

European Union Digital Education Quality Standard Framework Variables and Sub Variables - Operationalised

Effective digital education requires the thoughtful and skilful design of the following variables: content, delivery, support, community and structure. Carefully implemented learner assessment and program evaluation are essential to the success of a digital education program. Commitment to continuous improvement through emerging design ensures that digital education continues to meet evolving learning needs and leverage advancing technology.

Effective digital education leads to learner and academic staff satisfaction, increased learner knowledge and skills, the transfer of knowledge, and a positive impact on the organisation.

Theoretical Foundations

Constructivism acknowledges that one's learning is an active, ongoing process. Learning is subjective because individuals' cognitive processes differ. They perceive their environment and experiences differently and link their perspective to prior knowledge. As such, learning is unique, fluid and contextual.

Social constructivism takes learning to the collective level where people learn with and from others by interacting and collaborating in social contexts, or communities of practice or inquiry.

Connectivism is a digital learning theory applicable to networked, online environments. When people connect to and participate in an online community, they interact dynamically with others using rich multimedia resources. This environment provides new ways for people to make connections between ideas and concepts, and the capacity to create knowledge by incorporating current information.

Outcomes

Outcomes resulting from effective digital education include increased learner and academic staff satisfaction, increased learner knowledge and skills, transfer of knowledge, and a positive impact on the organization.

Learner satisfaction

Digital education provides education and training solutions that correspond to learner and community interests and labour market needs. Learners appreciate the convenience, flexibility, and access to resources that enhanced digital educational opportunities provide. Digital education removes physical barriers and travel limitations, empowering learners who live in remote or rural areas to participate in higher education study units or take classes in subjects that are not offered in their locations.

Academic staff satisfaction

Academic staff benefit from the flexibility and convenience that digital education provides both themselves and their students. Academic staff and training professionals who integrate

digital technologies into their teaching gain satisfaction as a result of increasing the learning opportunities, satisfaction and success of learners in a digital world.

Increased learner knowledge and skills

Relevant, authentic content ensures that learners attain intended learning outcomes. Digital education that includes complementary core competencies to match work and study skills, and provides versatile study paths ultimately leads to securing and maintaining better employment.

Transfer of knowledge

Carefully planned learning activities such as scenarios, problem-solving case studies, simulations, reflection, discussions and collaborative group activities enable learners to seamlessly transfer new knowledge to real-world applications.

Positive impact on the organization

Reusable, adaptable and scalable teaching resources can lead to innovation and change within organizations. Organizations can leverage effective digital education to become competitive, relevant, and innovative and enable academic staff and trainers to attract students, compete internationally and meet the needs of learners in the 21st century.

Content

The content of an effective digital education program provides all the information learners need to attain the required learning outcomes. Effective content is relevant, organised and chunked, supported by relevant resources, and grounded in theory and best practices.

Relevant

Each digital education session begins with a statement of three to five learning outcomes that are the objective of the session. Study unit designers then select content to align with and lead to these learning outcomes. Relevant study unit content faithfully reflects problems and issues that arise in real-world situations. Learners engage in activities that present the same type of cognitive challenges they will encounter in an applied environment. This enables the acquisition of information, concepts, and skills that are meaningful, comprehensive and relevant to the present or future workplace.

Organised and chunked

Content is organized into succinct segments or 'chunks' that present a comprehensive overview of the information needed to attain the learning outcomes. Content progresses logically, builds on previous information, and provides learners with a sense of pacing and completion. It is presented objectively, through unbiased language, matching the learner's level of understanding. Content is organised into clear sections such as introduction, information presentation, exercises, interaction, conclusion and take-home messages. The estimated amount of time required to complete each section is noted, tracked and adjusted as needed.

Supported with relevant resources

Additional readings and resources support the content overview to ensure that topics are covered in appropriate breadth and depth. Academic articles, videos, and websites provide background information and alternative presentation options that address varying learning styles and needs. The resources encourage learners to reflect on their own thinking and learning processes. Additional resources can encourage social negotiation and critical thinking, which can help generate insight and promote the elaboration of concepts and ideas.

