





Reseach Report on

THE DEVELOPMENT OF CRITERIA AND STANDARDS OF A DIGITAL TVET INSTITUTION

Programme Reform of Technical Vocational Education and Training in Vietnam in collaboration with Directorate of Vocational Education and Training

Hanoi, November 2023

General Information

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ABBREVIATIONS

Seq.	Abbreviation	Explanations
1.	DigTVETIns	Criteria and standards for a digital TVET institution
2.	AI	Artificial intelligence
3.	BMZ	German Ministry of Economic Development and Cooperation
4.	Cir.	Circular No.
5.	Dec.	Decision No.
6.	DoLISA	Department of Labor, Invalids and Social Affairs
7.	DVS	Digital Vocational Schools
8.	DVET	Directorate of Vocational Education and Training
9.	DX	Digital Transformation
10.	IT	Information technology
11.	GIZ	German Corporation for International Cooperation GmbH
12.	MoLISA	The Ministry of Labor, Invalids and Social Affairs
13.	TVET	Technical Vocational Education and Training

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SUMMARY

This Report presents the process of researching and developing a set of "Criteria and Standards for a Digital TVET institution" (DigTVETIns) implemented by the Programme Reform of TVET in Viet Nam under Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and in collaboration with DVET and senior experts.

DigTVETIns is an accumulated result of DX supporting activities for TVET in Vietnam since September 2020 by GIZ, legal documents and the model of a digital TVET institution, and the ecosystem of DX in TVET that includes of six components. Besides, the research team studied digital competence frameworks, and related criteria and standards developed by UNESCO, EU... to gain international perspectives.

Content development of DigTVETIns were based on experts' ideas, results of field trips to six partner colleges, and online surveyed responses of 217 TVET institutions nationwide. DigTVETIns were presented and discussed at the Consultation Workshop in October 2023 and received comments and feedback from DVET leaders, GIZ staff, representatives of Rector Boards from 11 partner TVET colleges and other TVET institutes. DigTVETIns can be considered as a collective intellectual product for the TVET system in Vietnam along with recommendations for and support from GIZ, DVET, GIZ's partner TVET colleges and experts.

1. GENERAL INTRODUCTION

1.1. The Programme "Reform of TVET in Vietnam"

The Programme "Reform of TVET in Vietnam" was authorized by the German Federal Ministry for Economic Cooperation and Development (BMZ), implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in collaboration with the Directorate of Vocational Education and Training (DVET), under the Ministry of Labour, Invalides and Social Affairs (MoLISA). The Programme "Reform of TVET in Vietnam" (the TVET Programme) aims at an enhanced, better aligning TVET in Vietnam to the changing world of work, towards a greener and digitized future. It serves three outputs:

- **Output 1:** State actors, TVET staff, TVET institutes and the business sector are interconnected thanks to digital technologies.
- **Output 2:** The regulatory framework of TVET is aligned to the requirements of the changing world of work.
- **Output 3:** The concept of High-Quality TVET institutes is successfully implemented in selected TVET institutes.

1.2. DX in TVET in Vietnam

DX has become an inevitable trend. It has a holistic impact and brings in new business models, products and services to any organization. The Government of Vietnam has consolidated the regulatory framework to guide the implementation of DX. Among the legal documents, the Decision No. 749/QD-TTg dated 06/03/2020 on the National Programme of DX, the Decision No. 942/QD-TTg dated 06/15/2021 on the Strategy of Developing Digital Government, and the Decision No. 2222/QD-TTg dated 30/12/2021 on the Programme of DX in TVET approved by the Prime Minister are prominently important. In the TVET sector, DX creates a new way of management and administration as well as learning and teaching methods. In addition, due to the changing world of work, an increased autonomy and competitiveness in education, TVET institutes need to initiate DX to develop a more adaptive, flexible, open, and responsive training system to rapidly cope with external changes.

Since September 2020, DX has become a key support component of the TVET Programme. The Programme focuses on three main support areas that include: strategic and policy advice; capacity development for TVET managers, staff and teachers, and advice and support for the development of digital solutions for TVET partners at both macro and micro levels. The TVET Programme has a structural and holistic approach for supporting DX in TVET by adapting the DX ecosystem which includes six components: 1) Update training content to meet requirements of the 4th Industrial Revolution and the industry, 2) Promote digital teaching

and learning methods, 3) Develop digital competence and e-pedagogies for teachers and learners, 4) Upgrade digital infrastructure, platforms and learning resources, 5) enhance digital management and administration of TVET organizations, and 6) update the legal framework to enable DX. In addition, data connection and cybersecurity are two environmental and integrated issues of the six DX components.

1.3. Reasons for the implementation of the activity

During the supporting process, GIZ has realized that awareness of DX in TVET has been enhanced and unified significantly, especially a holistic approach to the DX ecosystem among leaders, managers, teachers at partner colleges. However, they still encounter challenges and difficulties in self-assessing their DX capacity, DX implementation methods, development of DX action plans and DX performance administration. Partner TVET colleges understand their goals to become a smart/digital TVET institution, but they need clear guidelines and advice on developing a clear roadmap to achieve it.

In 2022, the TVET Programme conducted a review on the progress and results of DX activities at 11 partner TVET colleges. In addition, the research team explored different aspects, then successfully developed a concept note of a digital TVET institution model.

In 2023, based on the Official Letter No. 955/TCGDNN-VP on supporting the development of DigTVETIns and the Decision No. 211/QD-TCGDNN on the establishment of a Taskforce to develop DigTVETIns issued by DVET, the TVET Programme collaborated with senior experts to conduct this research on developing criteria, standards, indicators, evidence for the assessment of a digital TVET institution.

1.4. Purposes of the activity

The activity is to research, develop and propose DigTVETIns for DVET. DigTVETIns can be used by TVET institutes to identify their target of DX activities and helps them to self-assess their level of digital maturity independently in alignment with accreditation criteria and standards, and process for assessment and recognition of high-quality colleges. For state agencies in TVET like DVET, DigTVETIns can also be used to evaluate the overall DX results of the entire system.

1.5. Implementation methodology

The activity combined various research methods such as desk review, group discussion, consultation meeting, in-depth interview, and online survey questionnaire to collect quantitative and qualitative data and information.

1.5.1. Desk review

Consultants have conducted intensive reviews of the regulatory framework and documents on digital competency frameworks and digital competency assessment models for Vietnamese and international educational institutions.

Regarding legal documents, the consultants have studied the documents on national strategies for DX such as the DX National Programme (Decision No. 749/2020/QD-TTg), Digital Government (Decision No. 942/QD-TTg), Digital Economy and Digital Society (Decision No. 411/QD-TTg); the Strategy for Vocational Education and Training in Vietnam (Decision No. 2239/QD-TTg) and the Programme of DX in TVET until 2025, with orientation to 2030 (Decision No. 2222/QD-TTg).

In addition, the consultant team has consulted the legal documents of other ministries and industries on DX criteria and indicators such as: An Index and Criterion Set to evaluate the digitalization of undergraduate education institutions (Decision No. 4740/QD-BGDĐT) and Guidelines on building digital learning materials and online courses on the Massive Open Online Courses (MOOCs) platform (Decision No. 3784/QD-BGDĐT) of the Ministry of Education and Training; the DX Assessment Indexes (Decision No. 2027/QD-BNN-CDS) of the Ministry of Agriculture and Rural Development. The consultant team has also consulted the legal documents on indicators and criteria established to evaluate the digitalization of undergraduate education institutions (Circular No. 35/2021/TT-BLDTBXH) and the Criteria and process for assessment and recognition of high-quality colleges (Circular No. 35/2021/TT-BLDTBXH).

In addition, the team has researched and consulted international documents on the digital competency framework in the education sector, including:

- European Framework for Digitally Competent Educational Organizations (DigCompOrg), 2015.

- European Framework for the Digital Competence of Educators (DigCompEdu), 2017.
- The Digital Competence Framework for Citizens (DigComp 2.2), 2022.
- UNESCO ICT Competency Framework for Teachers (version 3), 2018.
- A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2, 2018
- Framework for DX in Higher Education of JISC (Anh), 2023.

- Education Management and Information Systems (SIGEDs) in Latin America and the Caribbean: the road to the digital transformation of education management of Inter-American Development Bank, 2021.

- A tool to support learning in the digital age of the European Commission (SELFIE).

1.5.2. Online survey

Qualitative and quantitative data from an online survey questionnaire is needed to provide feedback and comments on criteria, standards, indicators and evidence, as well as supplement quantitative and qualitative assessment and analysis. Based on the research objectives, an online questionnaire has been designed for departments under DVET, provincial DoLISAs, TVET institutes at college and intermediate training level from 63 cities/provinces. Each TVET organization discussed internally and sent only one survey response on behalf of the organization to the consultant team for collecting and analyzing.

1.5.3. Field trips (In-depth interviews, Consultation meeting, Group discussions)

The consultants and GIZ staff have conducted field trips at six (06) colleges in Hanoi, Bac Ninh, Nha Trang, Ninh Thuan, Ho Chi Minh City and Dong Nai. At the consultation meetings, the research team presented the overview and objectives of the field trips, the overarching concept of a digital TVET institution and DigTVETIns. After the presentation, the team organized a roundtable discussion to gather feedback from Rector Boards representatives, heads of IT faculties, and the departments of Training, Human Resource, Administration, Student Affairs, the Library and officers in charge of business cooperation, core teachers, IT staff, students and alumni, etc. Then, the team conducted in-depth interviews with each selected group and consultation meetings with the Rector Boards.

