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for Technical and Vocational
Education and Training

Innovating technical and vocational education and training

A framework for institutions



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Introduction

The UNESCO-UNEVOC Skills for Innovation Hubs (i-hubs) initiative was inspired by the challenges and opportunities facing technical and vocational education and training (TVET) from major global disruptions to the economy, society and environment. These include the combined effects of climate change, digitalization, emerging forms of entrepreneurship and, more recently, global pandemics. While the interconnected nature of these phenomena is disrupting every aspect of work and life, including the ability to respond to pressing skills demands or anticipate future skills needs, these issues are also creating room for innovation to seize the entrepreneurial and employment opportunities that come along.

There are merits to introducing innovation in TVET institutional settings. It helps increase citizens' potential to innovate and transform the economy and society through dynamic skills provisions. It promotes relevance and makes TVET an attractive option, that business considers an investment rather than a cost. In some cases where adopting change in traditional measures work more favorably, innovation can be in the form of an improvement in institutional efficiencies and effectiveness.

TVET institutions are encouraged to commit to an institution-wide approach to innovation, thereby maximizing their potential to overcome disruptive

challenges and become drivers of innovation in their local skills and innovation ecosystems. The i-hubs initiative represented a next step that centred on an Innovation Framework co-developed by UNESCO-UNEVOC with a selected group of UNEVOC centres.

The TVET system can no longer operate according to the business-as-usual approach of gradual, progressive evolution driven by policy-makers from the top down. In fact, national policy-making is struggling to keep pace with the disruption. The speed and scale of change calls for a radical shift, with TVET institutions increasingly taking the initiative from the bottom up and engaging in the innovation process.

WHY USE THIS FRAMEWORK?

The development of the UNEVOC Innovation Framework reflects an increased need for guidance and tools that can be used by institutions. Inspired by tools developed by UNESCO-UNEVOC and others, the UNEVOC Innovation Framework should be used according to institutional context.

By applying the UNEVOC Innovation Framework, TVET institutions can assess their preparedness to innovate, take actions to innovate learning



Assess institutional preparedness to innovate



Develop plans for improvement, mainstreaming innovation in institutional strategy



Enhance their ability to provide transversal and technical skills for innovation



Innovate the learning process, products and services offered



Inspire others to pursue the path of innovation

processes and products and services, and develop concrete outputs for improvement. In doing so, institutions can inspire other entities in their local ecosystem to pursue the path of innovation. It is through processes like these that TVET institutions will be able to develop transversal and technical skills for innovation in their local environment. The UNEVOC Innovation Framework is expected to contribute to efforts made by TVET institutions to mainstream innovation in their strategic planning.

The UNEVOC Innovation Framework (see Figure 1) provides systematic, institution-wide, measurable, evidence-based methodology to help TVET institutions develop mature, sustainable performance as drivers of innovation.

For the purposes of organization and systematization, innovation in TVET institutions has been divided into four dimensions:



They represent the areas to innovate to maintain the relevance of TVET institutions.

ABOUT THE FRAMEWORK

The UNEVOC Innovation Framework is comprised of an Innovation Toolbox that offers tools for institutions to assess their performance and future potential for innovation. These tools are primarily used to facilitate a host of guided or independent activities as part of self-assessment on innovation.

In brief, the UNEVOC Innovation Framework is comprised of:

- A **glossary** of common terms and concepts used throughout the document.

- The **Innovation Toolbox**, including:

- A **balanced scorecard (BSC)** for gathering and evaluating evidence on institutional performance according to key indicators selected by the TVET institution
- An **ecosystem map (ESM)** to identify key partners and maximize skills development and innovation potential in the TVET institution's environment
- Guidelines to identify and develop documents for a case study of an **innovative practice (IP)** at the TVET institution that can be shared with peers
- A tool for drawing up an **innovation action plan (IAP)** to define and implement actions to be taken by the TVET institution that address innovation opportunities revealed by a guided self-assessment (GSA)
- A **reference list of indicators**

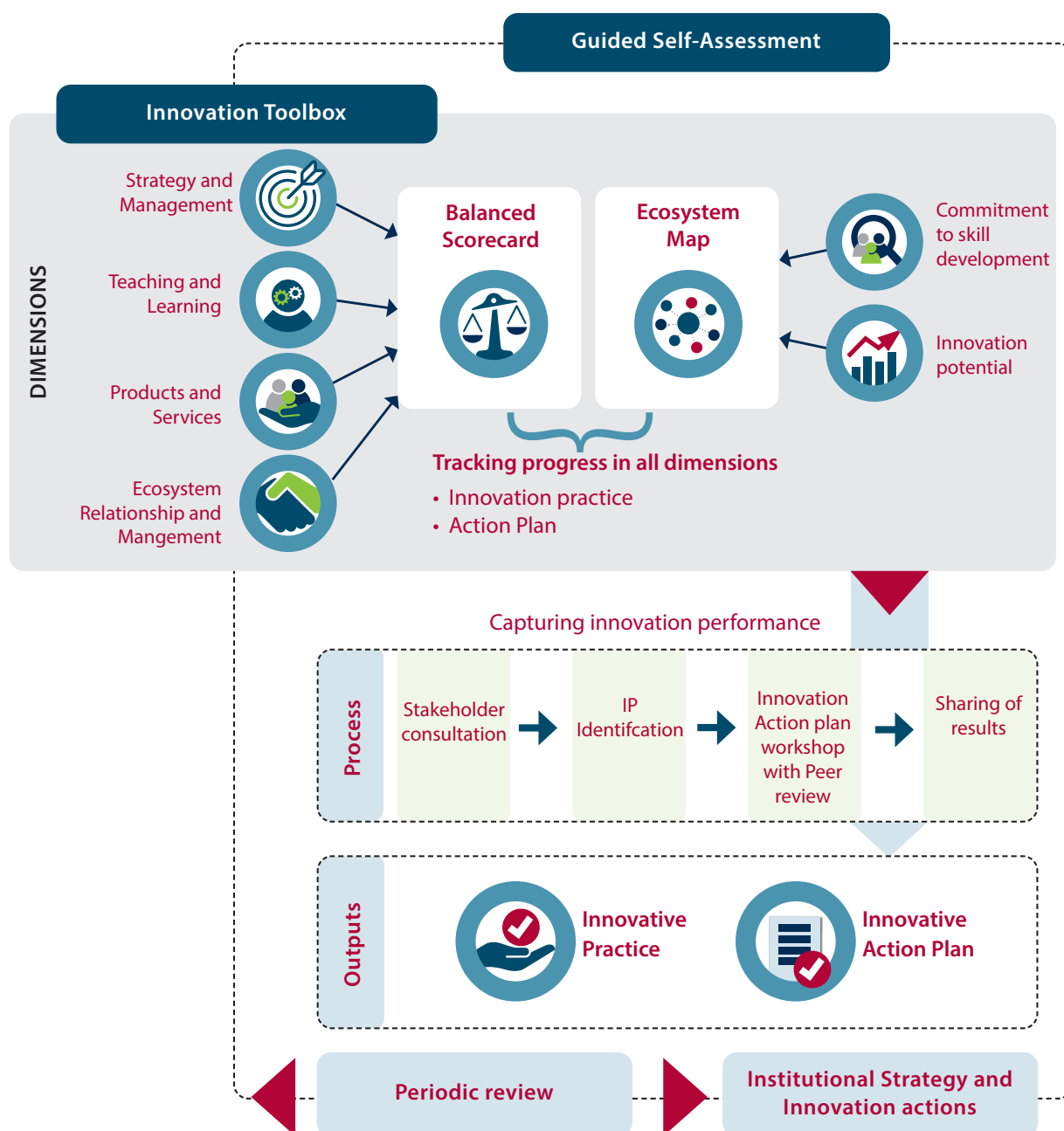
The **GSA process** is a structured exercise in which a TVET institution can consult internal stakeholders to assess its level of preparedness for innovation. The GSA process can be conducted independently, with the support of tools developed by UNESCO-UNEVOC. It offers opportunities for institutions to invite other institutional stakeholders to peer review the processes and outputs as they navigate through the steps to identify and consolidate institutional strengths and ways to address opportunities for further development.

TARGET GROUP

This framework is designed for use by TVET institutions (school-based, technical and vocational training institutes and colleges, enterprise-based training providers) that can identify with the systematic and sustained processes offered in this framework. These institutions are committed to understanding the current enablers and blockers of innovation in their institution, as well as their potential for innovation. The institutions that will use the framework are open to the idea of defining their own course of action to drive innovation and mainstream this systematically in their dimensions of institutional operations.

TVET institutions and training providers that seek to become centres of vocational excellence are also targeted by this framework since the document provides a complete toolbox that can support an initial assessment of their innovation potential.

FIGURE 1 The UNEVOC Innovation Framework



As a structured exercise, the **Guided Self-Assessment** is conducted as a voluntary process to assess an institution's potential for innovation. This assessment demands a 360 degree view of the state of play of innovation including the potential of an institution for innovation. As a process, the Guided Self-Assessment offers a series of actions within a specific time period, which includes a consultative process participated by Internal Stakeholders, a planning and documentation process that results in analyzed evidence and further concrete outputs of innovation (**Innovative Practice, Innovation Action Plan**). These outputs are intended to be analyzed and shared by an assessed institution of TVET with its relevant stakeholders as an evidence of innovation and a concrete plan of action to improve the current state of play.

To sustain the efforts of an institution, institutionalizing innovation into strategies and action plans are important steps after the assessment. The subsequent results and impact of deployed innovation in the institution are reviewed periodically, and assessment process repeated in an iterative manner until desired results are achieved for the institution.

The **Innovation Toolbox** is an important piece of the framework as it provides a rich set of tools.

The toolbox is comprised of the (i) **Balanced Scorecard** which is used to measure the innovation performance of an institution in the four dimensions for innovation (Strategy and management, Teaching and Learning, Products and Services, and Ecosystem relationship management) as defined in this framework, and the (ii) Ecosystem map which is used to analyze the strengths (commitment to skill development) and potential (innovation potential) of the institution's external stakeholders.

The framework offers a set of **Indicators** for each of the toolbox component. The Indicators are used together with the maturity framework as described in the toolbox. Together, these tools are useful for measuring the innovation performance of an institution and the performance of its institutional stakeholders and innovation ecosystem according to their innovation-related commitment and potential.

Glossary

Balanced scorecard (BSC)

The balanced scorecard is a tool for measuring the innovation performance of TVET institutions. It has four dimensions (strategy and management, teaching and learning, products and services, and ecosystem relationship management), which are intended to represent all the processes at TVET institutions. The balanced scorecard also includes a maturity level scale. Each dimension includes specific indicators to capture evidence of performance from stakeholders during consultations.

Commitment to skills development

Commitment to skills development is one of the two dimensions of the ecosystem map. It refers to the relevance of a stakeholder for the development of skills in the ecosystem. The dimension includes indicators to capture a stakeholder's commitment to skills development under different lenses.

Ecosystem map (ESM)

The ESM is a tool for analysing the TVET institution's external stakeholders. It has two dimensions: commitment to skills development and innovation leverage potential, with a scale of maturity levels. Each dimension includes specific indicators to capture evidence of performance from external stakeholders during the consultations.

Evidence

As used in the project's context, evidence relates to documented experience(s) of the institution or established policy and practices that are known to the institution's stakeholders. It may be gathered from a systematic set of information; through structured research, monitoring or evaluation processes; or from individual programmes and cases. It may be in the form of quantitative (based on research, data and statistics) and/or qualitative (based on cases, group or personal experiences and stories) sets of information.

Guided self-assessment (GSA)

GSA is the structured process used to: 1) gather innovation-related data from TVET institutions using an evidence-based assessment of the institution's innovation maturity level according to key performance indicators; 2) process the data that is gathered and translate it into useful information for the TVET institution; and 3) develop the outputs (innovation action plan and innovative practice), as proposed by the UNEVOC Innovation Framework.

Innovation

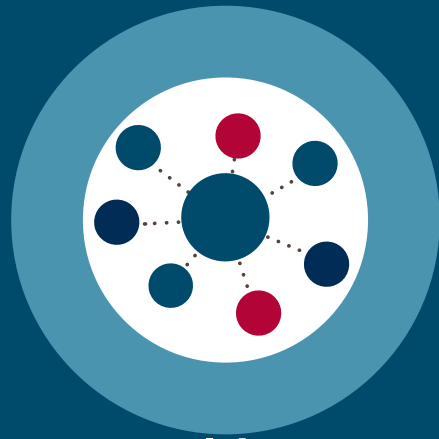
Innovation is defined as a substantial change in the way TVET is practised in an institution, making it more relevant to the needs of the economy, society and environment. Innovation also encompasses non-research and development (R&D) activities that are developed by TVET institutions from an existing stock of knowledge or knowledge external to the institution, not only through internal systematic R&D activities.

Innovation action plan (IAP)

The IAP draws on the outcomes of consultations with the TVET institution's internal stakeholders to formulate an institution-wide innovation plan or project. The aim of the project is to enhance the innovation maturity of the institution and improve long-term innovation performance based on evidence and indicators.

Innovation leverage potential	Innovation leverage potential is one of the two dimensions of the ESM. It refers to the stakeholder's potential as a driver for the development of innovation in the ecosystem. The respective indicators are intended to capture the stakeholder's clout in relation to the promotion of innovation under different perspectives.
Innovation toolbox	The Innovation Toolbox comprises the balanced scorecard and ecosystem mapping, the innovative practice and the innovation action plan. The Innovation Toolbox is deployed during consultations and the processing of the gathered data and is part of the UNEVOC Innovation Framework.
Innovative practice (IP)	An innovative practice is a new approach to TVET practice within the institution to make TVET more relevant to the needs of the economy, society and environment. It involves the balanced scorecard dimensions, is confirmed by documented output (with indicators of expected outcome or impact if possible) and is communicated in an innovative way.
Internal stakeholder	Four main internal stakeholder groups contribute to the consultations: senior management, administrative staff, teaching staff and students. Stakeholder groups may also include external stakeholders. These may be drawn from the private sector and business, community organizations, territorial bodies, the informal sector, research and development bodies, among others.
Maturity levels	The maturity levels of an institution and the ecosystem are analysed based on evidence corresponding to the indicators proposed in each of the balanced scorecard and ecosystem map dimensions. On the balanced scorecard, maturity level refers to the level of innovation performance reached by an institution using the maturity framework. In the ecosystem map, maturity level refers to the level of innovation performance assessed for each of the identified stakeholders (in particular) and the ecosystem (in general) in terms of commitment to skills development and innovation leverage potential. The maturity level for each dimension is based on the collective perception of the stakeholders that are consulted and the evidence that is presented.
UNEVOC innovation framework	The UNEVOC Innovation Framework (see Figure 1) provides a systematic, institution-wide, measurable, evidence-based methodology to help TVET institutions develop mature, sustainable performance as drivers of innovation. The UNEVOC Innovation Framework comprises a structured self-assessment process and a toolbox that enables TVET institutions to document and progressively build and maintain their capacity for innovation.





Innovation Toolbox



Innovation toolbox

This section describes the tools that are available for conducting a guided or independent self-assessment process. It suggests the ways tools can be used to help institutions achieve the objectives of the process. It is important for the team responsible for the process to familiarize themselves with the tools and how to use them.

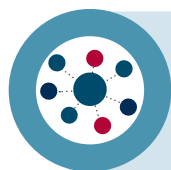
The UNEVOC Innovation Framework (Figure 1) combines the GSA process with the **Innovation Toolbox** comprising the following tools:



A balanced scorecard (BSC) to track progress and analyse performance across the TVET institution



An innovative practice (IP) to promote institutional learning and advocacy, and the strengths identified through the BSC and the ESM



An ecosystem map (ESM) to support stakeholder mapping and analysis



An innovation action plan (IAP) template to address opportunities for improvement identified through the BSC and the ESM

The UNEVOC Innovation Framework provides a systematic structure and establishes connections between and among tools, processes and outputs as they come together to support the institution's path to innovation and produce initial findings for institutions. The Innovation Toolbox is part of the UNEVOC Innovation Framework. It provides guidance on individual tools (e.g. the balanced scorecard) and describes the processes (guided self-assessment) for forming an evidence-based chain that leads to strategic action.

The framework is ideally used by the institution, led by responsible members who have reviewed the document and gained a complete understanding of the steps and processes involved. While additional support and guidance from UNESCO-UNEVOC can be provided on a request basis, the framework stands as a facilitating tool that can be used independently or with additional expert support from peer reviewers.



The balanced scorecard

PURPOSE

The balanced scorecard is designed to establish a baseline and track progress at TVET institutions in the dimensions of institutional innovation. It gives managers a comprehensive view of the institution.

A wide range of indicators for each of the dimensions of innovation in TVET is proposed in Tables 2 and 4. They serve as points of reference to track the relevant attributes or changes in the institutions. It is important to understand all the indicators and select from the list proposed for the balanced scorecard. The selected indicators are used in the guided self-assessment to gather evidence and analyse an institution's performance.

important pivot to oversee the connections with ecosystem relationship management, teaching and learning, and products and services. These are considered distinct yet equally important dimensions of innovation

- Innovation is a broad approach that can be applied to TVET institutions in different operational contexts. This allows for a degree of comparability and the potential for learning among TVET institutions
- The principles of performance measurement relate to efficiency, effectiveness/outcomes and legitimacy/recognition of the TVET institution's contribution
- Guidance on performance measurement of innovation is essential to document baselines and progress

OBJECTIVES

- Establish an evidence-based assessment of an institution's innovation performance against the UNEVOC Innovation Framework through a participatory process
- Create a baseline for measuring performance and progress along a scale of innovation. This encompasses four steps from initial development to sustained innovation
- Actively engage stakeholders in the innovation process by utilizing their ideas and developing their capacities as partners in skills and innovation
- Inform the institution's innovation strategy
- Identify future actions to enhance innovation potential
- Identify and document an innovative practice for institutional learning and international networking
- Inspire opportunities for international networking

DIMENSIONS

The UNEVOC Innovation Framework highlights efforts in TVET institutions to foster and sustain the current and future attainment of innovation. This allows innovation to grow in an institutional setting. It also creates an environment in which a single novel idea implemented on a small scale can grow to a large-scale culture where innovation is deeply embedded in the institution's strategy, teaching and course delivery; the services it provides; and its engagement with external stakeholders.

To identify and implement opportunities for innovation, monitor and evaluate performance, and learn and share innovative initiatives with other TVET institutions, UNESCO-UNEVOC co-developed an innovation concept with partners that operate in a range of TVET institutional settings. The aim was to represent practical situations in institutional operations and a vision that is shared across institutions that seek to innovate. This systemic, evidence-based approach to innovation is a key characteristic of the UNEVOC Innovation Framework.

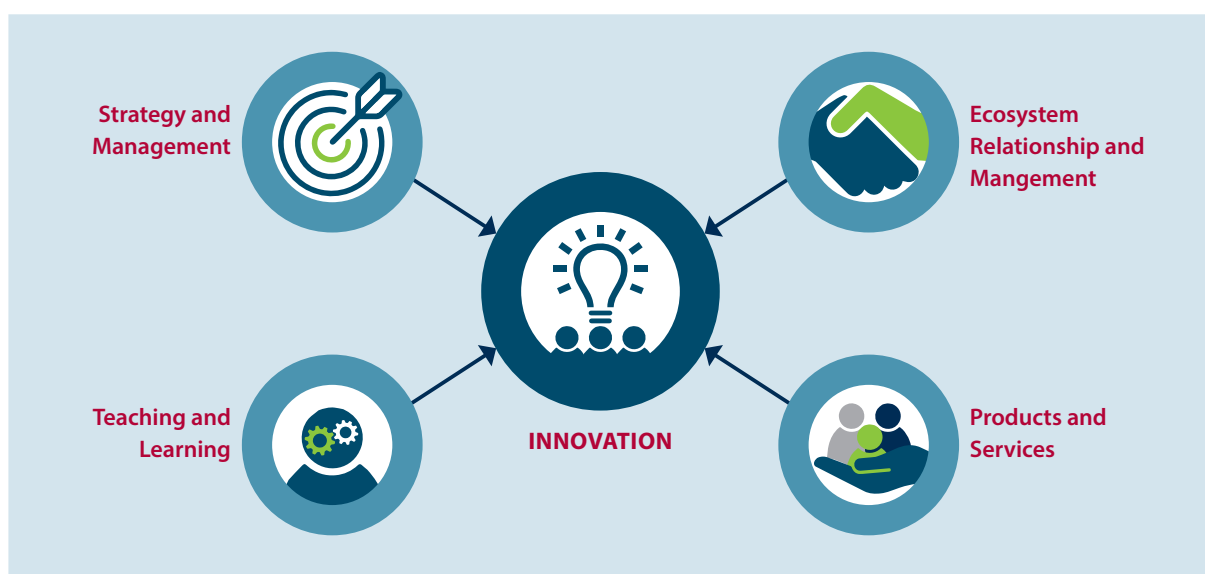
The resulting innovation system reflects the main characteristics or dimensions that are commonly found in TVET institutions.

ASSUMPTIONS

The balanced scorecard is based on the following assumptions:

- TVET institutions operate within typical organizational domains of a learning institution, whereby strategy and management is an

FIGURE 2 Balanced scorecard dimensions



The four balanced scorecard dimensions are described below.



STRATEGY AND
MANAGEMENT

Why is it important?

Innovation must be encouraged throughout the institution for TVET institutions to develop sustainable innovation systems.

How can this be done?

This can be achieved by embedding innovation from a high-level of strategy and priorities down to the daily practice of all staff and learners. Innovation must be stimulated across an institution's faculties, courses and activities. In practice, this dimension covers the capacity of the institution's leadership, management, organizational processes and culture to prioritize, inspire and sustain innovation. This involves continuing support for innovation from core functions such as planning, financing, human resources management, knowledge management, internal monitoring and evaluation procedures, internal communication and facilities management. A key example of this dimension is the identification of specific staff tasked with innovation and embedding innovative organizational structures, all in line with a specific mandate for innovation. This approach spans the breadth and depth of an institution and creates a self-sustaining culture and dynamic for innovation in which fledgling innovative ideas and initiatives can flourish and become mainstreamed.



