Green and digital skills for hospitality and tourism

From industry trends to competencies within TVET

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Short summary

Unlocking the potential of technical and vocational education and training (TVET) is instrumental for a more digital and sustainable hospitality and tourism sector.

The hospitality and tourism sector is a cornerstone for the global economy, yet its substantial environmental footprint necessitates urgent innovation. Embracing the use of cutting-edge technology, such as AI-driven customer management and smart analysis of energy consumption, can help mitigate these impacts and foster green, sustainable solutions.

As digitalization and sustainability redefine the industry, traditional job roles are undergoing continuous transformation, impacting the day-to-day tasks and activities of workers. The integration of emerging green and digital competencies into TVET is crucial for steering this transformation. By equipping workers with relevant qualifications and competencies, TVET holds the key to a greener and digitally driven sector.

This publication proposes approaches to facilitate the dual transition in hospitality and tourism, structured around the identification of emerging green and digital competencies in a timely manner, their integration into future-oriented curricula, and their effective implementation in TVET. Drawing on practical examples from Africa, Asia-Pacific and Europe, it offers actionable recommendations for policymakers and practitioners.

TVET stakeholders from across the globe are invited to embrace innovation and engage in the transfer of knowledge and good practices to unlock the sector's potential for a green and digitally just transformation.

7.6%

of GDP comes from the global hospitality and tourism sector highlighting its **great potential in driving the green and digital transition** (WTTC, 2023).

unesco

"Since wars begin in the minds of men and women it is in the minds of men and women that the defences of peace must be constructed"

Acknowledgments

Acronyms and abbreviations

3D	Three dimensions or three dimensional
AfDB	African Development Bank
AI	Artificial intelligence
ASEAN	Association of Southeast Asian Nations
AUDA-NEPAD	African Union Development Agency of the New Partnership for African Development
BIBB	German Federal Institute for Vocational Education and Training
BIHC	Boma International Hospitality College
BILT	Bridging Innovation and Learning in TVET
BMBF	German Federal Ministry of Education and Research
Cedefop	European Centre for the Development of Vocational Training
CiMSO	Client-centric Integrated Management Software
CMSA	Crowd Monitoring System Amsterdam
COVID-19	Coronavirus disease of 2019
EHL	École Hôtelière de Lausanne
EHT	École d'Hôtellerie et de Tourisme Paul Dubrule
EQF	European Qualifications Framework
ESCO	European Skills, Competences, Qualifications, and Occupations framework
ESD	Education for sustainable development
ESF Plus	European Social Fund
FACET	Facilitate the Adoption of Circular Entrepreneurship in the Tourism and leisure sector
GDP	Gross domestic product
GOVET	German Office for International Cooperation in Vocational Education and Training
GRETA	Greening Responses to Excellence through Thematic Actions
GSTC	Global Sustainable Tourism Council
ICT	Information and communication technology
IDEP	African Institute for Economic Development and Planning
IFITT	International Federation for Information Technologies and Travel and Tourism
IIEP	International Institute for Educational Planning
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
ISCED	International Standard Classification of Education
IVET	Initial vocational education and training
NQC	New qualifications and competencies
NTG	Next Tourism Generation Skills Alliance
OECD	Organization for Economic Cooperation and Development
PANTOUR	Pact for Next Tourism Generation Skills
SDG	United National Sustainable Development Goal
SFUVET	Swiss Federal University of Vocational Education and Training
TVET	Technical and vocational education and training
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-IBE	UNESCO International Bureau of Education
UNESCO-UNEVOC	UNESCO International Centre for Technical and Vocational Education and Training
VR	Virtual reality
WTTC	World Travel and Tourism Council

Glossary

Competency	Competency is the ability to apply and use a set of related skills, knowledge, and attitudes to successfully perform professional actions in a defined work setting. Competencies can be domain-specific, e.g. relating to knowledge, skills and attitudes within one specific subject or discipline, or general/transversal because they have relevance to all domains/subjects. In some contexts, the term 'skills', in a broader sense, is used as an equivalent of competencies (UNESCO IBE, Glossary of Curriculum Terminology, 2013).

For common expressions, such as 'skill needs', 'social skills' or 'upskilling', the word 'skill' is used in this publication instead of competency, but it is to be understood to refer to competencies. Transversal skills, which are broader and applied across different contexts, are specifically referred to as 'transversal competencies'[1] (European Commission and CEDEFOP, 2021). |
Digitalization	Digitalization refers to the broad transformation brought about by the widespread adoption of digital technologies. Within digitalization, three broad categories of combined applications of digital technologies are differentiated: automation, digitization and coordination by platforms (Eurofound, 2022).
Digital transition	Digital transition is the digitalization of diverse aspects of daily life. The scale and intensity with which this process has been taking place recently is unprecedented. The apex of these changes in TVET has materialized in the *Fourth Industrial Revolution*, prompted by the automation of industrial and administrative processes and the introduction of cyber-physical systems. This hybrid human-digital organization of work requires TVET, which lies at the intersection of work and education, to synthesize, process and provide timely solutions for challenges that arise.
Dual transition	The term 'dual transition' or 'twin transition' refers to both the green and digital transition. These two ideas are often combined because they invariably occur at the same time and, if managed well, can potentially reinforce each other.
Greening	In this publication, greening refers to the intentional and systematic efforts to incorporate environmentally friendly practices, technologies, and principles into various aspects of human activities, such as industries, infrastructure, and daily routines. The goal of greening is to reduce negative impacts on the environment, promote resource efficiency, and contribute to a more sustainable and ecologically responsible way of living and operating.
Green transition	The green transition is a process towards a new development model that ensures environmentally sustainable and fairer societies. It is a necessity to address the human-induced climate change emergency, environmental degradation (water, land, forests, atmosphere) as well as the loss of biodiversity (ETF, 2022).
Sustainability	The concept of sustainability refers to the practice of responsibly managing, conserving, and enhancing environmental, social, and economic resources to meet the needs of the present without compromising the ability of future generations to meet their own needs.
TVET	TVET is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods. TVET, as part of lifelong learning, can take place at secondary, post-secondary and tertiary levels and includes work-based learning and continuing training and professional development that may lead to qualifications. TVET also includes a wide range of skills development opportunities attuned to national and local contexts (UNESCO, 2015).
TVET provider	Training provider refers to a school, college or university providing TVET, plus those providing training in the workplace.

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1   In 2021 an expert group mandated by the ESCO Member States Working Group and the European Qualifications Framework Advisory Group developed a model to clarify the terminology around transversal competencies (terms such as 'core skills' and 'key skills'). The model proposed in their publication (European Commission and CEDEFOP, 2021) defines the term 'transversal competencies' as referring to a broad category of competencies that are not restricted to one single context but are applied in several contexts, while the term 'core skills' refers to a subset of transversal competencies (communication, numeracy and the use of technology).

Introduction

The Bridging Innovation and Learning in TVET (BILT) project aims to enable and strengthen peer- and policy-learning between Africa, Asia-Pacific and Europe by bringing together TVET stakeholders to share experiences, disseminate good practice examples, present learning opportunities, and offer capacity building tools.

In line with the BILT project's 2022–23 focus on the impact of the dual green and digital transition on skill needs and TVET systems, an international sectoral expert group was set up to:

- take stock of current debates around new skills in the hospitality and tourism sector within the three regions of the BILT project: Africa, Asia-Pacific and Europe;

- identify innovative TVET practices from the hospitality and tourism sector in each region.

This publication presents a consolidation of several outputs and work completed by the 2023 BILT Expert Group over the span of eight months. Its structure follows the **Three I's process** developed by the 2021 BILT Expert Group (UNESCO-UNEVOC, 2021) as well as the three stakeholder levels.

The report consists of six chapters. The first chapter introduces the aim of the publication, namely, to highlight new and emerging green and digital skills in the hospitality and tourism sector and how these can be identified, integrated into curricula and implemented in educational settings. It introduces the hospitality and tourism sector, the green and digital transformation as well as the role of TVET therein. The second and third chapters give an overview of green and digital trends in the hospitality and tourism sector and in TVET. The fourth chapter derives new and emerging competencies from industry trends and gives examples of how they were integrated into curricula at different ISCED[2] levels. The fifth chapter provides practical examples for the identification, integration and implementation of new green and digital competencies in hospitality and tourism occupations in TVET. The sixth chapter includes general and more specific recommendations for the different stakeholder levels, pointing out possible challenges and listing related resources and tools.

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2   The International Standard Classification of Education (ISCED) is a framework to facilitate comparisons of education systems across countries. For further information see: **International Standard Classification of Education (ISCED) | UNESCO UIS**

1. The dual transition in the hospitality and tourism sector and the role of TVET

The hospitality and tourism sector

The global hospitality and tourism sector is one of the largest industries in the world, accounting for approximately 7.6% of global gross domestic product (GDP) according to 2019 data from the World Travel and Tourism Council (WTTC, 2023). Data from the World Tourism Organization shows the sector accounts for 6% of total employment in G20 economies (UNWTO, 2019).

The hospitality and tourism sector is especially important for young workers because it offers employment opportunities for individuals with diverse skill levels, including those with lower-level qualifications. Additionally, the sector can serve as a platform for young professionals to contribute to positive environmental change. While the share of jobs held by young people across the entire global economy fell from 16.5% in 2010 to 12.5% in 2021, it stayed stable at around 15% in the hospitality and tourism sector. In addition to being central for young employees, the industry is particularly significant for female workers who account for 52% of the global workforce in the sector, compared to less than 50% of the overall global economy (WTTC, 2023).

The dual transition

Increased sustainability and digitalization are – among others – two central themes of the 21st century. Green practices, including energy-efficient operations and waste reduction, can reduce the industry's impact on the environment, whilst digitalization helps improve efficiency and provides personalized services to customers.

