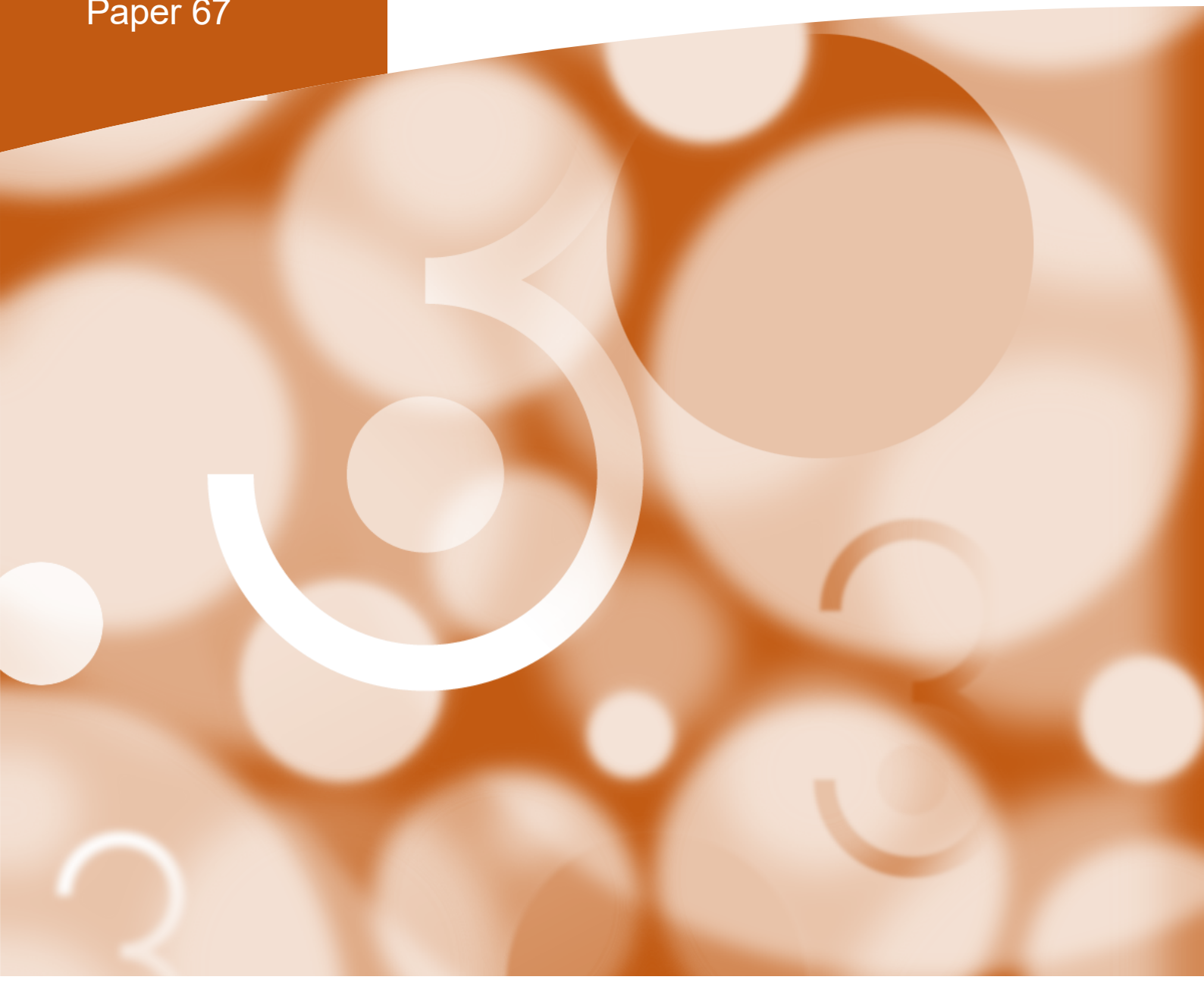
Mapping the evidence on learning to earning interventions in low- and middle-income countries

A framework proposal and scoping review

May 2025

Working Paper 67

Education



3ie International Initiative for Impact Evaluation

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About this working paper

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Executive summary

Youth unemployment remains a major issue in low- and middle-income countries (L&MICs), driven in part by a persistent shortage of skilled workers and rising numbers of youth not in employment, education or training (NEET). Technical and vocational education and training (TVET) is a key strategy for addressing this challenge, but funding for TVET remains limited and fragmented. To ensure that investments in this sector are guided by the best available evidence, the UK's Foreign, Commonwealth and Development Office (FCDO) has partnered with 3ie to launch a three-phase programme to synthesise and generate evidence on TVET interventions in L&MICs.

This report is the output of the first of a three-phase programme. It introduces a preliminary framework that maps "learning to earning" interventions (i.e., policies, programmes and projects) which support the transition from education to employment, against key learning and labour market outcomes. In developing the framework, we explored the causal pathways through which TVET interventions are expected to influence learning and labour market outcomes. Drawing on literature and interest-holder consultations, we identified the core barriers that limit the effectiveness of TVET programmes, such as learner access constraints, educator capacity gaps, and weak accountability mechanisms, and used these to structure the framework.

The framework includes five intervention categories: the availability, access, quality, and delivery of TVET, as well as supplementary services such as certification and job placement. The framework outcome categories include education and skills development, access to and quality of TVET services, individual labour market outcomes (e.g., employment, earnings), and business outcomes for both trainees (e.g., entrepreneurship success) and training providers (e.g., employee retention or productivity). The framework also incorporates cross-cutting themes, which are analytical filters used to better understand how interventions may vary in effectiveness across different contexts or populations. These include gender equity, green skills, and cost-effectiveness.