1.6. Activity summary

The activity of developing DigTVETIns officially took place in 3.5 months (from July 20, 2023 to November 3, 2023).

From July 20 to August 10, 2023, the consultant team finalized the digital TVET institution model including 06 components and developed DigTVETIns according to the 06 components.

From August 11 to September 9, 2023, the team conducted field trips at six (06) partner TVET colleges of GIZ in Hanoi, Bac Ninh, Nha Trang, Ninh Thuan, Ho Chi Minh city and Dong Nai.

From September 10 to October 11, 2023, the team designed an online survey and collaborate with the DVET to gather feedback from the departments/institutes within the DVET, local DoLISAs, colleges and intermediate institutions nationwide. As a result, 217 responses were collected, including 119 colleges, 58 intermediate institutions, 38 local DoLISA and 2 departments of DVET.

On October 17-18, 2023, GIZ collaborated with DVET to organize a workshop on the development results of the draft, discussions and feedback gathering from leaders of DVET,

the Taskforce established by DVET to develop DigTVETIns, experts, and representatives from GIZ's partner colleges on each criterion and standard of DigTVETIns based on online survey results.

After the workshop, the consultants continued receiving feedback to finalize DigTVETIns and submit to GIZ the document set including Research Report and DigTVETIns (including a digital TVET institution model and related concepts).

The final research findings were distributed to DVET, TVET institutions, GIZ programmes, Vietnamese and international organizations for reference.

2. THE LEGAL AND THEORETICAL BASIS AND INTERNATIONAL EXPERIENCE

2.1. The legal basis in Vietnam

The proposed DigTVETIns is based on the "Strategy for TVET development for the period 2021-2030, with a vision to 2045" issued under Decision No. 2239/QD-TTg dated December 30, 2021 of the Prime Minister and "The DX programme in TVET for the period 2021-2025, with a vision to 2030" issued under Decision No. 2222/QD-TTg dated December 30, 2021 of the Prime Minister. In addition, in the process of developing this set of criteria and standards for a digital TVET institution, the Law on Vocational Education and other related guiding documents were also referred to.

2.2. Theoretical basis

The theoretical basis for building DigTVETIns is the DX methodology presented in [21], [22]. The basic argument underlying this methodology is to consider each organization (a TVET institution, in particular) as a Cyber - Physical - Social System, in which digital connections, in addition to traditional connections in the physical environment, allow the enhancement of the capacity to collect, store, process and distribute data, information and knowledge. To further integrate the digital environment into a physical system successfully and effectively, every component of the physical system including its methods of operation (products, services, operating processes, governance, and management) and organizational structure (people, institutions, technology) must be changed appropriately.

Thanks to increased connectivity in the digital environment and outstanding data storage, analysis, and exploitation capabilities, a digital TVET institution will improve the quality and scale of training with existing human and material resources (in other words, making training smarter). Thus, the concepts of a digital TVET institution, DX institution or smart institution can be considered similar to each other.

It should be emphasized that the process of DX in a TVET institution is not only a process of enhancing IT applications by equipping additional modern hardware and software, but also a process of using data and connectivity to continuously innovate training content to closely follow the rapidly changing requirements of job positions and changes in training methods and school administration processes. The extensive use of digital data and digital connections will lead to security and safety risks in the digital environment and require corresponding protection measures. All the above transformations can only become a reality if there are profound transformations of the entire team of teachers, administrators, and students, as well as necessary changes in institutions, regulations, related economic and technical norms and of course appropriate investment in technology infrastructure. All the above transformation contents form a DX ecosystem in TVET and have been expressed in "The DX Programme in TVET for the period 2021-2025, with a vision to 2030" under Decision No. 2222/QD-TTg and will be presented in more detail in the following section.

DX in TVET institutions is a continuous process, with no stopping point. However, this transition cannot be carried out without setting milestones for each stage. DigTVETIns is developed based on an understanding of current technology and the actual capacity of colleges and is also intended to represent the destination for TVET institutions in the process of DX. Thus DigTVETIns should be considered as an open set of criteria and standards and regularly reviewed and updated to reflect new technological advances as well as the increasingly maturity levels of institutions.

2.2.1. Digital transformation ecosystem in TVET

There are six components of a DX ecosystem in TVET (see Figure 1):



Figure 1. The DX ecosystem in TVET

Training contents of a TVET institution includes a list of training occupations and corresponding training programmes. In the context of the ongoing Fourth Industrial Revolution, requirements for job positions are changing rapidly. New occupations are emerging while traditional occupations are disappearing or undergoing profound changes. Digital competency of workers has thus become a mandatory requirement for all job positions. In TVET, digital competencies include general digital competencies and specialized digital competencies. Both of these digital competencies need to be urgently added to the training programmes. On the other hand, digital competency is a dynamic concept and its connotation changes very quickly with technological advances that change every day. Thus, the DX of TVET institutions requires the use of digital technology to enhance information collection and processing capacity to promptly capture changes and update training programmes.

Training methods. Digital technology allows the implementation of online training, blended training, flipped classrooms, project-based learning... can be deployed easily and effectively. Advances in AI technology, especially generative AI, allow to greatly improve training quality. On the other hand, innovating training content, especially content that is new to teachers, also requires a drastic change in training methods. Innovating training methods requires transferring all teaching and learning activities (including testing and assessment) to a physical-digital environment; applying digital technology to provide personalized training as well as providing student services in a simple and convenient way; minimizing time to comply with bookkeeping regulations for teachers and administrators.

Administration - management. The DX of institution administration and management essentially means moving from document-based to data-based operational management. In short, the decision-making process will gradually shift to real-time data-based decision making. When all teaching and learning activities are recorded as digital data, analyzing that data with appropriate algorithms will allow more objective, timely and accurate decision-making. The DX of institution administration and management requires all resource management processes (human resources, training materials, facilities, finance, etc.) to be redesigned in sync with the application of digital technology.

Human resources. To transform training content and methods, administration and management methods, it is necessary to create positive changes in people (teachers, managers, students), legal framework and IT infrastructure. All managers, teachers, staff, and students need to be aware of the inevitability of DX and have the necessary knowledge and skills to be able to teach, learn, and work in a physical-digital environment. Because the core of DX is innovation and connection to share and accumulate data, information and knowledge, the capabilities related to innovation and sharing culture will be core elements in the culture of digital TVET institutions.

Legal framework. Current policies and regulations are built to operate in a physical environment. The addition and integration of the digital environment requires the modification and addition of policies and regulations that regulate interactions in the digital environment. Policies are external legal regulations that TVET institutions need to comply with. According to the national DX process, policies are being revised. The responsibility of TVET institutions is to grasp and promptly update new DX related policies (such as personal identification, non-cash payments, digital signatures, e-invoice etc.) of state management agencies. On the other hand, regulations involve the internal regulations and regimes developed and promulgated by the institution. Amending and supplementing internal regulations to suit the new operating model in the physical-digital environment is an important content of DX in TVET institutions. In short, digital TVET institutions need to have a system of regulations that regulate both activities in the physical as well as digital environment. Applying IT without corresponding regulatory adjustments will not be effective and often leads to increased workload of individuals and this is the main cause of failures in DX.

IT infrastructure. Although the DX methodology emphasizes that DX is not just a technological issue, it can be affirmed that without digital technology, there is no DX. Digital TVET institutions need to be invested and equipped with strong digital infrastructure, enough to meet the requirements of other components of the DX ecosystem in TVET. The digital infrastructure here includes IT infrastructure, application platforms and digital learning materials necessary for institutional operations.

2.2.2. Digital TVET Institution Model

The basic model for building DigTVETIns is shown in Figure 2.



Figure 2. Digital TVET institution model

This model is proposed based on principle 2 in the ST-235 DX methodology [22]. This principle affirms that DX is a process of innovation with data and connectivity. For TVET institutions, this means that their digital model must have a reliable and effective digital connection system, connecting all relevant entities (staff, teachers, students, parents, businesses, alumni, etc...). The digital connection system complements and enhances traditional connections in the physical environment to improve the institution's ability to collect, process and distribute data, information, and knowledge. Data and connection capacity enhanced by digital technology is the basis for transforming training contents, training methods as well as administration and management methods and is the core characteristics of digital TVET institutions.

The basic requirements for a connection system in the digital environment are legitimacy and security. The simple principle to follow while designing connection systems is "Each person has only one account" (Single Sign - On). Through this account, staff, teachers, and students will connect with the institution and have access to all authorized resources according to regulations.

For data capacity, the most important requirement is "true - enough - clean - alive". "True" means the data must be exact. "Enough" means not too little, but not too much to ensure data integrity. "Clean" means there must be no 'junk' data. "Alive" means that data must always be used and thereby updated and corrected when errors are detected during use. To ensure "true - enough - clean - alive", the data model must be consistent throughout the institution. This is an important difference compared to previous stages of IT application, when TVET institutions used many different, inconsistent software and could not share data with each other, leading to low application efficiency.

Integrating digital technology to build digital connections and data systems will create security and safety risks in the digital environment. Digital TVET institutions must have corresponding measures to ensure this important issue will be resolved.

Enhancing connection and data capacity as well as ensuring system security cannot only rely on investment in technology infrastructure but must ensure synchronous transformation of human, legal and technological factors as described above.

DigTVETIns is developed based on the presented digital TVET institution model, in which 06 criteria represent 06 corresponding components of the DX ecosystem in TVET. Elements of data connection and cyber safety - security are expressed through specific standards.