According to the UNFCCC (2019; 2023), travel and tourism generated 10.4% of global GDP in 2018, but also accounted for around 8% of global greenhouse gas emissions contributing to climate change. The hospitality and tourism sector contributes significantly to global energy consumption (10.6%) and water use (5.8%), as well as air pollutant emissions and material extraction (WTTC, 2023). There is, however, potential to optimize usage through the introduction of emerging technological solutions such as smart building management systems and artificial intelligence (AI) for analysing energy consumption (IPCC, 2023). Some specific examples already in use are described in this publication (see 2.2).

In practice, most of the examples of digital and sustainable innovation have an impact on the day-to-day tasks and activities of workers employed by hospitality and tourism businesses, many of whom received training from TVET providers. Thus, TVET has a central role in green and digital, as well as the dual, transition within the hospitality and tourism sector by providing opportunities for learners to develop relevant competencies.

Change through TVET

The impact of TVET on workers depends on their level of responsibility related to green and digital practices and their ability to influence their employer towards enhancing these areas at their workplace. That is, to what extent they have managerial responsibilities and are leading and shaping the transition of tasks towards more sustainability-oriented practices. Often – but not always – this coincides with the ISCED qualification level, whereby workers possessing qualifications on level 6 upwards are better placed to influence change due to being more directly involved in decision-making around service provision and product acquisition. By offering training to this target group on sustainability management and modules in the management of the digital transformation, TVET can have a direct impact on the sector. Through this work, TVET positions itself as an accelerator of dual transition in the sector.

Preparing tomorrow's workforce

Workers with qualifications below ISCED level 6 are likely to have a less direct impact on changing their workplace practices but they do play a vital role in ensuring sustainability, efficiency and overall improvement in the way they carry out their work, prepare products and provide services, for example ensuring equipment is turned off when not in use, following recycling policies etc. It is, therefore, crucial for all learners, irrespective of their qualification level, to develop the competencies which enable them to maximize sustainability and work proficiently with digital tools.

In the following chapters the influence of the green and digital transition on the hospitality and tourism sector and its workforce are described and the resulting skill needs are outlined. How TVET responds to these developments is discussed in chapter five.

2. Green and digital trends and skill needs for hospitality and tourism occupations

This chapter describes green and digital trends in the hospitality and tourism sector with specific examples from the three regions of the project and beyond. It is important to note that the depth of integration of these trends can vary greatly depending on available funds for education and innovation, and on priorities regarding digitalization and sustainability at governmental level, in industry associations, or individual businesses.

Specific examples from the industry are presented in tables, as shown below, using four categories of information: the type of trend (digital, green or dual); the variants of example (rare or common); the subsector to which an example belongs (tourism, hospitality or both); and the region from where the example was derived.

🌱 4⏻	* | ** | ***	Tourism | Hospitality	Africa | Asia-Pacific | Europe | North America
Green or digital trend	Rare (*) or common (***) example	Sector	Region

2.1. Digital trends

Current digital trends are driven by new technologies (hardware and software) and the use thereof. For the hospitality and tourism sector, the areas of use can be structured into three categories, using technology to: address problems; facilitate processes; and enhance experiences. All have an impact on providers as well as consumers, albeit sometimes in different ways and with different perspectives (for example, ease of access on the consumer end can result in larger sales on the provider end).

As digitalization holds great potential for the hospitality and tourism sector, workers need to be adept and agile to embrace this transformation and remain relevant. Specific opportunities and risks are described in this section and in 3.1.

Digital trends to address problems

Labour shortages

The labour shortage is an acute problem that can, in part, be tackled through automation (Morosan and Bowen, 2022). This is most prominent in the food and beverage subsector but also in the lodging and visitor attractions subsectors through the use of AI (e.g. chatbots), and in the travel subsector using biometric technology (e.g. e-gates) (BiometricUpdate.com, 2016).

4⏻	*	Hospitality	North America

The Number 1 Noodle House in Saskatoon, Canada, uses an anthropomorph robot to prepare knife-cut noodles as no human chef, familiar with the technique, was available to hire (CBC/Radio-Canada, 2018).

High overhead costs

In addition to the reason highlighted in the above example where no human chef with the required skill could be found, there is also the economical aspect of automation. The fast-food restaurant CaliExpress in California, United States of America, offers food prepared entirely by robots (Restaurant Technology News, 2023). The number of employees is limited to tasks such as packaging and handing over the food to customers, meaning a small amount of human interaction is retained. In this way, the restaurant can save a considerable amount of money.

Food waste

In addition to the labour shortage, food waste is an important issue in the sector that needs to be addressed. One digital solution to tackle it is to install electronic devices to automatically analyse food waste in kitchens. The result of this analysis enables staff to make informed decisions on how to reduce waste without compromising customer satisfaction.

4⏻	*	Tourism	Europe

The device, **Kitro**, monitors the makeup, quantity and time of food which is thrown away in kitchens. The resulting analysis can be viewed in an online dashboard and used as a basis to adapt operations to be less wasteful.

Crisis situations

Another example of technology being quickly adopted for problem solving is during crises such as the Covid-19 pandemic which resulted in a rapid shift to online and delivery services, including e-ticketing and cashless payments.

Digital trends to facilitate processes

Efficiency in communication

In the sector, there is a fine line between addressing problems and optimizing processes using digital technologies and applications, as often solutions to issues rely heavily on

enhancing and streamlining these processes. Automation can also lead to processes becoming more efficient, for example, where a machine or program can complete a task more quickly (and perhaps more thoroughly) than a human employee (Limna, 2022). Chatbots, for example, which are powered by AI, allow for immediate communication between customers and businesses at any time of day or night. Customers also receive answers to simple queries immediately and workers can focus on other tasks or more complex queries while technology handles routine communication.

Client-centred and collaborative provider services

Other examples of technology facilitating processes are the use of applications and platforms to access information, products, and services, including in the context of the collaborative economy, sometimes called the sharing economy. Platforms such as Airbnb have lowered the barriers for entry into the informal lodging subsector. Generally, such platforms lead to more choice and convenience, as well as improving ease of use, for the provider and consumer. Online distribution and price transparency contribute to dynamic booking, reservation and cancellation patterns, which, for example, enables customers access to information on the best current deals and aids staff and management in responding in real-time to bookings and competitor offers.

Another important aspect for providers of services in this context is upselling. For instance, offering customers incentives and simplifying the process of upgrading their room or adding breakfast through their booking platform, can significantly enhance revenue.

Some tourist destinations have even developed their own applications which combine features for guests and encourage them to spend time and money during their stay by, for example, providing information about local activities offering discounts and options for buying tickets for public transport or events.

4.⏻	**	Tourism	Asia-Pacific
The Japan Travel app helps visitors plan their activities, get tickets and make travel arrangements. Articles and special offers serve as inspiration for tourists to discover the country and its culture.			

The rise of generative AI also holds significant potential to facilitate certain processes in the hospitality and tourism sector (Mich and Garigliano, 2023). Miao and Yang, for example, suggest a text-to-image AI tool like Midjourney may support destination marketers in the creation of images (Miao and Yang, 2023).

Other ways in which processes facilitate guests and visitors' experiences are smart and contactless technologies. This includes, for example, biometric software for a seamless check-in, handheld gadgets and digital feedback tools (AWARE, 2023).

4.⏻	**	Hospitality	Europe
The City Hub hotel in Rotterdam, the Netherlands, offers self check-in as well as self-service at the bar, handling payments through a contactless wristband. Furthermore, their capsule-like rooms are smart, allowing light changes as well as music choice via their app (HTW Chur et al., 2018).			

A recognizable and widely used example of handheld gadgets are audio guides. Many tourist destinations offer them to provide visitors with pre-recorded, language-specific, guided tours thus reducing the need to hire large numbers of tour guides and saving the operator money. Handheld gadgets are also used to facilitate processes for enhancing the guest experience, such as a 24-hour concierge (The Peninsula, 2020) or accessibility features.

Another example in this subcategory is the use of virtual tours through 360-degree videos which allow tourists to get a preview of national parks, museums, hotels, or destinations before visiting in person.

4.⏻	***	Tourism	Africa
There are virtual experiences of South Africa's Kruger National Park, Table Mountain, the Pyramids of Giza and the Karnak Temple in Egypt.			

An emerging variation of this trend – and also a marketing measure – is the creation of metaverse virtual showrooms for brand engagement (Ioannidis and Kontis, 2023). The Chedi Andermatt, Switzerland, launched such a showroom in 2022 (The Chedi Andermatt, 2022), located in the *Worldline Metaverse Mall* in Decentraland (Worldline, 2023).

Digital solutions to enhance customer experience

This third category includes virtual reality (VR) and augmented reality (AR) for tourism experiences. An example of VR is used by Virtual Journeys New Zealand, which offers pre-recorded videos that can be watched with VR glasses comfortably at home and at very low cost. This gives the opportunity to virtually visit places that may be physically – in case of mobility-restrictions – or financially not accessible (Virtual Journeys New Zealand, 2021). AR is similar but combines VR with real life experiences, for example a physical visit to a historical site could be enhanced with a virtual experience by overlaying additional information or images.

4⏻	*	Tourism	Europe

At the ruins at Tremona archaeological park in Switzerland, ten augmented reality points have been created where visitors can experience how life at the settlement might have been during the Iron Age and Roman times by **wearing AR glasses**.

Similar experiences also exist in hospitality, such as the Sublimotion in Ibiza, Spain, which offers gastronomic performances using digital projections and VR to enhance the dining experience.

Personalization can also occur during the booking process through the use of big data with targeted products, services and advertising. Big data not only enables companies to target advertising at certain audiences, but it also provides users with information to guide their booking choices.

4⏻	*	Tourism	Europe

The city of Amsterdam, in the Netherlands, has created the **Crowd Monitoring System Amsterdam** (CMSA). Based on real-time data, the system monitors the number of visitors at a location or the number of occupied parking spaces to help locals and visitors decide whether to go to a certain place at a given moment or at a later time when the location is less busy or crowded.

A final, very tangible example of how to enhance personal experiences by means of digital tools is to use 3D printers to personalize tourist souvenirs (Anastasiadou and Vettese, 2019).