Grounded in theory and best practices

Theory and empirical research provide the basis for effective digital education content. Academic staff refer to their personal and professional experience, pedagogical best practices and adult learning theory to create activities that facilitate the transfer of theory into practice. Academic staff also take advantage of learners' personal and professional experience, so they not only learn from the tutor, but with and from each other. Academic staff from accredited learning organizations share core competencies and partner with subject matter experts from private industry to design learning solutions that are closely aligned with the skills required in the workplace.

Delivery

Effective digital education is carefully designed using intentionally selected technology to ensure the usability and accessibility of the learning platform. Pedagogical strategies leverage technology to ensure that the learning experience is engaging and interactive, provides opportunities for learner reflection, and facilitates teacher, social, and cognitive presence.

Intentional use of technology

Selective and relevant use of technology supports teaching and learning and results in educational solutions that assist with meeting future competence needs and ensure smooth, flexible, and convenient digital study paths for learners.

Usability

An effective digital education platform is intuitive to navigate. Information is continually updated to ensure there are no dead ends or outdated links. Careful organisation minimises the number of steps or “clicks”. Embedded objects such as shareware, images, audio, and video clips are easy to download. If external software is needed to view or use content, links and instructions are provided. Bandwidth should be considered when including large files (e.g., images, video, and animations). Careful use of colour, size and type of font, and background contributes to usability. EU legislation is addressed and adhered to (legislation: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L2102>).

Accessibility

An effective digital education platform is technologically robust, easy to navigate and freely available to all students and academic staff. A flexible and customised design based on analyses of how different learners may potentially consume the content incorporates a multitude of technological and pedagogical features that ensure the content is accessible to all learners and learning styles. It allows participation at any time and any place, including for those with limited access to the internet.

Content is often and ideally augmented by links and resources on the internet; therefore, delivery must be designed to ensure these external resources are accessible to all users.

Incorporates pedagogical strategies

Learning experiences are appropriately designed and facilitated by knowledgeable educators using evidence-based teaching practices. Academic staff incorporate a variety of instructional strategies and activities and apply a range of modes of learning to accommodate diverse learning styles, and to maximise and leverage the experience of each learner. Academic staff use pedagogic frameworks specific to digital education to guide the design, delivery and evaluation of their learning sessions. Academic staff or tutors are available within the learning environment to enable the comprehension of information and encourage self-directed learning. They solicit feedback, engage learners in problem-solving experiences, and provide positive reinforcement.

Pedagogical considerations include providing learners with a clear roadmap of expectations and learning outcomes, determining appropriate teaching and learning strategies, and determining the type and amount of content and appropriate level of instructor support. Pedagogical strategies also guide the development of formative and summative assessment.

Engaging and interactive

Effective digital education promotes and facilitates interaction with the content, as well as among learners and with the tutor. Engaging activities stimulate learners' interest and understanding and facilitate the transfer of knowledge and skill into practice. Peer-helping activities enrich the learning experience for adult learners, enabling them to assume personal responsibility and connect past learning experience to the current one.

Promotes reflection

In effective digital education, tutors encourage learners to reflect upon concepts and ideas learned by responding to thought-provoking questions that stimulate discussion and critical thinking. Content and design are leveraged to promote independent reflection, as well as in response to other learners.

Facilitates teaching, social, and cognitive presence

Effective digital education implements strategies to encourage participation and engagement by enabling learners to experience teaching presence. Teaching presence includes the perception that the tutor is available, reading posts, responding quickly to questions, and providing timely, relevant, and constructive feedback.

Effective digital education is designed to promote a sense of social presence or community engagement among learners and with their tutor. Having the opportunity to get to know and trust both the tutor and other learners, particularly at the beginning of a digital education study unit, enables learners to identify with the community and to communicate purposefully in a trusting environment.

Effective digital education encourages the learner to be cognitively present in the learning environment by incorporating activities specifically designed to challenge them to analyse,

think critically and reflect. Tutors ask thought-provoking questions and design problem-solving scenarios that require the learner to apply their new knowledge or skill to a work-related or practical situation.

Support

An effective digital education environment requires ongoing support from tutors, prompt feedback on assignments, and responses to emails and questions within interactive forums. Learners are introduced to the digital education platform to ensure they can engage with it effectively. Academic staff and tutors are trained to deliver and evaluate the program. Continuous technical and media support is available for both learners and staff.