It should be noted that the digital TVET institution model, proposed as a basis for developing DigTVETIns, not only refers to the development of technological infrastructure

(hardware, software) but also aims to put more emphasis on the use of that technology infrastructure to enhance data capacity, connection capacity and especially the level of data use and connection to change training contents, training methods and management methods in a smarter and more effective way.

2.3. International Experiences

The consultant team has studied and researched documents and international experiences on DX and digital competence in education, including documents on digital competence for educational institutions, digital competence for teachers and students of the European Commission, UNESCO and other educational research organizations. Within the framework of this activity, the consultant team studied and consulted three directly related documents, including the European Framework for Digitally Competent Educational Organizations (DigCompOrg), the Framework for DX in Higher Education of JISC (UK) and Education Management and Information Systems (SIGEDs) in Latin America and the Caribbean. Each framework offers a different model/evaluation, but all constitute the basis for the consultant team to learn and then propose a structure, model, and content suitable to the actual situation of TVET in Vietnam to include in DigTVETIns.

2.3.1. European Framework for Digitally Competent Educational Organizations

The European Reference Framework of Digitally Competent Educational Organization is an initiative of the European Commission, Directorate General for Education and Culture (DG EAC). Research and design of the Framework was carried out by the Joint Research Centre - Institute for Prospective Technological Studies (JRC-IPTS) in 2015.

The DigCompOrg framework can be used for educational organizations (i.e., primary, secondary and VET schools, as well as higher education institutions) to guide a process of self-reflection on their progress towards comprehensive integration and effective deployment of digital learning technologies. Digital learning technologies, in the context of DigCompOrg, constitute a key enabler for educational organizations, which can support their efforts to achieve their particular mission and vision for quality education. Deep, as distinct from superficial, integration of digital technologies requires significant educational innovation and implies a process of planning for change on three basic dimensions: pedagogical, technological and organizational.



Figure 3. The DigCompOrg

The DigCompOrg framework has **seven key elements** and **15 sub-elements** (see Table 1) and **74 descriptors** (see Appendix 1). Diagrammatically, the elements, sub-elements and descriptors of DigCompOrg are presented as the segments of a circle, with an emphasis on their inter-relatedness and inter-dependence (see Figure 3).

Thematic elements	Sub-elements		
Leadership & Governance	Integration of Digital-age Learning is part of the overall mission,		
Practices	vision and strategy		
	Strategy for digital- age learning is supported by an implementation plan		
	A Management and Governance Model is in place		
Teaching and Learning	Digital Competence is promoted, benchmarked and assessed		
Practices	A rethinking of roles and pedagogical approaches takes place		
Professional Development			
Assessment practices	Assessment Formats are engaging and motivating		
	Informal and Non- Formal Learning are recognized		
	Learning Design is Informed by Analytics		
Content and Curricula	Digital Content and OER are widely promoted and used		
	Curricula are redesigned or re- interpreted to reflect the		
	pedagogical possibilities afforded by digital technologies		
	Networking, sharing & collaboration is promoted		

Collaboration and	A strategic approach is taken to communication	
Networking	Partnerships are developed	
Infrastructure	Physical and Virtual Learning Spaces are designed for digital- age learning	
	The digital infrastructure is planned and managed	

Table 1. The elements and sub-elements of DigCompOrg

The primary purposes of DigCompOrg are (i) encourage self-reflection and selfassessment within educational organizations as they progressively deepen their engagement with digital learning and pedagogies (ii) enable policy makers (at local, regional, national and international level) to design, implement and appraise programmes, projects and policy interventions for the integration of digital learning technologies in Education and Training systems (iii) facilitate transparency and comparability between related initiatives throughout Europe, and it can also play a role in addressing fragmentation and uneven development across the Member States.

DigCompOrg is designed to focus mainly on the teaching, learning, assessment and related learning support activities undertaken by a given educational organization. It is not intended to address the full range of administrative and management information systems that may be in use within the organization. Besides, DigCompOrg complements rather than supersedes other frameworks and tools already in use for specific purposes: e.g., the DIGCOMP framework that can be used to develop relevant aspects of students' digital competence.

After the DigCompOrg, the European Commission has developed a Self-Assessment tool for Digitally Competent Schools (i.e., primary, secondary and VET schools) based on DigCompOrg descriptors, called SELFIE (Self-reflection on Effective Learning by Fostering the use of Innovative Educational technologies). SELFIE is a free tool designed to help schools embed digital technologies into teaching, learning and assessment.

SELFIE anonymously gathers the views of students, teachers, and school leaders on how technology is used in their school. This is done using short statements and questions and a simple 1-5 answer scale (see an example in Appendix 2). SELFIE asks a series of questions to teachers, school leaders and students to provide a snapshot of the use of digital technologies for learning at their school. The tool focuses primarily on learning rather than technology, and takes all dimensions into account including school strategies, teaching practices, infrastructure, curricula and student experience.

The questions and statements take around 20 minutes to complete. Based on this input, the tool generates a report – a snapshot ('SELFIE') of a school 's strengths and weaknesses

in their use of technology. This report is intended for dialogue and reflection within the school. The focus is on progress so SELFIE can be used by any school, not only the ones that are digital 'champions' or highly innovative.

2.3.2. Framework for DX in higher education (JISC)

Framework for DX in higher education was developed, in 2023, by JISC - a not-for-profit organization which is the UK digital, data and technology agency focused on tertiary education, research and innovation.

This DX framework has been developed in consultation with a range of UK professional bodies: Advance HE, Association for Learning Technology (ALT), Association of University Administrators (AUA), Association of University Directors of Estates (AUDE), Quality Assurance Agency for Higher Education (QAA), Society of College, National and University, Libraries (SCONUL), Universities and Colleges Information Systems Association (UCISA), Universities UK (UUK) and Vitae. This ensures the framework reflects sector priorities and links to key UK HE models and frameworks already in use.



Figure 4. Framework for DX in higher education (JISC)

The framework adopts a knowledge practices approach. There are the six elements and their four key areas of activity (see Figure 4). In addition to the underlying digital and physical infrastructure and the overarching organizational digital culture, the four core knowledge

practices focus on the wide range of activities, experiences and practices of an HE organization.

- Knowledge creation and innovation
- Knowledge development
- Knowledge management and use
- Knowledge exchange and partnerships

This takes the emphasis away from technological or business process approaches and puts the focus on what people do or need to do to enhance these practices within the organization. It also aims to help organizations see patterns, links and synergies across traditional boundaries, and encourage ownership and engagement of all stakeholders.

Each section has a list of keywords which highlight these aspects and reflect the kinds of principles and values that organizations often highlight in their corporate strategies. The framework structure highlights the importance of using information and data intelligently, building on existing collective wisdom, and also emphasizes the impact of knowledge creation, innovation and exchange in a global setting through collaborative social and learning networks.

The framework can be used to break down various elements of DX activity into achievable goals and actions. It is presented in varying degrees of detail from broad statements to illustrative examples of more specific activities (see Appendix 3). The framework helps educational organizations assess their digital maturity across all business activities. It can be used within educational organizations to:

- Map activities, strengths, ambitions, and key strategic principles and values.
- Bring together key stakeholders to allocate responsibilities and identify which teams have the expertise to fulfil each of the organizational activities.
- Recognize the range of digital expertise within the organization, and plan to use that more effectively.
- Identify any gaps in expertise or in responsibility, and plan to fill them.
- Identify digital maturity for different areas of activity: emerging, established, enhanced (in development).
- Support the development and success of digital strategy/ies and to connect strategies together.
- Draw up achievable, measurable action plans.
- Move forward from legacy systems and approaches.

- Contextualize their current position and next steps, recognizing each institution has a unique starting position and maturity levels.

2.3.3. Education Management and Information Systems (SIGEDs)

Education Management and Information Systems (SIGEDs) in Latin America and the Caribbean: the road to the DX of education management is a publication of the Education Division of the Social Sector of the Inter-American Development Bank (IDB).

Education Management and Information Systems (SIGEDs) can be defined as the set of key educational management processes required for the design, registration, generation, exploitation and dissemination of strategic online information in an integral manner in the framework of specific legal, institutional and technological infrastructure. A SIGED should allow complete and efficient management of the relevant processes at all the levels of the education system, incorporating new technologies. Having comprehensive information and management systems is essential to advance in the transformations required to optimize efficiency and equity in the allocation of resources.



Figure 5. Education Management and Information Systems (SIGEDs)

For the diagnosis of the SIGEDs, an information-gathering instrument which comprises 119 questions was designed, structured around six key education management processes: i) physical infrastructure and equipment; ii) schools; iii) students and learning; iv) human and budgetary resources; v) digital content for student learning and teacher training; and vi) tools for strategic management, as well as two structural conditions: i) technological infrastructure and ii) governance and institutional framework (see Figure 5).

The development of each process and structural condition is classified in one of four levels (see Figure 6):

- (1) Latent: SIGED does not cover the central processes and sub-processes and structural conditions that define it.
- (2) Incipient: SIGED partially covers the central processes and sub-processes and the structural conditions that define it but is not geared to efficient management.
- (3) Emergent: SIGED partially addresses the central processes and structural conditions that define it and its orientation is appropriate, but is geared to efficient management.
- (4) Established: SIGED covers more than 80% of the central processes and structural conditions that define it and is geared to efficient management.



Figure 6. Levels of development of SIGEDs

The classification is based on the level of development of the main functionalities of each process and structural condition, captured through closed-ended questions (between nine and 18 questions per process). Each question is associated with a sub-process or specific functionality that an established SIGED should fulfill (see Appendix 4). In addition, each answer includes a brief qualitative description of how the sub-process or functionality operates. The global SIGED score is calculated as the median of the score for each of the six processes and the two structural conditions.