The report also presents a rapid scoping of the existing evidence base, using 3ie's Development Evidence Portal (DEP). This exercise identified 91 impact evaluations and 13 systematic reviews, with notable regional disparities and methodological variation. Only one high-confidence systematic review with a primary focus on TVET was identified, which indicates a significant synthesis gap in the field.

As next steps, we will invite inputs on the framework from interest-holders working in the sector with the goal of arriving at broad buy-in and resonance within academia, policy and practice communities. We will facilitate this through a series of consultations, webinars and dialogues. In parallel, we will start planning for the second and third phases of this programme, with the goal of developing a set of global public goods supporting evidence informed decision making in the sector, including an evidence gap map (EGM) and a comparative effectiveness systematic review and 'Best Buys' report.

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Acronyms

3ie	The International Initiative for Impact Evaluation
DEP	Development Evidence Portal
DiD	Difference-in-difference
ETF	European Training Foundation
FCDO	Foreign, Commonwealth and Development Office
HICs	High-income countries
IE	Impact evaluation
ILO	International Labour Organization
J-PAL	Abdul Latif Jameel Poverty Action Lab
L&MICs	Low- and middle-income countries
MCC	Millennium Challenge Corporation
MOOC	Massive open online course
NEET	Not in employment, education or training
OECD	Organisation for Economic Co-operation and Development
SR	Systematic review
STEM	Science, technology, engineering and mathematics
TVET	Technical and vocational training and education
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund

1. Background

1.1 Youth unemployment in low- and middle-income countries

In 2025, despite positive gains in the past few years, youth unemployment will continue to be a global issue. Estimates show that the global youth (aged 15-24 years) unemployment rate is estimated to stand at 12.5% (ILO 2025), a decline from the pre-pandemic rate of 13.8% in 2019 (ILO 2024). However, this positive trend is not consistent across regions. In East Asia, the Arab States and South-East Asia and the Pacific, youth unemployment rates in 2023 were higher than in 2019 (ILO 2024). While many causes of youth unemployment exist, such as the decent work deficit (ILO 2024), one main contributor and challenge that many sectors face is a substantial shortage of skilled workers (Levin et al. 2023).

In addition to youth unemployment, the proportion of global youths not in employment, education or training (NEET), the indicator used to measure SDG 8.6.1, has remained stagnant at 20% over the past five years (ILO 2025). It is further estimated that one-third of youths reside in countries "off track" to achieving SDG indicator 8.6.1, primarily low-income countries in Arab States, North Africa and Sub-Saharan Africa. (ILO 2024).[1] This issue is becoming increasingly severe for underserved groups, including women. When breaking down youth NEET rates by sex, two-thirds of all young NEETs in the past five years are women (ILO 2025; ILO 2024). This gender divide remains when looking at youth labour force participation rates. From 2021 to 2023, women's youth labour force participation rate was 34% compared to 49% for young men (World Bank 2025).

1.2 Addressing youth unemployment through evidence-informed action

Technical and vocational education and training (TVET) is one of the main pathways for youth to transition from learning to earning, yet it remains critically underfunded (Levin et al. 2023). Low- and middle-income countries (L&MICs) rely primarily on domestic public funding for vocational education, although investment is less than 0.2% of GDP, compared to 0.46% in HICs (Levin et al. 2023).[2] And even before the global aid landscape shifted in early 2025, international funding for the sector was limited. ODA funding for vocational training in L&MICs fluctuates and varies by region (Levin et al. 2023). In Northern and Sub-Saharan Africa, it rose from US$34.8 billion in 2019 to US$40 billion in 2020, before declining to US$37 billion in 2022-23 (OECD 2025). In South America, it rose from US$36 billion in 2019 to US$50 billion in 2022, before declining to US$39 billion in 2023 (OECD 2025).

With funding decreasing, the need to ensure that what resources are available are used effectively is more important than ever. The use of rigorous evidence to inform decision making can ensure that the available resources are used as effectively as possible. Whether that investment is made by governments of L&MICs or by international and

[1] ILO (2024) considered a country or subregion as "off track" if the youth NEET rate saw no change or increased between 2015 - 2023 and was higher than 15 percent in 2023.

[2] The data includes how much money different levels of government (local, regional and national) spend on vocational education for secondary and postsecondary (but not university-level) students. The spending includes current and capital expenses, and transfers from 2011 to 2022

bilateral agencies, knowing which interventions have the largest effects, are most cost-effective and are scalable, for example, can help inform how to spend limited resources for the best effect.

In practice, this means access to high-quality, synthesised evidence comparing the costs and effects of different programmes and policies. While our scoping review shows an emerging primary evidence base on the effects of interventions focusing on the learning to earning transition, there have been no recent attempts at a sector-wide synthesis focusing on labour market outcomes.

With the urgent need to ensure that resources in this space are used effectively, the FCDO has identified a need to improve confidence in the evidence base and ensure funding is targeting the most cost-effective and impactful initiatives. There is also an expectation that the evidence base is somewhat limited in certain areas, with a potential need for investing in further evidence generation. For instance, further research focusing on core, as opposed to technical, skills, newer areas such as green skills and across a variety of countries and contexts.

Responding to this need FCDO has partnered with 3ie to begin developing an evidence synthesis and generation programme on TVET interventions in L&MICs to facilitate evidence informed decision making in the sector. The programme will be conducted in three phases and produce three research outputs, namely an initial scoping paper, evidence gap map and a systematic review and 'Best buys' report.