TEACHING AND
LEARNING

Why is it important?

To keep learning attractive for students in a digital age and provide them with market-relevant skills, TVET institutions will need to improve teaching procedures (pedagogical and didactic) to create a better experience for learners.

How can this be done?

Developments in pedagogical and didactic approaches and assessment over time, including the wide adoption of competency-based methods in the teaching and assessment of vocational skills and use of digital technology in the teaching and learning process, enable TVET institutions to update their methods and establish themselves as important players in the innovation ecosystem.

Overcoming these hurdles creates access to existing initiatives that TVET institutions around the globe are already using, such as: virtual and augmented reality and the deployment of smart boards, tablets and laptops; on-the-job training and apprenticeship schemes; problem-, challenge- and project-based learning; flipped courses and flexible pathways; audio and video tools; and simulators, gamification and internet platforms.



PRODUCTS AND SERVICES

Why is it important?

The constant and rapid developments in economy, the labour market and society brought about by job restructuring and adoption of digital and more sustainable business models have also changed the role of TVET institutions. Some independent TVET institutions can engage in new roles or capitalize on their mandate to provide additional functions that go well beyond the traditional core business of education and training.

How can this be done?

Institutions that advance in innovating their products and services consider their institutional capacity to develop and provide innovative products and services for learners and partners. They may: engage in innovative research and development to bridge the gap between basic research in academia and the commercialization of products, provide facilities and training for business incubators and start-up services, develop consultancy services, support partners in the development of prototypes, and register patents. This dimension also captures the capacity of TVET institutions to develop and deploy innovative services for learners and partners through innovative skills programmes; recognize prior learning; and adapt work-based learning, apprenticeship and career guidance to anticipate the changing needs of the labour market, communities and individuals, etc. TVET can only remain relevant for future generations if TVET institutions – or the structures that govern less independent institutions – innovate and adapt their products and services to anticipate the emerging demands of the economy, society and individuals.



ECOSYSTEM RELATIONSHIP MANAGEMENT

Why is it important?

A key challenge for TVET institutions has always been effective, efficient engagement with key players in the ecosystem that surrounds the institution. This familiar challenge has become more relevant due to rapid changes to ecosystems brought about by global developments. At the same time, advances in communication, such as digital tools and social media, provide new advocacy opportunities to promote the value of TVET as a career option against the returns from general secondary or higher education. Changes

in communication also provide opportunities for engagement and coordination of the ecosystem through partnerships with individual economic, societal and public partners and participation in established networks.

How can this be done?

This dimension covers the function of external communication and the involvement of external partners in an institution's governance structures. It also comprises the capacity of the institution to monitor developments in the ecosystem and identify demand for new skills, products and services. A key function is an institution's ability to trace its graduates and use their feedback to further adapt training delivery. Delivering relevant teaching and learning and products and services depends on an institution's ability to monitor emerging needs and opportunities in the labour market and society. An institution must be able to rapidly convert these needs into effective organizational practice, training, products and services that can enhance innovation capacity in the ecosystem. Finally, this dimension covers the institution's involvement in skills competitions and international networks.

Important:

The balanced scorecard begins with an initial commitment to change and continues through measures that make this change systematic. The results of the balanced scorecard can be converted into management instruments (such as spider charts) to assist internal self-improvement processes and to facilitate international comparison and peer learning.

MATURITY MODEL

The maturity model provides a structure for measuring the evolution toward systematic, sustained innovation that is recognized internally and by external stakeholders. The model suggests a four-level approach. Each level provides a description of the attained progress in innovation (i.e. from an absence of any awareness about innovation to fully embedding innovative practice throughout the institution's activities in an incremental manner).

The descriptors shown in Table 1 are used to assess the performance of the TVET institution against the balanced scorecard indicators. They facilitate discussions between actors in the institution to help establish an evidence-based assessment (Table 2).

Figure 3 and Table 1 present the maturity model and progress levels.

FIGURE 3 Maturity model

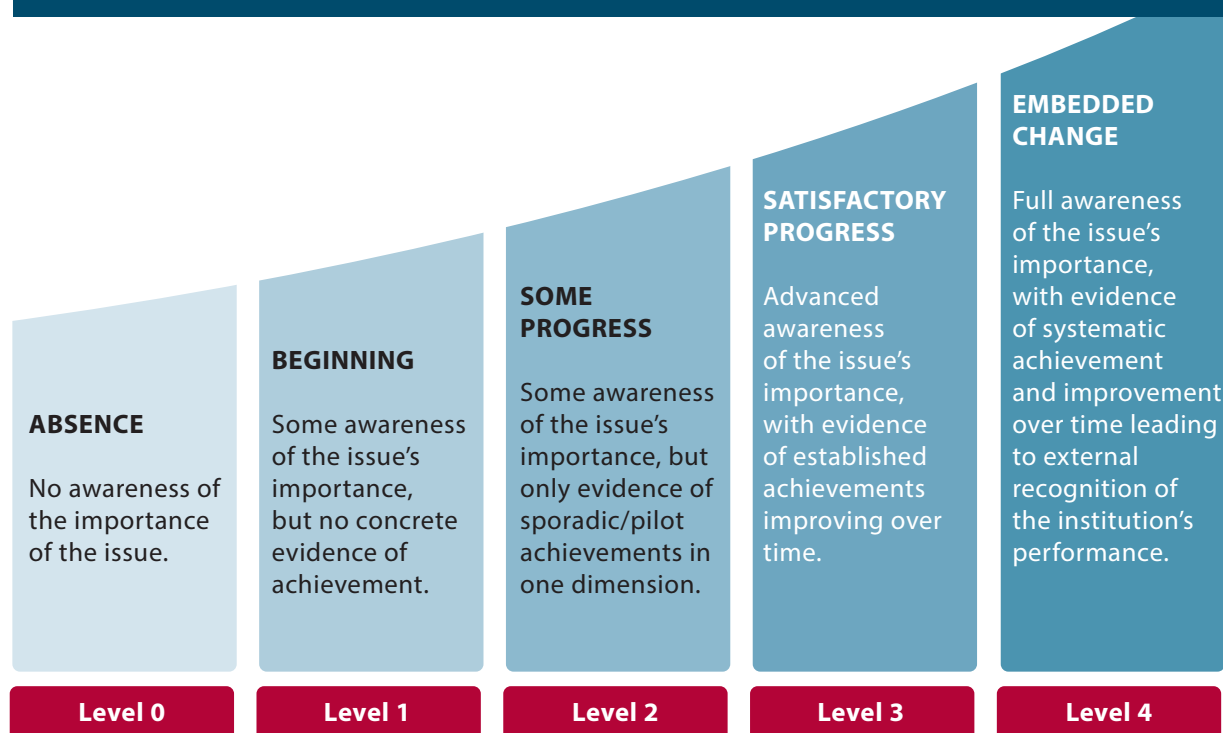


TABLE 1 Balance scorecard (Maturity model)

ABSENCE LEVEL 0	BEGINNING LEVEL 1	SOME PROGRESS LEVEL 2	SATISFACTORY PROGRESS LEVEL 3	EMBEDDED CHANGE LEVEL 4
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STRATEGY AND MANAGEMENT

No sense of the relevance of innovation and a complete lack of documentation. No evidence of human and financial resources, physical spaces, income or managerial support related to the promotion of innovation.	Some awareness of the importance of innovation in the organization, but no documentation. Lack of human and financial resources, physical spaces, income, or managerial support related to the promotion of innovation.	Some awareness of the importance of innovation in the organization, but only sporadic evidence exists in terms of documentation, human and financial resources, physical spaces, income generation, or managerial support related to the promotion of innovation.	Advanced awareness of the importance of innovation in the organization, evidence exists in terms of documentation, human and financial resources, physical spaces, income generation, and managerial support related to the promotion of innovation with improvements over time.	Full awareness of the importance of innovation in the organization, evidence exists in terms of systematic achievements, through documentation, human and financial resources, physical spaces, income generation, managerial support linked to the promotion of innovation. Institution is recognized for its excellence.
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ABSENCE LEVEL 0	BEGINNING LEVEL 1	SOME PROGRESS LEVEL 2	SATISFACTORY PROGRESS LEVEL 3	EMBEDDED CHANGE LEVEL 4
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TEACHING AND LEARNING

No awareness of the importance of innovative teaching and learning experiences.	Some awareness of the importance of innovative teaching and learning experiences, but no evidence of steps taken toward developing these experiences	Some awareness of the importance of innovative teaching and learning experiences with some evidence of innovation taking place in teaching and learning.	Advanced awareness of the importance of innovative teaching and learning experiences with evidence of improvement over time of innovation taking place in teaching and learning.	Full awareness of the importance of innovative teaching and learning experiences with evidence of systematic change and recognition of the institution's excellence.
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PRODUCTS AND SERVICES

No awareness of the importance of providing products and services that promote innovation processes.	Some awareness of the importance of providing products and services that promote innovation processes, no evidence of the provision of such products and services.	Some awareness of the importance of providing products and services that promote innovation processes; some evidence of provision of such products and services.	Advanced awareness of the importance of providing products and services that promote innovation processes, evidence of improvement in the provision of such products and services over time.	Full awareness of the importance of providing products and services that promote innovation processes; extensive evidence of excellence in the provision of such products and service and the institution is recognized for its excellence.
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ECOSYSTEM RELATIONSHIP MANAGEMENT

No awareness of the importance of managing the skills and innovation ecosystem.	Some awareness of the importance of managing the skills and innovation ecosystem, but no existing evidence of such management.	Some awareness of the importance of managing the skills and innovation ecosystem. There is evidence of such management.	Advanced awareness of the importance of managing the skills and innovation ecosystem. There is evidence of improvement in such management over time.	Full awareness of the importance of managing the skills and innovation ecosystem. There is evidence of excellence in such management and the institution is recognized for its excellence.
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BALANCED SCORECARD INDICATORS

Table 2 presents a list of indicators that can be used as a reference for measuring a TVET institution's level of preparedness to implement innovation in the balanced scorecard dimensions. The descriptors should be used as qualitative reference points of assessment and paired with Table 1, which provides the numerical value corresponding to the degree of maturity. This method should be applied during internal stakeholder consultations and the tools should be used to aid interpretation.

To apply the UNEVOC Innovation Framework, TVET institutions select fourteen indicators for

the balanced scorecard (four from strategy and management, three from teaching and learning, three from products and services and four from ecosystem relationship management), according to each institution's specific context.

Internal stakeholder consultations can and should be adjusted to reflect each TVET institution's priorities and strategic choices. This means, for example, that the number of indicators selected for each dimension can vary to allow for more information to be collected on one dimension. The overall number of indicators can also be adjusted to fit the time frame available for the exercise.

TABLE 2 Balanced scorecard indicators

1 Strategy and management	Descriptors
1.1 Innovation reflected in the TVET institution's vision/mission/strategy	Innovation is embedded in the vision/mission statements of the institution. Strategic plan includes innovation and is set as one of the strategic plan's priorities.
1.2 The existence of an innovation action plan in the TVET institution	Institution has an action plan focused on boosting innovation performance on the level of institution, with innovation-related objectives and actions, within defined timeframe and with defined resources.
1.3 Financial resources for innovation are allocated in the institution's budget	Financial resources are generated through innovation-related activities such as the provision of non-traditional services.
1.4 Income generated through innovation	Internally generated revenue stems from innovation-related activities.
1.5 Innovation-related competences and skills required on recruitment	Terms of reference for recruitment require skills and competences related to innovation.
1.6 Capacity building on innovation for staff	The institution provides informal and/or formal opportunities for the development of innovation-related skills and competences among all staff groups (teaching or non-teaching personnel), including women, disabled or member staff from indigenous or less-represented groups
1.7 Employees performance assessed based on innovation objectives	Indicators related to innovation objectives are set to measure employees' performance.
1.8 Innovation supported by dedicated manager/ staff	Institution allocates staff whose dedicated responsibility is to foster or coordinate implementation of innovative-related activities.

1.9 Physical space/offices/facilities dedicated to innovation	The institution has premises and/or facilities dedicated to the development/implementation of innovative-related activities.
1.10 Innovation embedded in the TVET institution internal communication	Innovation principles/issues are integrated into the institution's internal communication policies and practices.
1.11 Organizational processes oriented to foster innovation	Organizational processes established to foster innovation throughout the institution.
1.12 Knowledge gained through innovation activities shared by/with staff	There is a system in place to incentivize staff to share knowledge gained through innovation-related activities, such as regular meetings and gatherings, mentorship programmes, participation in product development, provision of services, etc.

2 Teaching and learning processes

Descriptors

2.1 In-service teacher training opportunities provided for innovation skills	Institution enables equal opportunity professional development of its teachers and trainers, irrespective of age, gender or regional/language, through specific trainings in the ecosystem designed to equip them with skills and competences to further the innovation goals of the institution.
2.2 ICT tools systematically deployed in teaching and learning processes	Institution systematically deploys digital infrastructure and tools such as computers, laptops, desktops, data projectors, smart boards, learning management systems and interactive teaching in teaching and learning processes.
2.3 Deployment of innovative teaching and learning experiences	Assessment of learning needs, definition of learning objectives, development of teaching and learning programmes, and implementation of a work plan and evaluation of the learning outcomes are carried out in an innovative manner.
2.4 Processes and resources invested in place aiming at developing new curricula and teaching and learning programmes experiences	Institution has defined policies, processes and resources dedicated to developing new curricula or to modernizing existing ones, which includes redefinition of required student competences, appropriate learning contents and teaching methods.
2.5 New teaching and learning methods/equipment are introduced by the institution	Institution innovates the way the teaching and learning is experienced in the learning environment and systematically introduces instructional tools or techniques, ensuring adequate training and familiarity of people adopting them.
2.6 Innovation-related skills, competences and themes mainstreamed in TVET programmes	Institution offers innovation-related content in its teaching programmes.

3 Products and services

Descriptors

3.1 Innovation projects and services development in the TVET institution	The institution leads or takes part in projects aimed at developing innovative teaching/practices or products/services.
--------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

3.2	Patents requested/registered for innovative products and services	Institution has patented or requested patent for innovative educational products and/or services.
3.3	Multitask/functional teams oriented to develop innovative products and services	There is system in place that enables innovative products and services to be developed through functional teams formed by specialists/students from different departments/sectors of the institution.
3.4	TVET institution engaged in research and development activities	The institution has a track-record of research and development activities conducted by teachers, researchers, students or learners.
3.5	Development of specific products and services for the ecosystem partners	The institution collaborates with the skills and innovation ecosystem for the development of products and services.
3.6	Career guidance services provision	The institution provides advice and/or career guidance to students to give them the necessary knowledge, skills and values to make informed decisions at each key education stage for successful transition from school to further education or work.
3.7	Recognition and certification of competences provision	Institution participates in the process of identification, recognition, validation and certification of competences previously acquired by students/learners in formal, informal and non-formal learning.
3.8	Provision of innovation-related skills programmes	Institution provides the required skills to innovation and innovate in the way the content is offered to the students/learners.
3.9	Additional support provided to students with special needs or belong to special-interest groups with normal constraints to participate in innovation activities borne by systemic hardships, language or other types of constraints	Institution provides adequate level of technical and non-technical support to facilitate people with special needs, migrants, indigenous people, other marginalized groups, etc. towards full participation and promotion of their innovation products/services

4 Ecosystem relationship management

Descriptors

4.1	Innovation incorporated in the TVET institution external communication strategy	Importance of innovation for TVET institutions is communicated to external stakeholders, and it is an important part of the public image of the institution.
4.2	Awareness of the skills and innovation ecosystem about the role of the TVET institution as agent of innovation is monitored and evaluated	Institution has system in place that enables collection, analysis and interpretation of data related to institution's activity as agent of innovation within the ecosystem.
4.3	Ecosystem monitored to identify new partners/ opportunities of engagement	There is system in place that enables institution monitoring potential partners and opportunities for collaboration within the ecosystem.
4.4	Ecosystem innovation skill needs and shortages monitored	There is a formal system in place that enables institution to collect data on innovation skills needs/ shortages to ensure that skills offered are aligned with market demands.

4.5	Employability/employment outcomes of graduates traced	Institution has mechanism in place that enables tracking post-graduation employment of its students and manages a database of qualitative and quantitative data for this purpose.
4.6	TVET institution actively engaged in local/ ecosystem formal networks and initiatives with different stakeholders	Institution's practice reflects acknowledgement of importance of involvement in networks and collaborations with different stakeholders in the ecosystem.
4.7	Ecosystem engaged in the definition of training needs and curricula development	Institution and ecosystem actively collaborate in defining of training needs and developing curricula.
4.8	Existing network of diverse contacts and potential partners	Institution has wide and diverse network of contacts within the ecosystem, including key stakeholders and potential partners, including from special sector or special interest groups.
4.9	Training provided to staff for partnership and collaboration management	Capacity building activities of the institution include raising awareness of its internal stakeholders on importance of collaboration/partnerships within the ecosystem, and trainings on how to manage such collaborations.
4.10	Processes and mechanisms developed to enhance innovation capacity in the ecosystem	Institution has developed processes and mechanisms to support the innovation capacity within the ecosystem through targeted actions.
4.11	Incidence of teaching and learning delivered in the skills and innovation ecosystem facilities	Institution is supported by the ecosystem in offering innovative teaching, such as work-based learning.
4.12	Skills and innovation ecosystem engaged in governance and/or creating institutional innovation strategy and action plans	There is formal system in place that enables ecosystem stakeholders to be part of institution's governing structure and/or to shape its strategic plan.
4.13	Participation in local/national/international skills competitions	Students of the institution are regularly participating in skills competitions at the local/national/international levels.
4.14	TVET institution engaged in international networks and learning opportunities on innovation	Institution is active in international networks, in which it engages in learning and knowledge exchange on innovation.

To use the balanced scorecard tools in a guided self-assessment activity, the following people must be identified.

- **GSA coordinator:** a person at the institution who has a full understanding of the framework's Innovation Toolbox and GSA process, is responsible for mobilizing teams and individuals who can support the process, is in charge of overseeing the group workshops, and is authorized to make decisions on management of the activities.
- **GSA team:** works closely with the coordinator to prepare all GSA activities including documents and tools that will be needed to ensure a smooth proceeding.

BALANCED SCORECARD FORM

The balanced scorecard form can be used during self-assessment workshops to collect data (individual or group) from the stakeholder groups. Each group will provide an assessment of all the dimensions, using a list of indicators previously selected by the TVET institution. The GSA process must represent the perspectives of all clusters of stakeholders and different types of assessment evidence should be considered.

The person responsible for the workshop must ensure that the scorecard and the process for using the balanced scorecard tools is adequately explained. For ease of recording data and visualizing the result of analysis, a GSA data recording and analysis online tool – available on UNESCO-UNEVOC's website – can be used.

User's guidance note

Under the overall supervision of the GSA coordinator, the BSC form should be used in self-assessment workshops. The following roles are assigned.

- **Workshop facilitator(s):** as part of the GSA team, this is the person in charge of facilitating the flow of the workshop discussion, with authority to manage the evidence presented. There could be more than one facilitator for each stakeholder group if the workshops occur simultaneously.
- **Group rapporteur:** this person is in charge of recording the data collected from discussions at the workshop and for generating aggregate data for each group, using a digital tool (if available).

How to use the form

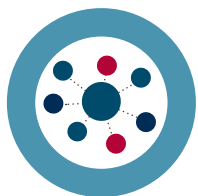
1. The form is distributed to participants or projected on the screen in the case of a larger group.
2. The facilitator explains how to use the form as a data collection tool for consultation. The form records all the indicators to be discussed in the consultation, the evidence presented and the corresponding mark to be given by the stakeholder group after considering all evidence.
 - As needed, the facilitator describes the chosen indicators that are deemed to represent the scope of innovation in the institution. These indicators are used as reference points to assess the preparedness of the TVET institution to implement innovation in each of the relevant dimensions of the BSC.
 - The list of chosen indicators and descriptors as qualitative references must be available to stakeholders for ease of reference.
3. The rapporteur uses the form as a hard or soft copy of the master form for recording data and evidence provided during assessment.
4. The rapporteur captures all the relevant evidence from each of the stakeholder groups and enters the information for the relevant indicators that are assessed. The evidence must be supported by official documents, institutional presentations or anecdotes from internal stakeholders who are able to confirm the evidence presented or drawn up for each indicator.
5. After all the evidence has been presented and discussed for each indicator, the group makes a collective decision on the institution's maturity level (see Table 1). The rapporteur ticks the box that corresponds to the rating.
6. For each GSA process, the rapporteur produces four master forms representing the data collected from stakeholder groups, to generate aggregated data that gives an overview of the institution's performance in the dimension.
7. The rapporteur writes the information collected in a clear, succinct manner.

The completed form serves as a record and final output of the consultation conducted with each internal stakeholder group. It is compiled with the outputs of other groups by the GSA facilitator, and turned over to the GSA coordinator, who will consolidate the information gathered from the four groups of internal stakeholders, process the data and inform the IAP and the IP.

TABLE 3 Balanced scorecard data collection form

Facilitator(s) Stakeholders Group Members:	Internal Stakeholder: <input type="radio"/> Senior Management <input type="radio"/> Administrative Staff <input type="radio"/> Teacher Staff <input type="radio"/> Students	Date:
		Start time:
		End time:

Dimensions	Indicators <i>(see Table 2 for the full list)</i>	Documented evidence of efficiency, effectiveness and outcome	Maturity Level <i>(Table 1)</i>
Strategy and Management			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
Teaching and Learning			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
Products and Services			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
Ecosystem Relationship Management			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
			<input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4



Ecosystem map

BACKGROUND

The ecosystem map (ESM) is a resource to support the TVET institution in the strategic management of cooperation with key actors, networks and assets from the skills and innovation ecosystem (Figure 3), which is composed of various actors and is influenced by the spaces in which activity drivers overlap. The ESM aims to help establish an understanding of the strategic economic or socio-economic ecosystem the institutions are set in. Opportunities for institutions to connect with their ecosystem for possible synergies can lead to symbiotic situations with high innovation potential.