The DX of a SIGED brings with it a series of efficiency gains in the management of an education system that include:

- 1. The availability of timely, high-quality information for the design of policies and the allocation of resources (human, physical and financial).
- 2. The time saved through digitization of administrative tasks that were previously carried out manually, with the resulting better use of human resources.
- 3. Budgetary savings, thanks to more efficient use of resources as a result of the availability of high-quality information and time savings

3. SURVEY RESULTS

3.1. General Information

During the development of DigTVETIns, the consultant team and GIZ staff conducted field trips, online survey and organized a Consultation Workshop.

The field trips were conducted at six GIZ's partner colleges in two phases. The first field trip at two colleges (Bac Ninh College of Industry and Hanoi Construction Technology College No. 1) aimed at gathering opinions for the first draft of DigTVETIns (including 8 criteria and 59 standards) compiled by the team based on desk review, international experiences and practical implementation of DX in TVET in Vietnam. Based on the feedback from the two colleges in this first survey, the team edited and produced the second version (including 6 criteria and 31 standards). The second field trip was conducted at four colleges (College of Machinery and Irrigation, College of Technology II, Nha Trang College of Technology and Ninh Thuan Vocational College) to gather feedback for the second version. After the second field trip, the team edited and completed the third version of DigTVETIns (including 6 criteria and 30 standards).

The online survey was deployed to gather opinions from DVET, DoLISAs, colleges and intermediate institutions in the TVET system nationwide on the third version of DigTVETIns. As a result, 217 responses were collected (see Figure 7) including opinions from 2 departments of DVET, 38 DoLISAs, 119 colleges and 58 intermediate institutions in 58 provinces and cities (Tuyen Quang, Thai Nguyen, Ha Nam, Lang Son, Vinh Phuc, Hai Duong, Ha Giang, Hanoi, Lao Cai, Phu Tho, Hai Phong, Thai Binh, Hoa Binh, Yen Bai, Bac Ninh, Lai Chau, Quang Ninh, Dien Bien, Nam Dinh, Ninh Binh, Cao Bang , Bac Giang, Son La, Thanh Hoa, Dak Lak, Lam Dong, Phu Yen, Ha Tinh, Binh Dinh, Quang Binh, Nghe An, Binh Phuoc, Quang Ngai, Quang Tri, Da Nang, Khanh Hoa, Dak Nong, Kon Tum, Thua Thien Hue, Quang Nam, Binh Thuan, Kien Giang, Ba Ria - Vung Tau, Long An, Dong Nai, Tien Giang, An Giang, Can Tho, Ho Chi Minh City, Soc Trang). At the end of the online survey, the consultant team compiled feedback for the third version of criteria and standards for a digital TVET institution for in-depth discussion in the workshop.



Figure 7. Participants in online survey

The Consultation Workshop was conducted with the participation of leaders of DVET, members of the Taskforce for the development of DigTVETIns established by DVET, GIZ's officials and experts, and 11 GIZ partner colleges' representatives. At the workshop, participants exchanged general views on the development of DigTVETIns and discussed in depth each criterion and standard. GIZ, officials from partner TVET colleges, and consultants received feedback and comments at the Workshop to synthesize the final draft with six (06) criteria and 25 standards. The results of the Workshop helped the team complete the research report and the final proposed DigTVETIns to transfer to the Taskforce of DVET to continue receiving and presiding the implementation on the next phase.

3.2. Key Results

3.2.1 The necessity of DigTVETIns

The results of the field trips, online survey and Consultant Workshop show that the majority of respondents believe that the development and promulgation of DigTVETIns is necessary. This will be a guide for TVET institutions to conduct activities in the DX process and help institutions determine their goals as well as self-assess their digital capabilities. The results of the online survey show that 195/217 (89.8%) responses agreed that DigTVETIns is necessary and very necessary (see Figure 8).



Figure 8. The necessity of DigTVETIns



Figure 9. Ability to self-assess the results of TVET institutions' DX activities based on DigTVETIns

In addition, 168/217 (77.4%) responses said that DigTVETIns can help TVET institutions self-assess the results of their DX activities (see Figure 9).

3.2.2 The appropriateness of Structure

The structure of DigTVETInswith six (06) criteria including Training Content; Teaching and Learning Methods; Administration - Management; Teachers, Staff and Learners; Policies and Regulations; Digital Infrastructure, Platforms and Learning Materials with 30 standards are considered reasonable (186/217 responses equivalent to 85.7%) (see Figure 10).



Figure 10. The appropriateness of the structure of DigTVETIns

3.2.3 The appropriateness of Content

According to the online survey, 84% of respondents thought that each standard in the third version of DigTVETIns has appropriate content (see Figure 11). Respondents also gave many useful comments to help the team complete DigTVETIns.





4. CRITERIA AND STANDARDS FOR A DIGITAL TVET INSTITUTION (DigTVETIns)

4.1. Scope and subjects of application

The scope and subjects of application of DigTVETInsare colleges and intermediate institutions in the TVET system of Vietnam.

4.2. Glossary

Digital TVET institute: These are TVET institutes that have been undergoing DX and have achieved DigTVETIns at an acceptable or higher level. Digital TVET institute is understood as another name for digital TVET institution.

Smart TVET institute: Basically, smart TVET institutes are also digital TVET institutions and have often made efforts and achieved results in intelligentizing activities. Smart TVET institutes is another name for smart TVET institutions. According to the intelligent nature of DX, digital TVET institutions can also be understood as smart TVET institutes.

Criteria: The criteria of DigTVETIns correspond to the components in the digital TVET institute model (Figure 2). In other words, the criteria of DigTVETIns are the basic tasks of a digital TVET institute.

Standards: The main and specific requirements and contents that need to be implemented to achieve the criteria.

Indicators: Important results that can be measured or evaluated (qualitatively and quantitatively) for each standard.

Demonstration: Visible products, documents, figures to help determine the assessment of indicators of each standard.

Standards assessment scale: These are the points specified and used to evaluate the level of achievement of standards in DigTVETIns. The scoring scales of different standards are different, with values ranging from 1 to 5 (1 is the lowest score and 5 is the highest score), depending on the importance of the standards. The evaluation score of DigTVETIns is the total score of all major and basic standards.

4.3. Objectives

DigTVETInsis is used first of all for institutions to self-assess their level of DX, then for DVET to monitor and evaluate the DX process of the entire system.

4.4. Structure

DigTVETIns is organized in a hierarchical structure with three layers: base layer; criteria layer; standard layer with indicators, scales and demonstrations (see Figure 12).



Figure 12. Structure of DigTVETIns

4.5. Consistency with vocational education accreditation criteria and highquality college criteria

DigTVETIns is developed in connection with accreditation standards as well as the criteria and process for assessment and recognition of high-quality institutes. DigTVETIns can be considered to supplement the criteria for accreditation and high-quality TVET institutes, with the concept that high-quality TVET institutes must be digital TVET institutions. Alternatively, a recognized high-quality college must gain a minimum assessment score out of the total number of assessment scores of a digital TVET institution.

5. RECOMMENDATIONS

To use DigTVETIns effectively, we would like to make the following recommendations:

5.1. For TVET institutions

Firstly, TVET institutions can use DigTVETIns as a basis for designing their DX programmes. It should be noted that when applying DigTVETIns to evaluate the current status of DX, TVET institutes may gain low scores or even no scores in certain standards and indicators. This is completely normal because DX is a process and if an indicator has a low score, it helps TVET institutions to identify areas of shortcomings that need to be overcome, or a way forward in the future.

Secondly, the implementation of DX in a TVET institution can only be successful if there is a unified awareness of DX among the entire leaders, managers, teachers, and staff of the institution. A coordination of common activities for all organization staff to study every single criterion, standard, indicator and evidence can be an effective solution to crease understanding, and together develop action plans to achieve DX goals at an organizational level. This method can also be useful for building KPIs of DX for individual staff and department in the institution, and for an effective management of DX implementation.

5.2. For DVET

Firstly, the promulgation of DigTVETIns nationwide potentially bring positive impact on DX in the TVET sector, contributing to a successful implementation of the "Programme of DX in TVET during 2021 - 2025, with a vision to 2030" issued under Decision No. 2222/QD-TTg by the Prime Minister. We recommend that DVET quickly develops guidance materials, assesses quality and submit DigTVETIns to the Ministry of Labor, Invalids and Social Affairs for approval and implementation.

Secondly, DigTVETIns can first be used by TVET institutions to self-assess their level of DX capacity. Then, DVET can also use it to evaluate DX activities of TVET institutions, thereby evaluating the overall DX status of the entire TVET sector.

Thirdly, DigTVETIns can be used in parallel with the current sets of criteria and standards for VET institutions (VET accreditation criteria, standards under Circular No. 15 /2017/TT-BLDTBXH, criteria and process for assessment and recognition of high-quality institutes under Circular No. 35/2021/TT-BLDTBXH). In case of updating the above criteria and standards, DigTVETIns can be used to update content related to IT applications. Alternatively, a recognized high-quality college must gain a minimum assessment score out of the total number of assessment scores of a digital TVET institution.

Fourthly, to effectively deploy DigTVETIns, it is recommended that the DVET further develops and promulgates other related standards and frameworks such as digital competence frameworks for teachers and learners, technical norms.