Regional differences: BILT Expert Group insights

The recent Covid-19 pandemic accelerated the adoption of digital technology in the sector, as can be seen in examples from all three regions of the BILT project and beyond, driven by reduced direct human contact and the increased use of digital interfaces in interactions. The extent of the adoption of digital technologies correlates with the availability of resources for businesses in the hospitality and tourism industry. Larger chains, as expected, are therefore more likely to have progressed further in their digital transformation than smaller, independent businesses.

On the African continent, members of the 2023 BILT Expert Group have observed that this has led to young entrepreneurs creating custom-made applications for hotels, as not all businesses can afford the expensive costs of software or applications already in use around the world. Specialized property management and hotel software solutions (for front desks, food and beverage, accounting, management offices etc.), however, are also widely accessible and used in this region.

The use of robots or computer programmable machines in hospitality and tourism businesses has become a defining feature of digital trends that set some regions apart from others. While a wide **variety of robots** are used in Asia-Pacific, Europe lags behind in this regard. In China, the use of robotic machines that mimic human-like movements to provide services has become relatively mainstream, whereas a study in Switzerland that analysed the possible use of robots in hotels there found customers showed a negative attitude towards them in service settings (Mosedale, 2020). It is anticipated, however, that due to labour shortages in the hospitality sector in Africa, Asia-Pacific and Europe, food and beverage providers will nevertheless start experimenting with this type of technology to remain competitive.

As regards to digitalizing the hospitality and tourism sector, Europe appears to be lagging behind other regions with a recent case study on the digital maturity of businesses with 10 or more employees in Portugal finding the hospitality sector is trailing behind (OECD, 2021).

2.2. Green trends

With its considerable environmental impact, the hospitality and tourism sector needs to transition to greater sustainability (WTTC, 2023). Due to the interconnected nature of ecological systems and their vulnerabilities to human activities and economic development—often characterized by unsustainable practices—the concept of sustainability in hospitality and tourism must encompass economic, social, and environmental dimensions. So-called green trends in the sector focus on taking responsibility for environmental protection. They are mainly caused by, or relate to, the impact of climate change and extreme weather events as well as unsustainable use of limited natural resources and loss of biodiversity. These factors have led to various changes and innovations (green transformation) in the hospitality and tourism sector. Transformations include adapting practices, processes and structures to align with the circular economy, eco-tourism, resource efficiency in business operations, and processes to ensure efficient use of natural resources. Prominent/common examples are introducing or enhancing new technology measures or approaches regarding clean energy (e.g. solar, hydrogen), and sustainability certification, including measuring and reducing greenhouse gas emissions and carbon output.

Circular economy

An important concept in the context of sustainability is the circular economy (Jones and Wynn, 2022). The Ellen McArthur Foundation (n.d) defines the circular economy as a system solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution.

It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature.[3] To achieve this, businesses should follow the 10R strategy as a path to a green transformation: refuse, reduce, reuse, repurpose, refurbish, recycle, remanufacture, recover, repair and rethink (Morseletto, 2020). These strategies also relate to the hospitality and tourism sector in varying degrees depending on the product or service, with more (or fewer) of the 10Rs taken into account.

🏭	*	Hospitality	Europe

The circular tourism accommodation, Zeeland Dike Suites, were built using recycled materials which can then be recycled again in the future, as part of the FACET project (Interreg 2 Seas FACET, 2023).

New and adapted products

To align business strategies with sustainability commitments, hospitality and tourism businesses adapt existing or develop new products. An example of this is the rise in ecotourism where instead of tourism putting pressure on local areas and communities, it supports them largely through bringing money for development projects to the region (AUC/OECD, 2023). The concept of regenerative tourism, where a visit should have a net positive impact, goes one step further. This, similar to ecotourism, means that some or all of the profits are reinvested back into the conservation or development of the hosting community. Sometimes this extends to visitors partaking in an activity that has a positive ecological and educational impact.

🏭	*	Tourism	Pacific

Hawaii Tours offers a hiking experience on Kauai where participants learn about the area Maha'ulepu and help remove invasive species at the Makawehi Cave Reserve (travel2change, 2020).

Taking responsibility for climate protection

Sometimes hospitality establishments decouple their sustainable activities from the economic-generating side of the business or services. Instead, they introduce measures to help protect the environment as part of acknowledging their responsibility as businesses operating in the area and giving back to the local communities.

🏭	*	Hospitality	Africa

Hospitality provider Wilderness carries out and supports many sustainable practices. At their Bisate Lodge in Rwanda they employ local people, support educational programmes for local children, set-up a community beehive plus ran other community projects such as replanting trees, habituating groups of gorillas, and installing three sewage treatment plants (Wilderness, 2020).

New and adapted processes

Concerning new or adapted processes for green growth and carbon-neutral hospitality and tourism, almost all processes can be accessed and improved, such as energy efficiency, use of renewable energy (AUC/OECD, 2023), use of local materials, reduction of food waste, and use of smart mobility.

🏭	*	Tourism	Europe

The tourist destination Saas-Fee in Switzerland has implemented a number of sustainable practices in the entire Saas Valley. The destination is entirely car-free and offers e-shuttle buses for transport. A district heating network and a photovoltaic system that supplies sustainable energy for the cable car in this ski area, are just a few examples of the changes they have made.

The changes towards greater sustainability in the lodging subsector are perhaps more well-known due to their visibility and marketing value. There is, however, also potential in the food and beverage subsector to increase sustainability with new or adapted processes. For example, if in preparation of a certain dish only 40% of a fish is used, the recipe should be adapted, or an additional dish offered, that uses some or all of the remaining 60% rather than it going to waste (Food Business News, 2023).

Green and digital intersection – the dual transition

To accomplish more sustainable practices, digital transformation plays an important role (Muench et al., 2022). Using digital measuring equipment, for instance, provides a necessary first step to locating areas of possible improvement of efficiency or reduction of emissions.

🏭 4.⏻	*	Hospitality	Africa

One provider of such measuring equipment for hospitality and tourism businesses is Best Energy in Kenya. With their energy measuring equipment, *Eniscope* a Mövenpick hotel in Nairobi has achieved considerable energy savings after three months of use (Best.Energy Kenya, 2023).

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3   Our natural assets such as geology, soil, air, water and all living things.

Another example of the intersection between digitalization and sustainability can be seen in sharing economy platforms. Food and beverage businesses can minimize food waste by offering surplus for a lower price on platforms such as ResQ and Too Good To Go.

Sustainability certification

A growing number of hospitality and tourism providers are attaining sustainability certifications from regulators such as the Global Sustainable Tourism Council (GSTC), **Green Globe**, **Green Key**, etc. New measures to meet the green certification may mean training in new green competencies for workers. An example of this, under the *GSTC Industry Criteria for Hotels*, is one of the indicators for energy consumption requiring that 'total energy used is monitored and managed'. If energy monitoring equipment is in place, workers need to have relevant competencies in digital skills (using hardware) and sustainable management to understand the measurements taken and their implications. Most other indicators are, however, less specific, such as 'Goals for reducing energy consumption are in place'. How this translates into practice at specific hotels varies and, consequently, different staff competencies are required.

Regional differences: BILT Expert Group insights

The African continent is exploring ways to address consequences arising from economic and social crises, climate change, environmental and biodiversity degradation, poverty, social exclusion, unsustainable waste management, and unemployment among highly educated youths. To avoid ecosystem collapse, the continent is adapting to a green economy agenda. The **Africa Agenda 2063** is the continent's strategic framework that aims to deliver on its goal for inclusive and sustainable development.

The Asia-Pacific region consists of a blend of developed and developing countries. In developed nations, such as Japan and Australia, the hospitality and tourism sector's approach to sustainability is often framed within a broader context of global responsibilities. With advanced infrastructures, higher levels of education, and greater public awareness of global issues, these nations frequently incorporate stringent sustainability standards and practices. In developing countries within the region, such as Cambodia and Vietnam, the primary concerns often revolve around immediate socio-economic needs. For many such countries, tourism is seen as a vital tool for economic growth. While there is an increasingly innate understanding of the importance of preserving natural ecological assets and cultural heritage and traditions — since they often form the backbone of their tourism appeal — there might be challenges in terms of resources, knowledge,

or infrastructure to implement sustainable practices effectively.

European countries also try to make their tourism activities more sustainable. Switzerland, for example, aims to transform their entire national tourism towards more sustainable methods with the programme, *Swisstainable*. The programme supports smaller businesses with fewer resources and encourages them to change towards a more sustainable future. As previously mentioned, Europe is lagging behind in sustainability in hospitality, especially in the food and beverages subsector. For example, compared to the USA, Europe was a late adopter of the 'doggy bag' to take away left-over food from a meal. In France, it was only in 2016 that new legislation passed that requires restaurants to provide containers for left-over food (Martin-Rios et al., 2018). Legislation on the limitation of single-use plastic and provision of biodegradable alternatives, however, was adopted early in Europe. It should be noted that although regulations such as these enforce certain sustainability practices on hospitality businesses, most practices are optional and adoption thus varies across the European region.

3. Green and digital trends in TVET

This chapter describes green and digital trends in TVET with specific examples from the three regions of the BILT project. It is important to note that the adoption of these trends by TVET providers can vary greatly, depending on available funds, institutional capacities, level of digital literacy and mindset, as well as on external requirements, such as government regulations and industry standards. The specific examples that illustrate the green and digital trends in TVET are presented in tables.

3.1. Digital trends

Whole-institution approach to digital transformation

The impact of digitalization on TVET is reflected in the digital transformation of TVET providers themselves. Instead of making small adjustments, some TVET providers tackle their own digital transformation in a holistic sense, digitizing not only learning and teaching but also internal processes and infrastructure.

4.⏻	**	Africa

The Boma International Hospitality College (BIHC) carried out an all-round transformation of its internal and external processes by adopting diverse technologies which, besides enhancing student experiences, led to internal efficiency of its processes involving staff, students and industry partners.