The tool assumes that the long-term objective of TVET institutions is to enhance employability, competitiveness and social cohesion by providing the innovation-related skills required by graduates entering the labour market, or through the provision of products and services supportive of innovation within the institution's skills and innovation ecosystem. In this respect, the TVET institution's ability to engage strategically and systematically with key stakeholders and assets is essential: this allows society to benefit from the institution's full innovation potential. It is assumed that TVET institutions already have a certain thematic strength or thematic emphasis and a good understanding of the economic landscape in their region in established and evolving sectors.

The ESM is dynamic: it not only maps key stakeholders in the skills and innovation ecosystem, but also helps TVET institutions to engage systematically with stakeholders to drive innovation.

ECOSYSTEM MAP DIMENSIONS

The UNEVOC Innovation Framework's ecosystem mapping approach is comprised of two external dimensions: commitment to skills development and innovation potential. These dimensions help map the demands and opportunities for skills and innovation among key stakeholders in the institution's ecosystem. They provide structured evidence so that the TVET institution can identify and manage relations with specific stakeholders according to their engagement in skills development and potential for innovation. The assessment can be used to further engage with

specific stakeholders and/or to identify categories of stakeholders interested in innovative skills (at sector or regional level or by stakeholder type, such as microenterprises, start-ups, etc.) that may be the focus of institutional engagement strategies, teaching and learning, products and services or networking initiatives. In this respect, the internal and external dimensions work together to support the overall institutional innovation capacity. These two dimensions cover the following.

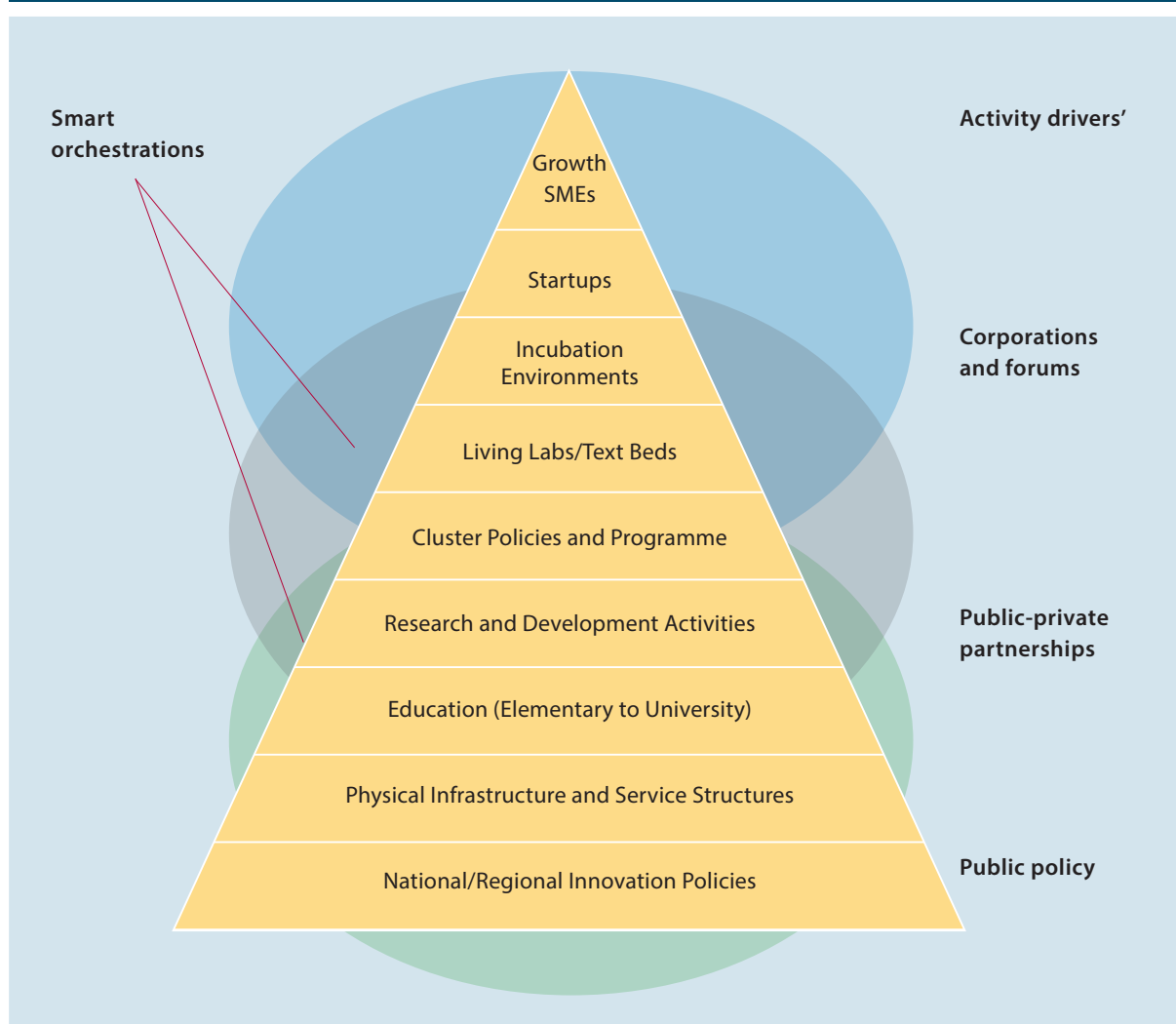
Commitment to skills development

This dimension maps the actual and potential demand for skills and highlights innovative skills within the local ecosystem. In this context, innovative skills may refer to new skills demanded by the economy or society due to global or local developments, or skills that can help create an innovative dynamic in the ecosystem (such as entrepreneurship or digital skills). The dimension assesses how specific stakeholders are engaged with the education and training sector, the demand for innovative skills by the stakeholder and its attention to workforce skills development. As an example, the mapping exercise could assess stakeholders' engagement in institutional governance structures, such as their participation in relevant networks. The exercise may also consider the importance given to a partner's human capital development as evidenced by competence-based job profiles, the provision of apprenticeship schemes or the presence and application of human resource development strategies.

Innovation potential

The stakeholder's innovation potential is a dimension that assesses evidence of the stakeholder's focus on innovation relative to the sector or business field. A broad example to understand a stakeholder's potential could be the stakeholder's communication and/or track record of specific innovative initiatives such as new products, processes or partnerships; the stakeholder's engagement in research and development; or the importance of the stakeholder within local or national development priorities. This dimension helps the institution to identify specific stakeholders or stakeholder categories according to their involvement in innovation.

FIGURE 4 Education and skills at the heart of the skills and innovation ecosystem

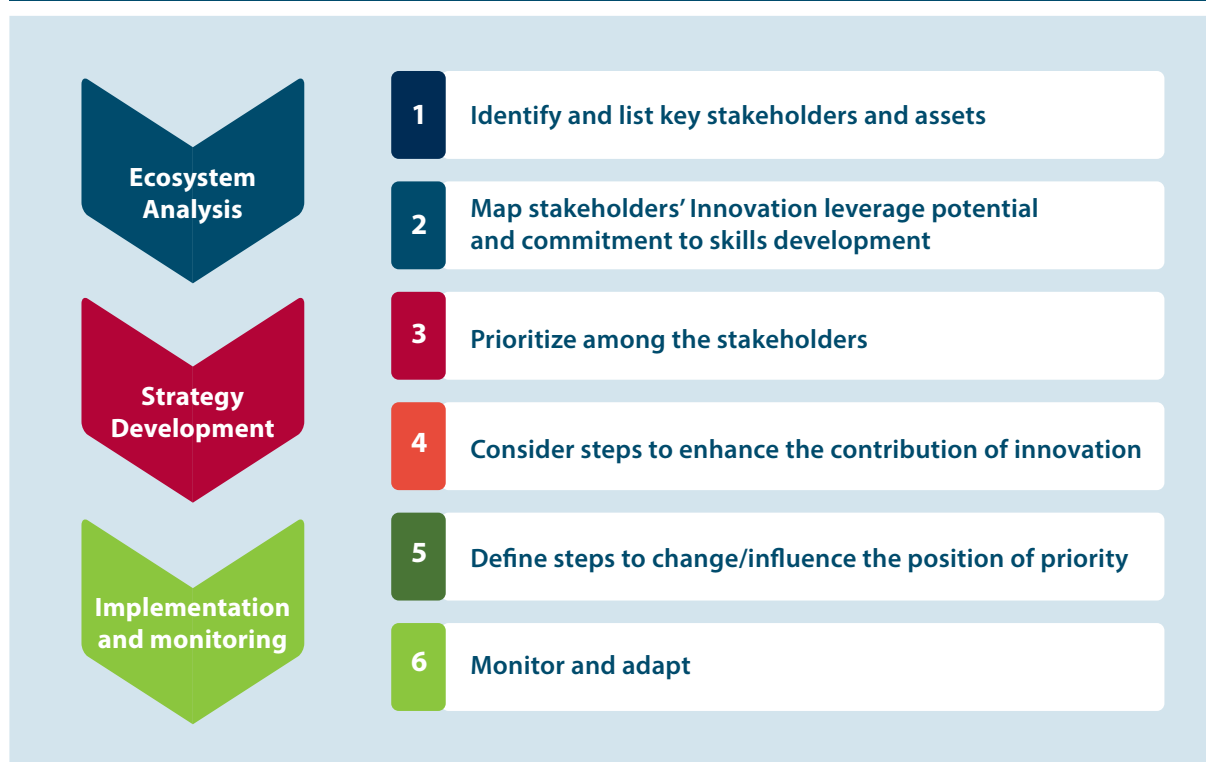


SPECIFIC OBJECTIVES

The tool maps the range of actors in the TVET institution's immediate skills and innovation ecosystem. These include established individual businesses in the formal or informal sector, and collective interest groups such as business forums or chambers of commerce that demand skills that keep pace with a dynamic marketplace. The immediate ecosystem also includes growth companies (SMEs in particular) that need skills for new occupations and emerging goods and services. It covers anticipating skills needs for future companies that are starting up or being shaped within incubation environments. Finally, it includes the contribution of public policy institutions, schools and universities to build up the stock of skills for long-term innovation capacity in the skills and innovation ecosystem.

The tool is designed for use with a diverse group of participants. These could be internal participants from the TVET institution or external stakeholder representatives. The output should inform the TVET institution's engagement with its skills and innovation ecosystem and should be considered when the IAP is designed.

FIGURE 5 Stages and steps of the ESM



Step 1

Identify and list the key stakeholders in the skills and innovation ecosystem to which the TVET institution belongs. The institution may want to focus on the industries, companies, individual entrepreneurs, key institutions, municipalities, regions and networks/forums (such as chambers) with which it can establish or strengthen a mutually beneficial partnership that considers geographic coverage, equipment and staff expertise.

Step 2

Map stakeholders according to their **innovation leverage potential** and their **commitment to skills development**. This should be done based on evidence about the stakeholders' behaviour and their economic and social influence. The evidence may come from studies, interviews or direct knowledge, such as existing cooperation with the TVET institution.

Innovation leverage potential indicates external stakeholders who contribute to the transformation of their environment through innovation or who are actively engaged in offering new products or services to society.

Commitment to skills development indicates external stakeholders who are engaged in activities

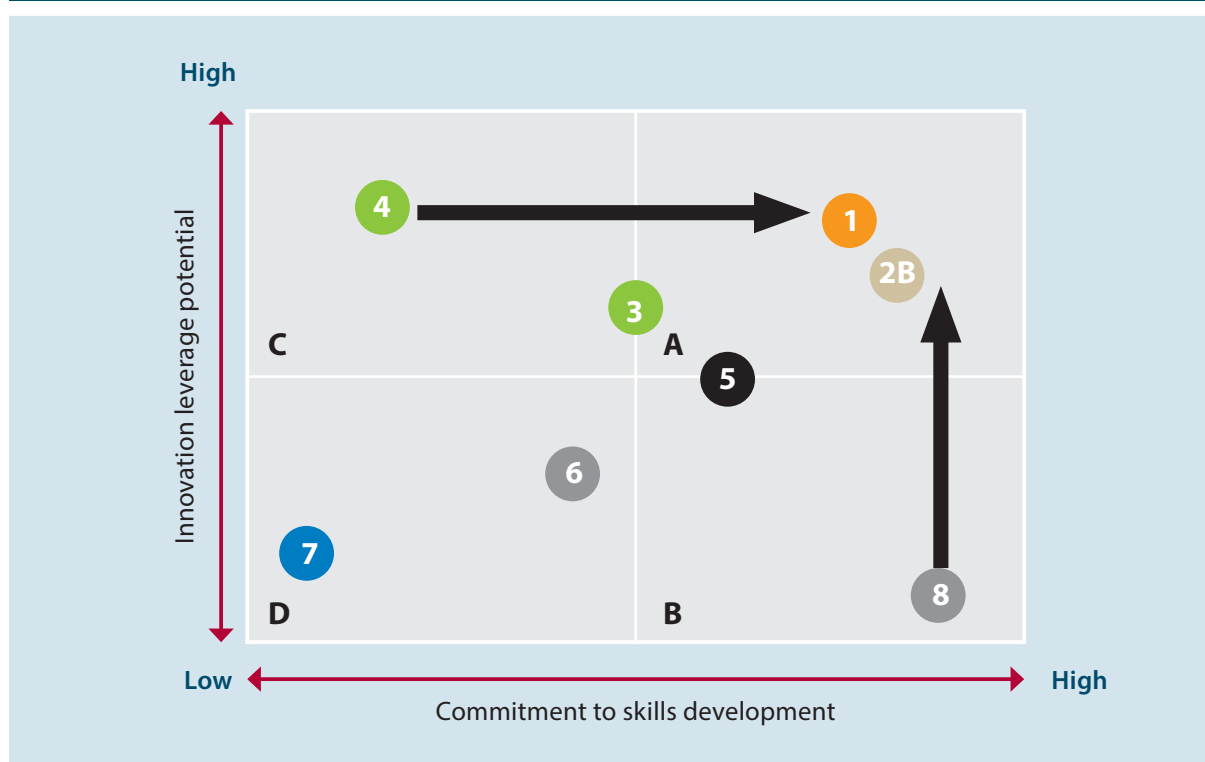
underpinned by skilled human capital and need to develop these skills accordingly. Such external stakeholders also commit to skills development by playing an active role in the governance and/or improvement of the TVET system.

Key questions are:

- To what extent is the stakeholder or sector reliant on skills development?
- How big an employer is the stakeholder/sector?
- How committed is the stakeholder to skills development?
- How much does the stakeholder engage with education and training providers?
- Does the stakeholder openly advocate the importance of skills?
- Does the stakeholder have a skills development strategy?
- Is the stakeholder aware of skills needs and shortages?
- Does the stakeholder have staff development programmes?
- Is the stakeholder active in work-based learning or similar educational strategies?

A consistent scaling system and use of evidence across stakeholders can be ensured by addressing these questions with a checklist such as that shown in the table below.

FIGURE 6 ESM: opportunity for strategic actions



Based on the responses, the innovation leverage potential and the commitment to skills development for each of the stakeholder can be mapped.

An analysis is given below.

- A. **High commitment to skills development/ high innovation leverage potential:** the most valuable stakeholder for sustained long-term cooperation and steering for the institution. Opportunities for engaging with stakeholders through the provision of products and services and the development of new teaching and learning experiences.
- B. **High commitment to skills development/ low innovation leverage potential:** relevant stakeholders for strengthening TVET-related activities in the institution. Especially important for providing input/support in the governance of the TVET institution, developing work-based activities, updating professional profiles, etc.
- C. **High innovation leverage potential/low commitment to skills development:** relevant stakeholders for engaging in the provision and development of products and services, especially considering advocacy measures for innovation skills development and/or considering applied innovation services.

- D. **Low innovation leverage potential/low commitment to skills development:** probably not a priority target for cooperation. Consider strategies to change the stakeholder's position on the map.

Step 3

Prioritize among stakeholders. In many cases, there will be numerous stakeholders in the ecosystem. It may therefore be useful to prioritize and identify the stakeholders that represent the greatest commitment to skills development or innovation leverage potential, who can easily be engaged by the TVET institution. An important consideration is the existence of ongoing cooperation agreements with the external stakeholder as an indicator of willingness for cooperation.

Step 4

Consider what steps to take with actors to enhance the contribution to skills development or innovation in the ecosystem. Which symbiotic relationship can the stakeholders and the TVET institution develop? This may be identified through the analytical process in Step 2 and represent a quick win or involve more substantial actions that create or improve mutually beneficial relationships and contribute to the development of the ecosystem.

Step 5

Define steps to change/influence the position of priority stakeholders in the map and their engagement in the skills development/processes based on institutional strategy.

What steps could be taken by the TVET institution to change/influence the stakeholder's position on the map? TVET institutions could directly approach stakeholders to engage them:

- In defining the TVET institution's overall strategy and identifying opportunities for the stakeholder to participate in governance of the TVET institution
- In mapping products and services relevant to the ecosystem that could be provided by the TVET institution, contributing to improvements in the teaching and learning experience and to internally generated revenues
- In developing innovative teaching and learning experiences that include real-life work experiences where students and teachers can apply academic and technical skills and develop employability

Step 6

Monitor and update the ESM. Periodically revisit the map and consider options for improvement/adaptation of prioritization and steps to change.

Important:

The ecosystem map can carry sensitive information or visualization of an institution's stakeholders. Please exercise utmost discretion or secure management's discretionary approval when sharing such information externally.

INDICATORS FOR ECOSYSTEM MAPPING

Table 4 presents a list of indicators that can be used as a reference for measuring the level of preparedness of the TVET institution to implement innovation in the ESM dimensions. The descriptors should be used as qualitative reference points of assessment and paired with Table 1, which provides the numerical value corresponding to the degree of maturity. This method should be applied during the internal stakeholder consultations and the tools should be used to aid interpretation (please refer UNESCO-UNEVOC website to access the GSA data recording and analysis online tool).

When applying the UNEVOC Innovation Framework, TVET institutions select six indicators from the ESM (three from the commitment to skills development and three from the innovation leverage potential dimensions), according to each institute's specific context.

Internal stakeholder consultations can and should be adjusted to reflect each TVET institution's priorities and strategic choices. This means, for example, that the number of indicators selected for each dimension can vary to allow for more information to be collected on one dimension. The overall number of indicators can also be adjusted to fit the time frame available for the exercise.

TABLE 4 ESM indicators

5 Commitment to skills development	Descriptors
5.1 The stakeholder has processes/practices in place for engaging with education institutions aimed at developing skills	The stakeholder has a track-record of engagement, either formally or informally, with educational institutions in its ecosystem, including non-TVET institutes for the purpose of developing skills.
5.2 The stakeholder has demonstrated/ demonstrates interest in actively participating in skills development initiatives	The stakeholders have demonstrated willingness and interest in educational strategies such as work-based learning or apprenticeships.
5.3 The stakeholder's services/products are highly dependent on skilled professionals	The activity(ies) performed by the stakeholders are partially or totally dependent on skilled labour
5.4 The stakeholder is a relevant player in the local, regional or national skills development environment	The stakeholder influences the skills development environment through policy, financial or economic support.
5.5 The stakeholder is a relevant player in the local, regional or national skills development environment	The stakeholder is a supporting voice on skills development in public and private fora, where the subject is discussed.
5.6 The stakeholder is a relevant player in the local, regional or national skills development environment	The stakeholder addresses specific needs of underrepresented groups and champions their cause to become part of innovation thinking in skill development and employment.
6 Innovation leverage potential	Descriptors
6.1 The stakeholder has processes/practices in place for engaging with education institutions aiming at fostering innovation	The stakeholder has a track-record of engagement, either formally or informally, with educational institutions in its ecosystem, including non-TVET institutions for the purpose of fostering innovation.
6.2 The stakeholders have supported/supports the introduction of innovation-related skills in curricula	The stakeholder understands the need for equipping students with skills and competences necessary in the innovation processes.
6.3 The stakeholder participates in the development of innovative processes, products or services	The stakeholder is an active player in the development of innovative processes, products or services.
6.4 The stakeholder is a relevant player in the local, regional or national innovation environment	The stakeholder influences the innovation environment through policy, financial or economic support.
6.5 Stakeholder advocates/champions for innovation-related issues in the society	The stakeholder is a supporting voice on innovation-related themes in public and private fora, where the subject is discussed.
6.6 Stakeholder advocates/champions inclusion of groups not traditionally reached by innovation	The stakeholder has a reputable standing to champion the cause of under-represented groups towards promoting their employment in innovation-related fields.

To use the ESM forms during the consultations, those familiar with the balanced scorecard process are tasked with similar responsibilities to those described in the balanced scorecard.

- GSA coordinator
- GSA team

ECOSYSTEM MAP FORMS

The ecosystem map forms (i.e. Table 5 and the ESM data collection form) are for use during consultations to collect data and analyse an institution's stakeholders, as described in steps 1 and 2 of the ecosystem map.

Unlike the balanced scorecard form, Table 5 and the ESM form are for gathering all the relevant information into one master document, recording new information and building on existing data provided by previous groups until a complete view of the identified stakeholders is established. It is therefore expected that discussions start with the output of the discussion of previous groups, and for meetings to occur sequentially so that groups can build on each other's outputs.