This report is the culmination of the first phase of this programme. We present a preliminary framework of learning to earning interventions and labour market outcomes developed based on the existing evidence base and in consultation with FCDO, academic experts and other interest-holders in the sector.

Our goal is that this framework can be used as the foundation for a second phase which focuses on searching for and identifying relevant literature to understand what has been researched and what gaps remain. The basis of this mapping exercise will then be used in a third, in depth synthesis phase which seeks to assess what works, including the comparative cost-effectiveness of different interventions.

2. A framework of learning to earning interventions

2.1 How we developed the framework

This scoping report is the result of a rapid scoping exercise, identifying what current research exists in the TVET and learning to earning domain and several consultations held with stakeholders. Initially, we consulted policy and academic literature by searching for relevant studies on 3ie's Development Evidence Portal (DEP)[3] and other relevant sources such as J-Pal, VoxDev and previous synthesis literature. We then produced a draft framework which was revised based on consultations held with FCDO, as well as academics, funders, practitioners and implementers (see Appendix A for the full list of

[3] 3ie's DEP is a repository of over 17,000 impact evaluations and 1,400 systematic reviews on topics across international development. The DEP is updated based on a monthly search and screening process and operates as a global public good.

consultations held). Alongside our framework, we briefly present an overview of what the evidence base in a potential second phase might look like.

2.2 What are learning to earning interventions?

The term "learning to earning" describes the process of moving from education to employment or entrepreneurship, acknowledging that this transition is not always straightforward. It encompasses diverse learning experiences, while also accounting for periods of stable employment, irregular work, unemployment or economic inactivity (Nicolai et al. 2023; UNICEF n.d.). This concept is particularly relevant in discussions about school-to-work transitions, as young people often encounter obstacles such as skill mismatches, limited job prospects and structural barriers within the labour market (UNICEF n.d.).

In creating a framework that defines learning to earning interventions and labour market outcomes, we focused on the delivery of technical and vocational education and training, as well as other supplementary interventions that aim to bridge the gap between education and employment. The supplementary interventions we have included are those commonly provided to TVET participants. When discussing TVET, we are inclusive of both TVET and skills training, including both core and technical skills as defined by the ILO (ILO, 2021). We also capture emerging areas such as green skills and have no restrictions on the types of skills and vocational training provided.

Using labour market terms, we focus here on supply-side interventions, and do not seek to cover interventions aiming to increase the number of employment opportunities available. Our framework focuses on interventions equipping participants with the knowledge and skills required to fill employment opportunities that exist in local markets. We recognise of course that there may be a lack of employment opportunities in certain contexts (Cieslik, Barford and Vira 2022; Barford, Coombe and Proefke 2020; Fox, Senbet and Simbanegavi 2016), but for reasons of feasibility we focus here on supply-side programming only. The exercise we have undertaken here could be replicated with a focus on demand-side programming. Combined with this work the output would be a comprehensive scoping of all programming supporting the learning to earning transition.

2.3 How might learning to earning interventions work?

When developing a framework of programming in any given sector, it is helpful to identify the exact issues that interventions are aiming to address. By looking at these issues, we are able to explore the causal pathway through which learning to earning interventions will impact labour market outcomes. While at a higher level, the problem faced here relates to youth unemployment due to a lack of appropriate skills and access to job opportunities to convert knowledge and skills into earning, having identified TVET as a potentially effective set of interventions to address this issue, we now need to understand which barriers prevent TVET interventions from being effective.

A joint report by the World Bank, ILO and UNESCO (Levin et al. 2023) outlines three symptoms of a broken TVET system, all of which are routinely cited in the literature as major barriers to the effectiveness of TVET interventions.

Firstly, there are significant barriers facing TVET learners. They are often financially challenged, lack information related to the labour market and TVET opportunities and females may suffer from social norms that prevent their participation (Osman 2014; ACET 2022; Avis 2024; Morley 2023). Learners may also face further societal stigma (Essel et al. 2014; Morley 2023) and lack foundational skills, as those who have performed poorly throughout the education system are often guided into TVET programmes (Obiakor and Newman 2022). Secondly, educators and trainers often lack the pedagogical knowledge and skills to deliver TVET interventions effectively (OECD 2021; Cedefop 2022; Subrahmanyam 2022). Finally, there are often few incentives for TVET providers to be accountable to either learners or enterprises (Ricou and Moore 2020). Most data collected as part of TVET programming looks at inputs as opposed to results and the data which helps understand why some learners are more successful is often hidden from stakeholders (Levin et al. 2023).

We have developed a framework of interventions and outcomes that aim to support the transition from learning to earning, using these three broad categories of barriers as our core organising framework for grouping interventions. Below, we outline our framework and provide examples of the types of interventions included in each of our categories (our full framework is available in Appendix B).

2.4 A framework for learning to earning interventions and outcomes

The following section outlines our intervention and outcome framework. To begin, we explore each intervention category, providing example studies of research for each type of activity. These categories are ordered based on our intervention groups. We then discuss our cross-cutting themes and end by presenting our outcomes framework.

2.4.1 Interventions

Availability of technical and vocation education and training programmes

To transition from learning to earning through participation in TVET programmes, a prerequisite is the availability of programmes for participants to join. The availability of technical and vocational education and training programmes group captures both government-led and private sector initiatives focused on the provision of TVET, either directly or through incentives. **Formal education development** includes policies and reforms that integrate TVET into national education systems, such as the introduction of high schools specialised in TVET (Yu et al. 2020). Meanwhile, **private sector development** can encourage businesses to participate in TVET delivery by offering wage subsidies and fostering public-private partnerships (PPPs) that support employer-led training initiatives (Oviawe 2018; Remington 2018; ETF 2020).