Tutoring

Success in the digital education environment is directly related to how present and engaged learners perceive their tutor to be within the virtual classroom. Learning, engagement, and enjoyment of the experience is enhanced when learners feel a responsiveness equal or superior to face-to-face instruction. Tutors communicate clear expectations and instructions, identify opportunities, challenges and agency, provide timely constructive feedback, announcements and updates, and create a learning community where learners feel comfortable and supported. Tutors address small problems before they become significant, thereby helping learners avoid stress, frustration and attrition.

Prompt feedback and service

Within a digital education environment, academic staff or tutors provide feedback on assignments and respond to email queries in a timely manner. To facilitate the ability of learners to access support from academic staff and peers promptly and conveniently, the learning environment also provides services such as interactive question and answer forums and online office hours. Class announcements, study unit notes, and assignments are readily available.

Technical and media training

Prior to the start of a digital education session, learners receive a thorough introduction to the learning environment, so they can comfortably access and participate in the digital education platform.

Professional development for academic staff/tutors

Academic staff/tutors are trained to design, deliver and evaluate effective digital education. The training provides the basic knowledge to facilitate a digital education learning session while enabling staff to experience what it is like to be a learner in the environment. Academic staff also have access to professional development through their organizations to keep up to date with digital education best practices. Training and professional development that is certified by an accreditation body can help to ensure quality and stimulate participation.

Technical support

Administrative and technical support are freely available to both students and academic staff to help them use and access the technical systems supporting the digital learning environment. Step-by-step instructional videos can be used to walk learners through downloading software or performing technical tasks. Face-to-face or video conferencing sessions can help learners who have challenges interacting with the technology.

Community

Effective and user-friendly digital education incorporates community-building strategies to establish a collaborative learning environment that is inclusive and safe. Tutors encourage a culture of commitment to thoughtful reflection, open discourse, experimentation, risk taking, assessment, and analysis.

Collaborative learning environment

The digital education environment enables learners to work together to explore a significant question or create a meaningful project. Study units and programs enable knowledge to evolve through discussion, reflection, and collaboration. Learners have the opportunity to take initiative and responsibility to listen, question, and think critically within the community of fellow learners. Learners are empowered by learning with, from and about one another. Tutors model the sense of community by supporting and providing constructive feedback to learners and encourage learners to do the same.

Inclusive and safe

Effective digital education establishes a learning community where learners feel comfortable and have a sense of belonging. Success, engagement, satisfaction, and learning are dependent on the support and sense of identity that comes from developing relationships within the learning environment and being a valued member of a community. Ethical principles guide tutors as they work to establish an inclusive and safe learning environment. These principles include learner confidentiality, learner development, pedagogical competence, an appropriate and supportive approach to sensitive topics, respect for learners and colleagues, and valid, fair assessment. The tutor also explains and enforces principles of internet etiquette. Options are provided to support varied learner needs and abilities.

Participatory culture

To encourage learners to actively and safely participate in the collaborative learning environment, a set of policies and expectations are established regarding etiquette and protocols for reflection and discourse within the community. This culture of participation can be facilitated by having learners create profiles that are available to other learners, so they get to know each other. A café-style forum where learners can socialise within the context of the learning environment can stimulate participation within the community.

Structure

Key structural components provide a scaffolding on which effective digital education is built and can continue to deliver value to the host organization and to learners. Developing and

maintaining effective digital education solutions that are scalable for varying and future needs of the organization and are customisable for different classes or learners requires organizational funding and buy-in. Clear statements of ethical and academic guidelines for assignments, postings, plagiarism, and participation can help ensure fair, consistent and high-quality standards within the learning environment.

Organizational funding and buy-in

The ability to create and deliver effective digital education depends on funding and buy-in from the organization planning to implement it. Developing a fully realized, robust, and scalable digital learning platform requires coordinating input from academic staff, instructional designers, software developers, videographers, and graphic designers. Delivery of successful digital education programs depend on ongoing, multi-faceted support including administrative assistance, training for academic staff, academic help for learners, as well as technology and media support for all participants.

Scalable and customisable

Effectively designed digital education can be scaled up or down according to class or staff requirements. It is easily adaptable for changing class or learner needs and can be delivered by several tutors for many course offerings.

Statement of ethical expectations

A clear statement of ethical expectations ensures that tutors and learners are aware of their ethical responsibilities when participating in digital education. This includes policies regarding confidentiality, attendance, participation, and consequences for cheating and plagiarism. It also communicates the expectations around demonstrating respect for other learners and academic staff.