Digital literacy

The digital transformation can also include integrating general information and communication technology (ICT) literacy into competencies to be developed by learners (see also 5.2). These transversal competencies are not only meant to enable learners to carry out a specific job, but also to be digitally competent in everyday life. This involves, for example, the ability to decide whether an online source is trustworthy or not (information literacy), or being able to choose a certain digital tool or application for a defined purpose etc. Particularly important for the hospitality and tourism sector, given the increasing number of data breaches in hotels (Trustwave, 2023), is the inclusion of basic data protection and cyber security skills training. This training includes awareness of sensitive data processing and the ability to recognize suspicious emails and untrustworthy links (Alrobaian et al., 2023).

Digital learning

The term digital learning refers to any synchronous learning (classes taking place at a set time, face-to-face or online) or asynchronous learning (learners working to their own schedule) that is supported by digital tools or methods. The opportunities presented by emerging technology are enticing for digital learning, particularly in the realm of gamified immersive and scenario-based training, which can occur in virtual spaces without the need for physical infrastructure. Limitations identified, however, include the cost of course development, availability of technology and equipment, and the potential for motion sickness among learners.

4.⏻	*	Europe

The EHL Hospitality Business School in Lausanne, Switzerland, utilizes VR immersive training for housekeeping (EHL Insights, 2021).

Additionally, digital learning offers interesting avenues for educational transformation such as the use of new generative AI tools that enable static documents, manuals and standards to be converted into interactive and engaging materials. Opportunities also exist in reactive online learning experiences and dynamic curricula, facilitated by smart learning management systems that automatically adapt to the individual learner's progress, strengths, and weaknesses, personalizing the learning experience.

Blended learning and e-learning

Another digital trend in TVET can be seen in the number of programmes adopting blended learning which refers to the combination of online and in-person teaching and training (UNESCO International Bureau of Education, 2013).

4.⏻	**	Africa

Kambaku Hospitality College in Namibia offers a mixture of online learning with hands-on workplace experience.

Blended learning settings enhanced with VR are also emerging, such as in the Emirates Academy of Hospitality Management (EAHM) and EHL Hospitality Business School where this extended blended model is being piloted as part of their digital hospitality academy hotel school.

Infrastructure and access to technology

Another key digital trend is updating infrastructure and procuring the latest technology for TVET learners and trainers enabling them to experiment with, and integrate, new technologies into their professional practices.

4.⏻	*	Europe

The Finnish TVET provider Omnia, the Joint Authority of Education in the Espoo region, created a **maker space** for their students. This space offers tools such as 3D-printes, laser cutters, VR headsets and robots for learners to use for their projects. Culinary students used this technology to experiment with 3D-printed food.

Access to technology can have a different meaning in different locations, depending on the level of digitalization. Acknowledging the digital divide and the uneven access to equipment, tools and digital skills is the first challenge in the digitalization of TVET systems (ILO, 2021). For example, in remote areas of Kenya, access to technology is sometimes limited. Through the procurement of hardware (computers), software (e.g. virtual desktops) and e-learning the Jitume *Digital Skills Lab Programme* aims to equip learners with digital competencies that were previously inaccessible to them (Matili Technical Training Institute, 2023).

Transversal competencies

Core skills, such as learning to learn (to enable lifelong learning), communication, teamwork and problem solving, are long established foundations for enhancing employability (Brewer, 2013). As a result of technological advances and the increased use of automated processes, these core skills, together with a broader set of transversal competencies, are now often referred to as '21st century skills'. Ever more important, as a result of job roles changing at an increasing speed, these foundational skills enable workers to be able to react to change, solve problems and collaborate with others. For example, as more repetitive administrative tasks are carried out more by technology/digital applications/ programs, the focus of workers has shifted towards more customer interaction (Ganji et al., 2023). In this case, workers need the relevant social skills to adapt to the change and achieve the goal of customer satisfaction, as well as flexibility and an open mindset to deal with adjustments within their work. In response to these changes and trends, transversal competencies are considered more and more important in TVET, arguably even more so than job-specific skills.

4.⏻	*	Asia-Pacific

In Singapore, **SkillsFuture** studied skill demands for the digital economy. They published three clusters of critical core skills that are crucial for workers to succeed in the digital world of work: thinking critically, interacting with others, and staying relevant.

With the advent of large language models, there is potential to develop scenario-based soft skill training that adapts to train transversal competencies online, covering areas such as complaint handling, cultural awareness and everyday tasks such as welcoming guests or presenting menus for upselling.

Regional differences: BILT Expert Group insights

4.⏻	*	Africa

Digitalization of TVET is an initiative of UNESCO, the African Union, the African Institute for Economic Development and Planning (IDEP) of the United Nations Economic Commission for Africa, the African Development Bank (AfDB) and the African Union Development Agency of the New Partnership for African Development (AUDA-NEPAD). TVET providers are integrating general ICT literacy into the set of competencies to be developed by learners to meet the needs of the digital economy.

In the African region TVET is also undergoing a digital transformation with various TVET programmes transitioning to blended learning. There can be significant differences, however, regarding the level of basic digital skills the learners acquire in formal or informal education settings depending on the learners location.

In Asia-Pacific, the situation is also starkly polarized due to the high costs associated with the digital transformation of educational institutions. These costs include equipping schools with digital infrastructure and tools, and up-skilling or re-skilling teachers. As a result, schools with access to financial resources, whether governmental or private, have managed to integrate digital skills into their curricula whereas, conversely, many schools in lower-income countries continue to struggle with this transition.

In Europe, learners entering the TVET system usually already have a certain level of basic digital competencies from prior education. However, similar to the other two BILT regions, there are **differences between countries**.

Whether a TVET provider integrates blended learning into their education programme or not depends on available funds to invest in the resources needed to create digital content, address cultural barriers, and the availability and

digital literacy of teachers. Privately funded hospitality schools are predominantly ahead of state-funded ones in this endeavour.

3.2. Green trends

Education for sustainable development

A crucial educational trend that also concerns TVET is the concept of *Education for Sustainable Development* (ESD). It refers to the goal of increasing or integrating educational activities that equip learners with the 'knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality' (UNESCO, 2023) at any educational level, from primary to post-secondary, including in TVET. Most – if not all – green trends in TVET can be surmised under ESD.

🧑	*	Europe

The Swiss competence and service centre, *éducation21* systematically furthers ESD on lower and upper secondary levels on behalf of the Confederation as well as the Cantons (administrative regions). It compiles and provides pedagogically tested learning materials, guidance and counselling, and financial support for school and class projects, as well as offering support from actors outside of the school.

Greening TVET institutions

In order for TVET providers to support the development of green competencies in learners, it is important they take a leadership role in implementing sustainable practices themselves by creating what are known as *green campuses*. This whole-institution approach to greening TVET, as described by UNESCO-UNEVOC (2017), suggests the incorporation of sustainable development not only through aspects of the curriculum, but also through integrated management and governance of the institution, the application of a sustainability ethos, engagement with the community and stakeholders, long-term planning, and sustainability monitoring and evaluation.

🧑	**	Asia-Pacific

The École d'Hôtellerie et de Tourisme Paul Dubrule in Cambodia, has become a certified EcoSchool. Through a holistic approach, aligned with the United National Sustainable Development Goals (SDGs), their EcoCampus initiative made awareness and action toward sustainability an intrinsic part of the life and ethos of their educational facilities. It endeavours to develop responsible attitudes and commitment that can be spread outside the campus as the certification is not awarded for simply enacting operational elements (e.g. water/energy saving, waste reduction), but also for equipping students and staff with: critical competencies in many social areas, knowledge regarding critical issues of sustainability, and positive behavioural disposition that they can replicate in their future workplace.

Other trends are the selective addition of sustainable practices such as recycling systems and efficient use of water and energy (UNESCO-UNEVOC, 2017).

🧑	**	Africa

False Bay TVET College in South Africa, implemented a waste to food programme involving an in-campus sustainable food garden. The programme comprised raised beds made of eco-bricks and cob, and an irrigation system, plus training for learners. The main aims for the programme were to build garden beds, implement waste management monitoring and evaluation and develop a waste management and composting system. The programme directly contributed to learners' health and wellbeing, improved nutrition, and contributed to higher programme completion rates.

🧑	*	Europe

The activities within the Greening Responses to Excellence through Thematic Actions (GRETA) initiative saw **18 centres of vocational excellence** (CoVEs) self-assess and peer-review their progress towards greening their institution. They profited from peer-learning sessions centred around specific themes to aid them in their efforts towards their green transition.

Transversal key competencies

Similar to ICT literacy, there is also a trend in TVET for green transversal competencies to be included in the set of competencies developed among learners. The aim is to develop a general understanding of sustainability and green practices for everyday life (e.g. waste disposal, consumer choices), thus equipping learners with a green mindset as early in life as possible.

🏭	**	Asia-Pacific and Europe

In Cambodia and Switzerland, transversal green competencies are taught separately to job-specific green skills. In the latter case, it is part of the mandatory general education which forms part of any initial vocational education and training (IVET) programme. Depending on the duration of the programme, a certain number of lessons are specifically foreseen for general education, including green and digital transversal competencies among others (such as language competencies, cultural understanding, political participation etc.).

Regional differences: BILT Expert Group insights

In Africa, greening TVET plays an important part in the *2063 African Agenda* for inclusive growth and sustainable development. There is no continent-wide initiative in place, such as the *Pan African Initiative for the Digital Transformation of TVET and Skills Development Systems* mentioned in the previous sub-chapter, but many local initiatives can be observed. Regarding transversal competencies, similar to ICT-literacy mentioned in the previous sub-chapter, the level of basic green competencies (for instance waste management, recycling etc.) also differs greatly depending on the region.

In Asia-Pacific, as a holistic and long-term strategic plan for the Association of Southeast Asian Nations (ASEAN) region, the *ASEAN Action Roadmap for Sustainable Tourism Development* has been adopted, which serves as a blueprint for the regional tourism industry and gives attention to the green and digital infrastructure investments. The formal implementation of green curricula, however, has not been universally adopted although TVET providers are becoming increasingly conscious of the need to incorporate green skills into their curricula or include these skills as part of learning objectives and outcomes. This shift is due to a growing awareness among visitors to the region regarding sustainable practices and a heightened focus on ecotourism in the region. Additionally, the mounting effects of global warming on the already climate-induced vulnerabilities in many developing nations in the region including flooding, extreme weather conditions and water and air pollution, are propelling the industry towards greener hospitality practices and sustainable tourism.