Access to technical and vocational education and training

Once TVET programmes become available, the focus shifts to addressing the barriers that prevent individuals from accessing them. Interventions which tackle these multidimensional barriers are grouped within the access to technical and vocational education and training group.

Financial and in-kind support interventions provide direct financial assistance through scholarships, cash transfers or vouchers to cover course-related expenses (Hicks et al. 2011; Blattman, Fiala and Martinez 2012; Camargo et al. 2021). These interventions

specifically focus on removing financial barriers to accessing TVET services. This is distinct from financial support interventions that solely aim to help individuals start businesses, such as public cash transfer programmes for new startups (Wu 2024), which do not intend to enhance access to TVET. Social barriers, such as societal stigmas and negative perceptions surrounding participation in TVET, can be addressed through **awareness programmes to counter social norms and biases** (Del Carpio and Guadalupe 2022; ILO 2017; Gyan-Amponsah, 2023; Osman and Speer 2024)**.** These interventions may target the general public or families to reshape negative perceptions of TVET participation, as well as underrepresented groups within societies. Excluded from this intervention category are wider social programmes that may include aspects outside of the TVET sphere, for instance, safe space campaigns (Bandiera et al. 2020).

Building quality technical and vocational education and training services
The quality of TVET programmes remains an important barrier for delivering better labour market outcomes. Improving the quality of TVET services depends on well-trained instructors, industry-aligned curricula and effective teaching methods to equip learners with the skills necessary for a successful transition into the workforce (Levin et al. 2023). The group, building quality technical and vocational education and training services, captures interventions that aim to increase the quality and effectiveness of TVET services.

Systemic capacity strengthening includes activities such as curriculum reforms, upgrades to physical infrastructure to create an inclusive environment and labour market information services to ensure the skills provided during TVET programmes match those required in the workplace (Dobbo 2018; Dubey et al. 2018; Mujuri and Kathomi, 2024). While the previous category focuses on systemic changes, **education and trainer delivery strengthening** focuses on addressing the educators' skills gap by providing them with pedagogical or vocational skills training (Blimpo and Pugatch 2023; Brown et al. 2023).

Increasing participants' access to relevant information can also increase the success of TVET programmes. **Vocation information** interventions provide TVET participants with information related to a vocation (e.g., wage expectations) to make an informed decision when joining a programme (Chakravorty et al. 2021; Gassier, Rouanet and Traore 2022). **Guidance services**, which capture activities such as mentorships and counselling services, pair participants with experienced professionals to offer advice, guidance and leadership (Alfonsi, Namubiru and Spaziani 2022; Germann et al. 2023; Hayashi et al. 2024).

Technical and vocational education and training delivery
Technical and vocational education and training delivery, is the group that captures programmes which equip individuals with both technical and core skills. Technical skills refer to occupation-specific competencies acquired through formal training and hands-on experience, while core skills include social, emotional, cognitive, digital and green skills that are transferable across different jobs and industries (ILO 2021). Together, these skills enable individuals to adapt, collaborate and innovate in an evolving labour market, ensuring they are not only job-ready but also capable of long-term career growth (ILO 2021).

Rather than relying on commonly used terminologies that may be inconsistent across different contexts (e.g., apprenticeships) the interventions we capture within our delivery group are based on the specific components that make up the activities. **Technical and vocational education (formal)** takes place in formal education environments such as schools and universities (López-Acevedo 2001; Castellano et al. 2012). Meanwhile, **technical and vocational education (non-formal)** occurs outside traditional formal institutions, including flexible and community-based learning environments (Barrera-Osorio, Kugler and Silliman 2021; Croke, Goldstein and Holla 2022; Novella, Rosas-Shady and Freund 2024;). Both categories capture programmes where the only component is education and training delivered in a classroom-based environment. **On-the-job training** provides skill development directly in the workplace without a formal educational structure (Bafaneli and Setibi 2015; Jung and Lee 2017), while **technical and vocational education combined with on-the-job training** integrates classroom learning with practical application, such as apprenticeships and internships (Crépon and Premand 2019; Hull et al. 2020). Focusing on broader workplace readiness, **core skills training** develops essential soft skills such as communication, problem-solving and adaptability, enhancing employability beyond technical competencies. The examples include microcredential programmes and entrepreneurship training that solely focus on core skills training (Shankar, Onyura and Alderman 2015; Calderone et al. 2019; Ashraf et al. 2020).

Supplementary education and training services

After TVET is delivered, challenges may still prevent participants from securing meaningful employment. Supplementary education and training services capture interventions that aim to further bridge the gap from learning to earning by supporting workforce transitions and long-term employment. **Certification programmes** validate technical and core skills, increasing employability and access to organisations that offer better working conditions (Bassi, Nansamba and Rasul 2018; Carranza et al. 2021). **Job matching services** help connect graduates with relevant opportunities (Ahn, Dizon-Ross and Feigenberg n.d.), while **job search training** improves employability by strengthening CV writing, interview skills and professional networking (Wheeler et al. 2022; Fazio, Freund and Novella 2025). Although job search skills are considered part of the ILO core skills framework (ILO 2021), interventions that focus solely on these skills are categorised separately from **core skills training**.

