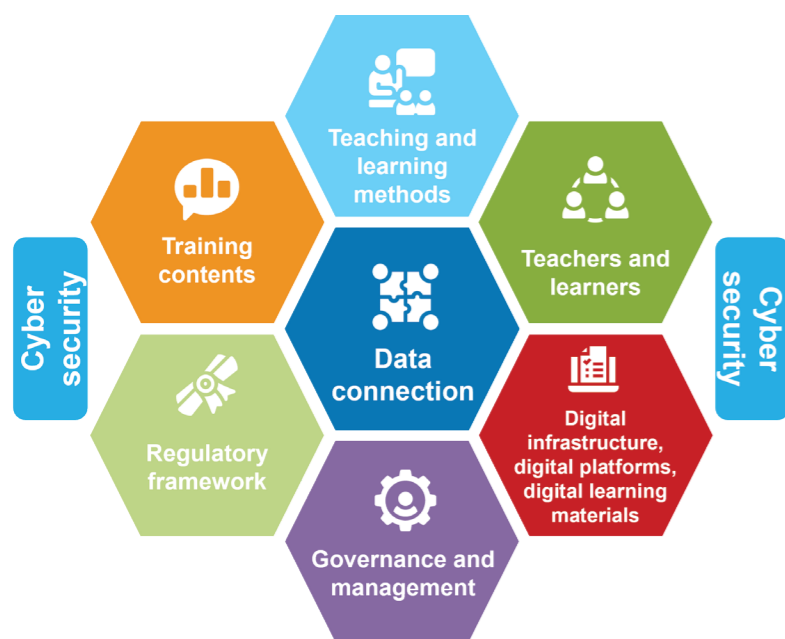


The Ecosystem of Digital Transformation (DX) in Technical Vocational Education and Training (TVET)



01 INTRODUCTION



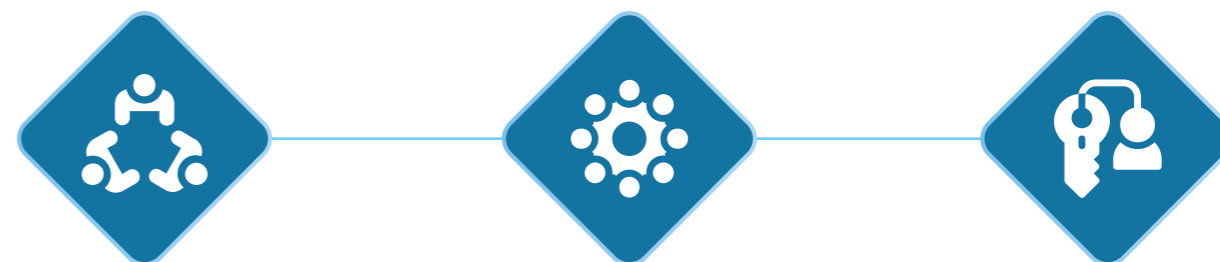
The Ecosystem of DX in TVET
(Ho Tu Bao, 2022)

In the national TVET Strategy to 2030 and vision to 2045, DX is identified as one of the two breakthrough solutions contributing to the development of a more open, flexible, and responsive TVET system. DX drives internal innovations in TVET management and administration, training content, and teaching and learning methods as well as responding to internal changes and requirements of the world of work, rapid development of digital technologies, and the autonomy and competitiveness among TVET institutes.

Drawing from our experience in supporting TVET partners, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) realizes that TVET institutes adopt inconsistent approaches to DX, often placing excessive emphasis on the application of information technology. Since 2021, GIZ, in collaboration with experts, has been advocating for an ecosystem of DX in TVET, guided by fundamental principles. This document presents the ecosystem model based on GIZ's practical implementation experiences, aiming to promote a holistic and comprehensive approach to DX in TVET.

02 KEY PRINCIPLES OF DX IMPLEMENTATION

According to Prof. Ho Tu Bao and Dr. Nguyen Nhat Quang (2022), for a successful DX implementation, TVET institutes need to consistently adhere to three pairs of key principles as follows:



Comprehensive - Holistic:
Everyone and every department in a TVET institute must get involved in the DX process. All activities of the TVET institute must be digitally transformed.

Consistent - Breakthrough:
For DX to be effective and responsive, it requires a breakthrough. For a successful breakthrough, DX needs to be implemented consistently.

Ownership - Leadership:
If DX is assigned to a person or an organization, no one else the person or the organization must do it by themselves. Without leadership, DX cannot be successful.

03 MEANING OF COMPONENTS OF THE DX ECOSYSTEM



(1) Training contents

While the 4th Industrial Revolution makes a number of traditional occupations disappeared and creates new occupations, and the remaining occupations are also enormously impacted by new digital technologies from manufacturing processes to models of products and services. This requires learners to be equipped with new competencies, knowledge and skills relevant to changing occupations, help them to adapt and meet the new requirements of the labor market and employers. Therefore, TVET institutes need to update their existing training programs, in which basic digital literacy and digital competencies of specific occupations are essential. In the context of DX, digital technologies and data connection help TVET institutes to regularly and continuously update training contents with the industry. For example, in 2023, GIZ supported 11 partner colleges to develop an Industry Advisory Board Portal (<https://iab.edu.vn/>). This digital platform supports TVET institutes and the business sector to exchange of information and data, providing an online survey tool to investigate employer's satisfaction of graduates, and training needs of the industry.