Finally, the development of DigTVETIns is to promote DX of formal TVET institutions. However, in a broaden view, DX is expected to contribute to a smart TVET system. In such TVET system, it is important to ensure a continuous implementation of DX; to invest in building industry-wide shared platforms; and to share learning materials, data, and other resources. Thus, it is the responsibility of DVET to promote general DX activities of the entire TVET system.

6. CONCLUSION

DigTVETIns can be considered a living document. However, this version can already be used by TVET organizations according to the feedback of key stakeholders participating in this research. The criteria and standards potentially bring in a positive impact on the overall implementation process of DX at TVET institutions.

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APPENDIX

APPENDIX 1: CRITERIA AND STANDARDS FOR A DIGITAL TVET INSTITUTION (DigTVETIns)

Perspectives on developing DigTVETIns for assessing a digital TVET institution.

- The purpose of developing and promulgating DigTVETIns is to identify specific requirements aligned with the objectives for the DX progress of TVET institutions. It helps TVET state management agencies and institutions to assess the status quo and achieved results.

- DigTVETIns is a supplement to the criteria and standards for vocational education and training accreditation according to the Circular No. 15/2017-BLDTBXH and the criteria and standards for high-quality institutes according to the Circular No. 35/2021/TT-BLDTBXH.

- DigTVETIns is developed with the purpose of considering DX as a method to achieve the strategic goals of TVET, aiming to innovate training content, training methods, administration and management methods. Criteria and standards related to human resources, legal framework and digital infrastructure need to be implemented synchronously to realize changes in working practices. DigTVETIns contributes to the realization of the "DX programme in TVET" issued under Decision No. 2222/QD-TTg dated December 31, 2021, of the Prime Minister.

- The essence of DX is innovation based on data use and data connection. Therefore, standards for data connection, cyber security and safety in a physical-digital environment will be integrated into all criteria and standards for a digital TVET institution.

- DX is a continuous process. Thus, DX targets (specific goals) can be adjusted in different stages due to rapid development of technologies. Therefore, DigTVETIns need to be flexible and adaptable to these changes.

- A number of criteria and standards focus on using digital technologies to innovate TVET institutions' operations to become smarter and more effective. If TVET institutions have invested in technologies but have not yet put them into daily operations to improve efficiency, this practice does not weight assessment score.

- To implement the assessment of criteria and standards for a digital TVET institution, evidence must be clear, complete, and verifiable.

- The implementation of some standards of a digital TVET institution need further guidelines from DVET or the Ministry of Labor, War Invalids and Social Affairs such as digital competence frameworks for staff and teachers; technical norms for IT equipment....

- Due to a diverse nature, indicators will be assessed using by assessment scales: binary (yes, no), Likert (for example: very good, good, average, weak, not done), percentile (score from 1 to 100), and all will be converted to a level scale at the end of assessment.

- DigTVETIns is applicable to TVET institutes of all types: public, private and those with foreign investment, not applicable to pedagogical colleges or other endemic TVET institutions.

Criteria	Standards	Indicator	Suggested proof/evidence
	 Training programmes have content that meet requirements of basic digital competency 	- The proportion of active training programmes that are updated with basic digital competency within a training cycle of the TVET institution.	 Dossiers of issuing training programmes (Decisions on the establishment of programme development teams, assessment committees, promulgation of training programmes) Content of training programmes cover basic digital competency includes Introduction to digital competency; Use of digital tools and platforms; Working in the digital environment; Creating digital content; Application of digital competencies in profession within the training cycle of the institution.
Criteria 1 Training Content	2. Training programmes have content that meets requirements of specific digital competency for training occupations	- The proportion of active training programmes that have been updated with specific digital competency of training occupations within a training cycle of the TVET institution.	 Dossiers of issuing training programmes (Decisions on the establishment of programme development teams, assessment committees, promulgation of training programmes) Content of training programmes cover specific digital competencies of the training occupations.
	 Training content is updated by digital connection methods with businesses and alumni 	- The proportion of active training programmes are updated by digital connection methods	 Survey documents: Business survey process, Learner tracing survey, survey results. Digital information systems, platforms, and connection tools are utilized to leverage information and data to identify labor market needs and job placement requirements to update training content.

				- Assessment documentation of training programmes with
				comments from business representatives.
				- Updated training programmes and modules
Criteria 2 Training Methods	4.	Training programmes and methods ensure a personalized learning process for learners	- The proportion of active training programmes that meet requirements of personalized learning for learners	 Training documents: programme curriculums, training plans, training progress, timetable etc. on digital platforms or applications. Courses and modules are designed to enable learners to develop and manage their learning pathways.
	5.	The institution applies blended learning methods	 The proportion of active training programmes that apply blended learning methods combining face-to- face and online approaches 	 Training programmes, digital learning materials, digital platforms or learning management systems, Other training methods such as project-based learning or flipped class, which are appropriate to each training content, are also recognized
	6.	The institution utilizes digital learning materials in teaching	- The proportion of active training programmes that use digital learning materials in training activities	 Detailed training programme and modules List of digital learning materials, or simulation technologies, virtual reality, augmented reality, mixed reality (VR/AR/MR) that are used for training.
	7.	Teaching and learning assessment activities are implemented using digital technologies and are integrated throughout the training process.	- The proportion of active training programmes that use digital technologies in teaching and learning assessment	 Detailed training programme and modules Testing and test banks are implemented on digital platforms. Regulations and policies on testing Digital platforms and data analytics are used to help teachers and learners evaluate and adjust the teaching and learning process appropriately.

Criteria 3 Administration - Management	8. The institution has a digital transformation programme with vision, goals, roadmaps and a clear performance administration system.	- The digital transformation programme and the performance administration system are implemented at institution wide.	 Decision on issuing the digital transformation programme (can be approved at the institution level) and the dossier of strategy development, action plan, implementation, monitoring and reporting of results in each phase. Digital transformation contents are integrated in the general strategies and development programmes of the institution. TVET institution leaders give guidance to the implementation of all aspects of DX activities directly and comprehensively together with annual evaluation and measures for improvements.
	9. The institution applies synchronized administration and management processes based on data exploitation and connection.	- The management of training and learning activities, facilities and equipment, human resources, administration, and quality assurance are operated on digital platforms utilizing data connection.	 Workflows of each department are operated on a digital platform, Dossiers of process development, update and adjustment Connections and integration among work processes are on the same platform
	10. The institution manages learners by using digital platforms.	- Student services such as administrative procedures, scholarships, extracurricular activities, training assessment, job and internship opportunities, career counseling activities etc. are provided on digital platformS.	 Digital platforms and systems manage sufficient student's data, Student's dossiers are digitalized. Students have accounts connected to learning management systems of the institution.

	11. The institution manages teaching and learning activities and training quality by using a digital platform.	- The proportion of active training programmes that implemented on digital platforms	 Digital platforms and systems manage sufficient student's data, Training programmes, teaching lessons, textbooks, reference materials, syllabus, test banks as well as all training documents, and records are digitalized. Reports on training management and training quality demonstrates consistent, integrated, open and public data
	12. Digital and printed learning resources are managed on digital library platforms or software.	- The proportion of staff, teachers and learners have accounts on digital library platforms or software to find and explore learning resources for teaching and learning activities.	- Digital library platforms or software provide sufficient learning resources and are effectively operated
	 Leaders, staff, teachers and learners are raised awareness of digital transformation in TVET 	- The proportion of leaders, staff, teachers and learners are raised awareness of digital transformation in TVET	 Training plans, decisions to open classes, training results, list of training participants Activity reports on conferences, seminars, trainings, workshops, internal training activities
Criteria 4 Teachers, staff and learners	14. Teachers have basic digital competencies, specific digital competencies of training occupations and e- pedagogies	- The proportion of teachers who are improved with basic digital competencies, specific digital competencies of training occupations and e- pedagogies	 Training plans, decisions to open classes, training results, list of traing participants for capacity development activities, Teaching and learning materials, lesson plans prepared and used by teachers, Teachers' lessons on digital platforms Digital classroom management records, digital learning records of courses under the responsibility of teachers

			- The application of capacity to produce digital learning materials and use digital teaching equipment
	15. Staff have digital competencies appropriate to their job positions.	 The proportion of staff are trained on digital competencies according to their job positions 	 Training plans, decisions to open classes, training results, list of training participants Ability to use data analysis and data connections to improve work efficiency.
	16. Learners have basic digital competencies to serve their learning at the institution and future work	 Surveyed results on learner's digital competencies after graduation. 	 Training plans, orientation plans, photos, contents Surveyed questionnaire, report on the analysis of surveyed results of graduate's digital competencies
Criteria 5	17. The institution updates and implements new guidelines, policies and regulations on digital transformation of state management agencies.	- The proportion of completing required documents relating to new guidelines, policies and regulations on digital transformation by state management agencies.	 General report of the administrative department on the implementation of the required documents by state management agencies Report on the results of the institution 's activities such as digital administrative system, personal identification, citizen digital signature, e-invoice, e-tax, cashless tuition fee payment and salary payment etc.
Institutions and regulations	 The institution applies internal regulations to encourage and recognize departments and individuals for their contributions to digital transformation activities. 	- The institution has regulations to encourage activities and results of digital transformation.	 Digital transformation activities and results are integrated in the institution's regulations and policies relating to incentives A summary of the institution 's digital transformation activities and their results in the year