Cross-cutting themes

While our intervention and outcome framework seeks to comprehensively capture relevant programming related to the learning to earning transition, other cross-cutting themes are pivotal to the domain. These cross-cutting themes, which branch across multiple interventions, are best captured in our framework as filters and are useful ways to divide the evidence base. Below, we highlight key themes which will be incorporated into further phases of our wider project.

Many interventions, especially those targeting access to training and services, may seek to overcome barriers specific populations face. Here, we propose a theme that addresses whether interventions target specific populations, such as women (Elsayed, Namoro and Roushdy 2022), persons with disabilities (Igei et al. 2020), conflict-affected/ displaced persons (Karlan et al. 2022) and rural populations (U-Learn, 2023) who may face specific geographical/physical barriers.

While our intervention categories capture the delivery of TVET, a further way to explore this evidence base will be by looking at factors related to the programmes themselves. For instance, whether the content is focused on green skills (Shankar et al. 2015), specific vocations (Miller et al. 2024) or wider educational topics such as STEM (Abuhummour 2024). Another key aspect may be the length of the training or education provided, for instance, short-term programmes (Batchuluun et al. 2017) or long-term programmes (Yamauchi et al. 2023). With the digitalisation of TVET we will also capture the specific delivery method, for instance online (potentially as part of a MOOC) or face-to-face. Finally, we will capture information related to the funding mechanism of the programme including who the funder is.

Finally, given the need to ensure resources in the sector are used effectively, we plan to include a filter which captures whether studies conduct cost-effectiveness analysis or not. Past 3ie experience on mapping exercises (phase 2) highlights that cost-effectiveness is rarely conducted as part of an evaluation (Gonzalez Parrao et al. 2024; Marion et al. 2024; Nabi et al. 2024). However, understanding and identifying the extent to which cost-analysis is built into programming within a sector can help further understand what works, at what cost and where further evidence is needed.

2.4.2 Outcomes

In addition to our interventions, we have also developed a framework of outcomes, those which are commonly evaluated as part of learning to earning programmes. Here, we discuss our outcomes at the group level (our full outcome list can be found in Appendix B).

Availability of technical and vocational education and training outcomes capture any measure of the number of opportunities that are available for either TVET programmes or on-the-job training placements. **Access to technical and vocational education and training** captures outcomes measuring changes in attitudes related to vocational work and TVET participation as well as the number of participants in TVET programmes. **Quality technical and vocational education and training services** capture outcomes measuring the quality of TVET. This includes assessments of an institution's and teacher's/trainer's ability to deliver TVET effectively. As well as whether TVET programmes are providing participants with the necessary skills they need through outcomes such as course completion and employment in vocations related to a participant's training.

Skills and education outcomes capture the skills developed by a participant during a TVET programme. This includes not only the possession of skills, but also their application. **Labour market outcomes (individual/households)** capture both immediate and downstream outcomes, for instance, wage employment as well as asset ownership. **Business outcomes (trainee firms)** captures any outcomes related to the business performance of a firm set up by a participant of a TVET programme. This will most likely capture outcomes related to entrepreneurship or core skill programmes. Whereas **business outcomes (training firms)** capture any business outcome as measured from the perspective of a firm providing training as part of a TVET programme. For instance, measures of whether employees are retained or whether new hires are displacing existing employees.

3. Results from preliminary scoping of the evidence base

The following section provides a summary of a rapid scoping of the potential evidence base related to our framework above. The evidence base was identified using 3ie's Development Evidence Portal (DEP) and did not consult any other sources.[4] As the DEP categorises all studies based on its own intervention taxonomy, the team scoped all studies identified as:

> Technical and Vocational Education and Training (TVET): Education and training which provides knowledge and skills for employment. TVET uses formal, non-formal, and informal learning.
>
> Labour market services and intermediation: Provision and promotion of employment services to jobseekers, such as job-matching, support, and counselling and advice.

It is important to note that the DEP taxonomy does not align perfectly with our framework. However, the two DEP intervention categories selected for this exercise are of clear relevance, and studies coded with these interventions are likely to map into our framework. In total, there were **91 impact evaluations** and **13 systematic reviews**.

3.1 Impact evaluation evidence base

Over one-third of all impact evaluations were conducted in Sub-Saharan Africa (n = 33). The evidence base across South Asia (n = 17), East Asia and Pacific (n = 16) and Latin America and Caribbean (n = 16) was similar, while fewer studies were identified in Europe and Central Asia (n = 6)[5] and the Middle East and North Africa (n = 3). One study occurred across multiple continents (Coulibaly and Yogo 2020).[6] Only six countries were the setting for five or more studies. Bangladesh (n = 8) and Uganda (n = 8) were the most common countries, followed by China (n = 7), India (n = 6), Brazil (n = 5) and Nigeria (n = 5).

There was a near-equal split between experimental (n = 49) and quasi-experimental (n = 42) evaluation designs. All experimental evaluations were randomised controlled trials, while fixed effects incl. DiD (n = 18) and statistical matching (n = 17) were the most common quasi-experimental methods. Instrumental variable design (n = 6) and regression discontinuity design (n = 1) were rarer quasi-experimental methods. Few studies employed a qualitative component alongside their quantitative analysis, with only 16 studies utilising a mixed-methods approach.

[4] Due to the rapid nature of this scoping exercise, solely utilising 3ie's DEP was a practical decision. As 3ie operates the DEP, the research team had access to underlying data related to the studies, meaning no additional data extraction was required.