4. New green and digital competencies

Competency in the scope of this publication

As trends in the hospitality and tourism industry change, job roles within it must adapt or new roles must be created. For example, the digitalization of reservations from paper to online requires a different set of competencies for managing bookings than it did previously – the end goal has not changed but the process has.

Competencies, which is what is often meant in the everyday use of the word skills, are defined as what is needed to carry out professional actions in day-to-day work life. International literature provides various definitions of the term competency, but one definition often relied on in practical contexts is that a competency is developed if a learner has acquired the relevant skills (practical or cognitive, like using a booking tool), knowledge (for example, understanding the booking process in its larger context) and attitudes (such as acting customer-oriented). This notion of competency is used in this publication in line with *New qualifications and competencies for future-oriented TVET* (UNESCO-UNEVOC, 2021).

Figure 1: Defining competency through the acquirement of skills, knowledge and attitude
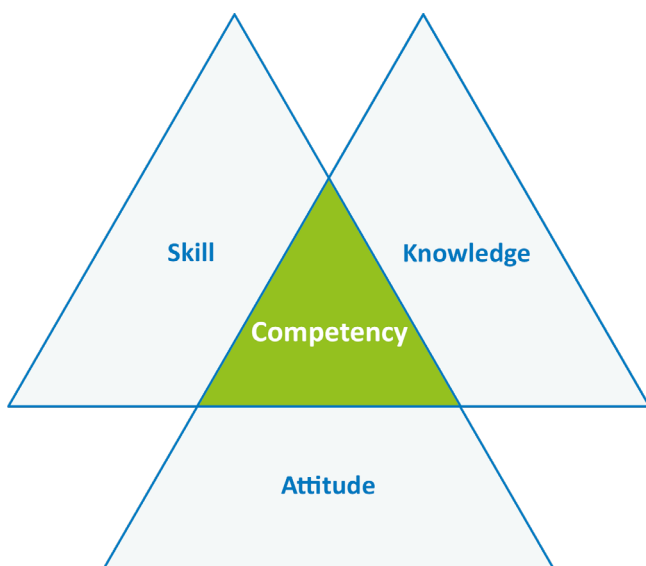
The 2023 BILT Expert Group decided to use the definition of competency with the addition of routine to the skill element. This means that the ability to perform a cognitive or physical task only falls under the definition of skill if the person who performs the action has also acquired the routine needed to perform the task. Practically, this means if a learner has performed an action only once, it is not yet a skill.

New green and digital competencies in the hospitality and tourism sector

Green and digital competencies are required in the hospitality and tourism sector to keep up with technological and regulatory changes, as well as to meet the expectations of customers. It is, however, an impossible task to list all the new green and digital technical competencies needed in the future. Derived from the trends described in the first chapter, however, new technical competencies needed in the sector generally encompass knowledge, skills and attitudes required for implementing, maintaining and supporting new or adapted processes, materials, tools, services and products.

The specific green and digital competencies required differ both across occupations and within them, in terms of depth and complexity, depending on the ISCED level of the occupation. For example, whether the role requires the worker to choose which new tool to use in their business (management level) or whether the job role simply requires the worker to apply said tool for tasks (lower level).

Green and digital units and elements of competency

Written representations of competencies, which can be found in training regulations, frameworks and/or curricula, depending on the country and TVET system, are units of competency and elements of competency. Units of competency break up an occupation into the main actions that make up the occupation for which competencies are needed. They can form independent training packages and qualifications of a given occupation. Elements of competencies are components of units of competency. According to NCVER's VET Glossary, they are 'key activities that must be performed to demonstrate competence in the tasks covered by the unit'.

Figure 2: Examples of a unit of competency with two examples of elements taken from 'Practitioner in hotel housekeeping' in Switzerland

Unit of competency
e.g. perform tasks in the dishwashing organization

Element of competency
e.g. operate and clean machines/equipment in the dishwashing organization

Element of competency
e.g. use the company's dishwashing/cleaning agents according to instructions in a resource-efficient manner
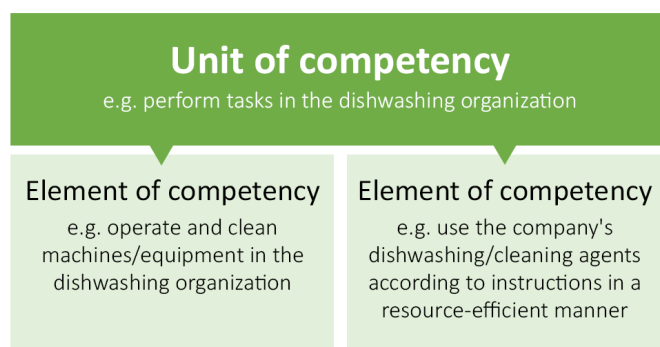
The following table gives examples of elements of competencies for each of the trends from different curricula in the three regions of the BILT project. The first column refers to one of the trends described in the previous chapter. The second column describes some of the new or adapted tasks workers carry out in their daily work life due to changes in connection with the trend. The verbs used for this description do not indicate the complexity of the task or depth of the required knowledge. They were chosen according to common use of language and resemblance to wording used in curricula is coincidental. The third column gives real examples from actual curricula.

Table 1: Examples of competency formulations for digital trends

Digital trend	Professional action/task	Example/element of competency from curricula
Automation: robots, machines, artificial intelligence	• Understand the technology, be aware of providers of service • Use in a business strategy • Process and analyse data • Use, upkeep	Monitor changes and trends in ICT (3D printing, robotics, artificial intelligence, augmented and virtual reality, internet of things (IoT), Big Data) and digital media that might affect a hospitality organization (Strategic Hospitality Information and Communication Technology module, ITS, Malta)
Automation: e-gates, self check-in, self-service at hotel bar	• Customer support • Process and analyse data • Use, upkeep	For hotel managers: have knowledge of relevant innovations in the field of technology and digitalization (Hotel-manager, Switzerland)
Software for efficiency	• Use, understand the technology, awareness of service providers • Process and analyse data	Submit a maintenance request through the HMS system (Housekeeping Operations, Cambodia)
Applications and platforms	• Placement of offers and information on the application/platform, customer support • Process and analyse data • Adapted business strategies	Process an online room booking and reservations on the internal booking system (Front Office Operations, Cambodia)
3D-printing	• Understand the technology, awareness of service providers • Determine areas of use • Use, upkeep	Use a 3D device and print a product in catering services (Restaurant and Catering Services, Finland)
Virtual experiences: 360-degree video	• Understand the technology, awareness of service providers • Determine areas of use • Conceptualize, produce and promote a 360-degree video	Devise, produce, price and market a virtual tour for a specific group of customers (Bachelor's degree in Tourism, Finland)
Virtual experiences: AR, VR, metaverse	• Understand the technology, awareness of service providers • Use in a business strategy	Understand the significance of current and near future modes of interaction (e.g. AI, AR, VR) and how these are modifying communication between the different tourism stakeholders (e.g. employees, visitors, service providers, etc.) (ICT from a Managerial Perspective module, ITS, Malta)
Handheld gadgets	• Customer support, upkeep	Critically review the best available technological solutions (2D scanning, 3D visualization, AR, VR, touchscreens, mobile devices, gamification and internet) that could positively support heritage interpretation at a particular site and/or an artefact (The Use of Digital Technologies in Heritage Interpretation module, ITS, Malta)

Big data	• Understand the technology, awareness of service providers • Use in a business strategy • Process and analyse data	Apply technology or other resources to improve customer service (Hospitality Manager, Scotland)
Personalized tourism	• Understand the technology, awareness of service providers • Use in a business strategy • Process and analyse data	Process data and information from guests, partners and employees with the help of the company's software programs (Guest relations officer, Switzerland)

Table 2: Examples of competency formulations for green trends

Green trend	Professional action/task	Example/element of competency from curricula
Eco-management	• Understand the concept, apply	Assess and compare the feasibility and cost-effectiveness of considered climate solutions (Bachelor's degree in Tourism, Finland)
Resource efficiency	• Understand the concept, apply	Assess the changes in operating practices or output at the workplace or in the vocational field (Restaurant and Catering Services, Finland)
Circular economy, circular practices	• Understand the concept, awareness of practices, awareness of service providers • Use in a business strategy • Apply	Minimize and reduce water use while cleaning and preparing rooms for guests (Housekeeping, Cambodia)
Ecotourism, regenerative tourism	• Understand the concept, awareness of practices, awareness of service providers • Use in a business strategy • Development of products, provision of services	Discuss the responsibility of tourists in the sustainability process and analyse the influence and responsibility of the key actors and stakeholders in achieving sustainable tourism (Master of Science FHGR in Business Administration with Specialisation in Tourism and Change, Switzerland)
Energy efficiency: efficient practices	• Understand the concept, apply • Process and analyse data	In the dishwashing organization: use the company's dishwashing and cleaning agents according to instructions in a resource-efficient manner (Practitioner hotel housekeeping, Switzerland)
Energy efficiency: energy monitoring	• Determine areas of use • Use, upkeep • Process and analyse data	Determine energy consumption of machines and equipment as well as water consumption during work processes (Cook, Germany)
Reduction of single-use plastic	• Understand the technology, awareness of service providers • Use in a business strategy	Propose justified solutions that can be implemented to develop own work or community's operation, product or service to reduce climate impacts (Restaurant and Catering Services, Finland)
Sustainable certificates	• Understand the technology, awareness of service providers • Use in a business strategy	Integrate insights about the environment and framework condition into daily operating processes and strategic decisions (Advanced Federal Diploma of Higher Education in Hospitality Management, Switzerland)
Transversal green competencies: working with others and in teams	• Communicate, share skills and knowledge	Share information with other housekeeping staff and front of office; read standard operating procedures (SOP), instructions and orders (Housekeeping, Cambodia)

5. Identifying, integrating and implementing new competencies – responses from TVET

This chapter describes how, from the trends mentioned in chapter 3, new green and digital competencies are identified, integrated into curricula and implemented by TVET providers (the *Three I's process*, see Introduction). As in previous chapters, examples from the three BILT regions are provided in tables throughout.