Learner Assessment

Assessment is integrated into the pedagogical strategies and meshes with the overall learning design. Assessment activities that encourage dialogue, collaborative activities, and problem-solving can be more effective than traditional tests. Clear guidelines about how learners should submit completed assignments, due dates, evaluation criteria, and modes for feedback prepares learners for the workload.

Program evaluation

Program evaluation is a systematic assessment of study unit content and delivery based on feedback solicited from participants. Academic staff conduct brief formative assessments at regular intervals throughout the study unit of study. Formative assessments ask learners what is working and what is not working for them in the study unit. The anonymous feedback enables staff to understand the progress and needs of learners and address minor issues before they become significant. A summative evaluation administered at the end of each study unit assesses the overall study unit to address quality standards related to content, delivery, support structure, community and outcomes. Consistent program evaluation provides quality assurance safeguards and ensures that best practices and

cutting-edge knowledge outcomes remain robust and equal or superior to traditional face-to-face learning.

Continuous improvement and emerging design

Academic staff and designers of effective digital education continually assess study units and sessions and, when possible, implement changes to improve the quality of the study unit in situ or for the next iteration. Updating content and design on an ongoing basis ensures that digital education continues to address evolving learning requirements and technological advances.

*All variables and sub-variables in this framework are considered essential to effective digital education design, delivery and evaluation. It is recognized that these variables and sub-variables are not isolated entities—there is overlap and redundancy between and among them. It is also realized that the descriptions for many of these variables and sub-variables could go under various terms or titles. It is the ‘concept’ and the collective application of these variables and

Table 3: Digital Education Variables and Sub-Variables

Structure	Delivery	Content	Community	Support	Outcomes
Scalability - course can be taught many times, the economy of scale justifies the time and effort needed to design.	Usability - information on the site is kept up-to-date, organized and easy to navigate with no dead ends or stale links.	Content is relevant and authentic. Content is grounded in theory and best practices.	A collaborative and healthy learning environment. The learning community is comfortable, inclusive, and safe.	Free convenient professional development is provided to faculty to support them in transitioning to teaching online.	Increased student satisfaction regarding options and quality of teaching and learning.
Motivation - buy in from administration and faculty. Provide solutions to the barriers preventing some educators from embracing technology to enhance teaching.	Accessibility - A variety of learning activities incorporated to address various learning styles. Evidence of Teacher, Cognitive and Social presence.	Content is professionally presented, organized and chunked in meaning segments, which progress logically building on previous information.	Students cooperate by interacting and supporting one another. Students are empowered by learning with and from one another.	Prompt feedback - timely, thoughtful and relevant feedback provided on assignments, and in response to postings and emails. Facilitators available for tutoring and support.	Increase faculty satisfaction regarding teaching options and flexibility. Increased knowledge and skills.
Ethical responsibilities - adhere to copyright compliance fair use, plagiarism and accessibility standards.	Pedagogical strategies chosen to support the achievement of outcomes and competencies. Activities require students to reflect and think critically.	Content is supported with relevant resources and additional readings. Instructional materials and resources conveniently	Students are challenged with responsibilities in the learning process.	Teachers are responsive to student needs and concerns. Technical support is available and issues promptly addressed. Basic technical and media training for students to increase	Opportunities to apply new knowledge in practical situations. Increased use and effectiveness of technology in teaching. Increased institutional impact,

<p>Institutional funding and support provided.</p> <p>Virtual platform selected considering both the accessibility and usability of the hardware and software.</p> <p>Collaboratively designed blended and online study units and courses with partnering European Union universities.</p>	<p>Activities are engaging and interactive.</p> <p>Evidence-based teaching practices and research informed teaching practices.</p>	<p>provided and accessible online.</p>	<p>Students are engaged in the learning process.</p>	<p>digital comfort and fluency in accessing and using the virtual platform and creating digital products (e.g. videos).</p>	<p>perception of quality and delivery, and international competitiveness in the digital era.</p>
<p>Evaluation</p>					
<p>A variety of formative and summative assessment strategies are implemented to ensure fair and consistent student assessment and attainment of the learning objectives. Ongoing program evaluation/audit is conducted to facilitate continual course/study unit improvement.</p>					