[5] The DEP only includes studies conducted in L&MICs. Europe and Central Asia has a large number of HICs, so we anticipate identifying fewer studies in this region. This also explains the absence of North America which is only made up of HICs.

[6] One study (Dennison, 2022) took place across the Middle East and North Africa and South Asia, and has been coded against both regions separately as opposed to the multiple continent code, which has been used when large multi-country datasets were employed (Coulibaly and Yogo 2020).

Nearly half of all studies (n = 41) had an equity focus. In most cases, studies conducted an analysis focused on an equity population through either sub-group analysis by sex (n = 16), heterogeneity analysis (other than sex) (n = 15), sub-group analysis (other than sex) (n = 15) or by measuring an effect on an inequality outcome (n = 2). Fewer studies which had an equity aspect focused on their research methods. Equity sensitive research process (n = 3), equity sensitive analytical framework (n = 1) and equity sensitive methodology (n = 1) were rarely used. The most common equity focus was sex (n = 29), followed by education level (n = 15), socioeconomic status (n = 12) and age (n = 11). No other equity population was evaluated in 10 or more studies.

In terms of what the research is evaluating, there are a variety of different vocations and programmes. For instance, technical training on brick production in an effort to improve worker conditions (Miller et al. 2024), an experiment randomising either female or male mentors to entrepreneurs (Germann et al. 2024) and a job matching platform which sent firms relevant candidates based on their needs (Wang, Yang and Liu 2024).

3.2 Systematic review evidence base

We identified 11 systematic reviews (SRs) published between 2011 and 2022. Of the 10 SRs which were completed (one was a protocol), only one was appraised as high confidence, two as medium and seven as low confidence.[7] Looking at the three high and medium confidence reviews, only one had a focus solely on TVET, while the others included a TVET related intervention within their broader scope.

Tripney and Hombrados (2013), looked at the impact of technical and vocational training on labour market outcomes in L&MICs. They included 26 studies and noted that there was a need to strengthen the evidence base due to methodological limitations and an overall lack of research.

Lwamba et al. (2021) looked at the impact of strengthening women's empowerment in fragile and conflict-affected settings. They included a section focusing on technical and vocational education and training and identified 12 studies, which they included within meta-analyses to understand impact across a range of women's empowerment outcomes. Focusing on labour market outcomes, authors found an impact on income, credit and asset ownership as well as the improved capacity of women entrepreneurs, but they found no effect on access to decent work.

Spangaro et al. (2021) looked at the impact of interventions aiming to reduce the risk of intimate partner violence in conflict-affected and post-conflict settings. Their conceptual scope included economic empowerment interventions, which, while mainly including group savings (an intervention which falls outside of our conceptual framework), did include one study focusing on business training.

Given that only one identified SR has an explicit focus on TVET, and that it was published over 10 years ago, combined with the availability of at least 90 impact evaluations suggests a clear synthesis gap. Addressing this gap will allow an assessment of the relative effectiveness and cost-effectiveness of different TVET interventions, including recommendations for policy and 'Best Buys'.

[7] All completed systematic reviews uploaded to the DEP are appraised against international standards indicating 3ie's confidence in the findings of the review.

4. Conclusions

This scoping paper stems from a partnership between FCDO and 3ie to begin consolidating and further developing the evidence base evaluating the effects and cost-effectiveness of different TVET programmes. The objective of this first phase was to develop a draft framework capturing key 'learning to earning interventions' and corresponding learning and labour market outcomes which can act as a starting point for a global effort to map, curate and synthesise the existing rigorous evidence on TVET programming in L&MICs.

In doing so, we have conducted a rapid scoping of the literature and consulted with academics, practitioners and implementers to obtain a range of perspectives. In the draft presented here, we aim to be inclusive and capture the universe of programming currently implemented in L&MICs.

As next steps, we invite inputs on the framework from stakeholders working in the sector with the goal of arriving at broad buy-in and resonance within academia, policy and practice communities. We will facilitate this through a series of consultations, webinars and dialogues. In parallel, we will start planning for the second and third phases of this programme, with the goal of developing a set of global public goods supporting evidence informed decision making in the sector, including an EGM and a comparative effectiveness systematic review and Best Buy report.

Appendix A: Full list of consultations

The following list of interest holders were consulted with and provided feedback during the development of our learning to earning framework.

- Abu Shonchoy, Associate Professor of Economics, Florida International University
- Adam Osman, Associate Professor of Economics, University of Illinois at Urbana Champaign
- Amal Mowafy, Jordan Country Coordinator & Regional Employment Policy Specialist, International Labour Organization (ILO)
- Bruno Crépon, Professor of Economics, ENSAE
- Caroline Krafft, Associate Professor, University of Minnesota
- Elizabeth Geagea, Senior Policy Analyst, Education, Global Affairs Canada
- Jane Rexworthy, Lead Associate Consultant, People 1st International
- Kevin Hempel, Founder, Prospera Consulting
- Liesbet Steer, Senior Advisor, Lead Empowering People for the New Economy Initiative, Systemiq Ltd.
- Mays Hegab, Deputy Executive Director, Sawiris Foundation for Social Development
- Max Steventon, Sustainability Manager, Systemiq Ltd.
- Odette Langlais, Education Specialist, Global Affairs Canada
- Ragui Assad, Professor and Freeman Chair for International Economic Policy, University of Minnesota