Each group will provide their own knowledge of evidence related to the institutional stakeholders identified by the previous group, and on a rolling basis, add new stakeholders to the list for further analysis. Each of the stakeholders that is identified

will be assessed according to opportunities for collaboration, and rated according to their commitment to skill development and leverage potential for innovation.

Alternative:

When needed, the facilitator must adapt the process so that all relevant stakeholders are identified in the consultation. If it is not possible to build on an initial list due to the range of interests that are represented, an entirely new list could be identified and discussed. The new list is then added to a previous list that has been discussed.

The GSA coordinator and GSA facilitator ensure that consultation participants (students and teachers) are well-informed of the institutional partners and the innovation projects and initiatives undertaken with them for an informed analysis. They also ensure that feedback gathered from the process represents the perspectives of all clusters of stakeholders and that different types of assessment evidence are considered.

User's guidance note

Under the overall supervision of the GSA coordinator, the ESM form should be used in consultations. The people identified from the team will also help facilitate and gather evidence that must be recorded using the form (see Table 6).

How to use the ESM forms

1. The ESM forms are distributed to participants or projected on a screen, in the case of a larger group.
2. The facilitator explains how to use the table and ESM form as a data collection tool for consultation. The form records all the indicators to be discussed in the consultation, the evidence presented and the corresponding mark to be given by the stakeholder group after it considers all evidence.
 - As needed, the facilitator describes the chosen indicators that are deemed to represent the scope of innovation in the institution in the ESM. These indicators are used as reference points to assess the preparedness of TVET institutions to implement innovation in each of the relevant dimensions.
 - The list of chosen indicators and descriptors as a qualitative reference must be available to stakeholders for ease of reference.

3. The rapporteur uses the forms as master documents for recording data and evidence provided during assessment.
4. The rapporteur captures all the relevant evidence from each of the stakeholder groups and enters the information.
5. After collecting the information and evidence related to external stakeholders, the group discusses the rating to be assigned for each indicator, namely commitment to skills development and innovation leverage potential.
6. At the end of the consultations, the rapporteur produces one table and one ESM collection form representing data from four stakeholder groups.
7. The rapporteur writes the information collected in a clear, succinct manner.

The completed form serves as a record and final output of the consultations conducted with the internal stakeholder groups. It is compiled with the outputs from the BSC assessment by the GSA facilitator(s), and turned over to the GSA coordinator who consolidates the information gathered from the four groups of internal stakeholders and use it to process the data and inform the IAP and the IP.

TABLE 5 Stakeholder and opportunity identification

External Stakeholders	Category*	Collaboration opportunity**
Stakeholder 1		
Stakeholder 2		
Stakeholder 3		
<div> <div>* Please indicate category:</div> <div> A - Companies B - VET Institutions C - Community D - Regional policy developers E - Individuals F - Research and higher learning institutions </div> </div> <div> <div>** Collaboration Opportunity</div> <div> Please indicate opportunities for collaboration between the institution and the stakeholder in the area of innovation </div> </div>		

*Note: According to time availability during consultation, the number of stakeholders to be identified may be increased.
The collection form can be modified according to preference*

TABLE 6 ESM data collection form

**** COMMITMENT TO SKILLS DEVELOPMENT - Please assign values 0-4 to the indicators below:**

Indicators	Scale (0-4)	Stakeholders		
		1	2	3

***** INNOVATION LEVERAGE POTENTIAL - Please assign values 0-4 to the indicators below**

Indicators	Scale (0-4)	Stakeholders		
		1	2	3

The data collected in Steps 1 and 2 of the ESM process are mapped further to present an overview of the opportunity for strategic actions (see also Figure 6).

The guided self-assessment

The guided self-assessment (GSA) process is supported by structured consultations with key stakeholders. These consultations are designed to elicit input on the current situation of innovation at the TVET institution and to discuss ideas for future development. The findings are then processed and analysed, which allows innovative practices and opportunities for improvement to be identified and contributes to a systematic process of innovation at the TVET institution.

The consultations are intended to build ownership, engagement and capacity among stakeholders as they meet and examine evidence of the TVET institution's current performance in innovation.

WHY CONDUCT A GUIDED SELF-ASSESSMENT?

The institution, supported by a team in charge of the process, is expected to identify concrete objectives that are linked with its overall innovation strategies.

For inspiration, this guide adopts the following GSA objectives.

The GSA can help:

- Consolidate evidence of innovation from across the institution that considers feedback and perspectives from a range of stakeholders.
- Establish and measure key performance indicators that can be used to monitor progress of the institution's innovation development over time.
- Identify institutional strengths and innovative practices that can be communicated to consolidate the TVET institution's profile.
- Inform institutional strategy, innovation development actions and achievements.

PRINCIPLES OF THE GUIDED SELF-ASSESSMENT

The GSA process is designed as:

- A flexible process, which can and should be adapted to the specific context and maturity level of each TVET institution. The priorities are set by each TVET institution. Examples could include reducing unemployment, matching skills to employer demands and supporting national development goals. These priorities will vary depending on the circumstances of each institution, its stakeholders and the national context. This is a system-wide approach in which the GSA considers evidence from and the interplay between the balanced scorecard dimensions.
- A participatory process informed by the representative perspectives of a range of internal stakeholders.
- A process that encourages assessment and reflection based on performance evidence, strengths and opportunities for development rather than achieving a high score.
- A cyclical process that embeds regular self-assessment into routine management and efforts to improve the institution's level of innovation.

THE GUIDED SELF-ASSESSMENT PROCESS

In an ideal scenario, the entire GSA process is managed by a responsible coordinator in the institution. It could last four to five days, depending on how comprehensive an assessment is needed. The length of the process is meant to be tailored and adapted to the context of each TVET institution (a sample guided self-assessment schedule is provided in Annex 1).

The GSA should be carried out in five sessions.

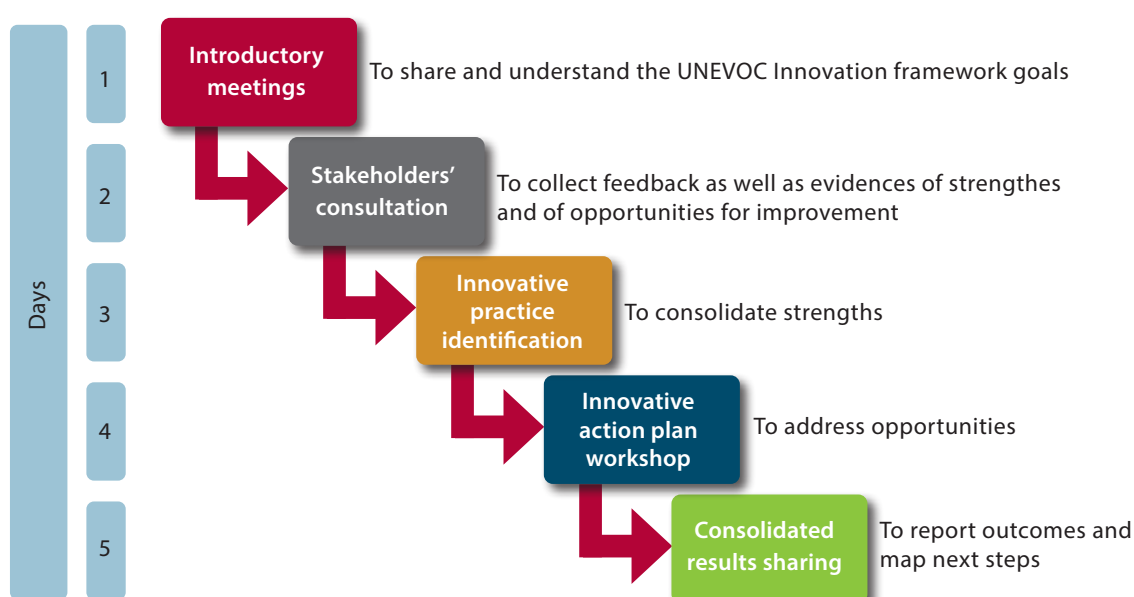
- **An introductory meeting** with the internal stakeholders to establish a common understanding of the expectations and the local context. This session also confirms the programme and fine-tuning of tools.

- **Internal stakeholder consultations** with representatives from the TVET institution's internal stakeholders, using the balanced scorecard and ecosystem map.
- **Innovative practice (IP) identification:** using as a basis the strengths and positive outcomes identified during the internal stakeholder consultations, the TVET institution develops a narrative of its innovative practice. The innovative practice should be representative of the entire institution's system of innovation, which is demonstrated through the analysis of how each balanced scorecard dimension has contributed to it.
- **Innovation action plan (IAP), planning and development:** based on the opportunities for improvement identified during the internal stakeholder consultations, the IAP workshop determines which opportunity will be addressed first by the TVET institution. The workshop also focuses on creating an IAP in accordance with the TVET institution's priorities and the available human and financial resources.
- **The consolidated results presentation** is a final session for compiling the aggregated results of the GSA. The findings from the tools and remarks on the tools themselves are presented and discussed with the TVET institution's senior management.

A. PREPARATORY ACTIVITIES

- The preparatory activities for the GSA begin around six to eight weeks before the UNEVOC Innovation Framework is implemented. Preparation work is led by the TVET institution coordinator and their team, with support from the UNESCO-UNEVOC team.
- A timeline for the GSA is proposed by the TVET institution. This is based on the proposed schedule in the UNEVOC Innovation Framework. Where possible, the timeline should be integrated with other relevant initiatives at the TVET institution (for example, strategic planning, advocacy initiatives, engaging stakeholders, institutional development events and conferences).
- Any relevant tools or materials available in the institution (the innovation strategy and stakeholders' map, for example) are shared with UNESCO-UNEVOC to facilitate data and evidence collection.
- A specific in-depth focus for the self-assessment in terms of theme, dimension, stakeholders, etc. may be defined by the TVET institution and communicated to UNESCO-UNEVOC.
- Indicators that are relevant for the TVET institution's specific context are selected for the balanced scorecard and the ecosystem map.

FIGURE 7 Key steps in the GSA



The guided self-assessment foresees at least fourteen indicators for the BSC and six indicators for the ecosystem map.

- Tools, slides and templates are tailored by the TVET institution and UNESCO-UNEVOC according to the context and focus of the GSA.
- Key internal and external stakeholder representatives, including key innovation partners who are relevant to the GSA sessions, are mobilized and prepared by the TVET institution (see Item B below).
- UNESCO-UNEVOC provides remote support for the UNEVOC Innovation Framework to the TVET institution coordinator and their team in advance of the GSA. This includes the following: an introduction to the UNEVOC Innovation Framework concept and tools, guidance on how to apply the UNEVOC Innovation Framework, guidance on how to interpret the results, and follow-up questions and answers.

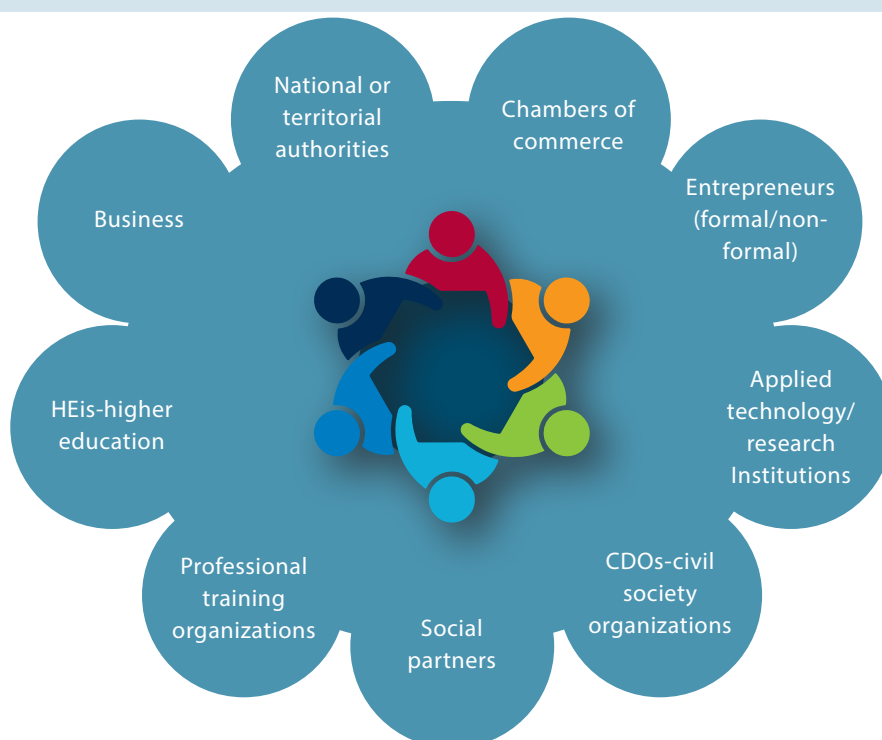
These external stakeholders may be mobilized for participation in the introductory meeting, which is an opportunity for the TVET institution to raise awareness and advocate its innovation-related activities. Furthermore, it is a chance for the TVET institution to understand the plans and activities that are currently on the agenda of the external stakeholders.

The internal stakeholders are invited to take part in the internal stakeholder consultation and encouraged to share comments on the institution's performance based on evidence taken from their direct experience in/with the TVET institution. As far as possible, the internal stakeholders should represent a broad range of units, fields, departments or areas of the TVET institution. Finally, prior to the GSA, teachers should raise student awareness about the process, as students can feel empowered by the ability to impact change. Teachers and students should be selected based on their experience, knowledge, commitment and interest. These qualities are beneficial for the quality of the process, as they are likely to ensure fruitful exchange and improve the results of the consultations. A digital survey has been developed to assist in selecting the most appropriate candidates to take part in the GSA.

B. PARTICIPATION IN THE PROCESS

Generally speaking, the TVET institution's external stakeholders may include representatives from bodies with an interest in skills and innovation, as shown in Figure 8.

FIGURE 8 External stakeholders



Potential criteria to use in the selection include:

- Time attending/working at the institution
- Work/study in different areas/departments
- Interest in subjects related to innovation
- Ability to work in groups
- Inclusive representation (participation of less-represented groups in terms of gender, geographical location, regional language or religion)

C. INTERNAL STAKEHOLDER CONSULTATIONS

The consultations are meant to collect data and evidence from the TVET institution's internal stakeholders on the institution's preparedness to innovate in the BSC dimensions. The consultations also collect data and evidence on the institution's ecosystem, as described in the two dimensions of the ESM (commitment to skills development and innovation leverage potential).

To generate comparable results, consultations with internal stakeholders are designed to be executed as follows:

- In four homogeneous groups, one group for each internal stakeholder
- Each group should be representative of the institution's breadth, with participants from different services, departments, courses, gender or geographical location
- Each group consists of five to eight participants
- The groups may meet in any order according to availability

It should be noted that the internal consultation process can be conducted online. While an online setting allows for a greater number of stakeholders to take part, it would not be realistic to expect each person to be involved in the discussion about how to mark each indicator. In an online setting, the objectiveness of the results stems from the larger number of participants in the process.

Lastly, the internal stakeholder consultations can accommodate a skilled moderator. This person can ensure equal participation of all group members and make efficient use of the time allocated for the exercise.

CAPTURING, PROCESSING AND PRESENTING THE RESULTS

To support the internal stakeholder consultations, UNESCO-UNEVOC has developed a toolbox containing electronic forms to capture the results of exercises to gather data and evidence. The toolbox also includes a software application to translate these data into meaningful information for the TVET institution. UNESCO-UNEVOC will combine the results of the BSC and the ESM into an aggregated analysis of the TVET institution's innovation performance. The results will be processed in two ways, each with a specific methodology and purpose.

The positive evidence and indicators of high performance collected during internal stakeholder consultations will be used to document the innovative practice for the TVET community. Drawing on the positive indicators found during the TVET institution's self-assessment, the BSC dimensions and examples gathered in the ESM, the TVET institution will identify and document a specific case that illustrates a systematic, institution-wide approach to innovation. Table 7 has been designed to support the TVET institution in documenting this IP.

The opportunities for improvement identified during the internal stakeholder consultation will be assessed in a problem analysis exercise, which will inform the creation of an innovation action plan. As previously mentioned, the TVET institution is expected to draw on the results of the BSC and on examples from the ecosystem map to identify a specific opportunity or opportunities for improvement. Table 8 has been designed to help the TVET institution to develop a project-based IAP with defined goals, actions, indicators and resources.

EXPECTED OUTPUTS OF THE GUIDED SELF-ASSESSMENT

The guided self-assessment generates outputs that will inform the TVET institution's tactical and strategic decision-making process as they relate to innovation. These include:

- Aggregated data from individual, internal stakeholders and institution scores, based on selected indicators, innovation dimensions and overall impression
- Data summary and analysis of results from internal stakeholder consultations
- Innovative practice documentation



Innovative practice

OBJECTIVES

This section outlines the proposed objectives, criteria, structure, process, format and style for identifying, documenting and presenting IPs.

Sharing concrete and verifiable examples of IPs is a key tool for TVET institutions to raise their profiles as frontrunners of innovation. These examples are also important in advocating for innovation and influencing decision-makers. Most importantly, the innovative practice is a key tool for a TVET institution to recognize and celebrate its achievements. The main objectives of identifying and documenting IPs are to:

- Empower TVET institutions to learn from the strengths and good practices in their institutions. This learning is essential to reflect on good practices, analyse conditions for success and identify opportunities for scaling up and making IPs systematic
- Enable TVET institutions to share their IPs among institutional stakeholders to enhance their profile and reputation in addition to the potential for stakeholder engagement
- Provide examples of an IP that can influence policy and decision-makers to embrace national, sector or local innovation and skills policies/systems based on examples that work

CRITERIA

Innovation is generally considered the result of a process that brings together various novel ideas in a way that positively affects the economy, society and environment. Therefore, it is natural that many stakeholders will be involved in this process. This means an IP can be considered relevant when it comprises innovation sustained by the four dimensions outlined in the balanced scorecard.

An IP will be regarded as such when it has been successfully implemented over time in the local context of TVET institutions and may inspire others in their quests for innovation. This means an institution's IP is specifically tied to its specific situation and circumstances. Moreover, the IP should ideally be demonstrated through a coherent, cohesive narrative that stresses the role played

by each dimension in supporting the overall achievement.

Complementary criteria for IPs are:

- A focus on innovation that reflects a systematic approach, utilizing all BSC dimensions
- Supported by a hard output that exemplifies the applied innovation (for example, a new curriculum, a prototype, a teaching method, a process or an advocacy tool)
- Innovative in the way the practice is communicated

STRUCTURE

The structure may vary according to the medium of communication that is chosen. However, the IP is expected to cover the following.

- Outline the strengths identified during the GSA
- Outline the steps taken and innovation output delivered
- Analyse the outcome/results of the IP. Where possible, include the expected impact in areas such as employability, enrolment and revenue
- Analyse lessons learned, problems overcome and key success or context factors. This includes methods for systematizing the approach using the UNEVOC Innovation Framework

PROCESS

The process includes the following steps:

- Identification by the TVET institution of the IP and method of communication based on the results of the consultations
- First version of the IP report prepared by the TVET institution
- Peer review/quality assurance by UNESCO-UNEVOC

STYLE, LANGUAGE AND FORMAT

Keep in mind the following when an IP report is compiled.

- The IP should be an inspiring story that is evidence-based. It should be practical, communicative and effective as a tool in a larger context or as a stand-alone document
- IPs will be grouped together in a 'family' of similar narratives and success stories
- The language is adapted according to the official language used by the institution and the intended audience for dissemination. Innovative formats are encouraged. Written documents are possible but videos, websites and e-tools or a combination of these media are also options

INNOVATIVE PRACTICE DOCUMENTATION TEMPLATE

TABLE 7 IP input suggested template

TVET institution information

IP title:

Purpose: the form collects narrative information about the IP selected by the TVET institution. It consolidates the institution's learning on achievements and establishes its national and international reputation. Please fill in the form and write a narrative account based on the prompts. Questions have been provided as a guide to help build the ideas and ensure all necessary information is included.

Context (max 500 words)

- What challenge or opportunity led to the innovation?
- When and how did the IP start?
- What is the focus of the innovation (i.e., Strategy and Management, Teaching and Learning, Product and Service, Ecosystem Relationship Management, others [please elaborate]) and how this has evolved over-time?
- What outcomes for the TVET institution have come from the IP?
- Who else has benefitted from the outcomes of the IP? In what way?
- What challenge or reason for innovation motivated the TVET institution to introduce the practice? How has it been sustained?

Strategy and management dimension (max 500 words)

- What is the management philosophy that supports the IP?
- What steps has the TVET institution management taken to facilitate or support the development of the IP? Have the steps been reflected in any systematic plan of action?
- What types of human, infrastructure or financial resources, or other types of investments have been made available by the TVET institution's management to finance or support the practice? How have they been mobilized?
- Has there been any significant change in the organizational or leadership strategy or vision that helps sustain, develop, or improve the existing practice?
- How have the problems or opportunities been linked to the innovation shared across the TVET institution/ teams?

Please provide any supporting evidence/documents, photos or links to any online information that can help verify your answers.

Teaching and Learning Dimension (max 500 words)

- What innovative teaching and learning experiences or new modes of instruction have been introduced by the TVET institution? What skills or outcomes are intended?
- What made the process(es) innovative in the context of the TVET institution?
- What specialized competences have the teaching staff possessed that allowed them to support the IP? Were there additional areas for professional development and training that were needed to improve and support the IP?

- What innovative technology or technologies have been used to deploy/test/assess the IP?
- How have they helped improve curricular delivery?

Please provide any supporting evidence/documents, photos or links to any online information that can help verify your answers.

Products and services dimension (max 500 words)

- What main products and services have been associated with the IP so far?
- How have these new products and services benefited students and the skills and innovation ecosystem?
- What mechanisms have been introduced to brand/register/protect the intellectual rights of those involved in their development in the institution?
- Has the provision of products and services to the ecosystem allowed for internally generated revenue?
- How have the development of products and services fostered or nurtured collaboration between students, teachers, or other stakeholders?