5.1 Identification

Stakeholders in TVET are aware of the megatrends regarding the digital transformation and the move towards sustainable practices. To establish what this means for TVET as a whole and TVET in hospitality and tourism in particular, it is necessary to identify the new green and digital competencies required. This entails examining the influence of these green and digital trends on the sector.

Trends in the industry are already being monitored by various hospitality and tourism focused research units such as the Islandic Tourism Research Centre, Kenya's Global Tourism Resilience and Crisis Management Centre (GTRCMC – EA) and the Hospitality Research Centre of the Hague School in the Netherlands. To have impact, these trends must then be translated into skill needs in TVET systems. The Scottish Tourism and Hospitality Skills Group provides an example of this monitoring and translation into skills needed as it brings together employers from the industry, public agencies, further industry stakeholders, including professional and trade bodies, and training providers, to identify and tackle skills challenges in the industry. With all the relevant stakeholders at the table, the link between trends and changes in industry to competencies needed can be easily made. Specifically, industry can provide information on how the work in the sector is changing and training providers can ensure learners can develop the relevant competencies.

🌱4⏱	**	Europe
The industry-led Scottish Tourism and Hospitality Skills Group is the focal point for the industry to identify and address skill capacity issues faced by the sector. It works with partners and stakeholders to influence skills solutions that are appropriate to supporting industry growth in respect of the Scotland Outlook 2030 strategy.		

Similarly, in Portugal, the **National Tourism Training Commission** has been established to bring together stakeholders related to education and training in tourism with the same goal of monitoring new trends and identifying relevant competencies. They aim to integrate and implement these new competencies in a coordinated manner involving all training providers in the sector.

A notable European Union-funded project in the context of identifying new or changed competencies is the **Pact for Next Tourism Generation Skills** (PANTOUR) which is the follow-up project of the **Next Tourism Generation Skills Alliance** (NTG). The project is led by 13 partners from ten EU-countries. The NTG developed many resources concerning the identification of new competencies including the **Skills Assessment Methodology** tool to identify skill gaps in the tourism sector and make connections between sector needs and competencies required.

At the macro level[4], approaches to identify new and changed competencies usually span across sectors. For example, the State Secretariat for Education, Research and Innovation (SERI) in Switzerland published two orientation guides to help identify and integrate green and digital competencies during curricula revision for any occupation. The **orientation guide for sustainable development** which includes an analysis tool, and the **orientation guide for digital transformation** which contains a catalogue of questions, both combine to assist in identifying skills and formulating learning outcomes for units of competency. These competencies are integrated into the national curricula through an industry-led process.

5.2 Integration

Identifying new green and digital competencies is only the first step in the *Three I's approach* for new qualifications and competencies. These competencies must then be translated into curricula (UNESCO-UNEVOC, 2021), but in a way that does not 'overload them' (OECD, 2020). Incorporating green and digital competencies into curricula, therefore, does not simply mean adding them to existing competencies, rather it requires a systemic integration ensuring they are embedded throughout the curricula. Several approaches can be taken to do this. Cambodia's Ministry of Tourism, for example, has taken a sector-wide approach, developing two policy documents: the *Cambodia Guidelines on Green Skills*

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4 Governance level, e.g. ministries, statutory bodies, etc.

in Tourism and Hospitality and the *Cambodia Guidelines on Digital Skills in Tourism and Hospitality*.

There are also approaches across sectors, usually at the macro-level, for example, Germany's minimum standards.

👨‍🌾 4.⏻	**	Europe
In 2020, the German government, social partners and the Federal Institute for Vocational Education and Training (BIBB) collaboratively updated the nationwide minimum standards for all regulated IVET programmes. These standards specify competencies to be developed across professions, including those in the hospitality and tourism sector. Green and digital competencies (*Digitized Working World* and *Environment and Sustainability*) are part of the modernized minimum standards.		

Examples of such competencies are: (green) 'recognize opportunities within own task area for the avoidance of instances of environmental pollution and impacts on society caused by the company and contribute to the further development of these opportunities', and (digital) 'communicate in ways which conserve resources, are appropriate to the target group and are efficient, and document communication results'. Although these examples are written in an abstract way suitable for a broad audience of learners, TVET providers are instructed to substantiate the competencies and support learners to develop them in a way which closely aligns with their profession and work life reality (GOVET, 2020).

Another example of an initiative that spans across sectors is the *Green TVET Framework for Skills Development of the Technical Education and Skills Development Authority* (TESDA) in the Philippines.

👨‍🌾	**	Asia-Pacific
TESDA developed 'green training regulations' for nationwide application. Training regulations are packages of qualifications, competency standards, training standards, assessment and certification arrangements. They serve as the basis for the development of the curricula, registration and delivery of training programmes.		

Another interesting resource for integration is the *European Skills, Competences, Qualifications, and Occupations framework* (ESCO). It describes, identifies and classifies professional occupations and competencies relevant for the EU labour market and education and training, such as 'promote virtual reality travelling experiences' or 'educate on sustainable tourism'.

In addition to the macro-level approach illustrated with the examples above, there are also meso-level approaches for the integration of green and digital competencies. The **DGI Tourism project** has developed a handbook with competencies for ISCED level 4[5] tourism professions.

👨‍🌾 4.⏻	**	Europe
The DGI Tourism handbook contains three units with competencies, topics divided in sub-units and implementation suggestions. The first unit revolves around the current and future tourism market, impacted by trends and innovation. The second unit focuses on sustainability in tourism, specifically tourism development, the management of tourism products and destinations and the integration of sustainable tourism products and services. The third unit is meant for the development of digital competencies, notably regarding the digital transformation of the tourism sector, e-commerce and digital tourism marketing and responsible data management.		

The competencies formulated in the DGI Tourism handbook can be used for the integration of green and digital competencies in curricula of ISCED level 4 tourism professions in different countries. Examples of such competencies are: (green) 'develop and implement sustainable tourism services, aimed at enhancing and integrating the environmental, cultural and economic resources of a territory with a view to innovation and sustainability', and (digital) 'implement new technologies and approaches in tourism management'. Depending on the conventional formulation of competencies in the curricula of different countries, these competencies can be integrated as such or further substantiated as required.

A challenge for the integration of new green and digital competencies is the training of learners for international markets. TVET providers in parts of Africa and Asia-Pacific take into account that their graduates might find employment in Europe, the USA, or the Middle East, often on the basis of a memorandum of understanding or similar agreements. Regarding job-specific green and digital competencies, it is therefore important to consider not only local industry trends to guide the integration of competencies, but also international ones to prepare graduates for diverse working contexts.

5.3 Implementation

A crucial further step is the implementation of new qualifications and competencies to ensure TVET providers support learners in developing relevant competencies by providing them with real-life learning opportunities. This includes ensuring teachers' and trainers' competencies are up-to-date and different training and skilling, reskilling and upskilling options are provided for them taking into account different contexts and needs, such as their age, cultural background, or previous experience.

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5   EQF level 4 professions, equaling ISCED level 4 professions.

Training of trainers and teachers

It is crucial for trainers and teachers to stay up-to-date with current industry trends and changes in the occupations they teach. This also extends to teachers' abilities to adopt new learning technologies and methodologies to train effectively and in line with learners' expectations.

4.⏻	**	Asia-Pacific

In Australia, the **Council of Hotel and Restaurant Trainers** (CHART) offers upskilling webinars for its members, such as 'How AI Will Change Training, for Better or for Worse', 'Game-Based Learning vs. Gamification' and 'The Digital Revolution in Restaurant Training & Operations'.

Some TVET providers encourage and enable trainers and teachers to have an attachment to a hospitality and/or tourism business. Teachers at Kibondeni College in Kenya, for example, do job-shadowing for a brief period of time. At Temasek Polytechnic in Singapore, teachers and trainers can pursue an industrial attachment for 2-3 days a week over a period of 3-6 months.

Integrated into teaching

To help learners develop green and digital competencies, these need to be integrated into the educational programme of the TVET provider. Regarding school-based learning, positive steps have already been taken with a number of hospitality and tourism schools integrating relevant modules into their programmes.

4⏻	**	Europe

The Kópavogur High School in Iceland, which offers TVET programmes in hospitality and tourism has integrated the module 'Learning and Computers' in their hospitality and tourism courses to help learners develop the relevant digital competencies.

The Swedish training provider YrkesAkademin, for example, aims to provide more job-specific digital competencies in its *Business Developer Hospitality* programme, such as requiring learners to develop competencies for 'leading digital transformation processes'.

A further option to support learners to develop relevant competencies and to give them the most up-to-date input, is to invite industry experts to give courses or teach specific lessons.

4.⏻	**	Asia-Pacific

At the Shenzhen Polytechnic University in China, students and lecturers learn about the latest developments and necessary competencies in the industry through mentors from the Huazhu group, famous for the digitalization of their hotels.

Another option for TVET providers is to organize activities and initiatives outside of the regular training programme to help learners develop new green and digital competencies.

	**	Europe

Apprenticeships in Hospitality Scotland organized a 'Learning Journey' in 2022 where learners discovered the use of seaweed as a sustainable, 100% natural and organic material in food preparation (Apprenticeship in Hospitality Scotland, 2022).

Exposure to current industry trends, tools, solutions and workplace learning

In the same vein, up-to-date competencies regarding trends in the industry and exposure to relevant technologies that enable, for example, efficient property management, energy and resource efficiency, or waste reduction, are crucially important. This exposure can be managed in different ways, the most effective of which being dual training. Some countries already have a dual system in place, others have a school-based system which includes work-based learning (e.g. an internship) as part of their studies. A further option is to expose students to current industry practice in the classroom.