			- The list of leaders, staff, teachers, learners of the institution is recognized and encouraged to achieve digital transformation results
	19. The institution applies regulations and guidelines on cybersecurity and safety in the digital environment for staff, teachers and learners.	- The institution applies regulations and guidelines on cybersecurity and safety in the digital environment.	 List of regulations, policies and guiding documents Annual activity plan, implementation of guidelines, cybersecurity and internet safety Report on results of cybersecurity and internet safety activities List of leaders, staff, teachers, and learners are raised awareness of the implementation of regulations, policies, guidelines on cybersecurity and internet safety
	20. The institution implements measures to support learners for accessing digital devices and resources for learning.	- The institution has measures to support learners in accessing digital devices and resources for learning.	 Plan to implement measures to support learners' access to digital devices and resources for learning There is a self-study area with Internet connection and software for learning There is a digital library and computer labs Provide a stable Internet connection for learning Report the results of the year.
	21. The institution applies internal regulations and	- The institution has regulations and guidelines on	 Documents of internal intellectual property and copyright regulations/guidelines.

	guidelines on intellectual property and copyright.	intellectual property and copyright.	 Activity report on the implementation of internal regulations/ guidelines on intellectual property and copyright.
	22. The institution ensures digital infrastructure to help staff, teachers and learners work, teach and learn	- The institution has digital infrastructure that meets the working, teaching and learning conditions of staff, teachers and learners.	 Annual report of the institution's digital infrastructure meets the needs of staff, teachers and learners Internet service contract Documents of procurement, provision of equipment for digital infrastructure such as servers, computer labs, e- learning rooms, digital libraries etc. Reports related to digital infrastructure utilization results
Criteria 6 Infrastructure, platforms, and digital learning materials	23. The institution has a unified data architecture to ensure that the internal database system is connected, shared and used among units and departments.	 The institution has a data architecture design consistent with its organizational structure, functions and tasks. The proportion of activity areas (training, research, student services, human resources, finance etc.) that have data described in a common data architecture and shared internally with each other via digital platform/ software. 	- A document describes the overall data architecture of the institution

24. The institution uses their own or shared digital platforms that have internal connections and connections with external organizations	- Digital platforms connect staff, teachers, learners, and external stakeholders (for example: parents, industries, alumni and other TVET institutions etc.).	 Reports on activity results and directly onsite investigation of digital platforms The institution explores or connects its data with the database system of DVET, ministries, industries, local and parent organizations. Service contracts for developing digital systems/ platforms such as LMS, DMP, digital learning resource
25. The institution uses their	- The proportion of active	 management etc. (if applicable) Report on the use of digital learning resources for
own or shared digital	training programmes that	training programmes and directly onsite investigations on
learning resources for	have digital learning	digital platforms Statistical report on the list of textbooks, reference books,
training activities.	materials.	digital learning materials per training programme

APPENDIX 2: EUROPEAN FRAMEWORK FOR DIGITALLY COMPETENT EDUCATIONAL ORGANISATIONS

Thematic	Sub-elements	Descriptors
elements		
		1. The potential of digital learning technologies is clearly
	Integration of Digital-	flagged
	age Learning is part of	2. The benefits of digital learning technologies are
	the overall mission,	communicated
	vision and strategy	3. The strategic plan encompasses digital-age learning
		4. Open education is an aspect of public engagement
		5. Planning builds on enablers while addressing barriers
	Strategy for digital-	Internal stakeholders have a degree of autonomy
	age learning is	7. Opportunities, incentives and rewards for staff are identified
Leadership &	supported by an	8. Digital-age learning is aligned with broader priorities
Governance	implementation plan	9. There are twin goals of modernizing existing educational
Practices		provision and offering new opportunities
		10. There is a shared understanding of and commitment to
		the implementation plan
		11. Management responsibility is clearly assigned
	A Management and	12. Resources are aligned with budgets and staffing
	Governance Model is	13. The outcomes, quality and impact of the implementation
	in place	plan are reviewed
		14. Specific initiatives or pilots are evaluated
		15. Implementation status is benchmarked
		16. Oversight of policy and direction is evident
	Digital Competence is	17. Staff and students are Digitally-Competent
		18. Safety, risks and responsible behavior in online
	promoted,	environments are foregrounded
	benchmarked and	19. The Digital Competence (DC) of staff and students is
	assessed	benchmarked
Tooching and		20. DC is included in staff appraisal
l earning and		21. Staff are partners in change
Practices		22. New roles are envisaged for staff
	A rethinking of roles	23. New roles are envisaged for students
	and pedagogical	24. Pedagogical approaches are expanded
	approaches takes	25. Personalized learning is developed
	place	26. Creativity is promoted
		27. Collaboration and group work is expected
		28. Social and emotional skills are developed
Professional		29. A commitment to Continuous Professional Development
Develonment		(CPD) is evident
Development		30. CPD is provided for staff at all levels

		31. CPD is aligned with individual and organizational needs
		32. A wide range of CPD approaches is evident
		33. Accredited/certified CPD opportunities are promoted
	Assessment Formats	34. The scope of formative assessment is extended
	are engaging and	35. Summative assessment is diversified
	motivating	36. Self- and peer-assessment are promoted
		37. Rich, personalized and meaningful feedback is
		encouraged and expected
Accomment	Informal and Non-	38. Prior, experiential and open learning are recognized and
nractices	Formal Learning are	accredited
practices	recognized	
		39. Learning analytics is given strategic consideration
	l earning Design is	40. A code of practice for learning analytics is in place
	Informed by Analytics	41. Learning is supported through learning analytics
		42. Quality management and curriculum/programme design
		are supported through learning analytics
		43. Staff and students are the creators of contents
	Digital Content and	44. Content repositories are widely and effectively used
	OER are widely	45. Intellectual property and copyright are respected
	promoted and used	46. Digital tools and contents are licensed as required
		47. Open Educational Resources are promoted and used
		48. Subject-based learning is reimagined to create more
Content and		integrated approaches
Curricula	redesigned or re-	49. The time and place of learning is rescheduled
	interpreted to reflect	50. Online provision is a reality
	the pedagogical	51. Learning in authentic contexts is promoted
	possibilities afforded by digital technologies	52. Digital learning provision is evident across curriculum
		areas
		53. Students' digital competence is developed across the
		54. Networked collaboration for staff to pool expertise and
		Share contents is the norm
	Networking, sharing &	55. Knowledge exchange enous are recognized
	collaboration is	50. Students engage in elective networking
Collaboration	promoted	57. Participation in knowledge-exchange activities and events
and		58 Internal collaboration and knowledge exchange is
Networking		expected
5	A strategic approach is	59 An explicit communication strategy is in place
	taken to	60 A dynamic online presence is evident
	communication	
	Partnerships are	61. A commitment to knowledge exchange through
	developed	partnerships is evident

		62. Staff and students are incentivized to be actively involved in partnerships
	Physical and Virtual Learning Spaces are designed for digital- age learning	63. Physical learning spaces optimize the affordances of digital-age learning64. Virtual Learning Spaces are optimized
		65. An Acceptable Usage Policy is in place
		66. Pedagogical and technical expertise direct investments in digital technologies
	The digital infrastructure is planned and managed	67. A range of digital learning technologies supports anytime/anyplace learning
Infrastructure		68. Bring Your Own Device (BYOD) approaches are supported
		69. Risks relating to inequality and digital inclusion are addressed
		70. Technical and user support is evident
		71. Assistive technologies address special needs
		72. Measures to protect privacy, confidentiality and
		73. Effective procurement planning is evident
		74. An operational plan for core ICT backbone and services is in place

APPENDIX 3: AN EXAMPLE OF SELFIE

Area C: Infrastructure and Equipment

This area is about having adequate, reliable and secure infrastructure (such as equipment, software, information resources, internet connection, technical support or physical space). This can enable and facilitate innovative teaching, learning and assessment practices.

Answer options: five-point scale and not applicable (N/A)

ltem code	Item title	SCHOOL LEADER	TEACHER	STUDENT	IN-COMPANY TRAINERS
C7	Data protection	In our school, there are data protection systems in place	In our school, there are data protection systems in place		In our company, there are data protection systems in place
C8	Digital devices for learning	In our school, there are school- owned/managed digital devices for students to use when they need them	In our school, there are school- owned/managed digital devices for students to use when they need them	In our school, there are computers or tablets for me to use	
WBL C9	Digital devices for learning in company			In our company, I can learn operating the relevant (digital) equipment	In our company, students are allowed to work with the relevant (digital) equipment for learning purposes
C17	Database of training opportunities	In our school, students have access to a database of in- company training opportunities	In our school, students have access to a database of in- company training opportunities	VET: In our school, I have access to a database of traineeships, apprenticeships and other opportunities	
C10 OP	School owned devices for students	In our school, there are school owned and managed portable devices that students can take home when needed	In our school, there are school owned and managed portable devices that students can take home when needed	In our school there are portable devices for me to take home when needed	In our company there are company owned and managed portable devices that students can take home when needed
Чd	Digital divide: Measures to identify challenges	In our school we have measures in place to identify challenges that arise with Blended Learning, related to students learning needs and socio- economic backgroun d	In our school we have measures in place to identify challenges that arise with Blended Learning, related to students' learning needs and socio-economic background		In our company we have measures in place to identify challenges that arise with Blended Learning, related to students' learning needs and socio- economic background

APPENDIX 4: FRAMEWORK FOR DIGITAL TRANSFORMATION IN HIGHER EDUCATION (JISC)