(2) Teaching and learning methods

In 2021, when GIZ and experts conducted fieldtrips and interviews with teachers at 11 partner TVET colleges. There was a question about the effectiveness of online teaching and learning activities during the Covid pandemic. The majority of interviewed teachers responded that it was not effective. The reasons, that they shared, were not being able to manage learners during online classes, and to conduct engaging activities with them. The grassroots reasons were probably their readiness of digital literacy and e-pedagogy. They simply brought teaching methods from a physical classroom to an online classroom. They were not equipped with adequate digital literacy to master digital tools and digital platforms to manage students in an online classroom. They were not well trained on e-pedagogy to deliver engaging and interesting teaching activities. On the contrary, teaching and learning in the DX era requires teachers to apply various training methods such as new blended learning, flipped class, and project-based learning “with support of digital technologies”. Learners increasingly require for the personalization of their learning process, flexibility in selecting learning contents, learning at their own speed, space, time and capacity. Teaching and learning methods can be diversified by using different kinds of digital learning resources by teachers. Instead of output-based assessment (tests, assignments, final exams, learning attitudes in the classroom, nowadays teachers can utilize learning management systems (LMS) to collect and analyze learning data to holistically assess learners’ competence in progress-based assessment process. Teaching performance can be evaluated and teaching methods can be adjusted accordingly based on real-time data. In a near future, teachers have to prepare themselves for a new requirement - that is “AI pedagogy”. In September 2024, UNESCO issued an AI Competence Framework for teachers.

DX of management and governance places very specific requirements on TVET institutes. Firstly, TVET institutes need to develop a DX strategy/program/project in which vision, goals, and roadmap are specified, clear, and feasible. The DX strategy/program/project needs to be realized through short-term action plans (e.g. monthly, quarterly, annual) and long-term action plans (e.g. 3 to 5 years), and especially an implementation monitoring system of the effectiveness of DX activities. Secondly, management and governance processes must be updated in line with DX requirements, and consistent within an TVET institute and with external organizations based on data connections. Third, if DX in education is learner-centered, student management and services (enrolment, administrative procedures, scholarships, student evaluation, extracurricular activities, skills development, career advice, internship and job opportunities, the business-parent-school-learner connection...) must be supported by digital technologies. Fourth, teaching and learning activities, training management, quality assurance activities must be delivered on digital platforms. Finally, TVET institutes use digital platforms or software to manage teaching and learning resources in both printed and digital formats as well as to provide library services for learners. The implementation of these above requirements needs a leadership champion and creates fundamental changes in the management and governance of TVET institutes.



(3) Governance and management



(4) Teachers and learners

The regulatory framework needs to be one step ahead to lead and to create an enabling environment for DX in TVET. TVET institutes reinforce policies and regulations of state management agencies on DX, realizing them by complying and implementing internal guidelines, regulations, and statutes. On the other hand, within the scope and authority, TVET institutes should develop internal mechanisms and regulations in accordance with the legal system, such as incentive systems to encourage and recognize staff participating in DX, guidelines on network safety and security, accessibility to digital technologies, data connection, intellectual property, and copyright in their organizations.



(5) Regulatory framework



(6) Digital infrastructure, digital platforms, digital learning materials

As stated, DX should not be simply understood as the applications of information technology. However, if TVET institutes cannot ensure (i) fundamental digital infrastructure (hardware, equipment, unified data architecture to create synchronous internal connections, etc.), (ii) software and digital platforms to support all aspects of management, operation, teaching and learning, service provision, and (iii) capacity to produce digital learning materials, it is unrealistic to achieve DX goals. Investments and operation of equipment, software, and services help staff, teachers, and learners to work, teach, and learn effectively in a new environment.

In addition to the 06 basic components of the DX ecosystem in TVET mentioned above, the 02 factors of “**data connection**” and “**cyber safety and security**” are implicitly understood to be ensured and integrated in all DX content. In the 06 components, in order to update training content, innovate teaching and learning methods, and promote digital management and governance, the institutes need to invest in improving digital literacy for leaders, staff, teachers and learners, apply and update legal framework, invest in digital infrastructure, digital platforms and capacity to develop digital learning materials.

DX needs to be implemented synchronously in the 06 components, which are closely interconnected and interdependent, for sustainable development. For example, to implement e-pedagogy, TVET institutes have to (i) improve teacher’s capacity, (ii) invest in and apply digital technologies, (iii) develop a master plan with clear guidance, plans and goals at the organizational wide such as 30% of modules/subjects delivered on digital platforms to meet the criteria of a high quality TVET institute, and (iv) develop technical guidelines and incentive systems for teachers. Without any of these conditions, it will be difficult to promote the implementation of e-pedagogy comprehensively, effectively and sustainably.