4.⏻	**	Africa

Some TVET providers in Africa profit from CiMSO property management software being provided free-of-charge to educational institutions for training purposes. Thus, learners are exposed during their training to software that is widely used in the industry.

Another possibility to enable exposure to industry trends is to provide the space in which to experiment with new tools, offers and practices. The Lab Hotel at the Hotel Management School in Thun, Switzerland, offers the possibility for their students to try new sustainable practices and digital tools in real hotel rooms within their school-run hotel.

🧑‍🏫 4.⏻	**	Europe

Also in Switzerland, the *EHL Swiss School of Tourism & Hospitality* in Passugg has a training restaurant – similar to the *Sublimotion* mentioned in 2.1. – where students can enhance their competencies in digitally enhanced culinary experiences (Zuberbühler, 2023).

In a dual TVET system, such as Germany's, green and digital competencies are not only developed at schools, but also in the workplace. Exposure to up-to-date green and digital practices requires that workplaces are sufficiently digitalized and sustainable. The German Federal Institute for Vocational Education and Training (BIBB) has a long-lasting tradition of **promoting sustainability in TVET by project funding**. The so-called 'pilot projects' aim to test and disseminate innovative approaches linking sustainability and TVET for a wide range of different industries through:

- fostering sustainability-oriented skills;
- designing specific teaching materials;
- conducting further training for skilled workers; and
- establishing sustainable learning venues.

🧑‍🏫	*	Europe

The new programme '**Sustainable at work – future-oriented Vocational Education & Training**' is implemented by BIBB with funding from the Federal Ministry of Education and Research (BMBF) as well as co-funding from the European Social Fund (ESF Plus). The overall goal is the sustainability-related qualification of in-company TVET trainers via the implementation and dissemination of further training courses.

Upskilling

The previous examples focused on learners working towards a TVET qualification. New green and digital competencies are, however, also relevant for workers who have already graduated and thus need to be provided with different learning opportunities. They too need to have the possibility to develop the green and digital competencies needed for their work.

🧑‍🏫 4.⏻	*	Europe

The initiative *Skills to Advance*, implemented in Ireland, specifically aims to offer upskilling courses for the hospitality and tourism sector. The courses are offered by local education and training boards throughout the country.

Short courses

An option for upskilling is via short courses. TVET providers, in collaboration with industry stakeholders, have proactively designed short courses to enhance learners' and workers' green and digital competencies. These courses address the growing demand for expertise in sustainable practices and digital technologies.

🧑‍🏫 4.⏻	**	Asia-Pacific

Tourism Training Australia has developed various **short online courses that help develop very specific competencies**. Learners receive a digital badge upon completion and can thus acquire micro credentials that stack together to meet the requirements for units of competency in the national training framework and get formal recognition.

Two notable online platforms in the hospitality and tourism sector are **typsy**, which offers over 1,500 lessons in a purpose-built video library, and **atingi**, a pioneering digital learning platform which provides learners with free, high-quality and locally relevant learning opportunities.

Other learning formats

Educational training is sometimes also provided by organizations that are not TVET institutions. These organizations typically have a broad focus on sustainability with educational offers and materials being just one of their many activities.

🧑‍🏫	*	Europe

The international climate protection organization with Swiss-roots, **Myclimate,** offers a 'company challenge' for apprentices of all occupations. Apprentices attain their transversal and job-specific green competencies by developing their own sustainability project within their company and/or training provider in the Swiss dual TVET system.

New certificates and programmes

In higher level TVET certificates/professions primarily (ISCED level 6 occupations and above), entire courses are developed, particularly in the area of sustainability.

🧑‍🏫	***	Africa

The **Institute of Tourism and Hospitality Management Dean Kimathi University of Technology**, Kenya, offers a Bachelor's as well as Master's degree and a diploma in *Sustainable Tourism and Hospitality Management*.

Other examples include the Climate Friendly Travel Diploma by SunX and the Institute of Tourism Studies in Malta, and the *Sustainable Management* major in the Swiss Professional Degree in Hospitality Management at the EHL in Switzerland. While a focus on green competencies is more common, a focus on digital competencies can sometime be found.

🌱4.🔵	***	Europe

The University of Applied Sciences Grisons, Switzerland, offers a Master's degree in *Tourism and Change* which equips graduates with the competencies to react innovatively to changes in the industry caused by, not only the green but also the digital, transformation.

Transversal competencies

As mentioned in chapter 3, transversal green and digital competencies are sometimes taught by TVET providers separately from job-specific competencies. They can, however, also be part of lessons that are directly linked to competencies relevant for occupations, as the learners usually need a broad foundation to understand more specific concepts. For example, to understand a given sustainable practice in a specific industry context it helps if the learner already knows about the concept of sustainability and can thus see how the practice fits into this framework.

🌱	**	Africa

The initiative at Dedan Kimathi University of Technology in Kenya provides an example of integrating transversal green competencies. The university co-developed a sustainable waste management learning module which has been essential in strengthening students' and staff's competencies in waste management. The module focuses on developing a practical model the trainees use for tracking, documenting and minimizing waste in the learning environment.

A third relevant category of transversal competencies are also sometimes referred to as 'soft skills', '21st century skills' or 'core skills'. These terms usually refer to a narrower collection of general, situation-independent, transversal competencies such as social skills, critical thinking and problem solving.

🌱4.🔵	*	Europe

In the hospitality context, the EHL Swiss School of Tourism and Hospitality in Passugg, Switzerland, gives prominence to emotional intelligence. The students develop the relevant competencies in the *Affective Hospitality* module, including how to understand, regulate, recognize and deal with emotions. The aim of this addition to the curriculum is to get to the heart of what is truly relevant for the positive guest experience (Schweighauser, 2023).

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6. Recommendations

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6.1. Overview

This concluding chapter of the report proposes a set of practical recommendations with concrete and actionable steps targeting stakeholders at macro-, meso-, and micro-level of the TVET system.

As TVET systems differ widely across countries, the starting points TVET providers may find themselves at when they want to further green and digital skills can vary considerably.

For this reason, the recommendations in this chapter are structured according to a selection of such starting points or initial situations the stakeholders may find themselves in. Key recommendations are summarized in the table below with further details provided thereafter:

Table 3: Initial situations and corresponding key recommendations

	Initial situation	Recommendation
Key recommendations	TVET governance has not yet acted and is not about to (lack of will or capacity)	• Initiation of the process by industry bodies • Involvement of development partners and business associations for capacity building of government officials
	No existing green and/or digital competencies in hospitality and tourism curricula	• Start revision of curricula/training regulations • Look for good practice examples from similar contexts • Include industry, TVET providers and research institutions in the process • Take shortened process into consideration: adding competencies to existing curricula/training regulations instead of a complete revision
	Trainers with limited knowledge of industry	• Prioritize teachers and trainers with industry experience when hiring • Upskill staff through job shadowing in industry

In order for workers to develop the green and digital skills required in the hospitality and tourism sector, each step of the *Three I's process* (see also Introduction and chapter 5) needs to be taken.

Identification: To address the impact of green and digital trends and the associated skills challenges in the industry, it is crucial to determine which green and digital competencies and qualifications are currently needed and will be relevant in the near future. This will help provide better intelligent service experiences to customer, reduce energy consumption, and ensure sustainable development.

Integration: Through various innovative approaches, these competencies need to be systemically integrated into training regulations and curricula. This involves incorporating them into written representation units and elements of competency to ensure the efficient development of green and digital skills (see chapter 5).

Implementation: Based on national curricula or training regulations, TVET providers need to create opportunities for all learners to develop new practical green and digital competencies relevant to the industry through their educational facilities, teaching and training.

This process requires collaboration between all levels of TVET stakeholders[6]:

- **Macro-level:** governance e.g. ministries, statutory bodies.
- **Meso-level:** advocacy e.g. business member organizations, trade unions, research institutes, teachers' associations, non-governmental organizations.
- **Micro-level:** delivery e.g. TVET schools, companies, other TVET providers.

Regular national and school-specific curriculum reviews should be conducted using a multi-stakeholder approach, led by the level responsible for the TVET curriculum (macro, meso, micro). While business member organizations are

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6   The stakeholder levels are described in the three volumes of 'New qualifications and competencies for future-oriented TVET' compiled by the 2021 BILT Expert Group on NQC. For further information see: **https://unevoc.unesco.org/bilt/nqc**.

best placed to advise on the current skill needs, research institutions can supply research-based evidence to predict future green and digital trends in the labour market, as outlined in chapter 3, and their corresponding competencies.

In order to effectively utilize this data, the different stakeholders must work collaboratively. To enable this, policies should be established at the **macro-level**, guided by evidence-based decision making. These policies should allow for timely curricula revisions and the transfer and implementation of innovative and promising practices from other countries, contexts and institutions.

With their in-depth knowledge of industry needs, **meso-level** organizations act as the informers of the required green and digital competencies. They can also act as drivers of the process.

In the development of green and digital competencies, **micro-level** organizations have a crucial role as they are the learning locations where development happens. For this endeavour to be successful it requires institutions to have the necessary infrastructure, skilled staff (trainers and teachers with green and digital competencies themselves), and legal bases on which to model their curricula or training plan.

6.2. Specific recommendations

The previous sub-chapter gives a broad overview of the recommendations provided by the 2023 BILT Expert Group. They are described in more detail in the following tables. The titles indicate which stakeholder level (see 6.1) the recommendation is aimed at.