Elements	Sub-elements	Examples of activities that might be done
Organizational digital	Digital culture and mindset	Work with stakeholders to produce a glossary that provides an agreed
culture		organizational definition of terminology that reflects the principles and values of the
The values, beliefs and		organization (e.g. resilience, sustainability, inclusion, graduate attributes,
practices affected by the use		responsible and ethical research and innovation)
of digital technology.		 Develop codes of practice for different areas of business activity that articulate
Empowering digital culture		clear expectations around digital practices and behavior
and leadership (strategy,		 Encourage staff to identify new digital opportunities to improve their working
planning and investment),		practices and to feed in suggestions via the appropriate approval routes
focusing on core strategies,		 Apply ethical frameworks to ensure staff and learners approve the use of
administrative structures and		automated notifications
processes, effective		Review existing job descriptions and person specifications to ensure that digital
governance, stakeholder		capabilities relevant to each role are up to date
support, development and		 Provide opportunities for staff and students to self-assess and reflect on their
engagement.		own digital capabilities and develop individual development plans to enhance the
The organization's digital		areas they identify as important
culture also determines its		 Ensure that digital leaders have opportunities to self-assess and reflect on their
approach to issues such as		own digital capabilities and enhance these to model digital confidence to others
digital safety and wellbeing,		 Give senior leaders the opportunity to attend a digital leadership course

openness, collaboration, and		• Use the Jisc role profiles to consider and baseline digital capabilities of different
equity, diversity and inclusion,		groups (e.g. digital leaders, professional services, teachers, students, library staff,
as well as how well it		learning technologists, researchers)
implements and adapts to	Organizational identity	Carry out an organization wide audit of manual and digital relationship
organizational change.		management systems to develop a coherent and integrated single source
		customer relationship management (CRM) system
		Promote and encourage a sense of belonging for all stakeholders and provide a
		mix of on-site and digital opportunities for them to demonstrate presence and
		engagement
		• Encourage students to establish and build professional/career related digital
		identities throughout their course
	Organizational wellbeing	Engage and involve stakeholders to develop shared guidelines and approaches for
		the use of digital communications to negotiate, argue respectfully, and deal with
		and respect difference
		• Develop accessibility and inclusion policies, practices, support and guidelines to
		ensure that all stakeholders have equitable experiences of work and learning
		• Make sure accessibility, inclusion and wellbeing challenges and problems are
		addressed as a high priority
		• Provide staff with digital tools, apps or services to manage their wellbeing (eg
		time management, workload prioritization, screen time), and encourage their use
		• Investigate the ethical use of digital nudges (automated notifications) to monitor
		wellbeing of staff and/or students

	1	
		 Offer remote/hybrid working for appropriate roles to improve recruitment and
		retention of skilled staff. Encourage engagement, reconfigure tasks and events to
		fit a digital format, and address mental health and equity issues
		 Upgrade or reconfigure workspaces to support a flexible, hybrid work culture (e.g.
		upgraded classrooms, conference rooms, shared workspaces)
	Organizational change	Ensure senior leaders are clear about their roles as digital leaders and confident to
		model good digital practice and innovative approaches to others
		 Carry out a review of roles and remits of existing senior management groups/
		committees, in light of development plans, to clarify group responsibilities and to
		identify any gaps in coverage
		 Provide time and space for staff to benefit from digital transformations and
		ensure recognition and sharing of good practice
Knowledge creation and	Digital vision and horizon	Develop a series of visioning workshops for senior leaders
innovation	scanning	 Encourage leaders and governors to be aware of digital transformations in
Analyzing emerging trends		industry, research and development, education, and business sectors and
and developments across all		consider how to incorporate appropriate new practices and approaches into the
areas of the organization's		organization (e.g. curriculum development, knowledge practices)
business to inform policy and		 Create a futures-thinking or foresight framework for the organization which
development. Enhancing		supports policy decision making
knowledge creation and	Research	Enable interdisciplinary approaches to research through digitally-connected
innovation through research,		communities
and collaborative activities.		 Provide access to appropriate scale and type of research infrastructure
Considering the wider impact		 Identify routes to access appropriate technologies (e.g. high-performance
		computing)

on local, regional, national or		within or outside the organization to support high complexity/high-capacity
international communities.		research
		 Provide adequate and well-managed research data storage
		 Provide secure access to open research data management infrastructure and
		policies to support clear research data lifecycle provision to include preservation
		and disposal
		• Ensure that effective content management systems are developed and used and
		maintained to support storage, retrieval and access to research and enterprise
		outputs, including internal and external digital repositories
		• Identify routes to managing physical research assets and equipment digitally to
		support a sustainable research estate
		• Identify routes for researchers to access research software and data engineering
		services where appropriate
		 Offer research software engineering services to researchers to develop and
		improve code for specific research projects
		• Reduce bureaucracy and administrative burdens on researchers by streamlining
		and simplifying research management process
		 Ensure availability and management of effective and interoperable research
		management processes, systems and technology
	Innovation	Enable recognition, recruitment, development and retention of creative digital
		practitioners in professional roles
		 Encourage and support staff to take calculated risks and experiment with
		technologies
		 Develop a ring-fenced innovation budget to support initial development of ideas

		 Provide opportunities for students to be involved as partners in research- 	
		informed digital innovation	
		 Create new events, awards, initiatives and funding streams to support digital 	
		creativity	
		 Support centers of excellence in digital fields and ensure their expertise is 	
		leveraged	
		inside the organization	
		• Enable a culture of enterprise and facilitate initiatives that contribute to the wider	
		community; build entrepreneurship skills in students	
	Wider impact	Ensure staff and students have the appropriate technologies, support, and training	
		to produce digital content for different audiences	
		 Maintain efficient marketing and communications to ensure that organizational 	
		outputs and key messages are effectively managed, stored, branded, and	
		disseminated	
Knowledge development	Curriculum development	Work to transform and develop courses across the organization according to	
Supporting knowledge		changing strategic visions, employer needs, and/or frameworks such as active	
development within the		blended learning, personalized learning, hybrid learning, and transdisciplinary	
organization to ensure all		learning	
stakeholders can learn, work		 Reconsider and redesign traditional assessment and feedback to realize the 	
and thrive in a digital		affordances of digital approaches, ensuring staff and students have the required	
environment. Rethinking and		digital capabilities	
enhancing digital learning,		 Explore economic models for offering blended learning at scale 	
teaching and assessment		 Identify and implement new international programmes of study 	

	Consider new global markets for courses exhibiting increasing demand in light of
	increased digital learning capacity and staff capability
	 Explore how digital and physical spaces are being/could be used to provide
	enhanced opportunities for student flexibility and engagement
Digital learning	Use a balance of in-person and digital methods to provide timely and appropriate
	feedback throughout a course to allow students to self-regulate their learning
	 Encourage and support learners to self-assess, identify, and articulate their
	digital and study preferences, and needs through a mixture of in-person and digital
	diagnostic methods
	Offer learners regular opportunities to assess their digital learning capabilities
	and identify what support they need to build on these
	Provide learners with appropriate digital tools and encouragement/support to
	reflect on their learning (eg e-portfolios, personal blogs)
	Provide opportunities for curriculum teams to assess and reflect on the levels of
	digital capability and identify areas for professional development opportunities for
	student flexibility and engagement
Digital teaching	• Establish a set of metrics and analytics that can be used to measure the success
	of digital learning beyond the simplistic data such as attendance and retention
	Invest in self-access resources to support the development of digital capabilities
	among staff
	• Explore or research the use of AI to provide a personalized learning experience
	which identifies and responds to the needs and preferences of learners
	Provide opportunities for teaching staff to share digital practices and expertise
	formally and informally

	 Ensure recognition and reward for teaching staff who develop their digital
	capabilities (eg appraisal, grading, time allocation, career opportunities, specialist
	roles, link to teaching excellence)
	 Redesign the management and delivery of assessment and feedback
	mechanisms
	 Leverage technologies to scale delivery of high-quality services to students
	located
	anywhere in the world
	 Adapt quality improvement processes to support the adoption of digital
	approaches to learning, teaching and assessment
	• Work with stakeholders to identify barriers to the adoption of technologies related
	to blended/hybrid learning and find ways to deal with this equitably (e.g. cameras
	on/ off for remote students, environmental impact of digital interactions)
	 Identify alternative means to support knowledge practice for people who are
	unable to access in-person spaces or equipment (e.g. games, simulations)
	• Work with other HEIs as consortia to advocate for increased availability and
	affordability of e-books with publishers
Learner experience	• Embrace the notion of presence (for staff and students) which can be
	demonstrated synchronously or asynchronously as an alternative to contact hours
	• Include the digital wellbeing of students in wider student wellbeing initiatives and
	services
	• Take an active interest in the digital experience of learners through research,
	surveys and/or consultations
	Use technology to provide personalized, adaptive learning and assessment

		Provide effective careers support, employment brokering and employment-based	
		skills development, through a balance of technological and in-person approaches	
		• Survey students to find out about their access to technology, connectivity, and	
		learning spaces before they start their course to find out what additional support	
		they might need	
		 Ensure that international and TNE students have the support they need to 	
		experience a sense of belonging and learn effectively	
		 Consider the global mobility of students and the impact this might have on 	
		access to services, learning and support	
Knowledge management	Information management	Use digital information to support effective organizational planning and decision	
and use	and use	making, problem solving, and monitoring organizational performance	
		• Ensure that staff and students can critically evaluate digital information in terms	
Enhancing access to and use		of its accuracy, provenance, relevance, value and credibility	
of information and data to		 Produce guidelines on copyright, data protection, information security, open 	
support all areas of the		licensing, and IPR so that staff and students are fully informed around legal	
organization, including		requirements and organizational principles	
research and teaching.		 Investigate the use of AI in the provision of information/library services 	
Enabling the collation,		 Identify responsibility for the archiving of the organization 	
preservation, management,	Data management and use	• Review existing policies and practices to reform and upgrade data management	
sharing, and use of		practices, systems and services	
information and data to inform		• Engage with stakeholders to understand and critique the role of data in the	
decision making.		organization, and more widely in society	
		• Share data openly (where this does not conflict with data privacy and security) for	
		societal learning and scholarship	