Please provide any supporting evidence/documents, photos or links to any online information that can help verify your answers.

Ecosystem relationship management dimension (max 500 words)

- Which external actors have been relevant to the implementation of the IP? Are there formal agreements in place with them?
- What motivates stakeholders to engage in the IP? Please reference their commitment to skills development and/or their innovation leverage potential.
- Why have these external actors been relevant? What unique role have they played?
- How has the partnership with external stakeholders helped the IP evolve?
- Has there been regular interaction among stakeholders to understand their needs and new opportunities of working with them?
- How has the TVET institution reached out to the external stakeholders? What other plans for outreach are in the pipeline?
- What have been the direct benefits of these partnerships for students and teachers?
- Has the participation in the IP enhanced the stakeholders' commitment to skills development and/or its innovation leverage? If yes, please explain how.

Please provide any supporting evidence/documents, photos or links to any online information that can help verify your answers.

Impact of the innovative practice in addressing issues (social, economic, environmental, policy) (max 300 words)

- What social/ economic/environment-related or political/strategic impact(s) has the IP produced so far?
- What was the impact to direct and indirect target groups?
- How have the impacts of the IP been measured?
- What indicators have been used to measure the impacts of the IP?

Lessons learned (max 300 words)

Communicating about the practice

- What high-impact communication material(s) and documentation can be produced to share the IP with a global audience (e.g., video, poster materials, electronic or digital media, etc.)?

Expected next steps for the innovative practice

TABLE 7 IP Input Suggested Template

TVET institution information

IP Title:
Purpose:

Context (max 500 words)

Strategy and management dimension (max 500 words)

Teaching and learning dimension (max 500 words)

Products and services dimension (max 500 words)

Ecosystem relationship management dimension (max 500 words)

**Impact of the innovative practice in addressing issues
(social, economic, environmental, policy) (max 300 words)**

Lessons learned (max 300 words)

Communicating about the practice

Expected next steps for the innovative practice



Innovation action plan

DEFINITION

The IAP is an important output of the process described in this framework. It draws on the outcomes of consultations with the TVET institution's internal stakeholders to formulate an institution-wide innovation plan or project. The project is intended to enhance the innovation maturity of the institution and improve the long-term innovation performance based on evidence and indicators.

The IAP should be developed in a participatory manner and used to manage the cycle of an innovation project or initiative. This includes planning, implementation and evaluation through a format known as the programme design matrix. The IAP consists of a set of activities aimed at achieving a specific goal, within a defined time frame, with defined resources and in a specific TVET institution. The aim is to achieve an innovation-related objective.

PROCESS

The IAP is developed in an on-site participatory workshop at the TVET institution that is attended by the institution's internal and (optionally) external stakeholders. These stakeholders contribute to the design of the IAP by providing insights into the TVET institution's current situation and by sharing their personal and professional knowledge and experience. The workshop is best conducted in a small focus group of six to eight people using flip chart paper or an overhead transparency. It is important that input can be added as the conversation progresses.

The IAP workshop is divided into four sequential sessions. Each lasts two hours and has clear methodologies, objectives and outcomes. The first two sessions are the analytical part of the workshop. At this stage, the TVET institution's stakeholders are invited to reflect on the opportunities for improvement highlighted by the balanced scorecard and by the ESM during the internal stakeholder consultations.

Based on the analysis of improvement opportunities as well as the objectives set by the stakeholders and validated by the TVET institution's senior management, the next two sessions are aimed at defining the specific strategy or strategies for implementing the IAP based on the findings of the previous session.

To make the implementation of the IAP as efficient as possible, the TVET institution is invited to develop an operational plan. This is a detailed framework of the activities based on the IAP containing relevant information on activities, results, timeline, responsible people, inputs and expenses.

INNOVATION ACTION PLAN TEMPLATE

The template is used to guide the identification of the goal, objectives, desired results and other information that can help to monitor the progress and achievement of milestones of the innovation action plan. To use the form, mobilize a team that is familiar with results-based management or quality assurance systems at the institution.

IMPORTANT

The template provides a basic structure for developing an action plan. Institutions are encouraged to consider using other useful resources that can help them achieve the same objective of this step.

TABLE 8 Logical framework

IAP overview	Objective verifiable indicators	Means of verification	Important assumptions
Overall goal			
Specific objective			
Results	Preconditions		
1.	1.1		
	1.2		
	1.3		
2.	2.1		
	2.2		
	2.3		
3.	3.1		
	3.2		
	3.3		
4.	4.1		
	4.2		
	4.3		
Activities	Inputs	Milestones	
1.1			
1.2			
1.3			
2.1			
2.2			
2.3			
3.1			
3.2			
3.3			
4.1			
4.2			
4.3			



Innovative practices

This section showcases innovative practices from partners of the UNEVOC i-hubs project. These examples show different maturity levels in the four dimensions described in the framework, as well as different commitment levels and leverage potential of stakeholders in their skills ecosystem.



Innovative practices

INTRODUCTION

The story of innovation in TVET

Education and work are undergoing major changes in the 21st century brought on by social, environmental and economic disruptions. TVET institutions – the traditional training grounds for key skills and competences demanded by the labour market and entrepreneurship – face challenges in innovating these skills to meet the uncertain demands of the future.

In response, TVET institutions have introduced new measures – ‘innovative practices’ – with great potential to rejuvenate the future of TVET and change the way it is defined and practised.

To highlight how TVET is innovating to meet the rapidly shifting needs of the workforce and society, UNESCO-UNEVOC launched the Skills for Innovation Hubs (i-hubs) project in March 2019. The project featured nine pilot institutions selected from the UNEVOC Network, based on their proven experience and commitment to innovation.

i-hubs case studies

These i-hubs case studies are a companion to the Innovation Framework, which describes the parameters, definitions, processes and self-assessment procedures for TVET institutions to mainstream innovation.

This section provides deeper insights into the Innovative Practices implemented by the nine TVET institutions in the i-hubs project. The following pages contain case studies give an overview of each institution’s innovative practice, and an analysis of the enabling conditions and best practices that supported innovation.

The analysis is based on indicators in four innovation dimensions that assess innovation capacity within an institution. A more comprehensive explanation of the dimensions and other factors for assessing innovation capacity are part of the Innovation Framework. For the purpose of these cases studies, the following definitions of the innovation dimensions should be kept in mind:



Strategy and Management: The capacity of institutional leadership, management, organizational processes and culture of the institution to prioritise, inspire and sustain innovation. This creates a self-sustaining culture and dynamic for innovation, where new ideas and initiatives can flourish and become mainstreamed. Innovation in this dimension is particularly notable at the Rift Valley Technical Training Institute and the Berufskolleg an der Lindenstraße vocational college.



Teaching and Learning: A key aspect of this dimension is familiarizing TVET teachers, trainers, and instructors with the pedagogical developments of recent years that incorporate new methodologies and technologies for teaching a digital generation, and providing the digital literacy required by the 21st century job market and society. Innovation in this dimension is particularly notable at the Malta College of Arts, Science and Technology and the Shenzhen Polytechnic.



Products and Services: This dimension covers the capacity of an institution to develop and provide new functions beyond traditional teaching and learning for students and partners. Examples include research and development, business incubator and start-up services, work-based learning, and career guidance. Innovation in this dimension is particularly notable at the Basque Centre of Research and Applied Innovation in VET and the Yaba College of Technology.



Ecosystem Relationship Management: An institution's capacity to monitor emerging needs and opportunities in the labour market and society, and to respond with new skills, products and services. This dimension also reflects an institution's engagement and coordination of its ecosystem through partnership with public and private sector stakeholders, as well as participation in established networks. Innovation in this dimension is particularly notable at the Seychelles Institute of Technology, Finland's Joint Authority of Education in Espoo Region, and the Technical Education and Skills Development Authority Women's Centre in the Philippines.

USING THESE CASE STUDIES

The case studies include a basic overview of each institution, a summary of its innovative practice, and a breakdown of its strengths in each dimension. Comments on the enabling factors and best practices are intended to highlight potential starting points for other TVET institutions considering innovative practices of their own. These comments are colour coded by dimension: strategy and management, teaching and learning, products and services, and ecosystem relationship management. In documenting the innovative practices of the i-hubs project, UNESCO-UNEVOC hopes to inspire other TVET institutions to consider their own capacity for innovation. Bringing together the story of the i-hubs reflects the diversity and range of ingenuity available in the UNEVOC Network.

The macro impact of micro businesses in Malta

1 Case Study



Malta College of Arts, Science and Technology (MCAST), Paola, Malta

Established

2001

Student body

7,000 full-time students,
4,000 part-time students (2019)

Teachers and trainers

750+ (2019)

Educational focus

MCAST is Malta's leading vocational education and training institution, offering more than 180 full-time and more than 300 part-time vocational courses ranging from certificates to Master's degrees. All courses are fully accredited at Malta Qualifications Framework (MQF) and European Qualifications Framework (EQF). The college features six institutes: Applied Sciences, Creative Arts, Engineering and Transport, Business Management and Commerce, Community Services, and Information and Communication Technology.

Mission statement

'To provide universally accessible vocational and professional education and training with an international dimension, responsive to the needs of the individual and the economy.'

The island nation of Malta is home to many

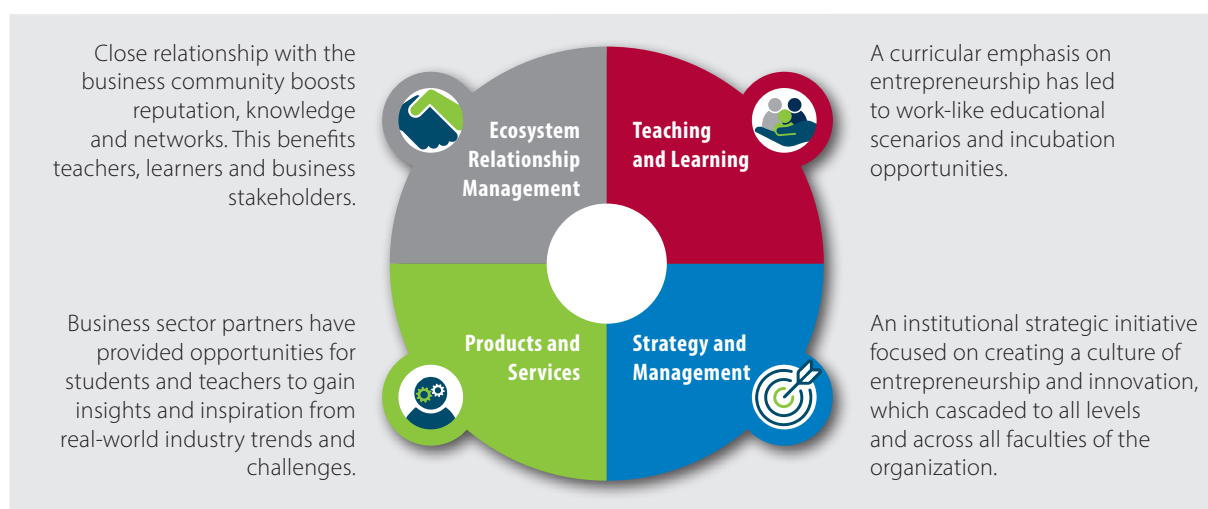
small and medium enterprises (SMEs) and micro businesses in a dynamic entrepreneurial landscape. To ensure its students are equipped with the skills to keep up with rapid change, the Malta College of Arts, Science and Technology (MCAST) maintains a distinguished Entrepreneurship and Entrepreneurial Learning programme.

Of the roughly 103,000 registered businesses in Malta, only 112 employ more than 250 employees. The rest employ less than 50 people and are considered SMEs; most (97.3 percent of all businesses in Malta) are considered micro businesses with fewer than 10 employees.

Given this background, the MCAST established its Entrepreneurship and Entrepreneurial Learning programme that aimed at teaching students how to start and operate successful small businesses. The programme has been up and running for 10 years now, but thanks to MCAST's Strategic Initiative 2019-2021, entrepreneurship training is now even more firmly embedded in MCAST's curriculum.

The innovative practice in teaching and learning represents a significant step forward at an institution already at the forefront of TVET in Malta.

Dimension analysis



Innovations in teaching and learning at MCAST have firmly established the field of entrepreneurship at the centre of the curriculum.

What does a curricular emphasis on innovation and entrepreneurship look like?

MCAST has innovated its teaching and learning methods by developing simulation-training centres, providing students with practical experiences in a work-like environment and work-like educational scenarios that utilize cutting-edge information communication technology (ICT) tools. The college has scaled the outreach of its innovative approach by mainstreaming entrepreneurship and entrepreneurial learning across all programmes.

In what ways do teachers and learners take ownership of the entrepreneurial approach?

The innovative impact is enhanced by multidisciplinary teams of learners from different departments working together on business ideas and plans. For teachers, MCAST provides systematic opportunities for ongoing teacher training and development. Staff are also encouraged to carry out research into entrepreneurial learning pedagogy and to integrate more real-world experiences into classroom teaching.

In order to develop innovative capacity in teaching and learning, MCAST put in place supportive measures throughout its strategy and management approach. This emphasises innovation through the development of an entrepreneurship culture that is embedded in its Strategic Initiative 2019-2021.

How do strategic initiatives create momentum across an entire institution?

The Strategic Initiative at MCAST cascades the focus on entrepreneurship to all levels and across all faculties of the organization. It cements MCAST's commitment to keeping pace with the country's rapidly evolving business landscape. In order to keep up, the school itself must also evolve at a rapid pace.

How can internal stakeholders be encouraged to embrace a new strategy?

Faculty and support staff are given full managerial support and resources to develop the provision of entrepreneurship. One example is the new Entrepreneurship Centre on campus – a top-down initiative that created space for teachers and learners to experiment with new methods.

With the strategic, didactic, and curricular elements in place, new products and services have reinforced MCAST's innovative capacity.

How can close access and interaction with industry partners inspire products and services that support entrepreneurial education?

Access to business mentors and incubators helps learners move from a controlled training environment to real-world simulation and business start-up. At MCAST, learners have even more to gain from these experiences due to the opportunities available to put them into practice at the institution's business incubator programmes and facilities. Teachers benefit from this access as

well: business sector partners are invited to brief teachers and learners on the latest industry trends or challenges, which in turn influences curriculum and the learning process.

MCAST's ecosystem relationship management reflects years of close collaboration with public and private sector stakeholders.

How can an institution manage its ecosystem in a way that maximizes entrepreneurship?

Through its mandate and close cooperation with government bodies (Malta's Development Agency, national skills council, ministry for education and employment) and business networks, MCAST is actively engaged in ecosystem processes and activities. MCAST uses its membership in government bodies and networks to advocate entrepreneurship and the importance of entrepreneurial skills.

How does frequent interaction with the business landscape create agility and flexibility at an institution?

MCAST uses active partnership with local businesses to enrich its teaching and learning, access mentors for start-up businesses, get work experience for trainers and provide young entrepreneurs with real-life challenges and opportunities (800 businesses support work-based learning). These efforts have cemented MCAST's long-term reputation as a leading TVET institution in Malta.

KEY TAKEAWAYS

Building on 20 years at the forefront of TVET education in Malta, MCAST aims to put its students at the cutting edge of innovation and entrepreneurship. Its efforts to embed innovation as a priority with the Strategic Initiative 2019-2021 will ensure diverse entrepreneurial offerings reinforced over several years of instruction. By continuously evaluating and challenging teaching and learning, products and services, and the ecosystem, MCAST creates new opportunities and ensures that existing practices remain dynamic and relevant.

MCAST's efforts to create programmes and a learning environment that reflect the trends and demands of the local industry represent an innovative practice. Aligning with international TVET goals such as the SDGs are important for a TVET institution, but an institution's most immediate impact is local. MCAST's strategy reflects this reality and uses it as a guideline to shape policy, curricula, and campus culture – an approach that TVET institutions can replicate.

Award-winning innovations from TVET students

2 Case Study



Rift Valley Technical Training Institute (RVTTI), Eldoret, Kenya

Established
1962

Student body
5,200 (2019)

Teachers and trainers
138 (2019)

Educational focus:

RVTTI is a leading technical training institution in Kenya. As an East Africa Community centre of excellence in TVET, RVTTI plays a pivotal role in helping Kenya achieve its development goals through competence-based education and training in technical and business disciplines.

Mission statement

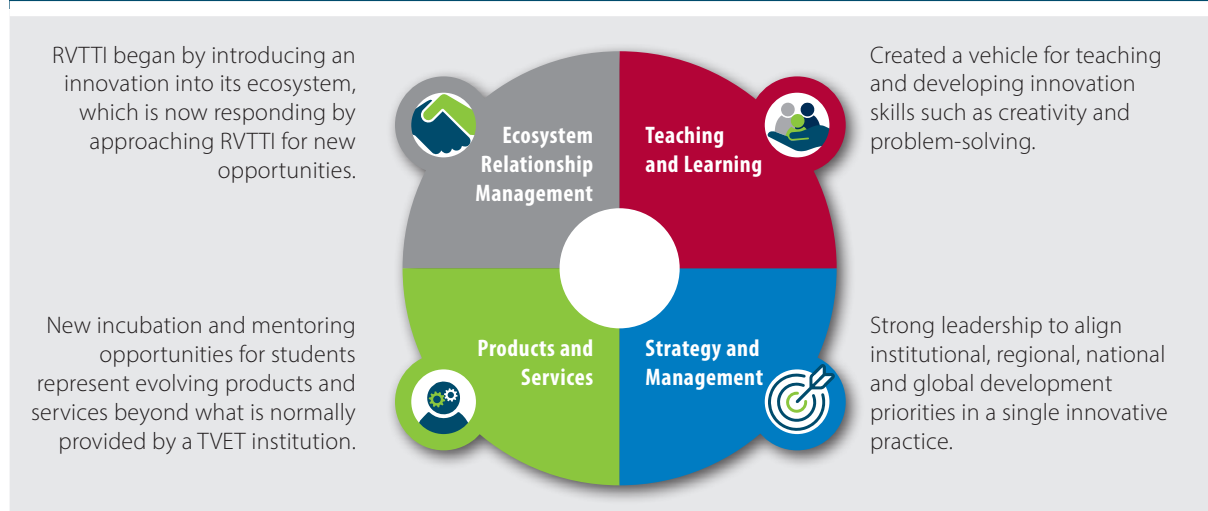
'To train competent and innovative human resources in technical and vocational disciplines to meet the changing needs of industry and society.'

At Kenya's Rift Valley Technical Training Institute (RVTTI), what began as an incentive for developing technical innovation has evolved into a showcase for new technology made by TVET students.

In Kenya, RVTTI is recognized as a relevant player in the national innovation system and is seen as a centre of quality management among TVET institutions. From this position, RVTTI is keenly aware of the need to prepare young people in Kenya for new economic opportunities by improving their skills, employability, competitiveness, efficiency and capacity for innovation. A few years ago, the institution also observed a growing consensus among stakeholders of a need to encourage innovation in TVET, so students were recognized and better prepared to address issues facing society. They noted that funding issues often meant innovations created by young people were not getting off the ground.

As a result, in 2015, RVTTI introduced its Innovation Awards. The cash prizes for products and services promote and nurture student innovations in support of commercialization and income generation, employment and youth entrepreneurship. After five years, the Innovation Awards are firmly established and shining a spotlight on the creativity and innovative abilities of TVET students in the region.

Dimension analysis



Implementing the Innovation Awards was driven by a variety of factors across all dimensions, but the most important involved RVTTI's strategy and management. With a strong strategic direction based on national policies, top-down internal policies, resource commitment and solid processes, RVTTI has turned its Innovation Awards into a long-term success.

What strategy and management factors shape the specifics of an innovative practice?

RVTTI created the Innovation Awards to align with national development priorities, such as the Kenyan Vision 2030, that focus on digitalization, greening and entrepreneurship. A 2015 strategic decision by the Board of Management created the Innovation Awards and made them a top governance priority (which also secured future funding).

What factors laid the groundwork for successful execution and launch?

The RVTTI Innovation Action Plan was created to establish an enabling environment for innovation with a coordination office for research and development. The office conducted an analysis of innovation award schemes in other institutions to ensure it learned key lessons from other experiences, especially in higher education. This led to RVTTI's internal policies, criteria and processes for the scheme from its launch to conclusion.

How did management sustain success?

The Innovation Awards needed student submissions to thrive, and dedicated communication efforts encouraged potential applicants from RVTTI and across East Africa to take part. This international dynamic consolidated RVTTI's profile as a TVET leader in East Africa.

The Innovation Awards also impacted teaching and learning by providing teachers, students and the ecosystem with motivation and examples regarding the practical use and relevance of new innovation-related skills and competences offered by RVTTI.

How does a common point of reference for teachers and students impact instruction and learning?

The Innovation Awards were an opportunity to shift curricular focus to core innovation skills such as creativity and problem-solving. Previously, RVTTI's instruction relied on traditional, classroom-based TVET instruction and was geared toward completing exams and graduation. An institution-wide initiative such as the Innovation Awards can be a game changer for innovating content and delivery.

How has a shift in curricular focus impacted teachers and learners?

Modernizing the curricula and teaching methods helped engage and motivate teachers and trainers. Through the awards, faculty have more opportunities to work with industry partners, and gain relevant skills and experiences that lead to new roles, such as mentoring young entrepreneurs as they develop ideas. Learners benefitted from an enriched classroom experience: not only were they encouraged to take part in the competition for the opportunity to win, but also for the exposure, promotion, and new skills associated with submitting an entry.

RVTTI used the Innovation Awards to change the range of Products and Services provided by the institution to external partners.

How does an innovative practice inform the creation of new products and services?

The Innovation Awards were an opportunity for RVTTI to work with external partners on an analysis of skill demands and business opportunities in East Africa. This included an analysis of funding opportunities for young TVET aspiring entrepreneurs – normally a key weakness in business development. RVTTI also has new incubation capacities, start-up business services and assistance in registering intellectual property rights – opportunities identified through the Innovation Awards.