Table 4: Macro-level recommendations: planning and preparation

Starting point	Recommendations	Possible challenges to address	Stakeholders to be involved	Useful tools and resources
No green and/or digital competencies currently in hospitality and tourism curricula. The country does not currently have green and/or digital competencies integrated into their hospitality and tourism occupations curricula, but the responsible authority intends to start the process of integration.	**Work with stakeholders to identify the green and digital skills required.** Hospitality and tourism businesses, the future employers of TVET graduates or provider of workplace-learning, and TVET providers themselves, should be included in the process as early as possible. Whilst businesses are best placed to give a reliable picture of current industry trends and the workplace reality TVET graduates face, TVET providers have a realistic view of what can and cannot be achieved with the resources available to them and can thus support in developing a curriculum that is ambitious but achievable. If further resources are required, already having an establish dialogue with industry can help meet the goals set by governance. The central goal should remain the employability of graduates as well as the transition to a more sustainable future.	**Stakeholders' dialogue not seen as genuine, just a gesture.** Ensure all stakeholders feel engaged and able to voice their opinions and suggestions, not doing so is a common reason why dialogue/communication breaks down and parties leave the discussion table. **Unwillingness to disclose current green practices by industry.** As regards sustainable practices, industry stakeholders may be reluctant to disclose their current green practices because of fears of being accused and penalized for greenwashing, or because of a current lack of effort to make their business more sustainable.	• Relevant government ministries • Private sector employers • Relevant business associations • TVET providers	**Next Tourism Generation Collaborative Framework**
Governance has not yet acted and is not about to. No green or digital competencies have been integrated into curricula and there is no movement at the governance level to do so despite a significant mismatch between industry needs and the competencies developed by learners at TVET providers.	**Work with industry bodies to lead and persuade stakeholders at TVET governance level.** If the governance level lacks initiative to integrate new green and digital competencies into curricula, industry bodies can take the lead in this process and persuade governance to acknowledge the need to start the process.	**Reluctance to engage in dialogue.** During the process there might be reluctance at governance level to engage in dialogue, therefore a positive approach is important to highlight the benefits of a green and digital transformation and the opportunities created by the transformation.	• Industry bodies and business associations • Government	**Lean Methodological Framework** by DGI Tourism project.

Starting point	Recommendations	Possible challenges to address	Stakeholders to be involved	Useful tools and resources
Government has not yet had a green and/or digital transformation. If governments themselves lag behind in the green and digital transformation, the green and digital skills in the hospitality and tourism sector may not be among its priorities. In addition, officials of such governments may not be best placed to lead the process within TVET in this case.	**Look to stakeholders outside of government for expertise and guidance.** In order to attain the relevant knowledge and experience needed for a green and digital transformation in the sector, development partners, business associations, and innovative TVET providers should be consulted.	**External expertise may be difficult to locate, and there may be a reluctance to admitting it is needed.**	• Research institutions • Private sector business associations • TVET providers	
Local and national government officials lack the capacity to lead green and digital skills transition in TVET. Government officials responsible for green and digital transition lack the technical knowledge and awareness of the topic due to limited links to or exchange with employers.	**Undergo research into future industry trends.** As curricula should prepare learners for the future, it is important to anticipate upcoming trends and relevant competencies to ensure the longest possible lifetime of curricula. To identify future green and digital competencies, it is advisable to consult current research into future industry trends. Several research bodies are already carrying out this research in the sectors.	**Potential unavailability of curricula-specific research.** Research centres looking into future trends in hospitality and tourism may not have available research tailor-made for the purpose of curricula development. If the process is started early enough, however, relevant research could potentially be requested or incentivized.	• Research institutions • Private sector • Business associations • TVET providers • Government	See 5.1 for some examples

Table 5: Meso-level recommendations: strategic leadership and policy development

Starting point	Recommendations	Possible challenges to address	Stakeholders to be involved	Useful tools and resources
Green and/or digital competencies are to be integrated in hospitality and tourism curricula.	**Consider revisions instead of a complete rewrite of curricula.** The process of curriculum development can take a long time so it is advisable to consider whether a compete revision is necessary or whether simply integrating green and digital competencies into the curriculum could be equally effective. Sometimes a complete revision is necessary but the different possibilities of tackling the process should be carefully considered.	**Inflexibility within existing curricula.** If the regular review and update of the curriculum is not possible, this could hinder the integration of new green and digital competencies.	• Government • Relevant TVET departments • TVET training providers	The Swiss VET system allows for a fast-track revision process. The State Secretariat for Education, Research and Innovation SERI can be contacted to share their experience: **Vocational Education and Training (VET)**
National curriculum or several accredited curricula. Countries either have national curriculum or national educational standards/guidelines in place or TVET providers develop their own accredited curricula.	**Identification and integration of green and digital competencies must be tackled on a national as well as a local level.** TVET providers can identify green and digital competencies for their curricula but they cannot integrate them if they are not included in national curriculum or educational standards/guidelines, as coherence between the two levels is required.	**Confronting TVET providers with new regulations before ensuring they are ready.** A dialogue between the national and local levels needs to be established early. It is not advisable to confront TVET providers with new regulations without ensuring they are ready to carry them out as intended.	• Research institutions • Private sector business associations • TVET providers • Government	

Table 6: Micro-level recommendations: implementation

Starting point	Recommendations	Possible challenges to address	Stakeholders to be involved	Useful tools and resources
Limited funds to teach green and digital competencies. TVET providers may find themselves unable to fully implement new green and digital competencies in the classroom owing to limited funds. Software and hardware needed to train learners to use new programmes or new devises can be expensive. The same problem may be faced by businesses that offer work-place learning. If the relevant practices are not yet in place or the infrastructure not up-to-date, the transformation may come at considerable cost.	**Look to workplace learning or dual systems for support.** Particularly in school-based TVET systems, a way around the problem of limited funds is workplace or dual learning. Exposing learners to industry trends and the chance to develop their green and digital competencies can be achieved through dual, or apprenticeship systems or internships.	**The number of placement opportunities may be limited, depending on the location.** There may not be enough businesses with the required level of digitalization and sustainability where learners can develop the relevant green and digital competencies. Businesses may also be reluctant to take on learners for workplace learning as it comes with additional responsibilities for them to support and mentor the learners. It is important, therefore, to draw attention to mutual benefits in this process such as the businesses being able to potentially screen learners for future employment.	• TVET training providers • Hotel and tourism, private sector • Technology companies	The Cedefop study examines key drivers and consequences of workplace learning - **Workplace learning: determinants and consequences | CEDEFOP**
	Seek industry partnerships to develop joint programmes. Another way of including new green and digital competencies in the (school-based) training with limited funds is to seek business partners and jointly develop programmes, therefore splitting investment costs.	**Difficulty in attracting industry partners for a joint programme.**	• TVET training providers • Hotel and tourism, private sector • Technology companies	**Kibondeni College** in Nairobi, Kenya, has relevant experience and can be contacted for information.
Trainers with limited knowledge of industry. In the same way countries differ regarding their TVET systems, they also differ on the level of TVET providers. One such difference is the background of trainers and teachers employed with some schools only employing people with a background in a relevant industry, and others not requiring it.	**Ensure trainers and teachers have industry exposure.** Without a background in, or a continuing link to, industry it is difficult for trainers and teachers to stay up-to-date with new developments in the workplace. It is therefore advisable to give them the opportunity for industry exposure (see also 5.3). Even a short industrial attachment, such as job-shadowing, can be beneficial, although an industrial attachment with a longer duration (1-3 days a week over a 3-6 month period) and with hands-on involvement, is recommended.	**Provision of industry attachment could be costly.** Industry exposure, depending on the conditions (i.e. who pays for the teacher or trainers' time at a business), is an investment for TVET providers so it is advisable to find efficient solutions by highlighting the benefits to all parties involved.	• TVET training providers • Hotel and tourism private sector • Technology companies	**Temasek Polytechnic** in Singapore has relevant experience and can be contacted for information.

Conclusion

This report on TVET for hospitality and tourism in Africa, Asia-Pacific and Europe highlights the similarities, differences and promising practices in TVET in these regions. It also emphasizes that the effectiveness of TVET is largely dependent on several critical factors: the commitment of both the government and the private sector, the engagement of social partners and the community, the level of local and national expertise, as well as the adaptability of curricula.

Ensuring the involvement of TVET stakeholders at macro-, meso- and micro- levels is crucial for TVET systems to efficiently respond to emerging green and digital trends. This report provides actionable recommendations to TVET stakeholders on how they can contribute to identifying, integrating and implementing new qualifications and competencies for the hospitality and tourism sector.

The recommendations formulated by the BILT Expert Group address common starting points within TVET systems, such as the absence of green or digital competencies in the existing curricula and the limited knowledge of industry among TVET teachers. The BILT Expert Group stresses the importance of collaborative efforts among stakeholders to identify the green and digital competencies in demand. It encourages businesses to spearhead the integration of new green and digital competencies in curricula in the absence of government action.

The BILT Expert Group also recommends prioritizing research into future industry trends, considering occasional updates of curricula rather than their complete revision, as well as distinguishing between green and digital skill needs at national and local levels. It endorses workplace learning, the development of joint programmes with industry partners, and the exposure of trainers and teachers to industry practices.

TVET that caters for green and digital competencies in the hospitality and tourism sector plays an important role in advancing the UN Sustainable Development Goals (SDGs), in particular SDG 4 - quality education. It also indirectly supports SDGs 8, 9, 11, 12, 13, and 17. The *Sustainable Development Goals Report 2022* acknowledges that 'the promises enshrined in the SDGs are in peril'. TVET stakeholders have an opportunity to join forces and intensify their collective efforts to achieve the SDGs. The TVET community in the hospitality and tourism industry is uniquely positioned to make this sector beneficial for individuals, economies and societies.

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Green and digital skills for

hospitality and tourism

The hospitality and tourism sector is one of the largest industries in the world, with a significant environmental footprint. Embracing technological solutions such as smart monitoring of energy consumption, food waste management, and AI-based applications to enhance customer experience while supporting eco-friendly tourism can help mitigate negative impacts and foster sustainability. As digitalization and sustainability redefine the industry, occupations are undergoing continuous transformation, impacting the day-to-day tasks and activities of workers. Adapting policies and regulations as well as integrating emerging green and digital competencies into TVET curricula is crucial for steering this transformation.

This publication delves into the growing importance of green and digital competencies in TVET for the hospitality and tourism sector. It explores how these competencies can be identified, integrated into future-oriented curricula and training regulations, and effectively implemented in TVET provision, including school and work-based learning. Featuring many examples from Africa, Asia-Pacific and Europe, alongside actionable recommendations, it offers practical guidance for policymakers and practitioners alike.

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