Appendix B: Intervention and Outcome Framework

Table B1: Intervention framework

Intervention Group	Intervention Group Definition	Intervention Category	Intervention Category Definition	Example Activities
Availability of technical and vocational education and training	Interventions that aim to create and increase the number of technical and vocational education and training programmes.	Formal education development	Interventions, such as policies and reforms, that create and increase the number of technical and vocational education and training services delivered through the public sector.	- Introducing TVET courses in school curricula - Creating TVET-specialised schools
		Private sector development	Interventions, such as policies and reforms, that create and increase the number of technical and vocational education and training services delivered outside of the public sector (e.g., private enterprises, civil society actors). This includes both incentives for developing services and taking on trainees, as well as mandated measures such as monitoring requirements or penalties for non-compliance.	- Wage subsidies - Private public partnerships (PPP) - Financing initiatives
Access to technical and vocational education and training	Interventions that aim to overcome barriers that prevent individuals from pursuing education and training.	Financial and in-kind support	Interventions that provide participants with financial assistance, or in-kind support, to access technical and vocational education and training services. Financial support is explicitly for covering costs related to course enrolment and other direct expenses required to access education and training. It does **not** extend to general transport or other living costs that may overlap with apprenticeship-style programmes.	-Scholarships, cash or vouchers
		Awareness programmes to counter social norms and biases	Awareness programmes aimed at shifting social norms and biases that hinder access to technical and vocational education and training. Programmes may target social norms related to women's involvement as well as societal stigma around partaking in vocational training and gaining employment in certain sectors. This category excludes programmes that only address norms related to technical and vocational education and training participation as one of many other social norms.	- Social campaigns

Intervention Group	Intervention Group Definition	Intervention Category	Intervention Category Definition	Example Activities
Building quality technical and vocational education and training services	Interventions which aim to increase the quality and effectiveness of technical and vocational education and training services. This includes building the capacity of those delivering the services, as well as ensuring training and education participants have all they need to increase their likelihood of success. .	Systemic capacity strengthening	Interventions which target technical and vocational education and training systems with the aim of ensuring they deliver an effective service. This includes ensuring the knowledge and skills provided match the current needs of the sector, as well as making sure participants have what they need to engage with the services effectively.	- Skills matching - Curriculum reforms - Upgrading of physical infrastructure -Sector Skills Councils
		Education and trainer delivery strengthening	Interventions which strengthen the ability of individuals and organisations delivering technical and vocational education and training by providing them with the tools and capabilities they need to be effective educators.	- Teacher training
		Vocation information	Interventions which provide participants with information in order to make an informed decision when joining, or during, a technical and vocational education and training programme.	- Provision of information on wage expectations and sector opportunities
		Guidance services	Interventions that connect individuals with experienced professionals to provide technical and vocational education and training opportunities, career guidance, industry insights and other practical advice.	- Mentorships - Counselling services
Technical and vocational education and training delivery	Interventions which directly provide participants with technical and vocational education and training. There is no exclusion based on delivery mechanism (e.g.,	Technical and vocational education (formal)	The provision of technical and vocational education delivered in a formal education environment (e.g., school, university). It includes education for technical (hard) skills and may also include additional education on core (soft) skills. Any method of delivery is included, such as online and face-to-face. Practical applications of skills, so long as they take place in a classroom-based setting, are included here. This category only includes the provision of education services without any further activities.	- University courses

Intervention Group	Intervention Group Definition	Intervention Category	Intervention Category Definition	Example Activities
	online, face-to-face) and includes both formal and non-formal education environments.	Technical and vocational education (non-formal)	The provision of technical and vocational education delivered outside of a formal education environment. It includes education for technical (hard) skills and may also include additional education on core (soft) skills. Any method of delivery is included, such as online and face-to-face. Practical applications of skills, so long as they take place in a classroom-based setting, are included here. This category only includes the provision of education services without any further activities.	- Private skills development courses
		On-the-job training	The provision of on-the-job training without a specific educational component. Here training and knowledge is provided in the workplace and does not take place in a classroom environment.	- Job placements - Traineeships
		Technical and vocational education and on-the-job training	The provision of technical and vocational education in both formal and non-formal environments alongside the provision of on-the-job training. It includes education and training for technical (hard) skills and may also include additional education and training on core (soft) skills. The combination of education and on-the-job training (including apprenticeships and internships) may include financial remuneration as a salary or a stipend to cover expenses and can include formal certification at completion.	- Apprenticeships including dual apprenticeship models
		Core skills training	The provision of education and training on core (soft) skills only. Core skills are defined based on the International Labour Organization's core skills framework (ILO, 2021). This includes social and emotional skills, cognitive and metacognitive skills, basic digital skills and basic skills for green jobs.	- Microcredential programmes (core skills only) - Entrepreneurship training
Supplementary education and training services	Interventions implemented alongside or after the delivery of education and training	Certification	Interventions which certify a participant’s technical (hard) or core (soft) skills. This category captures certification outside of a technical and vocational education and training programme. Certification that takes place as part of a programme is included in the relevant category within the 'technical and	- Certification programmes

Intervention Group	Intervention Group Definition	Intervention Category	Intervention Category Definition	Example Activities
	which aim to further help individuals move into employment.		vocational education and training delivery' group.	
		Job matching	Interventions which provide additional information to participants on how their skills and experience align (match) with job openings, as well as those which directly match job seekers with employers.	- Job matching services
		Job search training	Interventions which provide participants with core (soft) skills related to searching for and effectively identifying employment opportunities. While job searching is a core skill defined under the ILO core skills framework (ILO, 2021), interventions which solely target this skill, are included here as opposed to the 'core skills training' category.	- Training services