What is the impact on future products and services?

RVTTI used the Innovation Award scheme to further its research into TVET, with an emphasis on the role of TVET in innovation. As a result, RVTTI has now combined the Innovation Awards with an annual TVET conference for East Africa. In addition to promoting TVET research, the conference – hosted by RVTTI – provides insights into how innovative TVET skills can lead to business development opportunities.

In terms of ecosystem relationship management, RVTTI gained new analytical capacities of its ecosystem for identifying key actors and potential partners.

How can an innovative practice change the dynamic of ecosystem relationship management?

The visibility of the Innovation Awards has motivated national and local partners to deepen their level of engagement with the institution. This includes providing technical and financial support for the start-up enterprises, as well as work-based experience for teachers. The annual Research and Innovation Conference provides a local, national and international platform for industry leaders, policymakers and researchers to share knowledge and reflect on current needs and opportunities for TVET skills.

KEY TAKEAWAYS

The Innovation Awards are a unique way of recognizing talent and ingenuity of TVET students. However, a further and potentially more valuable piece to the puzzle is providing students with guidance on how to make their ideas viable in the long-term. RVTTI has managed to achieve both: not only has the institution's management remained committed to hosting the event every year, but it has also actively pursued opportunities for expanding the event's impact on students and regional stakeholders.

RVTTI's Innovation Awards are a best practice because growth, maturation and scalability are built into the strategy. From the very beginning, the Innovation Awards provided benefits to immediate stakeholders in the RVTTI network; subsequent years saw a steady stream of new stakeholders, collaborations and opportunities for award-winning entrepreneurs to turn their ideas into viable businesses and solve real social problems in Kenya.

Innovative practices, such as RVTTI's Innovation Awards, have high growth potential and present opportunities for collaboration with other TVET institutions and stakeholders. As the RVTTI example shows, a clear strategy helps ensure the project's momentum and growth are efficiently channelled.

Spread the word: German students discovering the benefits of TVET

Case Study



Berufskolleg an der Lindenstraße (BKaL), Cologne, Germany

Established

1900

Student body

3,600 (2020)

Teachers and trainers

138 (2020)

Educational focus

BKaL is a vocational college offering 16 business and administration programmes in addition to multiple types of university entrance qualifications. The programmes are divided into the technical college for economics, the commercial college and business management school, and the vocational college.

Mission statement

'Develop the competences of students so they can succeed in an ever-changing world with a holistic approach, modern teaching methods, digital technologies and courses, and career guidance in the field of business and administration.'

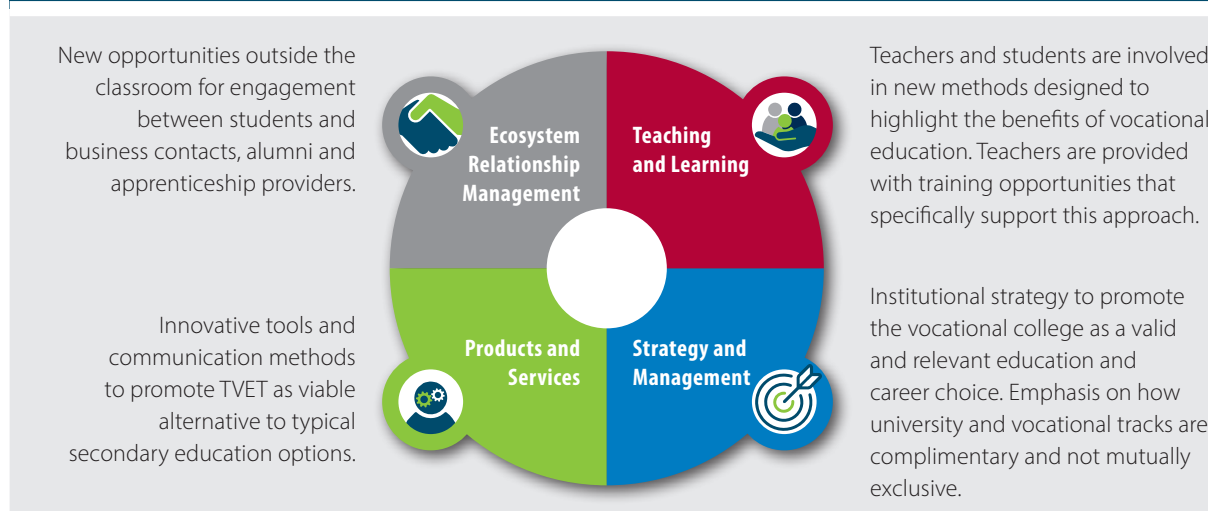
For many young people, the path through school and into higher or technical education is often associated with rigid interpretations of what is considered the norm. But what if there were more options that allowed schoolchildren a degree of flexibility in their future education choices and provided more robust vocational training? Berufskolleg an der Lindenstraße (BKaL) in Cologne, Germany, is exploring ways of making this an attractive option.

For more than two decades, Germany has seen a steady increase in the annual number of new university students. At the same time, the number of new apprentices has remained flat and even experienced a slight decline. To combat this trend and reinforce the value of vocational education, the Berufskolleg an der Lindenstraße (BKaL) vocational school has implemented a new approach to the entire concept of secondary school, TVET and university certification. Their 'BKaL 360' approach is taking hold and changing norms long held by teachers, students, alumni, parents and business stakeholders.

At BKaL, full-time students pursue leaving certificates for studying at a university or a university of applied sciences. Part-time students take part in vocational education and training programmes; in Germany, these integrate school-based learning with work-based practice in a dual system.

BKaL 360 seeks to combine the opportunities inherent in both the full-time and part-time paths to differentiate itself from other institutions, while ensuring all students can utilize BKaL's vocational expertise, university preparatory programmes and links to the business community. These efforts begin before students enrol and include alumni outreach.

Dimension analysis



The BKaL 360 initiative is backed by a strategy and management policy that emphasizes the college's ability to provide the best of both worlds: university-bound students are exposed to the benefits of vocational training, while vocational students in the dual-system have clear options for pursuing university studies. By developing, communicating and progressively implementing a clear and evidence-based strategy with innovative tools and processes, BKaL is enhancing the appeal of TVET and its institutional role as a TVET provider.

How did management facilitate institutional acceptance of the innovation?

Blurring the lines between the university and vocational tracks within the college hinged on a management decision to develop the principles and processes of BKaL 360 in one discipline, before scaling up to all 16 of the institution's disciplines. This required a torchbearer to lead efforts within the test discipline, and to communicate the benefits and implementation process to the other disciplines. Clear positive results from the first department led to all departments embracing the change.

How can the benefits of TVET be communicated effectively to an unfamiliar audience?

BKaL needed tools in place to win over one very important audience: the parents of prospective students. Innovative tools and vehicles to inform and engage parents were implemented to show them the comparative advantage of a BKaL education in terms of labour market outcomes and access to higher education compared with general secondary education.

The focus of new products and services at BKaL was creating new vehicles and venues for explaining the concept and benefits of the college's options to new or unfamiliar audiences.

What conditions necessitated new products and services?

The dual-system offered at BKaL – classroom lessons alongside vocational education – is not a new concept in Germany, but one that has become less familiar to local learners, parents and pre-secondary schools. Businesses looking for prospective talent or candidates for apprenticeships may also underutilize BKaL's dual-system students. BKaL 360's outreach was designed to make the dual-system option more appealing. It includes specific presentations and opportunities for dialogue that draw attention to the available options at BKaL – ranging from vocational instruction to university entrance exams – and how these options can be combined.

How does an institution enhance the credibility and value of TVET?

BKaL promotes the importance of TVET as an education and career choice among learners, teachers, parents and the business community. This is coupled with a comprehensive information and career support system that informs potential learners before they join the institution, guides their study and career choices while attending, and helps trace and engage graduates during their initial career development.

What role do current and former students play in shaping the learning experience?

At BKaL, dual-system students are tasked with creating presentations that inform their full-time peers of the benefit of vocational training and alternative paths to university. By design, this exchange is conducted among peers on equal footing. The presentations create an opportunity for the dual-system students to reflect on their vocational studies and the link between their classroom and apprenticeship environments. Input from alumni also helps students understand the context of the working world they will enter after finishing at BKaL.

To prepare students in the dual-system for sharing insights with their peers about vocational training and apprenticeships, teachers were called on to introduce new lessons and methods to the curricula. The commitment and motivation of teachers and students were essential for making sure these changes to the teaching and learning dimension were effective and permanent.

What is the best way to motivate teachers for a programme that depends on their engagement?

To facilitate the peer-to-peer vocational presentations by dual-system students, teachers needed to adopt a new set of pedagogical teaching methods, such as project-based learning. At BKaL, this involved gaining familiarity with digital tools, such as Microsoft's Office 365 cloud-based services. BKaL ensured that training was in place to facilitate uptake. A pilot phase in one of the school's departments made rollout in other departments much easier – champions from the pilot phase could lower inhibitions among staff and share learning as other departments were brought on board. BKaL also introduced opportunities for faculty and staff to work together and develop an institution-wide approach to career development. These 'Pedagogical Days' addressed topics such as classroom management and digitalization. This approach boosted staff buy-in and commitment for BKaL 360.

The rollout of BKaL 360 was a success due to BKaL's ecosystem relationship management efforts to engage public and private sector stakeholders in BKaL's strategy, teaching and learning, which contributed to renewed appreciation and buy-in for the specific added value of the institution.

What are some strategies for attracting new external partners that will lend credibility and visibility to an innovative practice?

BKaL's innovative external communication strategy included career fairs and alumni networks. This was embraced by business partners who saw BKaL 360 as an opportunity to target TVET for specific business needs while raising the quality of apprenticeship education and training. BKaL 360 helped renew collaboration partnerships with influential business partners, which contributed to better apprenticeship opportunities for BKaL students. BKaL 360 also led to new avenues of collaboration between BKaL and primary or pre-secondary schools to ensure that stakeholders at these schools – including prospective learners and their parents – are aware of the educational and professional advantages to be gained by attending BKaL.

KEY TAKEAWAYS

BKaL's approach to secondary education represents an adjustment to a system that has been long-established and embraced in Germany. However, it also represents a clear understanding of the changing business landscape and the evolving role TVET needs to play in the lives of young people.

The next step for BKaL and its BKaL 360 approach involves expanding the programme to all 16 of the school's disciplines while earning buy-in and increased legitimacy from external stakeholders, namely parents and potential industry partners. Engaging parents while their children are still in primary school is part of BKaL's plan to gain support for its innovative TVET approach, as is increased scope for alumni participation and industry stakeholder involvement. The benefits of peer-to-peer exchange on the merits of vocational education will only increase as this practice becomes more established.

BKaL's innovative practice is a clear example of an institution that recognized a changing landscape and quickly moved to react: nothing changed about the quality or scope of BKaL's TVET instruction, but the college recognized that students were slowly drifting away from these opportunities. This represents BKaL's contribution to the i-hubs project: the ability to adapt to a changing landscape to ensure the value and relevance of TVET instruction remains visible and understood.

Seychelles' innovation pipeline

4 Case Study



Seychelles Institute of Technology (SIT), Mahe, Seychelles

Established
2006

Student body
310 (2019)

Teachers and trainers
38 (2019)

Educational focus:

SIT is a TVET institution operating under the aegis of the Seychelles Ministry of Education and Human Resource Development. Full-time, part-time and apprenticeship training programme students work toward certificate, advanced certificate, diploma and advanced diploma qualifications. With the exception of the advanced diploma, the qualifications are developed locally to meet the needs of industry: carpentry and joinery, electrical installation, electrical and electronics, masonry, mechanical engineering, motor vehicle mechanics, painting and decorating, plumbing and refrigeration, and air conditioning.

Mission statement

'To work in partnership with industry, using quality and responsive programmes, which incorporate innovation and research to enrich learners' competences for employment, entrepreneurship and lifelong learning in a globalized environment.'

Seychelles Institute of Technology (SIT) is a one-of-a-kind institution on the island country of Seychelles. As such, it takes the responsibility of remaining on the cutting edge of TVET innovation seriously, with new ecosystem partners and a forward-thinking strategy impacting the country's vocational education system.

All Member States are facing economic, societal and environmental disruptions, brought on by climate change and new demands on the workforce. For some countries – such as the island nation of Seychelles with its limited land and human resources – these challenges are increasingly existential: youth unemployment and an influx of expat labour pose challenges to the economy, while climate change is raising urgent questions about sustainable development. Addressing these problems requires new skills and approaches, a reality that SIT has turned into an opportunity for its staff and students.

As Seychelles' sole TVET institution, SIT recognized its duty to adapt its teaching and learning principles, while positioning itself as a proactive partner in innovation to government institutions, NGOs, and businesses. Many SIT graduates go on to work in engineering and construction in Seychelles, and SIT has embraced its responsibility to make sure its graduates are equipped with skills that meet the demands of the future workforce.

The result has been a progressive approach to innovative TVET at SIT and a steady stream of graduates ready to tackle one of the country's most urgent environmental issues: its water supply.

Dimension analysis



SIT's ecosystem relationship management was a major factor in implementing its innovative practice. In addition to strengthening ties with major public partners in sustainable development fields such as the Seychelles Energy Commission, the United Nations Development Programme and the Public Utility Corporation, SIT proactively engaged with new stakeholders. These new contexts and environments positively impacted the institution's curricula, teachers, students and strategic approach.

To what extent can relationships within the ecosystem influence an institution's strategic plan or initiatives?

A close understanding of the needs and opportunities of the ecosystem led to innovations in SIT's stakeholder network. Partnerships have been formalized with memoranda of understanding, leading to opportunities for joint pilot initiatives where financial and operational duties were shared. These pilot projects helped SIT scale up its innovation potential in other dimensions and impact on the ecosystem and prepared SIT to move into the driver's seat on later projects.

How does an institution ensure new partnerships contribute to forward-thinking TVET?

At SIT, the school deliberately selected progressive partners in fields that related to its curricular and institutional goals. For example, working with the Indian Ocean Commission led to renewable energy training for five lecturers that focused on heating water using solar panels. Not only is providing continual education opportunities for teachers a best practice, but in this case, SIT made

sure the instructors returned with skills that would specifically enhance their ability to teach about solar energy use.

Non-traditional products and services intended to support the sustainable development needs of the Seychelles were a direct result of collaboration with a broad range of external stakeholders.

How can existing demands in the community or institutional landscape be addressed through new products and services?

One early example was the Seychelles Water Warriors programme that saw SIT plumbing students conduct on-site visits to private homes in local communities to fix leaky pipes. Other efforts included building rainwater collection tanks for private use or constructing a gabion barrage dam to reserve water for agricultural use during drought periods. These efforts were part of a collaboration with an external partner – Sustainability for Seychelles – but paved the way for an in-house effort called Greening the SIT Campus.

What represents innovation in well-established TVET industries?

SIT has provided technical input for upgrading occupational TVET trades to include innovative competences within professions that align with modern development goals, such as the SDGs. This still reflects local job market demand for technical skills, but delivers these skills based on a new set of parameters. The institution has also conducted research into innovative recognition of prior learning (RPL) tools to award qualifications to domestic and migrant workers without formal TVET training.

SIT's Strategic Plan includes changes to the teaching and learning processes at SIT led by the Academic Committee.

What subject matter and skills should be emphasized as curricula evolve?

The SIT curricula were updated to focus on work-based learning and emphasize on collaboration with partners in key sectors, such as environmental science or renewable energy. The work-based learning environment is supported by teaching methods that encourage research, innovation and action-based learning. New digital technologies and hardware reinforce these lessons, and teachers and trainers are utilizing modern communication methods to share experiences and collaborate on how to modernize pedagogy.

SIT has cemented its commitment to innovation through changes to Strategy and Management that include a dedicated Strategic Plan 2019-2023.

How can management create conditions for a permanent shift toward innovation in institutional culture?

SIT's Strategic Plan established innovation as the core purpose for the institutional vision and priorities. A dedicated Research and Innovation Committee with clear management roles was tasked with executing the strategy using a comprehensive framework of policies and processes. Specific innovation indicators are included in the Strategic Plan to ensure innovation performance management. This is monitored every semester and reported to SIT leadership.

What tools and processes can establish momentum behind new strategic efforts?

Internal communication processes – led by the Director and deployed through the Research and Innovation Committee – engage all staff and learners by challenging them to contribute innovative ideas or initiatives and share them using segmented digital channels. Market research into innovation needs and opportunities in Seychelles provides new information that can lead to new ideas and initiatives.

Are there ways to use existing facilities on campus to encourage innovation?

The SIT Research and Innovation Committee looked inward to identify sustainable development opportunities: Greening the SIT Campus project sees students from different departments work together to install a system of rainwater collection tanks to provide water for workshops and toilet facilities.

KEY TAKEAWAYS

At SIT, TVET innovation began by shifting the focus of partnerships within the ecosystem to specific developmental goals. Shared pilot projects with ecosystem partners have given way to initiatives by SIT – an indication that the institution is hitting its stride on innovating TVET. The momentum behind the innovative practice has been accelerated through dedicated strategic plans, newly enabled management groups and close involvement of staff and students. The institution succeeded in these efforts by taking a gradual, methodical approach that built upon past success.

As a i-hubs project partner, SIT provides an excellent example of an institution with an institutional strategy that focused on openness to innovation. Initially, SIT was not always leading these innovations, but the institution embraced opportunities and looked to build on them over time. Following several years of gradually finding its footing, SIT is now able to lead on future innovations on campus and share its expertise.

Innovation on a grand scale

5

Case Study



Shenzhen Polytechnic (SZPT), Shenzhen, China

Established

1993

Student body

23,601 (2020)

Teachers and trainers

2,406 (2020)

Educational focus

SZPT is a higher TVET institution funded by the Shenzhen municipal government for TVET education and training. When it was established, it was one of the earliest independent public higher TVET institutions in China. It now strives to be a pioneer of innovative development in TVET, a cradle of technical skills and entrepreneurship, a R&D centre for SMEs in Shenzhen, a lifelong learning school, and a TVET teacher training base, positioning itself as a world-class TVET institution with Chinese features that shares Shenzhen's solutions with the international TVET community.

Mission statement

'To supply interdisciplinary, innovative, high-calibre, technical and skilled human resources while serving students' career development, Shenzhen's local industries and enterprises, and Chinese economic and social development.'

Shenzhen Polytechnic is one of China's largest and most renowned TVET institutions. The school's comprehensive and innovative approach to TVET on such a large scale has given its practices national prominence.

In recent years, Shenzhen Polytechnic (SZPT) has seen its reputation increase. In 2018, SZPT's 'practice of progressive entrepreneurship education' won first place in a national TVET achievement competition. In Guangdong province, where the institution is located, SZPT has been recognized as a 'demonstration college' for innovation and entrepreneurship education.

These are major distinctions in a country where the pace and scale of innovation are high, and competition is strong. SZPT has built its reputation on a wide range of programmes, initiatives, student opportunities and partnerships. Everything is housed on a campus that includes a pioneering technology research and development centre for micro-businesses and SMEs, a global innovation and entrepreneurship education centre for technical and skilled talents, and support for innovative talents and entrepreneurs.

In other words, SZPT creates a learning environment that immerses students in the concepts and principles of innovation and entrepreneurship.

Dimension analysis



The engine for driving innovation at SZPT is its approach to teaching and learning in entrepreneurship. By including innovation and entrepreneurship across all curricula, learners take a progressive path that starts with an introduction to innovation and builds to business start-up opportunities and beyond.

What is the pedagogical approach to teaching innovation and entrepreneurship?

By mainstreaming innovation throughout all SZPT learning programmes, the institution has created a comprehensive learning environment that immerses learners in the concepts and practices of innovation. Lessons are a blend of innovation competences (such as innovative thinking or creativity) and entrepreneurship skills (such as methods and skills for starting a business).

How can entrepreneurship become a fixture in the curriculum?

SZPT has created a standardized curriculum based on progressive acquisition of innovation competences known as the 'four-in-one' curriculum: enlightenment, preparation, professional vocational education and practical preparation of business plans by student teams. This approach is tied to specific innovative teaching practices and professional development opportunities designed by SZPT to create a team of 600 innovation and entrepreneurship education instructors.

SZPT's strategy and management focus on an Innovation Action Plan comprising a large-scale, top-down culture of innovation and entrepreneurship that permeates every dimension

of the institution's management, operations, staffing, funding and partnerships.

What conditions enable a culture of innovation and entrepreneurship that reaches every corner of an institution?