	 Identify all sources of data across the organization to support a better
	understanding of the learner experience and to use this to improve learner
	outcomes (e.g. use of library resources, engagement with the VLE etc.)
Business intelligence (BI)	Gather market intelligence to benchmark institutional position (e.g. research
	performance)
	 Ensure leaders and governors are aware of digital transformations in industry,
	education and business sectors and support new practices and approaches into
	the organization as appropriate (e.g. curriculum development, knowledge
	practices)
	 Consider how information is used in the institution and highlight this (e.g. local
	Labor market intelligence to identify career opportunities for students, student
	admissions trends to consider future size and shape)
	 Gain consensus on priorities for reporting - what information is essential for
	decision making and who should provide it
	 Provide access to appropriate user-defined data dashboards for people in
	different roles across the organization
	 Create a roadmap for the implementation of business intelligence services,
	considering interim measures where needed
	 Prioritize the collection of data needed to achieve goals (e.g. attendance
	monitoring in place for learner analytics)
Decision making	Understand business processes in different contexts across the organization and
	how digital enables and constrains these (eg education, research, support)
	 Give governors and senior leaders access to information and data to support
	decision making and planning

Knowledge exchange and	Communication	 Work with stakeholders to create digital communication guidelines that are 		
partnerships		inclusive (e.g. codes of conduct, email etiquette, managing online behavior)		
Enhancing knowledge		 Establish a culture of zero tolerance to online harassment and bullying 		
exchange to communicate		Work with stakeholders to consider how different digital formats and messages		
and disseminate key		achieve		
organizational messages and		different purposes and how far digital media and networks influence social		
encourage collaboration and		behavior		
community participation of all		 Develop guidelines for online synchronous and asynchronous communication 		
partners/stakeholders.		approaches to ensure a consistent and fair experience is had by all stakeholders		
	Collaboration	• Ensure that systems and procedures for safe and secure data sharing support		
		collaborative activities across the organization		
		• Work with stakeholders to create rules and guidelines for effective and inclusive		
		digital collaboration within and outside the organization		
		• Consider how to work with TNE partners to share systems and technologies and		
		identify potential challenges and risks		
	Community participation	Contribute towards local and regional industry and business to drive innovation		
		and economic growth		
		• Link with cultural and social initiatives in the local community or region to enrich		
		the experience of staff and students and encourage social and environmental		
		change		
	Relationship management	• Enable and encourage students to develop and build relationships with potential		
		local, regional, national and international employers		
		 Develop and maintain strong and lasting relationships with alumni 		

Digital and physical	Robust digital infrastructure	 Establish horizon scanning activities that enable all stakeholder groups to 	
infrastructure		participate and contribute	
Providing robust and secure		 Encourage the development of shared local and institutional evaluation plans, 	
infrastructure through relevant		methods and procedures	
expertise and vision, including		 Carry out regular review audits to map data flows, workflows and processes 	
appropriate investment in		across different functions to inform digital strategy going forward	
networks, systems, hardware,		 Ensure digital planning is coordinated with other relevant plans and strategies 	
software and digitally		(e.g. estates, learning, teaching and assessment, student experience, research,	
equipped physical spaces,		information and communication, international, IT, corporate plan)	
and ensuring effective		 Develop a cross-organizational steering group to take forward digital strategies 	
management and standards		and plans	
compliance.		 Implement strategic digital visions as appropriate through digital leadership and 	
		effective governance (e.g. cloud-first, mobile-first, digital-first, people-first,	
		sustainability)	
		 Balance investment and effort to both refresh, consolidate and/or integrate 	
		existing/legacy systems and services and develop new ones as appropriate	
		• Plan for changing investment and procurement in the switch from majority capital	
		expenditure to majority revenue expenditure (e.g. move to cloud services)	
		• Plan for a balanced investment between fixed computing and resources/facilities	
		for personal device use (e.g. under a bring-your-own or leasing policy)	
		 Coordinate software purchasing, licensing, and access across diverse parts of 	
		the organization to maximize efficiency and availability	
		 Engage with partners to identify opportunities for external investment in digital 	
		equipment or resources	

•	Ensure digital infrastructure planning and decisions take account of the diverse
n	needs of staff and students, particularly those at risk of exclusion through issues
s	such as poverty, disability, mental health, physical location, language, or any other
а	access difficulties.
•	Ensure that digital infrastructure decisions and activities do not create barriers to
p	participation, working or learning
•	Ensure digital infrastructure planning and decisions are considered against
c	organizational targets for environmental sustainability (eg energy use, carbon
fo	ootprint, net zero)
•	Ensure that virtual environments reflect and are representative of diversity in the
r	eal world
•	Provide opportunities for all stakeholders to proactively engage in the design of
tl	he digital environment
•	Balance investment and effort to both refresh, consolidate and/or integrate
е	existing/legacy systems and services and develop new ones as appropriate
•	Plan for changing investment and procurement in the switch from majority capital
е	expenditure to majority revenue expenditure (e.g. move to cloud services)
•	Plan for a balanced investment between fixed computing and resources/facilities
fo	or personal device use (e.g. under a bring-your-own or leasing policy)
•	Coordinate software purchasing, licensing, and access across diverse parts of
ti	he organization to maximize efficiency and availability
•	Engage with partners to identify opportunities for external investment in digital
е	equipment or resources

Digital connectivity	 Provide and maintain secure systems, services and content (e.g. cyber security
	protections and protocols)
	 Establish an incremental plan, targets, and roadmap to implement and/or
	integrate new systems, platforms, or applications to ensure minimum disruption to
	established business activities
	 Develop and support systems and services to enable effective and ethical
	collection and use of high-quality, secure data (e.g. business intelligence
	architecture, data centers, data dashboards, high performance computing (HPC),
	data visualization) and procedures
Digital support	Establish organizational guidelines for the impact of digital connectivity on the
	environment; suggest ways to mitigate this through changing practice (e.g. carbon
	footprint of email sending and storage)
	Carry out ongoing monitoring of network usage, performance, and capacity, and
	highlight aspects that present current or future challenges (e.g. e-sports, e-
	science)
	 Ensure websites, digital services, and apps provided through the organization are
	accessible across multiple platforms/devices and comply with accessibility
	standards and regulations
	 Ensure no one is disadvantaged due to accessing services and systems that are
	outdated and less secure
	 Consider the challenges of global interconnectivity, technical impacts and
	potential restrictions

	• Establish appropriate plans and policies that specifically focus on data privacy
	and ethics, and cyber security issues that are unique to work-from-home
	environments
	• Expand, upgrade, and adopt digital security measures such as multi-factor
	authentication, password tools, threat detection, monitoring, ransomware
	protection software, and endpoint and Wi-Fi security
	 Work to achieve ISO 270001 certification to manage information security
	• Work with and access specialist services to support incident response, forensics
	and the recovery of organizational digital estates to mitigate the impact of attacks
	Access appropriate services to support cyber security activities (e.g. Cyber
	Essentials), and participate in events and activities to support threat intelligence
	sharing
	 Manage roll-out and training for new digital systems and major updates
	• Establish a shared understanding of the differences between IT support and
	supporting a range of different digital practices (e.g. digital learning, digital
	research, data analytics)
Estates management	• Carry out a full audit of teaching rooms, their 'purpose' or configurability, and the
	equipment in them, including rooms with specialist facilities
	Streamline systems across the organization to facilitate room and equipment
	booking and measure room use to ensure physical spaces support current practice
	Utilize data from intelligent environments to identify traffic and use of campus
	spaces to support ongoing improvement and development
	 Provide virtual tours for people who cannot access physical spaces
	 Provide a variety of bookable hybrid and virtual spaces
•	

Include the effective	pedagogical use of learning spaces and equipment in the
plan for developing di	gital capability of teaching staff and provide training materials
and support for staff a	nd students using the spaces
Consider furniture, re	oom layout, technology use and pedagogical approaches in
different learning space	ces to ensure flexible options are available. Consider
limitations that may im	npact on teaching and learning in a blended/hybrid context
 Assess the level of te 	echnical support required to adequately maintain (and keep
current) the large num	ber of technology-equipped rooms. Ensure that a sufficient
and appropriate mix o	f technical, administrative and teaching support is available

APPENDIX 5: AN EXAMPLE OF SIGEDS

LATENT	INCIPIENT		ESTABLISHED
1.1 How many and wh	ich systems/modules ex	ist within this process?	How do they operate?
1.2 Do you apply the unique	e school building identification	model?	
There is no unique identifier for each element	Not all elements have a unique identifier	A unique identifier for each element exists, but there are duplications or other data quality issues	A unique identifier for each element exists and there are no duplications
1.3 Do you keep a unique re	ecord of buildings in digital form	nat for use in the day-to-day m	anagement of schools?
There is no unique record	There is a partial unique record, or several records, scattered in digital format	A complete unique record in digital format exists but it is not used for the day-to-day management of schools	A complete and updated unique record in digital format exists and it is used in the day-to-day management of schools
1.4 Do you record the geore	eferenced data of school buildi	ngs?	
There is no georeferenced information on school buildings	There is a partial digital record of the georeferenced data of the buildings, although it is outdated	A complete digital record of the georeferenced data of buildings exists, although it is outdated	There is a complete and updated digital record of the georeferenced data of the buildings

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