Table B2: Outcome framework

Outcome Group	Outcome Group Definition	Outcome Category	Outcome Category Definition	Example Measures
Availability of technical and vocational education and training	Outcomes assessing the availability of technical and vocational education and training opportunities, including structured learning programmes and employer-provided hands-on training.	Technical and vocational education and training opportunities	Measurements of the number of technical and vocational education and training services available.	- Number of technical and vocational education and training programmes
		On-the-job training opportunities	Measurements of on-the-job placement opportunities extended by employers to technical and vocational education and training participants.	- Number of apprenticeships offered by an employer
Access to technical and vocational education and training	Measures that evaluate improvements in people's access to and participation in technical and vocational education and training.	Aspirations	Measurements of career goals and motivation and confidence in pursuing technical and vocational education and training.	- Ambition to work in particular vocation - Business ownership ambition - Reservation wages
		Gender norms	Norms related to the roles and expectations surrounding men and women within a society.	- Parental ambition for children - Women's empowerment
		Participation in technical and vocational education and training	Any outcome measure of participation in a technical and vocational education and training programme.	- Course enrolment - On-the-job training enrolment
Quality technical and vocational education and training	Outcomes that assess the quality of technical and vocational education and training providers, including institutional	Institutional quality and capacity	Measures of the quality, accessibility and effectiveness of technical and vocational education and training institutions.	- Programme accreditation - Modernisation of spaces and services - Mismatch of skills - Quality of graduates

Outcome Group	Outcome Group Definition	Outcome Category	Outcome Category Definition	Example Measures
services	capacity and educator (and trainer) competence. The outcomes also include how effectively institutions align participants' skills with their desired job sectors.	Assessment of educator or trainer skills	Measurements of an educator or trainers' ability to deliver quality technical and vocational education and training.	- Assessments of abilities
		Retention of educator or trainer	Measures of the retention of educators or trainers at institutions, which is related to maintaining a stable and experienced teaching workforce over time.	- Retention rate of educators or trainers
		Completion of technical and vocational education and training programmes	Any measure of an individual's completion in a technical and vocational education and training programme.	- Dropout rates - Course retention - Course graduation
		Employment sector	Measures of whether a participant in a technical and vocational education and training programme is later employed in a sector related to their chosen vocation.	- Vocation
Skills and education outcomes	Measures of an individual's core (soft) and technical (hard) skills as well as formal education outcomes.	Knowledge and possession of skills	Measurement of whether an individual possesses core (soft) skills or technical (hard) skills related to technical and vocational education and training.	- Assessments of abilities - Certification
		Adoption and utilisation of skills	Measurement of whether an individual adopts and utilises core (soft) skills or technical (hard) skills related to technical and vocational education and training.	- Frequency of skill use - Frequency of business practices
		Knowledge diffusion	Measurement of whether skills, practices or knowledge acquired through technical and vocational education and training are shared and transferred to others within a workplace, community or peer network.	- Knowledge sharing in the workplace or community

Outcome Group	Outcome Group Definition	Outcome Category	Outcome Category Definition	Example Measures
		Job searching and seeking behaviour	Measures of an individual's job seeking behaviour. Though this is the adoption and utilisation of a core (soft) skill, the application of job searching as a core (soft) skill is captured here rather than the 'adoption and utilisation of skills category'.	- Job searching
		Formal educational outcomes	Any measure of an education outcome related to the formal education system and not technical and vocational education and training.	- School attendance - School completion
Labour market outcomes (individual/households)	Any labour market outcomes measured at the individual or household level. These do not include outcomes measured at the business level.	Job transition time	Any measurement of the time it took an individual to transition into employment, regardless of whether they did or did not have a job previously.	- Time spent unemployed
		Wage employment	Participation in wage employment (formal or informal jobs where the participant is working for an employer in exchange for a wage).	- Number of hours worked
		Job quality	Any measure of the quality of an individual's job.	- Length of employment - Employment at larger organisations - Workplace benefits - Work-related stress and mental health outcomes - Occupational risk and health factor
		Job satisfaction	Any measure of an individual's satisfaction with paid employment.	- Self-reported measures
		Income and savings	Any measure of individual or household income and savings.	- Wages - Household expenses -Remittances

Outcome Group	Outcome Group Definition	Outcome Category	Outcome Category Definition	Example Measures
		Asset ownership	Any measure of an individual or household ownership of assets. There is no restriction on the type of asset measured and this outcome also captures measures of the value of assets.	- Ownership of leisure goods
Business outcomes (trainee firms)	Business related outcomes specifically for businesses set up by individuals who participated in a technical and vocational education and training programme.	Business ownership	Any measure of whether an individual who participated in a technical and vocational education and training programme owns and operates a business.	- Business ownership - Business survival
		Business performance	Any business performance measure specifically for a business set up by an individual who participated in a technical and vocational education and training programme.	- Business profit - Business revenue - Number of employees
Business outcomes (training firms)	Business related outcomes specifically for businesses who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	Firm employment	Any measure of the number of employers working for a business who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	- Number of employees
		Employment creation	Any measure of employment creation for a business who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	- Job displacement
		Firm profit	Any measure of profit for a business who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	- Business revenue - Business expenses - Business productivity
		Firm retention	Any measure of employee retention for a business who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	- Employee retention - Employee turnover

Outcome Group	Outcome Group Definition	Outcome Category	Outcome Category Definition	Example Measures
		Employee performance	Any measure of an employee's performance from the perspective of a business who acted as the employer or on-the-job trainer during a technical and vocational education and training programme.	- Days and hours worked - Quality of work

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