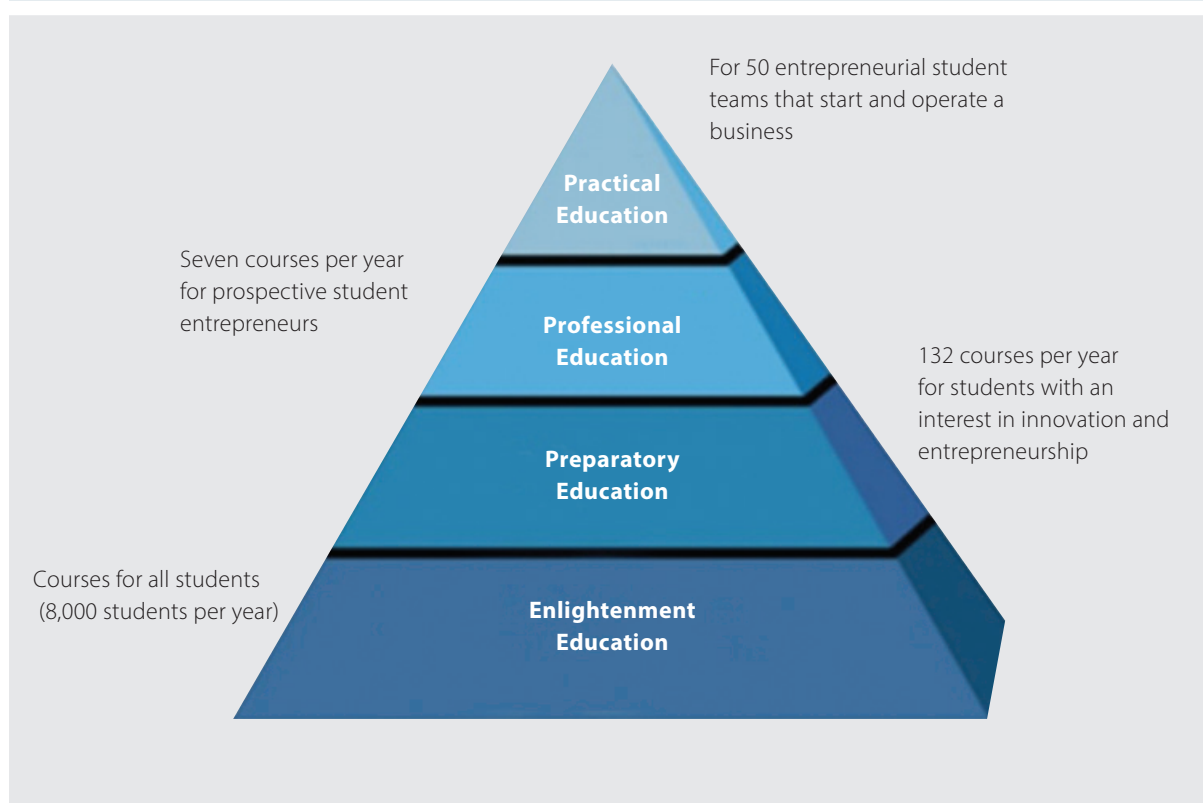
SZPT's success in strategy and management is deeply embedded in policies and processes that are measured against internal innovation benchmarks. The Innovation Action Plan also comprises the development of dedicated facilities for entrepreneurship. These extend beyond teaching faculties, and include a College Student Creative and Entrepreneurship Park and the Maker Centre, which provides free open source-tools for learners and access to a national innovation and entrepreneurship library. Management efforts to encourage student clubs and competitions for business plans and innovation are also effective.

SZPT's non-traditional products and services are also a major contributor to institutional innovation. These are informed by SZPT's formal role as Shenzhen's SME R&D centre, which facilitates active engagement in R&D activities.

How can research influence the products and services that are offered by a TVET institution?

SZPT analyses business developments and opportunities, and draws upon this research to inform TVET opportunities. Business incubators and mentorship services are available to help new business initiatives, and insights from businesses provide a source of real-life cases or challenges, which in turn inspire the creation and testing of business prototypes commissioned by industry partners.

FIGURE 9 Shenzhen Polytechnic (SZPT) “Four-in-One” Curriculum System for Innovation and Entrepreneurship Education



Source: SZPT

How can leading insights into TVET products and services benefit other institutions?

SZPT has developed a national innovation and entrepreneurship resource library with support from the Chinese Ministry of Education. It covers 34 provincial regions and is used by over 800 colleges to enhance knowledge and understanding of innovation and entrepreneurship.

SZPT has also utilized its ecosystem relationship management to enhance its multi-disciplinary approach to innovation and entrepreneurship. This has put the school in a position to contribute to platforms, initiatives and collaborations with business partners.

What are some characteristics of a TVET institution that actively fosters innovation in its ecosystem?

SZPT creates ownership and buy-in for its work by actively participating in collaborative efforts with stakeholders, including interdisciplinary learning centres or innovation and entrepreneurship platforms. Networking by management and staff is encouraged and facilitated through participation

in a wide range of ecosystem fairs, conferences, alliances, and competitions. Thanks to a robust local business environment, SZPT has worked with leading companies on shared collaborative platforms and training. It has also worked with global companies to create entire schools, such as the Huawei School of Network Technology.

KEY TAKEAWAYS

While many other TVET institutions will not be able to replicate SZPT's scale or resources, the school's culture, dedicated spaces for innovation and entrepreneurship, and educational approach to introducing innovation and entrepreneurship represent an array of best practices.

SZPT represents what is possible when a TVET institution establishes itself as an authority in teaching entrepreneurship, creates an environment for students to succeed and responds to the needs and opportunities of the business sectors.

In this sense, SZPT is a true 'hub' as defined by the i-hubs project – the focal point of TVET innovation in its regional and national setting.

Finland's 'one-stop shop' for migrant services

6 Case Study



Joint Authority of Education in Espoo Region (OMNIA), Espoo, Finland

Established

1982

Student body

2,000 general upper secondary education students, 9,000 vocational qualification students, 25,000 liberal adult education course students (2019)

Teachers and trainers

880 (2019)

Educational focus:

OMNIA is a non-profit organization owned by three municipalities in the greater Helsinki metropolitan area. OMNIA offers a wide range of services that support lifelong learning: vocational upper secondary education, professional career-related and apprenticeship training, general upper secondary education, corporate training workshops, and liberal adult education courses.

Mission statement

'Promoting inclusion, skills and well-being of citizens and boosting the vitality of municipalities, communities and enterprises of the region.'

The path towards employment and integration in a new society is often long for migrants. Rather than continue with integration policies that can be frustratingly slow for all stakeholders, one of Finland's regional TVET centres is testing a new approach.

Like many European countries in recent years, Finland has seen its population of migrant residents increase. This is especially true in the region around the city of Espoo: one estimate says that the migrant population in Espoo will reach 30 percent by 2035. Statistics also show that the unemployment rate among migrants is currently around 2.5 percent higher than native Finns. Given these figures, the Finnish government has made it a priority to shorten the path to employment for migrants. The city of Espoo's strategy states that the level of education for migrants needs to be increased, and the path to societal integration and working life needs to be quicker and more flexible.

In short, Finland – and the Espoo region in particular – are interested in putting migrants on the fast track to joining the labour market. Unfortunately, this is where Finland runs into a problem familiar to other European countries facing the same issue: a lack of centralized services, such as the employment office, vocational training centres or social support. This makes progress difficult for migrants, leading to a self-fulfilling cycle of marginalization. This is where OMNIA, a multisector TVET provider and regional development centre, enters the picture. OMNIA enjoys a good reputation and working relationship with regional authorities. It has experience in programmes specifically targeting migrants, and maintains close ties to regional businesses.

This made OMNIA the good choice for bringing a team of various professionals, counsellors and public authorities under one roof to better serve migrants and introduce them to the labour market in a quicker, more efficient way. The result is Osaamiskeskus (OSKE), OMNIA's Skills Centre for Migrants, which represents an innovative approach to migrant integration and creating a sustainable workforce led by a traditional TVET institution.

Dimension analysis

Existing relationships were leveraged and modified to meet specific challenges and opportunities of the mandate – shortening the path to employment for migrants – given by the Espoo region, national government and business networks.

Careful monitoring and documentation of the approach enabled it to be rapidly and robustly scaled up in other regions in Finland.



Utilizing expertise from partner organizations created learning content and pedagogy adapted to the specific case regarding migrants at OSKE.

A dedicated steering committee emphasizing active partner participation to define goals and develop organizational processes was essential in responding to a new public mandate.

After receiving the request from Finish authorities for support in shortening migrants' path into the workforce, OMNIA drew upon its ecosystem relationship management capabilities and created OSKE in close collaboration with its existing partners. Although these relationships had existed for some time, the circumstances of the OSKE project created new avenues for collaboration and innovation.

Why does it make sense for a TVET institution to take the lead on ecosystem relationship management?

OMNIA's existing experience, working relationships and reputation in external collaboration with local public and private bodies in Espoo lent them a great deal of networking capital. Rapid adaptation and extension of OMNIA's existing network ensured OSKE was outfitted with the necessary services for migrants. Existing partnerships were also revised and adjusted by the Steering Committee, with each partner taking on new roles according to its expertise. External communication and advocacy kept ecosystem stakeholders informed and engaged.

How do trust and reputation play a role when entering uncharted waters?

In the Espoo region, OMNIA has always enjoyed a reputation as a competent partner to the various institutions and public authorities with which it works. In the new context of the OSKE project, OMNIA called on these partners to take on new

roles and contribute new competences and services. There was some pushback and scepticism, but for the most part, these partners were willing to let OMNIA take the lead because of the strength of the previous working relationships. This meant the OSKE project quickly moved from concept to pilot, allowing all parties to focus on the important process of trial and error rather than becoming bogged down by potential institutional hurdles.

Although OMNIA's TVET instruction continued as before, the specific requirements of OSKE demanded innovations in teaching and learning. Migrants required specific (sometimes non-educational) services, delivered by instructors with non-traditional pedagogical backgrounds.

What opportunities exist for innovating the path to TVET instruction?

Language, education gaps and support measures identified among the migrants went beyond OMNIA's normal TVET instruction and drew upon expertise from social workers, employment office representatives, trauma specialists and language teachers.

How can a TVET institution address potential barriers to student success in a TVET programme?

OMNIA worked to remove obstacles to TVET instruction for migrants. This included work-based learning that incorporated innovative pedagogical approaches for learners with limited Finnish

language skills. Gender empowerment issues, learning disabilities or prior trauma were potential barriers to success on a TVET programme. By addressing them prior to the programme, OMNIA created higher chances for success for migrants. OSKE led to a redefined concept of the Products and Services that can be provided by a TVET institution.

How can opportunities for redefining the boundaries and scope of services at a TVET institution be identified and launched?

OSKE did not lead to new economic or business solutions for the external ecosystem, but it did represent a new understanding of the social services and benefits that can be anchored at a TVET institution. OMNIA was presented with a challenge: shorten the path to employment for migrants. In coming up with the best way to solve this problem, OMNIA identified new roles it could adopt. Other regions in Finland are looking to adopt OMNIA's approach, indicating that its strategic framework, documented toolbox and processes are scalable.

OSKE was able to get started quickly because of Strategy and Management measures implemented at OMNIA. These were based on OMNIA's designation as the institution in the driver's seat on finding the best way forward to deliver on the mandate.

How does management coordinate and implement a rapid response to a new public mandate that addresses an acute societal issue?

Following the request from national and regional authorities, OMNIA leadership formulated an innovative strategy for shortening migrants' path to integration in the workforce and society. To implement the strategy, OMNIA's management set up a comprehensive organization-wide approach: a Steering Committee of all partners responsible for implementing OSKE and a Steering Group that established common tools and processes.

What are the advantages to starting from scratch on a new strategic priority?

With specific needs of migrants seeking to enter the workforce in mind, OMNIA created a culture of customer service that supported migrants on their entire journey into the labour market. This began with TVET pre-qualifications – an area not necessarily part of a TVET institution's normal scope. OMNIA also created new tools for assessing migrants' educational and professional background and recognizing prior learning.

KEY TAKEAWAYS

OMNIA was tasked by Finish authorities with solving a unique problem: shortening the path to employment for migrants. Although this encompassed tasks outside the scope of its traditional role as a TVET institution, OMNIA leveraged strong existing relationships with its partners to create the OSKE Skills Centre for Migrants. These efforts created new roles for stakeholders and new services for learners. Although the project is still a work in progress, the results are noticeable enough that the approach is being expanded to similar institutions in other regions of Finland.

This case from the UNEVOC i-hubs project partner demonstrates how leaders in TVET institutions can respond to a challenging new mandate from central government to create a completely new TVET service – in this case, for migrants. By forming new internal units and processes, adapting teaching methods and through close coordination with its public and private partners, OMNIA has put in place an institution-wide innovative approach that is being scaled up in Finland and can inspire other TVET institutions.

An overview of TVET in the Basque Country

Case Study



Basque Centre of Research and Applied Innovation in VET (Tknika), Basque Country, Spain

Established

2005

Student body

N/A

Teachers and trainers

207 (YEAR)

Educational focus

Through networking and direct involvement by the Basque vocational training teaching staff, Tknika develops innovative projects for the region's 35 TVET institutions in the areas of education technology and management. The disciplinary focus of Tknika's work is in the fields of biosciences, advanced manufacturing, digital and connected factories, and energy.

Mission statement

'To make research and applied innovation core fundamental elements of vocational education and training in the Basque Country, to make progress in new learning settings and processes, and to reduce the skill gap from when an idea or technology comes about until society can take advantage of it.'

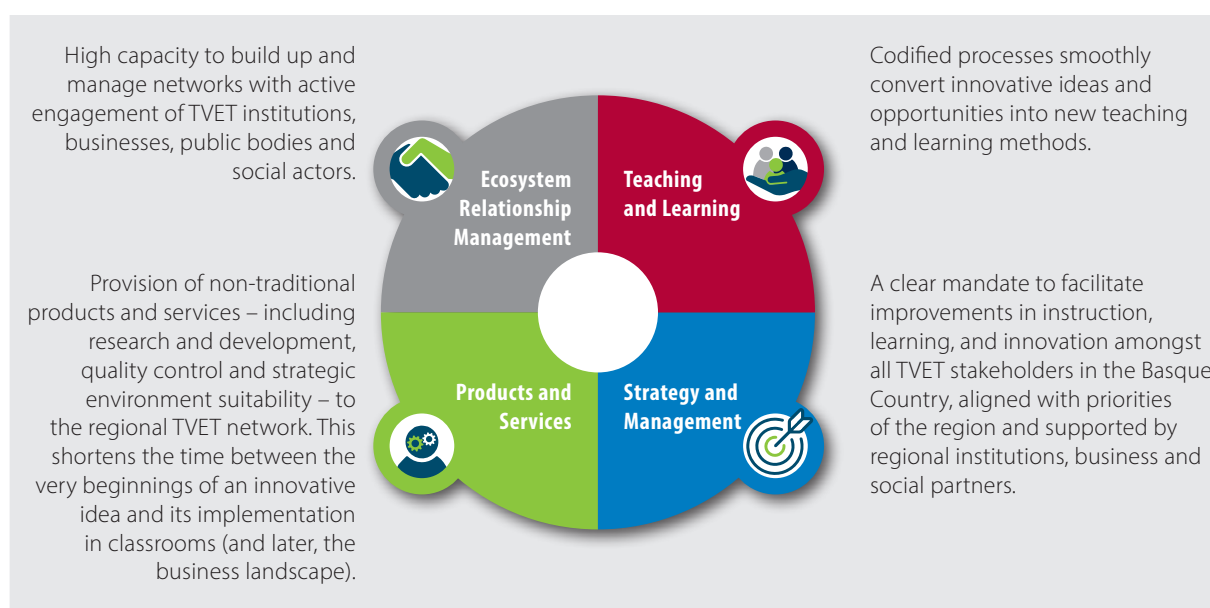
Many innovations highlighted in the UNESCO-UNEVOC Skills for Innovation Hubs project come from individual TVET centres. However, in the Basque Country, one institution is leading efforts to bundle individual projects and innovate the region's entire TVET sector.

For an institution that focuses on innovation in TVET, Tknika is unusual in that it employs teachers, but has no classrooms. It focuses on teaching students, yet has never graduated any.

This is because Tknika is no ordinary TVET institution. Rather than adopting a traditional TVET role and directly teaching the skills that are needed on the labour market, Tknika's mandate is to facilitate improvements in instruction, learning, and innovation amongst all TVET stakeholders in the Basque Country. Tknika 'networks the networkers,' setting projects and initiatives in motion and making sure that new developments in policy, the private sector and civil society are quickly embraced by TVET institutions, and incorporated into teaching and learning.

When Tknika was created in 2005, officials from the Vice-Ministry of Vocational Training observed that TVET centres in the Basque Country were working toward different aims in pursuing various innovative projects. Opportunities for synergy and mutual learning were being missed, and Tknika was tasked with creating a better system for sharing knowledge and mainstreaming new projects and ideas.

Dimension analysis



The main innovation in TVET practice in Tknika is rooted in the products and services it provides to enhance the teaching and learning experience among TVET institutions in the Basque Country.

How does Tknika serve both TVET institutions and external stakeholders with new products and services?

Tknika works with TVET institutions and partners from private and public sectors to convert developments in the ecosystem into prototypes for training purposes in school environments. In addition, TKNIKA has identified areas of specialization for research into current or future industry demands. Finally, Tknika systematically consolidates new products and services, which are then cascaded throughout the TVET school network.

Tknika's innovative focus on product and service development is driven by a clear approach to strategy and management, and a positive enabling environment.

How is institutional strategy and management different without a direct teaching mandate?

TKNIKA's mission is to facilitate knowledge sharing, and mainstreaming new products and ideas into learning across the TVET school network. Strategy, therefore, is aimed at establishing clear paths for knowledge transfer, promoting innovative practices within the regional network, and spreading the Basque Country's strategic objectives, including:

regional employment goals or gender-equality efforts; the European Union Smart Specialization; and the United Nations Sustainable Development Goals.

How is success measured without institutional performance indicators such as graduation rate, or figures pertaining to employment after graduation?

Tknika's management has created codified processes with a framework to define the desired goals of its innovations. This allows success to be measured in terms of network uptake and engagement. With a clear ministry mandate to coordinate the applied research and innovation system of Basque vocational training, Tknika defines strategy for all the region's vocational training centres. The success of these efforts can also be measured based on collective results of all institutions.

While Tknika is not directly involved in teaching lessons or working with students, it does transmit teaching and learning knowledge and methods that have the most direct impact on teachers and trainers. This is the advantage of Tknika's efforts to maintain close knowledge of new demands in the regional business environment, the strengths of individual TVET institutions in its network, and development goals of regional and international authorities: teaching and learning methods are built to quickly service these needs.

How can teaching and learning methods developed outside of TVET institutions be quality controlled?

Tknika maintains an active rotation of teachers and trainers from regional TVET institutions on its staff. All innovative projects at Tknika include training for educators on how to apply the new teaching methods. Innovations at Tknika are not simply academic exercises; specific implementation in TVET institutions is always the goal.

Tknika has developed tools to optimize its ecosystem relationship management and ensure new developments in policy, the private sector, and civil society are quickly communicated and embraced by TVET institutions, and incorporated into teaching and learning.

How does a regional applied research centre become a nodal point between TVET institutions and public or private stakeholders?

Due to its position as a regional innovation and applied research hub, Tknika has earned a reputation as a helpful, well-connected partner for communication and collaboration. This puts Tknika in a good position to closely monitor the ecosystem: business sector innovations can lead to shifts in instruction and emerging ideas at schools can be scaled up to other TVET institutions. Another strength of Tknika's ecosystem management is its in-depth analysis and understanding of specific strengths and areas of expertise at individual TVET centres.

KEY TAKEAWAYS

Tknika's institutional mandate is to enhance innovation in TVET in line with regional strategic priorities. The clear and codified processes Tknika has created to fulfil this mandate are what set the institution apart: they allow innovative ideas and opportunities to smoothly transition into concrete products and services for teaching and learning. By involving teachers and trainers in the process of developing products and services, Tknika creates 'teacher-friendly' innovations that are quickly embraced and implemented. Teachers also associate certain standards with Tknika innovations: any innovation includes professional development opportunities for teachers and related training materials.

Tknika's capacity to build and manage networks through active engagement of TVET institutions, businesses, public bodies and social actors has cemented its ongoing success as a catalyst for regional TVET innovation. It is a unique example of a UNEVOC Network member that sits above a regional network of TVET centres and helps them all stay on the cutting-edge of TVET.

Fermentation, percolation and incubation at the TESDA Women's Centre

Case Study



Technical Education and Skills Development Authority (TESDA) Women's Centre (TWC), Taguig City, Philippines

Established
1998

Student body
1,100 (YEAR)

Teachers and trainers
17 (YEAR)

Educational focus:

The Technical Education and Skills Development Authority (TESDA) is the government agency tasked with managing and supervising technical education and skills development in the Philippines. The TESDA Women's Centre (TWC) was established through an aid grant from the government of Japan and offers national certifications in a number of fields relating to manufacturing, tourism and the service sector, including: automotive servicing, barista, bartending, housekeeping, bread and pastry production, and electrical installation and maintenance.

Mission statement

'As the lead TVET institution of excellence in women empowerment, TESDA Women's Centre advocates and provides programmes and services geared towards quality-assured, inclusive and gender-fair TVET.'

The TESDA Women's Centre (TWC) in the Philippines has always been a reference point for entrepreneurial learning and empowerment for women. Now, by working with a committed industry partner and investing in new facilities for innovation, TWC graduates are baking and brewing their way toward modern entrepreneurship.

The campus of the Philippines' Technical Education and Skills Development Authority (TESDA) is located in the city of Taguig near the capital, Manila. In addition to TESDA's central offices, the location is home to the TESDA language skills institute, the TWC, and several other institutions and local businesses.

Hundreds of students, administrators, instructors, guests and local workers pass through the campus every day, often stopping at TWC's Café Juana. At TWC, the café represents much more than just a coffee break: it stands for entrepreneurship, the empowerment of women, successful public-private educational collaboration and TVET innovation.

The café is the face of TWC's innovative practice: the Business Incubation Centre (BIC). At the BIC, vocational education programmes – many of which are designed for the tourism sector – address 21st century skills and provide learners with guidance and facilities to launch their own businesses.

Dimension strengths

Dimension analysis



The first TWC programme to make use of the BIC was the national certification in bread and pastry production. It was brought on by TWC's strong partnership with a large national flour producer and represents excellent innovation in Ecosystem Relation Management.

How can a project provide a rallying point for collaboration with ecosystem stakeholders?

After TESDA completed planned renovations to one of its buildings on campus, TWC realized it would be the perfect location for the BIC. At the same time, the Pilmico Foods Corporation and its parent company, Aboitiz, recognized an opportunity to work with TWC students and teach them the latest technologies and techniques in baking. The resulting 'Incubation Kitchen' at the BIC was the starting point for many additional innovations at TWC. Collaboration on the BIC led to the provision of materials, equipment and facilities; external support for teaching and training; and industry assistance for young entrepreneurs transitioning from the BIC onto the market.

How can an innovative cooperation with one stakeholder be scaled to achieve innovation across the entire institution?

As the BIC came together, TWC took the opportunity to reinforce relationships with public bodies. For example, the BIC provided a more suitable setting for monitoring and coaching offered by the Department of Trade and Industry. With incubation facilities, the TWC Alumni Association

identified an opportunity to provide micro-finance assistance to graduate recipients. Establishing 'proof of concept' with the bread and pastry national certificate has led to similar collaborations with other sectors on respective national certificate programmes.

While financial and material support from industry partners were essential to launch the BIC, TWC's strategy and management efforts created an Institutional Development Plan that cemented the institution's commitment to the BIC and its educational goals.

How can institutional leaders make innovation a strategic priority?

TWC's strategy integrated the BIC initiative into the institution's existing core business: empowering women through entrepreneurship and supporting sustainable development. Allocation of planning and financial resources by management sent a signal that the BIC was a high priority.

How can management ensure a large-scale project creates excitement and enthusiasm amongst internal stakeholders?

Upgrades of training facilities, new physical spaces, as well as the latest technologies and techniques were tangible results of the BIC. The Institutional Development Plan sought to inform and motivate learners and trainers about the BIC through careful internal communication. Learners became engaged as they applied for a spot in the new BIC.

With the facilities and equipment in place, the BIC also triggered a range of innovations in teaching and learning at TWC.

What new teaching and learning innovations were implemented along with the BIC?

TWC has integrated core innovation skills and entrepreneurship development across all its national certificate programmes, all housed or instigated by the BIC. Physical spaces (such as an on-site bakery and café) provide authentic work-based learning opportunities. Other national certificate programmes, such as barista and bartending, can make use of the same space. Traditional learning spaces are upgraded and now include coaching/mentoring, networking, marketing assistance and market research. Assistance with accounting/financial management, technology commercialization, and regulatory compliance are also available.

How did the BIC help expand curricular shifts toward entrepreneurship and innovation skills, and new opportunities for teacher training?

New physical spaces, updated programming and expanded teaching and learning methods at TWC helped bring about curricular changes. New emphasis on skills such as critical thinking, problem solving, digitalization and greening could be implemented much better in the context of the new facilities and revised programmes. Teachers and trainers also benefit from new situations to implement the latest opportunities for professional training in the fields of entrepreneurship and innovation.

New teaching and learning opportunities are directly supported by innovative products and services.

What makes the BIC an innovative product and service, rather than just a new building on campus?

The BIC provided a home for innovations relating to all other dimensions, including the curriculum, work-based experience and physical learning spaces. A walk-in bake house, food stalls, and bar and restaurant facilities offer professional products and services made by learners for fellow students, staff, guests and local workers. These on-the-job experiences take place in the same on-campus facilities (the BIC) as entrepreneurship training and start-up incubation. With realistic work-based experience, up-and-coming entrepreneurs can make better use of available TWC microloans as they find their footing on the market.

KEY TAKEAWAYS

At TWC, an industry partner's investment and collaboration led to a unique opportunity to invest in new facilities and equipment, but also to update curricula and educational offerings for specific national certificate programmes.

Looking forward, TWC recognizes the need to attract more partners to the BIC. Not only does this ensure the BIC's financial future and secure ongoing opportunities for graduates, but by attracting a diverse group of external stakeholders, the BIC can be scaled up to include other fields and disciplines for a sustainable innovation at TWC.

TWC has always strived for excellence as a TVET institution, and its innovative collaboration on the BIC between the institution, partner industries and graduates is bringing about a new era in empowering Filipino women. Through collaboration with other UNEVOC Centres as part of the i-hubs project, TWC's innovative practice and experience are already extending beyond its own campus.

Mushroom cultivation, bottle recycling and cutting-edge TVET in Nigeria

Case Study



Yaba College of Technology (YCT), Lagos, Nigeria

Established

1947

Student body

28,201 (2018/2019 academic year: 13,596 full-time and 14,605 part-time students)

Teachers and trainers

844 (2018/2019 academic year: 662 lecturers, 15 instructors, 21 librarians, 146 technologists)

Educational focus

The YCT mandate is to provide full-time and part-time courses of instruction and training in technology, applied science, commerce and management, and other fields of applied learning relevant to the technical, vocational and industrial needs of Nigeria. The college has eight schools: Art, Design & Printing; Engineering; Environment Studies; Liberal Studies; Management and Business Studies; Science; Technical Education; and Technology.

Mission statement

'To produce knowledgeable and innovative graduates, worthy in skill and character, through effective teaching, learning and research for the technological advancement of Nigeria.'

The Yaba College of Technology in Nigeria has developed a knack for connecting its researchers and students to projects that address real-world problems, encouraging creativity and innovation, and fostering long-term relationships with external stakeholders.

One of the main goals at Nigeria's Yaba College of Technology (YCT) in Lagos is to utilize the school's strengths as a TVET institution to meet the needs of the community, and to help solve some of the most pressing issues in Lagos and Nigeria. These include better food security, reducing the unemployment rate and lowering environmental pollution.

Since the introduction of the YCT Applied Research and Technology Innovation Centre in 2006, demand-driven research has guided a curriculum and set of projects that provide students with professional training, anchored in real-life problem-solving situations.

Within this environment, YCT researchers and students have worked on research projects, products and services that directly impact markets and gain wide acceptance. These have included forays into mushroom cultivation that helped establish a new food crop in Nigeria, to works of art made with recycled glass bottles that stimulated students' entrepreneurial creativity.

Dimension analysis



YCT's mechanisms for identifying the demands of private and public sector stakeholders, and converting them to non-traditional products or services represent a best practice of innovation in the Product and Services dimension. The resulting ideas, prototypes and applications exemplify how TVET skills can be utilized to directly respond to real-life market or industry needs.

What are the benefits of focusing on 'market-ready' products and services at a TVET institution?

At YCT, some initiatives involve significant economic factors: while the school's production of mushrooms as a green crop was initially an opportunity to develop new skills for farmers, the mushrooms also became a source of income for the institution. However, other initiatives draw on the institution's broader TVET skills, such as combining art and design with recycling techniques for the redeployment of used glass bottles. These products also provide YCT with the opportunity to teach about registering patents and intellectual property rights. YCT is also in a good position to recognize opportunities for scaling up its research and innovation activities to reach a broader market potential.

How does an institution maintain focus on applied research projects without drifting into areas that are less relevant to specific real-world issues?

YCT encourages students to apply for research grants and other sources of funding, and provides institutional support during the application process.

Such grants contain a certain built-in framework that helps keep research projects focused and relevant to a specific industry challenge or development need. The same applies for direct collaboration with a company or an industry; a set of research parameters or specific scope to a project exists from the very beginning. Taken as a whole, this approach acts as a natural filter that favours relevant projects.

The focus on research and innovation at YCT has led to strong developments in its Ecosystem Relations Management: mutually beneficial partnerships with leading actors in the local ecosystem are regularly revisited and renewed, ensuring that partnerships with key stakeholders from priority public and private sectors continue to lead to opportunities for innovation and skills.

How does an institution ensure innovation leads to stronger, mutually beneficial stakeholder relationships?

At YCT, external stakeholders are invited to structured seminars to brief institution leaders and faculty on upcoming demand and opportunities for skills and technical abilities in their sector. In return, YCT research and innovation activities provide opportunities for developing ideas and approaches that could be applied in industry. Work-based learning schemes also ensure learners are gaining relevant technical skills and businesses can access employees with innovation skills.

YCT's strategy and management approach focuses on the link between TVET research, innovation and economic development. The institution's

clear vision, mission and strategic plan has been systematically rolled out and cascaded across all faculties with defined processes and funding.

How does a large-scale shift toward innovative skills, such as creativity and entrepreneurship, take root and grow?

YCT's leadership made R&D a priority in 2006 when it created the YCT Applied Research and Technology Innovation Centre and embedded it in the institution's mission. Explicit institutional strategic plans were cascaded to all faculties and departments. The current Strategic Plan 2018-2023 continues the twin focus on research and innovation, and aligns the institution, its faculty and learners with the most pressing issues on the national policy agenda. These include improving food security, raising youth employment and addressing sustainable development challenges, such as greening.

What role does management play in making sure R&D is successfully integrated with TVET?

Since 2006, YCT management has invested resources (more than US\$5.5 million) to build up intellectual and technical capacities, and equip laboratories for research and innovation projects. A framework of processes and practices guided priorities, and ensured efficient and effective management of these initiatives. The institution also made efforts to attract co-investors for innovation projects. As projects are launched, specific processes ensure clear criteria and transparent decision-making. Internal communication is prioritized, so all faculty and learners receive regular updates on activities and progress, in addition to encouragement to take part.

YCT's clear and documented strategic approach is supported by a complementary innovation dynamic in teaching and learning that motivates teachers with a range of motivating opportunities for professional development.

How can an institution motivate teachers and trainers to introduce innovation skills?

YCT established a Flexible Skills Development Centre to regularly organize professional development seminars for teachers and instructors. These create awareness of innovative pedagogy and new techniques, such as problem-based learning, open education resources and flexible and blended techniques. A collaboration with the Commonwealth of Learning offers online courses for improving the capabilities of staff for technology-enabled learning. Departmental champions are appointed from the teaching staff

of each department to promote the ideals of innovative teaching and support their colleagues. The institution has also aligned the teacher performance evaluation process to support and encourage innovative pedagogy.

How can new curricular content that emphasizes creativity and problem solving teach core innovation skills?

Projects housed in creative fields such as the fine arts facilitated several learning opportunities and contact with industry partners for learners at YCT. One example is a bottle recycling art project initiative, launched in collaboration with Coca Cola. The works of art teach students to creatively solve an existing industry problem (encouraging a shift from plastic to glass bottles) and consider upcycling as an entrepreneurial concept. This approach encourages and motivates learners to explore their own independent projects or conduct their own research.

KEY TAKEAWAYS

Whether it is technical innovations in mushroom cultivation or finding innovative ways to make products and art using upcycling, YCT is committed to utilizing non-traditional TVET services to create a benefit to society. YCT guides its students toward opportunities to participate in applied research and development projects that address specific industrial or developmental issues.

The result is a learning environment of discovery and innovation. The lines between traditional classroom lessons, lab-based problem solving and work-like environments have been blurred; graduates leave YCT with experiences and skills tailored to Nigeria's labour market and development challenges.

YCT is actively engaged in innovating its products, curricula, and teaching and learning methods. With its Strategy 2018-2023, these efforts are focused on new horizons: sustainability, opportunities for growth and diversification, and creating career-ready graduates.

In focusing on applied research that is based on the demands and circumstance of its ecosystem, YCT has made a significant pivot from traditional TVET instruction. The skills taught are dynamic and adaptable in response to the complex and quickly evolving challenges of YCT's environment. This shift is occurring in TVET throughout the world, and YCT provides a strong example of how other TVET institutions can implement a similar change.

TVET innovation – taking the next step

These nine i-hub case studies represent innovative practices in TVET among UNEVOC Centres. However, their ideas should be considered as starting points for a continuing process, not a definitive conclusion on how innovation in TVET should work.

Across all nine i-hubs, there were commonalities in the approach and methods utilized by the institutions in each of the four innovation dimensions. While some of the enabling conditions for innovation at the i-hubs were specific to each institution, the following best practices in each dimension can be applied at any TVET institution considering an innovative practice:

STRATEGY AND MANAGEMENT

The most effective innovative strategy and vision is supported from the top and cascaded throughout an institution.

- Document the institutional strategy, including goals and indicators of success
- Align with national, regional or local development strategies from the very beginning
- Dedicate resources – organizational staff and structures, processes, funding – to create the framework for implementing the strategy and delivering the vision. Making resources dedicated is as important as the scale or amount
- Communicate clearly and consistently to engage internal and external stakeholders in the process
- Identify a rallying point – such as a specific location, facility or initiative – to motivate staff, faculty, learners and external stakeholders

TEACHING AND LEARNING

Innovating how teaching and learning takes place at a TVET institution is a never-ending process, but implementing an innovative practice is an excellent opportunity to make changes to this dimension.

- Upgrade curricula content as a matter of course when implementing an innovative practice
- Mainstream innovation, entrepreneurship and digital skills to help embed and scale up institutional innovation
- Provide Professional Development Opportunities for faculty to create ownership of an innovative practice among teachers
- Equip educators with the latest pedagogical methods, such as the use of ICT pedagogy, to expedite deployment across the institution

PRODUCTS AND SERVICES

One of the most important innovations taking place at TVET institutions are the new roles they are playing in education, the workforce and in society.

- Identify existing needs or challenges in economic development and social cohesion
- Expand the role of a TVET institution by addressing development problems specifically and exploring solutions beyond traditional teaching
- Provide direct developmental support through business incubation, testing industry prototypes, and research and development

ECOSYSTEM RELATIONSHIP MANAGEMENT

Changes in society are affecting businesses, governments, and other traditional partners of TVET institutions – these changes are an opportunity for these relationships to expand and evolve.

- Understand the skill shortages and needs of external stakeholders. This is done by keeping them actively engaged in institutional governance, strategy and operation
- Focus specifically on innovation skills fundamental for business development, entrepreneurship, social actors and individuals in a time of disruption
- Actively participate in networks at the local, national and international level
- In these networks, advocate for innovation and the critical contribution of innovation skills in development

- Create opportunities for collaboration by partnering with specific external stakeholders in mutually beneficial areas, such as work-based learning, teacher training opportunities, mentoring, crowdfunding, joint research or business prototype commissions

UNESCO-UNEVOC hope you have found the i-hub case studies informative, insightful, and most importantly, inspiring. The goal is to encourage other TVET institutions to explore conditions that could lead to innovative practices in their environments.

Annex

ANNEX 1 Guided Self-Assessment Sample Agenda

APPROX. TIMING	ACTIVITY	OBJECTIVE	METHODOLOGY	PARTICIPANTS	INPUTS
DAY 1					
09.00 – 10.00	Introductory Meeting(s)	<p>To establish a common understanding of expectations and the local context.</p> <p>To confirm the programme and final preparation of the Innovation Toolbox.</p>	<p>Meeting with the TVET institution manager, coordinator and team to set the parameters of the Guided Self-Assessment and clarify any remaining issues.</p> <p>TVET institution coordinator presents the GSA process, including participants.</p> <p>Briefing by the TVET institution on the background and innovation context.</p>	<p>Senior Management</p> <p>TVET institution coordinator and team</p> <p>UNESCO-UNEVOC</p>	GSA programme
10.00 – 13.00	First Internal Stakeholder Consultation –	<p>Gather evidence and feedback on institutional innovation performance according to BSC.</p> <p>Map and assess partnerships with key external stakeholders according to the ESM.</p>	<p>TVET institution coordinator and UNESCO-UNEVOC will jointly facilitate the Internal Stakeholder Consultations with representatives from the first internal stakeholder group.</p> <p>150-180 minutes are allocated for each interview.</p>	<p>Internal stakeholder 1</p> <p>TVET institution coordinator and team</p> <p>UNESCO-UNEVOC</p>	<p>PowerPoint</p> <p>BSC</p> <p>ESM</p> <p>BSC and ESM data collection forms</p>
13.00 – 14.00					
14.00 – 17.00	Second Internal Stakeholder Consultation	Same as above	<p>Same as above with the second internal stakeholder group.</p> <p>150-180 minutes are allocated for each interview.</p>	<p>Internal stakeholder 2</p> <p>TVET institution coordinator and team</p> <p>UNESCO-UNEVOC</p>	Same as above

APPROX. TIMING	ACTIVITY	OBJECTIVE	METHODOLOGY	PARTICIPANTS	INPUTS
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DAY 2

09.00 – 12.00	Third Internal Stakeholder Consultation	Same as above	Same as above with the third internal stakeholder group. 150-180 minutes are allocated for each interview.	Internal stakeholder 3 TVET institution coordinator and team UNESCO-UNEVOC	Same as above
12.00 – 13.00	Lunch				
13.00 – 16.00	Fourth Internal Stakeholder Consultation	Same as above	Same as above with the fourth internal stakeholder group. 150-180 minutes are allocated for each interview.	Internal stakeholder 4 TVET institution coordinator and team UNESCO-UNEVOC	Same as above
16.00 – 16.30	Coffee Break				
16.30 – 19.00	Internal Meeting	Consolidate and summarize the results of the consultation process	Initial assessment of BSC and ESM results plotted on the Innovation Matrix Preparation PowerPoint	TVET institution coordinator and team UNESCO-UNEVOC	BSC and ESM data aggregation forms

DAY 3

08.30- 10.45	Discussion of Preliminary Results	Identify potential structure of the IP	Open discussion on the results of the consultations, including positive outcomes to be considered in defining the IP. Preparation of the IP session in the afternoon on Day 3.	Same as above	PowerPoint BSC and ESM aggregated data IP Template
10.45 – 11.00	Coffee Break				
11.00 – 12.30	Discussion of Preliminary Results (cont.)	Identify potential opportunities for improvement to be addressed by the IAP	Open discussion on the results of the consultations and identifying opportunities for improvement to be considered for the IAP.	Same as above	PowerPoint BSC and ESM aggregated data IAP Template
12.30 – 13.30	Lunch				
13.30 – 15.30	Guided Documentation of IP	Based on consultation outcomes and potential IP options, identify conclusions taken from consultation activities; further analysis of these conclusions informs the practical steps that will be documented in pursuit of IP	TVET institution coordinator and UNESCO-UNEVOC will jointly facilitate a discussion to analyse and build the narrative about what facilitated the IP. The discussion will focus on one IP selected based on the strengths from the BSC and the results of the ESM.	Internal Stakeholders TVET institution coordinator and team UNESCO-UNEVOC	PowerPoint BSC and ESM aggregated data IP Template

APPROX. TIMING	ACTIVITY	OBJECTIVE	METHODOLOGY	PARTICIPANTS	INPUTS
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DAY 3

			Expected output is a draft report outlining the IP and how each of the BSC dimension contributed to it.		
15.30 - 16.00	Coffee Break				
16.00 - 17.00	Guided Documentation of IP (cont.)	Identify conclusions taken from consultation activities; further analysis of these conclusions informs the practical steps that will be documented in pursuit of IP	<p>TVET institution coordinator and UNESCO-UNEVOC will jointly facilitate a discussion to analyse and build the narrative about what facilitated the IP.</p> <p>The discussion will focus on one IP selected based on the strengths from the BSC and the results of the ESM.</p> <p>Expected output is a draft report outlining the IP and how each of the BSC dimension contributed to it.</p>	Same as above	Same as above

DAY 4

09.00 - 10.45	IAP workshop (Problem Analysis)	Use the cause-effect rationale (Problem Tree) to visually present the problem to be addressed by the IAP	TVET institution coordinator and UNESCO-UNEVOC will jointly facilitate a discussion to analyze the core problems and opportunities identified during the consultations and elaborate on main causes and effects.	Same as above	PowerPoint BSC and ESM aggregated data IAP Template
10.45 - 11.00	Coffee Break				
11.00 - 13.00	IAP workshop (Objective Analysis)	Establish the relationship between the goals for innovation and how to achieve them.	Based on the findings of the previous session, define the core objective of the IAP. Following to that, elaborate on the best way to address the core objective of the IAP and create an Objective Tree.	Same as above	Same as above
13.00 - 14.00	Lunch				
14.00 - 15.45	IAP workshop (Definition)	Define the concrete strategies to implement IAP according to the Objective Analysis.	Using the options identified in the previous session and considering the resources available at the TVET institution, select the optimal "branch" of the Objective Tree as the IAP.	Same as above	Same as above
15.45 - 16.00	Coffee Break				

APPROX. TIMING	ACTIVITY	OBJECTIVE	METHODOLOGY	PARTICIPANTS	INPUTS
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DAY 4

16.00 – 17.30	IAP workshop (Design)	Determine and record the content of the IAP	Using the “branch” selected in the previous section, the IAP will be designed. It will clearly indicate the objectives, expected results, activities and inputs that will guide and condition the implementation of the IAP.	Same as above	BSC and ESM aggregated data IAP Template logical framework operational plan
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DAY 5

09.30 – 11.00	Consolidated Results Presentation and Discussion	Present and discuss the results of the consultations (IAP and IP) and of the implementation of the UNEVOC Innovation Framework.	Presentation by the TVET institution Coordinator and discussion with UNESCO-UNEVOC of the four main outcomes of the GSA: BSC, ESM, IAP and IP. Discussion and agreement on follow up actions.	Senior Management TVET institution coordinator and team UNESCO-UNEVOC	BSC and ESM aggregated data IP IAP
11.00 – 12.00	Final Meeting	Wrap up, conclusion and next steps	Review learnings and outcomes from the GSA programme, methodology, and implementing the GSA report, IP and IAP	Same as above	PowerPoint
12.00 – 13.00	Lunch				

Global developments including the transition to greener economies, the application of digital technologies in the world of work, and the COVID-19 pandemic, amongst others, are changing the way we live and work. These developments are driving technical and vocational education and training (TVET) systems to improve their capacity to identify the future skills demands and to expand access to skills development opportunities. As TVET adapts itself to the impacts of significant social, environmental, and economic disruptions, innovative practices emerge with the potential to rejuvenate the future of skills development. Schools, training centres and colleges have the potential to play a leading role to drive innovation in their local skills and innovation ecosystem.

This practical guide proposes a framework for TVET institutions to increase their capacities to drive innovation. The framework is developed on the basis of UNESCO-UNEVOC's 'Skills for Innovation Hubs' (i-hubs) initiative, which included the participation of ten pilot TVET institutions from Africa, Asia and the Pacific and Europe. The practical guide provides a systematic, institution-wide, measurable and evidence-based methodology that enables TVET institutions to streamline innovation into their strategic planning, products and services, ecosystem engagement, and teaching and learning processes.

